

Astrology and Sociability: A Comparative Analysis of the Results of a Psychological Test

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Abstract — The aim of this study is to compare sociability scores with classic astrological data found in the natal charts of a population of 524 students (Ss), of an average age of 22.09 years, by using the Eysenck and Wilson psychological test. The position of the Sun in eleven out of the twelve zodiacal signs (months) corresponds significantly to alternations of higher and lower sociability for the odd and even signs of the zodiac respectively, this being in complete conformity with astrological tradition. Since other alternations are also revealed, particularly in the case of the planet of Mars, it would appear that the argument of self-attribution by the Ss cannot be used to undermine these results. Moreover, the division into months of the calendar year eliminates all alternations, thus fully justifying an astrological, zodiacal and seasonal division — the Vernal point corresponds to 0° of Aries — which cancels out any influence of the precession of the equinoxes phenomenon. On the other hand, in the two types of annual divisions — zodiacal and calendar — a significant sinusoidal evolution (COSINOR) in the sociability scores appears, with a maximum in October/Libra. At present this cycle cannot be explained. The Moon, Mercury, Venus and the Ascendant show little or no connection with sociability. The positions of the planets at the four astrological "angles" (Ascendant, Midheaven, Descendant and Nadir) correspond slightly to astrological data, while the "aspects" (angles in degrees) formed between the Sun and planets partially confirm the astrological data for Jupiter and Saturn.

Keywords: Astrology — sociability — personality inventory — statistical analysis — COSINOR

Introduction

The problem of a correlation between astrological factors based on the one hand on data relating to birth, and on the other, on personality traits, has been the object of several studies, few of which have turned out to be positive.

Pellegrini (1973) and Angst & Scheidegger (1976) searched, without any success, for a relationship between the solar sign of the zodiac and values obtained through the use of a psychological test (Freiburger P1 and CPI respectively). However, Mayo, White and Eysenck (1978), who adopted a similar approach in 1978, found a clear relationship between the solar sign and extro-introversion (Eysenck, Personality Inventory): the odd signs (Aries, Gemini,

Leo, Libra, Sagittarius and Aquarius) are notably more extrovert than the six others (Taurus, Cancer, Virgo, Scorpio, Capricorn and Pisces).

These findings sparked many years of controversy, usually calling into question the test which was believed to be biased because of "self-attribution" by candidates who were assumed to have had prior knowledge of their signs (Pawlik & Buse, 1979; Kelly & Sasklofske, 1981; Eysenck & Nias 1982; Russell & Wagstaff 1983; Fourie 1984). Only van Rooij *et al.* (1988) found the result of Mayo *et al.* to be positive in 1988, but this seems to have been subsequently refuted by van Rooij (1991).

Another type of study consists in comparing the results of a test with the views of astrologers. However, this method does not seem to be a very valid one, and its results are usually negative: Tyson (1984), Angevent & Man (1988) or McGrew & McFall, (1990) to cite a few examples.

One imperative emerged in the face of such contradictory studies. This was to resort to additional astrological data other than just the solar sign (Fuzeau-Braesch (1989)) and to construct more advanced methods for statistical analysis.

To our knowledge, only one publication has partially answered this need. Hume and Goldstein (1977) took into consideration a large number of astrological factors (the eight planets, the Sun and Moon, the Ascendant, the twelve signs of the zodiac, the twelve houses, and the five aspects, in the tropical and sidereal zodiacs). However, their failure to find a correlation was largely due to their statistical methods. They divided the test results of 196 individuals into two groups according to their score levels (two tests were used: Leary and MMPI) and carried out 632 chi-2 tests. Since only 23 of them were significant, the entire astrological hypothesis was rejected by the authors who did not study the 23 positive chi-square tests in question, even though this could have been of some interest. This is why we wished to examine the problem again, using new data and reliable statistical methods.

Methods

Psychological Test

The Eysenck and Wilson (1975) test, translated into French by the author, was selected to carry out this study, and provides a score ranging from 0 to 30 for each subject (Ss). Among the 21 items of this test, it was decided to focus primarily on the analysis of *sociability* which, in fact, was shown by Eysenck *et al.* (1992) to be highly correlated with extroversion. The French translation of the test was submitted to the author, Professor Eysenck, who did not express any disapproval. It has worked very well in France and Ss have had no problem in answering it. It should however be pointed out that the mean of the French population is 18.05, and is therefore higher than the 16.6 of the English population tested. This is not surprising and in no way invalidates our results.

The general method used consists in adhering closely to the concrete, unweighted and objective results of the test by working on the quantitative scores obtained.

Population Studied

The population consisted of 524 French voluntary students from seven different high-level schools or universities studying in various fields, including science, architecture, business administration and psychology (Ecoles Polytechnique, Supplec, Institut Universitaire de Technologie, Hautes Etudes Commerciales, Ecole Supérieure de Commerce, Ecole Supérieure d'Architecture, UFR Universitaire de Psychologie). These different professional streams were chosen deliberately in order to avoid any eventual psychological bias linked to a specialization. Their ages ranged from 18 to 30 years, with an average of 22.09 years. This had the advantage of limiting the dispersal of positions of the so-called "slow" planets.

It was clear from contacts with the students that they had very little or no knowledge of astrology, as they were all engaged in studies which occupied most of their time and energy. In view of the imbalance between the number of females and males (213 females compared to 311 males) and the restricted number in each category, the decision was made not to analyze the genders separately in this study.

Methods of Astrological Analysis

The date and time of birth of each of the 524 students made it possible to calculate their natal charts with the position of the ten elements of the sky, taking into account by traditional astrology: the Sun, the Moon, Mercury, Venus, Mars, Jupiter, Saturn, Uranus and Pluto, as well as the axes of the horizon (Ascendant to the East, Descendant to the West) and of the Meridian (Midheaven = *m.c.* and Nadir = *i.c.* for the upper and lower culminations), that is to say, the four traditional "angles". One should also add the "aspects" between the planets, that is to say, the geometric angles formed between them from 0 to 360°.

The astrological base considered is the tropical zodiac, of which the twelve signs correspond to the following divisions, according to the axes of the equinoxes and solstices:

Aries	21 March–20 April
Taurus	21 April–20 May
Gemini	21 May–21 June
Cancer	22 June–22 July
Leo	23 July–22 August
Virgo	23 August–22 September
Libra	23 September–22 October
Scorpio	23 October–21 November

Sagittarius	22 November–20 December
Capricorn	21 December–19 January
Aquarius	20 January–18 February
Pisces	19 February–20 March

The theory of Ptolemy was carefully taken into consideration. According to this theory, the signs alternate in their "masculine" (odd) and "feminine" (even) traits; it has been used again by contemporary astrologists under the respective terms of "extrovert" and "introvert".

The most simple, objective, reliable and appropriate statistical method was adopted for each problem under investigation. The aim was to compare the results obtained with the rules of traditional astrology, which will be explained and discussed in the section on working methods, so as to avoid the need for the reader to have either a formal preliminary account of astrology or prior knowledge. Thus, after an account of the raw results, a general discussion will expound their meaning.

Results

This study should start with an analysis of the list of objective astronomical data relating to the 524 Ss. Table 1 shows the positions of the ten elements of the sky and the Ascendant distributed among the twelve signs of the zodiac (tropic: 0° Aries = Vernal point, equinox of spring in the northern hemisphere), followed by the four angles, indicating the number of Ss and the mean scores for each group.

It should be noted in this table that the so-called "rapid planets" cover all the twelve signs of the zodiac, but that this does not apply to the "slow" ones since the births occurred mainly within a three-year period. Thus, Jupiter was to be found in eight signs (Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio), but mainly in the last two; Saturn in six signs (Aries, Taurus, Gemini, Cancer, Leo, Pisces, but mainly in the first three); Uranus in Libra in the case of 498 Ss; Neptune in Sagittarius in the case 438 Ss; Pluto in Virgo and Libra in the case of, respectively, 206 and 318 out of the 524 Ss.

The standard errors and confidence intervals were calculated: in many cases, they were high compared to the mean, ranging from 0.52 to 2.76. It was therefore observed that the significance of the mean of each group could not be studied by resorting to such methods. In fact, *the analysis of variance (ANOVA) produces global probabilities (F for Fisher) which are nearly always higher than 0.05. Consequently, such analyses are overall irrelevant for the purposes of this kind of study.* This is due to the wide disparity in the values of the psychological scores frequently encountered in this kind of work. In the rare cases in which the probability obtained was equal to, or lower than, 0.05, the analysis of variance was obviously retained. *Whenever necessary, other statistical methods were used; these are described below.*

TABLE 1
Individual Mean Scores on Sociability¹

Factor	N	Mean	Factor	N	Mean	Factor	N	Mean
SU-AR	57	16.73	VE-AR	39	18.45	SA-AR	14	16.89
SU-TA	58	17.76	VE-TA	42	19.01	SA-TA	134	17.50
SU-GE	54	18.78	VE-GE	68	16.80	SA-GE	260	17.85
SU-CN	45	17.76	VE-CN	53	18.92	SA-CN	109	19.06
SU-LE	43	18.91	VE-LE	41	17.77	SA-LE	2	21.50
SU-VI	40	17.75	VE-VI	33	18.20	SA-PI	5	22.70
SU-LI	38	19.28	VE-LI	30	18.70	SA-AS	33	18.73
SU-SC	38	18.79	VE-SC	60	18.53	SA-NA	20	17.45
SU-SG	41	19.01	VE-SG	26	18.27	SA-DS	30	15.98
SU-CP	38	17.13	VE-CP	36	18.40	SA-MH	36	19.38
SU-AQ	36	17.97	VE-AQ	54	17.96	UR-VI	11	18.27
SU-PI	36	17.04	VE-PI	42	16.29	UR-LI	498	18.00
SU-AS	36	18.82	VE-AS	28	18.77	UR-SC	15	19.60
SU-NA	27	17.80	VE-NA	17	17.82	UR-AS	33	17.50
SU-DS	21	19.57	VE-DS	36	16.69	UR-NA	30	17.63
SU-MH	33	19.91	VE-MH	25	18.08	UR-DS	31	17.73
MO-AR	37	17.97	MA-AR	51	18.69	UR-MH	24	17.79
MO-TA	49	16.64	MA-TA	66	17.73	NE-SC	86	18.26
MO-GE	41	18.37	MA-GE	45	16.93	NE-SG	438	18.01
MO-CN	46	18.32	MA-CN	39	18.42	NE-AS	22	15.05
MO-LE	48	17.79	MA-LE	33	17.67	NE-NA	33	18.27
MO-VI	46	18.39	MA-VI	39	19.03	NE-DS	32	18.27
MO-LI	39	17.79	MA-LI	30	18.43	NE-MH	21	17.64
MO-SC	37	19.23	MA-SC	36	17.74	PL-VI	206	17.70
MO-SG	42	17.79	MA-SG	39	18.42	PL-LI	318	18.27
MO-CP	48	18.21	MA-CP	38	16.97	PL-AS	26	19.85
MO-AQ	46	17.63	MA-AQ	68	19.32	PL-NA	20	17.98
MO-PI	45	18.74	MA-PI	40	16.48	PL-DS	22	18.98
MO-AS	35	18.49	MA-AS	35	18.10	PL-MH	26	17.27
MO-NA	27	17.67	MA-NA	30	18.25	AS-AR	23	16.50
MO-DS	31	18.18	MA-DS	35	19.14	AS-TA	21	18.74
MO-MH	27	16.89	MA-MH	40	18.34	AS-GE	43	18.95
ME-AR	65	17.24	JU-AR	3	17.50	AS-CN	60	17.93
ME-TA	50	18.40	JU-TA	1	25.50	AS-LE	56	17.95
ME-GE	26	17.73	JU-GE	2	22.50	AS-VI	59	19.25
ME-CN	43	17.91	JU-CN	2	19.75	AS-LI	56	17.23
ME-LE	62	18.40	JU-LE	4	16.50	AS-SC	65	17.93
ME-VI	30	17.63	JU-VI	10	18.80	AS-SG	46	17.03
ME-LI	38	18.88	JU-LI	32	18.53	AS-CP	49	16.89
ME-SC	45	19.71	JU-SC	84	17.18	AS-AQ	29	20.00
ME-SG	54	18.09	JU-SG	87	17.93	AS-PI	17	19.44
ME-CP	31	16.98	JU-CP	104	17.90			
ME-AQ	36	18.44	JU-AQ	126	18.30			
ME-PI	44	16.90	JU-PI	69	18.51			
ME-AS	28	18.93	JU-AS	34	17.99			
ME-NA	23	16.72	JU-NA	36	18.75			
ME-DS	17	19.03	JU-DS	32	18.30			
ME-MH	45	18.50	JU-MH	30	17.90			

AR = Aries, TA = Taurus, GE = Gemini, CN = Cancer, LE = Leo, VI = Virgo, LI = Libra, SC = Scorpio, SA = Sagittarius, CA = Capricorn, AQ = Aquarius, PI = Pisces, SU = Sun, MO = Moon, ME = Mercury, VE = Venus, MA = Mars, JU = Jupiter, SA = Saturn, UR = Uranus, NE = Neptune, PL = Pluto, AS = Ascendant, DS = Descendant, MH = Midheaven, NA = Nadir.

¹Values of the individual mean scores on sociability for each factor considered: each sign of the zodiac and each angle, for each element of the sky successively.

Sun

Figure 1 represents the differences to the mean as a percentage of the psychological scores distributed among each of the twelve zodiacal signs for the Sun. The values for a certain number of signs are lower than the mean while others are higher. It is striking to note that from Taurus to Pisces, the differences to the mean alternate regularly, following an odd-even sign order of one lower and one higher. A Student-t of the general formula:

$$t = n \left[\frac{\sum \mu_{odd}}{n} - \frac{\sum \mu_{even}}{m} \right] / \sigma \sqrt{\frac{1}{N_{odd}} + \frac{1}{N_{even}}} \quad (1)$$

makes it possible to test the alternation hypothesis by considering on the one hand, the six odd signs (Aries, Gemini, Leo, Libra, Sagittarius and Aquarius) and the six even signs (Taurus, Cancer, Virgo, Scorpio, Capricorn and Pisces).

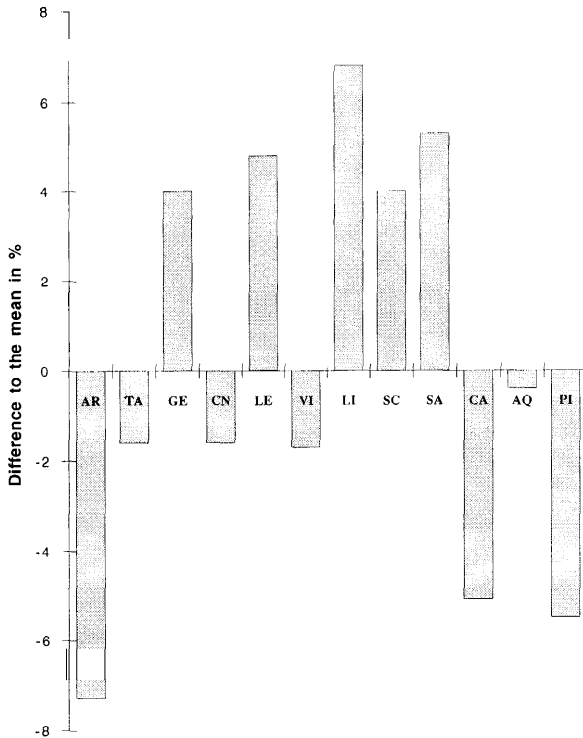
SUN / ZODIACAL YEAR

Fig. 1. Difference to the mean in percentage for each sign of the zodiac and the Sun. See caption of Table 1 for abbreviations.

It shows a probability higher than 0.05 ($t = 1.92$) which is therefore insignificant. On the other hand, by eliminating Aries, as clearly suggested by Figure 1, and by testing the alternation hypothesis on five odd and six even signs, the following result is obtained.

Group	Mean	Number
1 (even 2 to 12)	17.803	255
2 (odd 3 to 11)	18.716	212

The statistics thus signify, in this particular case for the Sun :

$$t = [18.79 - 17.705] / 5.06 \sqrt{\frac{1}{212} + \frac{1}{255}} = 2.31 \quad (2)$$

which is higher than 1.96 and indicates a $p > 0.05$ level.

The mean scores therefore alternate significantly between odd and even signs, with the exception of Aries, the justification of which will be found further on through the means of a COSINOR analysis.

In addition, 35 computerized random draws of the 524 values of the scores, with the same distribution in number of individuals in each of the twelve signs, failed to bring to the fore any regular alternation between them, as detected in the case of the real values.

Figure 2 represents the differences to the mean according to a division into months of the calendar year: the alternations disappear completely, showing higher means from July to November and lower means from December to April. It should be pointed out that this distribution does not follow the birth curve of France, the well-known maximum of which is in May and the minimum in January (INSEE data). This phenomenon can be analyzed by the following method.

Analysis by the COSINOR Method

This method (Halberg *et al.*, 1972) shows a sinusoid of the 524 scores, the acrophase of which is situated in October of the calendar year, with a very high significance of 0.02. This sinusoid also appears in the zodiacal year but with a $p = 0.04$ that is a little lower but still significant at the 5% threshold. The A amplitudes correspond to one half of the intra-annual rhythmic variability. The COSINOR sinusoid is shown in Figure 2.

Other Elements of the Sky in the Signs

Similar analyses were carried out for the Moon, Mercury, Venus, Mars and Ascendant (Figures 3 to 6), the other planets not being retained for the above-mentioned astronomical reasons. The COSINOR analysis does not detect any sinusoid at a significant level.

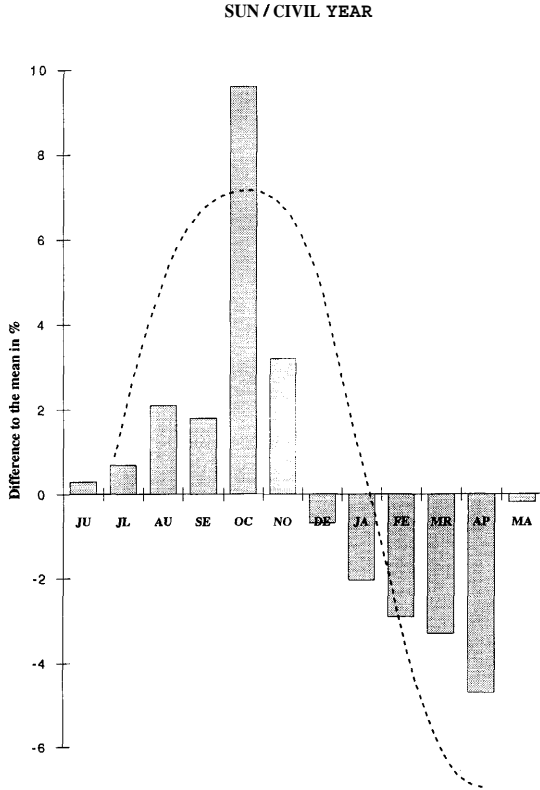


Fig. 2. Idem Figure 1, for each of the months of the calendar year. Dotted line: COSINOR sinusoid.

JU = June, JL = July, AU = August, SE = September, OC = October,
 NO = November, DE = December, JA = January, FE = February,
 MR = March, AP = April, MA = May. See caption of Table 1 for abbreviations.

Moon

A clear alternation from Cancer to Pisces, visible in Figure 3, is not confirmed by the calculation of the t described above, which gives a probability of over 0.05. Nor does the classic Student- t between adjacent signs provide any significance.

Mercury and Venus

The mean scores for these two planets do not reveal any visible alternation (Figures 4 and 5). However, a significant difference is detected for Venus by the calculation of the Student- t between adjacent signs: Taurus-Gemini $p = 0.02$, Gemini-Cancer $p = 0.02$, as well as Pisces-Aries $p = 0.05$.

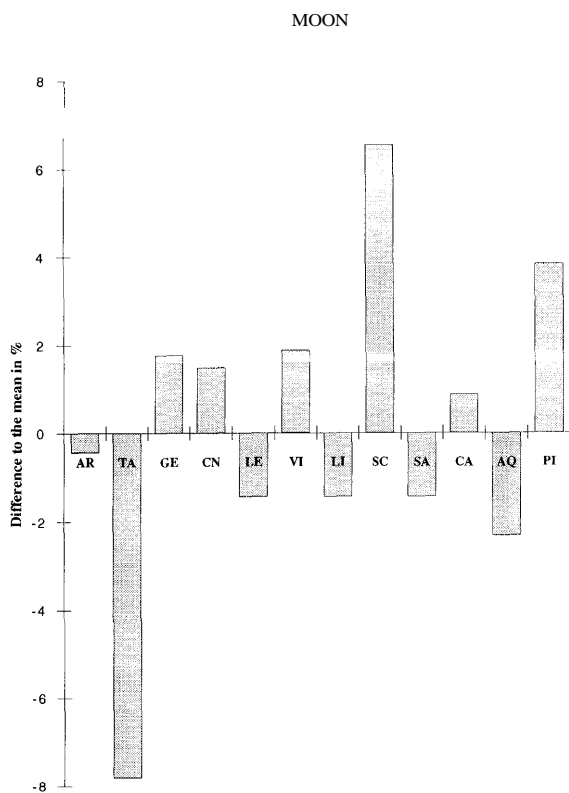


Fig. 3. Idem Figure 1, Moon.

Mars

The graph (Figure 6) provides a means to test the clearly alternated signs of Aries-Taurus, Libra-Scorpio, Sagittarius-Capricorn and Aquarius-Pisces for which the weighed t linked to the alternation hypothesis is 2.81, that is to say, a probability lower than 0.05. Furthermore, the classic Student- t calculated between Capricorn-Aquarius, Aquarius-Pisces and Pisces-Aries indicates a highly significant p of 0.02, 0.005 and 0.03 respectively.

Ascendant

General and regular alternations do not emerge (Figure 7), but certain differences to the mean are notable. An alternation hypothesis between Aries-Taurus, Virgo-Libra and Scorpio-Sagittarius is statistically significant with a $t = 2.33$, in other words, a p lower than 0.05. Moreover, the Student- t between the adjacent groups Virgo-Libra and Capricorn-Aquarius gives values of $p = 0.03$ and 0.009 respectively.

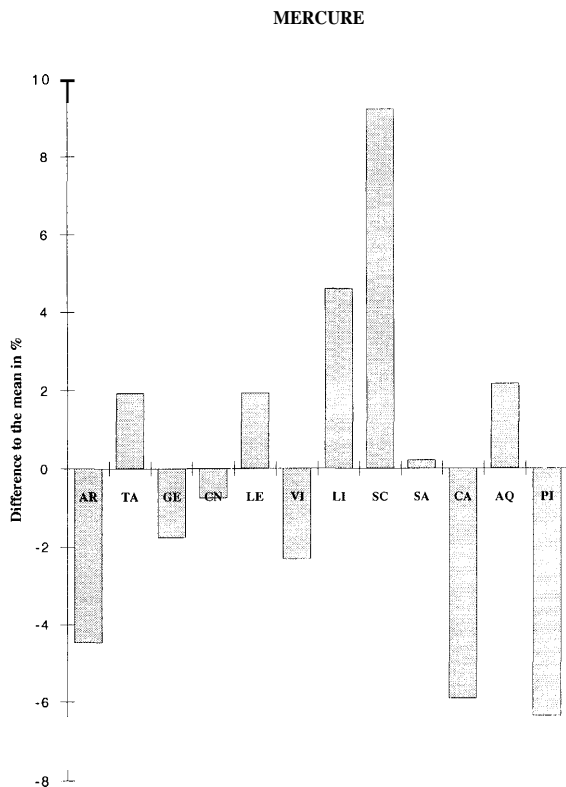


Fig. 4. Idem Figure 1, Mercury.

Angles

Figure 8 represents the differences to the mean scores for the four angles, Ascendant, Midheaven, Descendant and Nadir, by considering each of the ten elements of the sky as being at an angle of nearly $\pm 10^\circ$ to these points. The values vary considerably.

The astrological hypothesis consists in affirming an enhancement of the planets situated in these positions compared to the zones situated between each of them, that is to say, in the four zones of the zodiacal circumference: 10 to 80° , 100 to 170° , 190 to 260° and 280 to 350° respectively. The calculation method of the Student-t between adjacent groups only detects four significances

Sun/Midheaven ($p = 0.02$), Saturn/Midheaven ($p = 0.02$), Neptune/Ascendant ($p = 0.05$) and Pluto/Ascendant ($p = 0.009$). The other columns of the graph merely represent statistically insignificant tendencies at a 5% threshold.

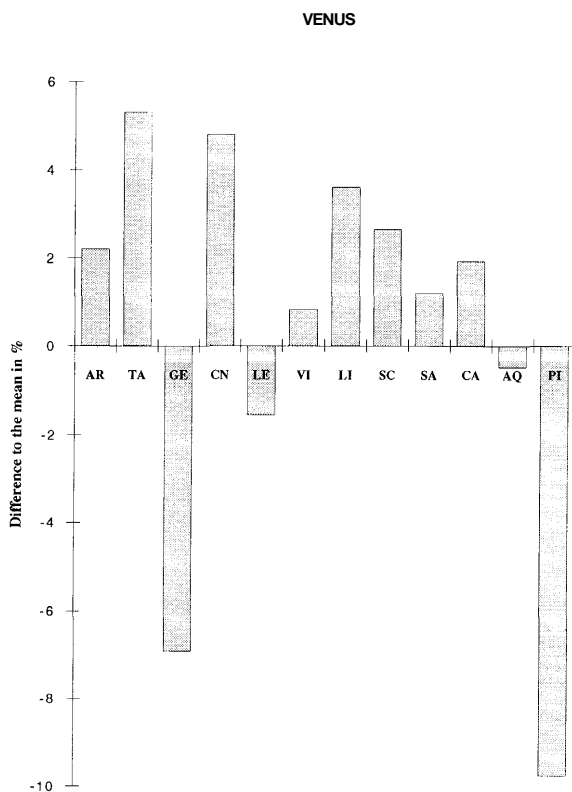


Fig. 5. Idem Figure 1, Venus.

Aspects

The astrological "aspects" are constituted by special geometric angles formed between the different elements of the sky. The means of the sociability scores were therefore calculated, in view of the results described above, according to the angles formed by the Sun on the one hand, and the Moon, Mars, Jupiter and Saturn on the other. The planets Mercury and Venus were not examined in this analysis since they never shift away from the Sun by more than 27 degrees in the case of Mercury and by 48 degrees in the case of Venus, owing to their orbits.

The calculations were carried out in 30° sections, from 0 to 360°, in the trigonometric sense of "positive" or "direct" (anti-clockwise). Thus, for example, a positive angle of 300° is also a negative angle of 60°, starting from the base 0°.

Here, the analysis of variance (calculation of F) only indicates a significant probability in the case of Jupiter and Saturn, of 0.0006 and 0.018 respectively (Figures 9 and 10). It can be seen that the mean scores are usually higher or lower than the general average.

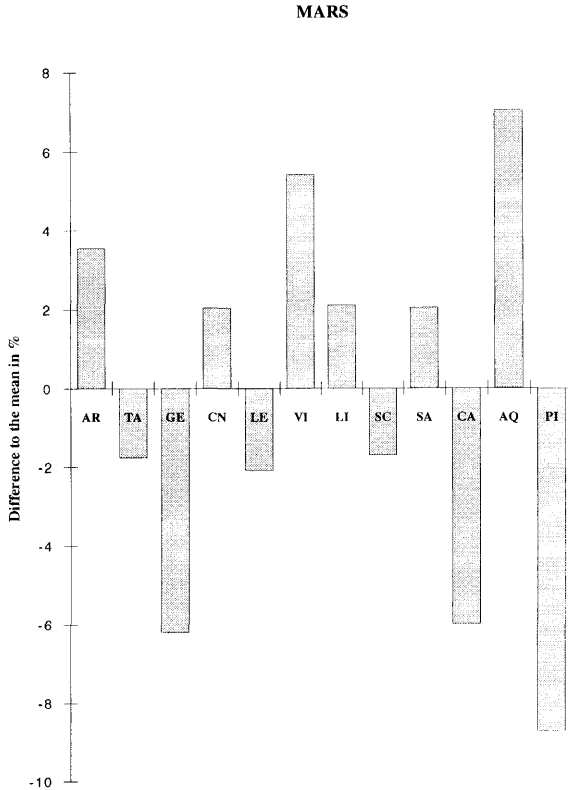


Fig. 6. Idem Figure 1, Mars.

Discussion

Hypothesis of Alternation

With the Sun in a sign, the sociability scores alternate significantly and in a regular way from one sign to another, from Taurus to Pisces. The most sociable signs are Gemini, Leo, Libra and Sagittarius (= odd signs); Scorpio is more sociable than the general average but less than the two adjacent odd signs; while Aquarius is average and therefore more sociable than the two adjacent signs, Capricorn and Pisces, which have the lowest mean scores. Only Aries departs from the rule since its sociability score is the lowest of them all. It should be noted in this respect that traditional astrology never describes this sign as "sociable" but as basically "energetic, decisive and go-ahead", and it will be seen below that an interpretation can be put forward. The way the COSINOR analysis explains this anomaly will be confirmed further on in this discussion.

AS

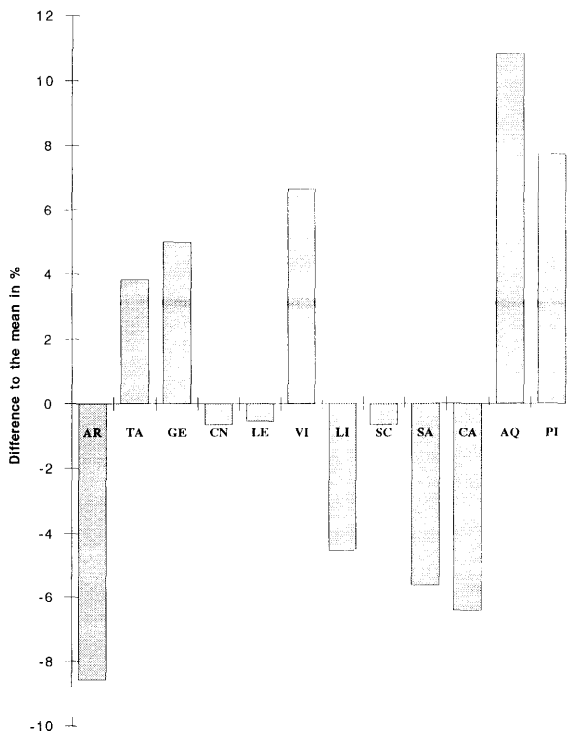


Fig. 7. Idem Figure 1, Ascendant.

In addition, the alternation of odd and even signs is confirmed by 35 random draws for which regular alternations of all consecutive signs were never obtained.

Thus, with the exception of the sign Aries, this alternation seems to clearly confirm and reproduce the results of Mayo *et al* (1978). However, the alternation of the more potentially sociable individuals born with the Sun in odd signs, and the least sociable individuals in even signs, is a traditional astrological fact.

Druzhinin (1995) recently treated in a similar way the results of several psychological tests carried out among 523 students attending a secondary school in Kaliningrad (Russia). The rather complex results show an excess of extroversion in Leo, but since regular alternations did not emerge, the author searched for other classic astrological groupings. He believed the most appropriate was an arrangement in signs known as "mutable" (Gemini, Virgo, Sagittarius and Pisces), "fixed" (Taurus, Leo, Scorpio and Aquarius) and "cardinal" (Aries, Cancer, Libra and Capricorn). The Sun in "mutable" signs

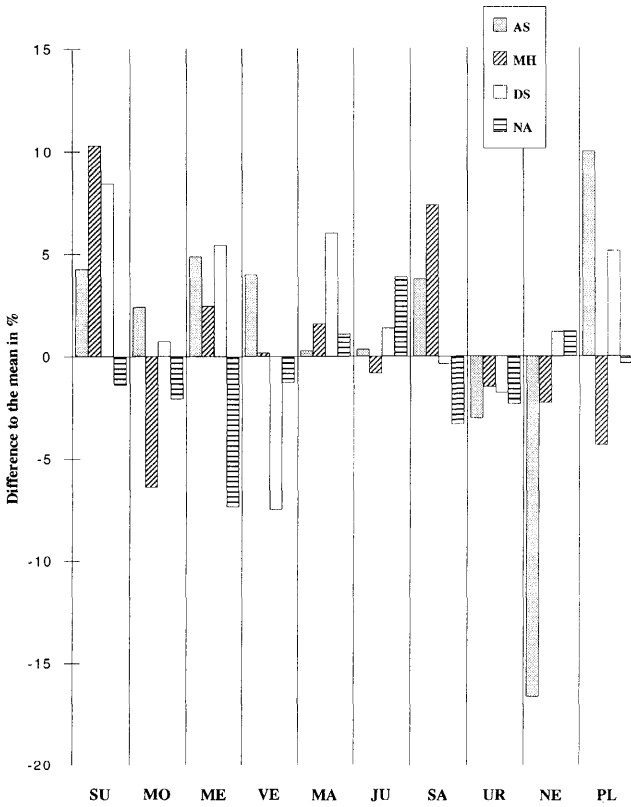


Fig. 8. Differences to the mean in percentage for the four angles (Ascendant, Midheaven, Descendant, Nadir) according to the ten elements of the sky considered. See caption of Table 1 for abbreviations.

corresponded to the most extrovert Ss. However, such groupings were not applicable to the results presented here (see Figure 1).

Our findings are therefore closer to the work of Mayo & Eysenck, 1978. In the lengthy and worldwide controversy they provoked, the main criticism of their work — and which could consequently include us — is that of "self-attribution". According to this theory, the Ss replying to the test questions are likely to be influenced by a knowledge of their own solar birth sign. However, it is difficult to put credence in such a theory because the test is composed of a total of 630 questions on 20 psychological items other than sociability, and these questions are intermingled in such a way that their order cannot be perceived by the Ss. Yet an additional opinion could be sought further on: this concerns the results relating to other elements of the sky which are not as widely known as the solar birth sign.

Comparison Between the Calendar and Zodiacal Years

The calculation of the mean of sociability scores for the twelve months of the calendar year (Figure 2: June to May) removes any alternation. The astrological phenomena therefore seem to be definitely linked to a seasonal division according to the equinox/solstice axes which not only permits the actual definition of the twelve zodiacal signs but also fully justifies it.

COSINOR Analyses

The entire annual trend of the sociability scores corresponds very significantly to a sinusoid with an acrophase in October, including, through the alternations described above, the zodiacal zones from Cancer to Aries in the part situated under the mean. This sinusoid does not correspond to the seasons since the winter of our hemisphere only consists of three signs: Capricorn, Aquarius and Pisces.

It is interesting to observe that the sinusoid in question can be found in both cases: the zodiacal and the calendar years. In the zodiacal year, the significant alternations are modulated by a remarkable annual rhythmic phenomenon which includes, and can explain, the paradoxically low mean of the Aries sign.

It is impossible to state what this annual rhythm corresponds to. As far as we know, no such cycle has ever been described. Is it climatic? It would be very interesting to replicate this analysis in the southern hemisphere.

Other Elements of the Sky

The Moon shows regular variations which, strangely enough, are opposite to those of the Sun, but the alternation hypothesis is not statistically significant. No regular alternations correspond to Mercury and Venus. Yet in the case of Venus, the scores of Taurus and Cancer are notably higher than Gemini; likewise, those of Pisces are notably lower than Aquarius. In the case of Mars, statistically significant alternations have been demonstrated for eight out of the twelve signs.

These results, therefore, indicate a partial link between Venus and Mars and sociability. This is yet another argument for rejecting the self-attribution theory. Although knowledge of the solar sign is fairly widespread among the present population, it is inconceivable that the same applies for the signs in which Venus or Mars are to be found.

Ascendant

Several significances of the mean scores relating to the signs of the Ascendant have been demonstrated, indicating a partial linkage with sociability. However, in this respect, they diverge from the rules of astrology in which tendencies traditionally correspond to those of the solar signs.

Angles

According to the method adopted, only the Sun and Saturn in Midheaven and Pluto in the Ascendant correspond to a significantly higher-than-average sociability, while Neptune in the Ascendant produces an extremely low score.

The initial result concerning the Sun fully confirms traditional astrology, that of Saturn and Pluto is in conflict, while Neptune is not contradictory.

It should be observed that the strong notions of classic astrology, such as the angular Jupiter linked to a profound sociability, do not appear here, while Uranus, always below the mean in our analysis — even though not to a significant extent — is very relevant to it. It can also be observed that our results, even the insignificant ones, seem to indicate a certain heterogeneity among the four angles (higher or lower than the mean) for the same element of the sky, which is not a traditional notion in astrology.

One should mention here the findings of the very numerous analyses undertaken in France by the Gauquelins (Fuzeau-Braesch, 1996; see also Ertel & Irving, 1997 and Kurtz, Nienhuys & Sandhu, 1997 for contradictory view) showing a strong correspondence between professions (and related personality traits) and planets situated at the angles: Saturn for scientists, Jupiter for actors and politicians, Mars for sportsmen, Moon for painters and writers. However, these analyses are not similar to the present study on sociability, and cannot be legitimately compared.

Aspects

The traditional aspects of astrology, accurately described by Kepler, (Simon, 1979) are:

conjunction	:	0° (±10°)
semi-sextile	:	30"
sextile		60"
semi-square	:	45"
square		90"
trigon		120"
sesqui-square	:	135°
quinconce		150°
opposition		180°

Astrological interpretation does not usually make a distinction between "direct" or positive angles and "indirect" or negative angles. Thus, a sextile or a trigon may be interpreted in an identical fashion on both sides of the conjunction position of 0°.

It has been seen that only the planets Jupiter and Saturn form angles with the Sun that are significantly different. Jupiter is considered in astrology to be an element corresponding to a high degree of sociability, especially when it forms a conjunction, sextile or trigon with Sun. Figure 9, in fact, indicates that the angles 0 to 30°, in the positive and the negative sense, show a sociability

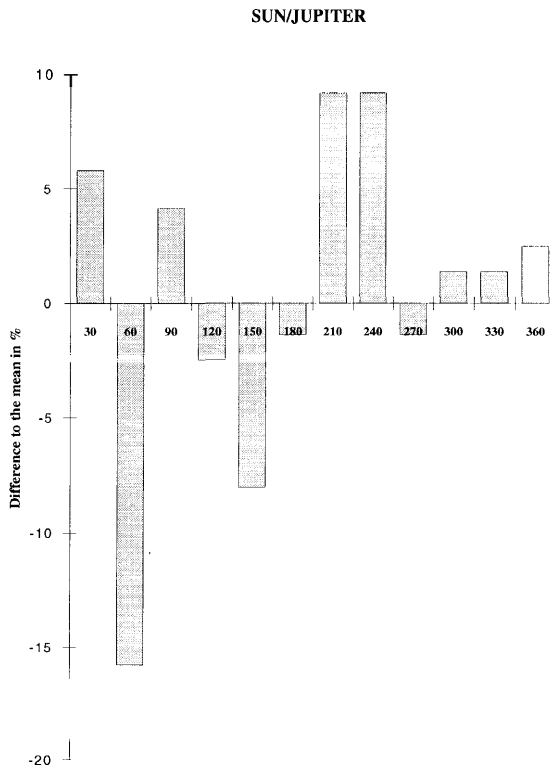


Fig. 9. Differences to the mean according to the angle in degrees (trigonometric, positive or direct sense (anti-clockwise) from 30 to 360°, formed by the Sun and Jupiter. Example: 30 = mean of the scores of individuals having in their natal chart an angle from 0 to 30° between the Sun and Jupiter.

higher than the mean, but also the angles 60 to 90° (square), and then to a large extent, the angles 180 to 240° (opposition and following positions). But a reverse result has been noted for the angles 30 to 60°, and 120 to 150°: the mean scores are very low, thus contradicting traditional astrology.

The same applies to the angles formed by the Sun and Saturn. Unlike Jupiter, Saturn is traditionally considered to be a rather negative element in terms of sociability. Figure 10 shows that for angles 90 to 120°, then angles 210 to 360°, that is to say, conjunction, sextile, trigon and quince in the negative sense, this is indeed the case. On the other hand, three sections can be detected in which the mean scores are higher than the average: from 0 to 30°, from 60 to 90° and from 180 to 210°; this does not accord with traditional astrology.

To conclude this kind of analysis, it would obviously be interesting to accumulate several elements, such as those which increase sociability (for example, for the sign Libra: the Sun with the addition of Venus, Mercury and Mars)

SUN/SATURN

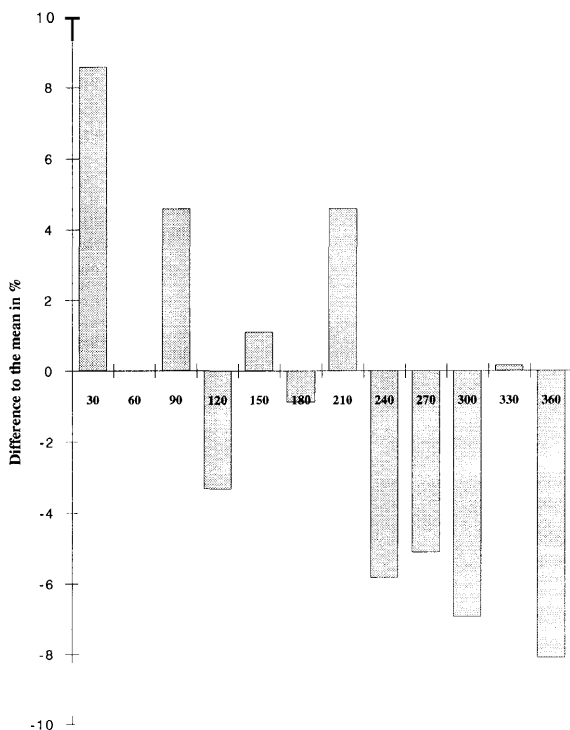


Fig. 10. Idem Figure 9, angle in degrees between the Sun and Saturn.

or others which decrease it (for example, Libra once again: the Moon and the Ascendant) in the separate results described above. But the operation would be impossible here since the number of Ss replying to the accumulations taken into account for Libra is too small for a study of this kind (for instance, only two Ss have the Sun, Mercury and Mars in Libra in their natal chart). An experiment permitting this type of research would initially require several thousand tested students.

Conclusions

A certain number of results are in keeping with astrological data (Fuzeau-Braesch, 1996), particularly with respect to the zodiacal division, strongly confirmed in the case of the Sun, and also Mars. The sociability scores generally alternate in the odd and even signs of the zodiac.

Furthermore, an annual non-astrological evolution was disclosed by the COSINOR method, showing a significant sinusoid of sociability at its maximum in Libra/October and at its minimum six months later. This is a new fact which should be interpreted, for example, by comparisons with different cli-

matic regions. This sinusoid (which has never been described as far as we know) helps to understand fully why the significant alternational hypothesis excludes the sign of Aries which has a particularly low level of sociability even though it is an odd sign.

It is interesting to observe that the results of the mean sociability scores change when studied according to a division into months of the calendar year, in which case zodiacal alternations disappear completely. This can be seen as a justification of the so-called "tropic" zodiac, indicating that the 0° Aries corresponds to the Vernal Equinox of astronomers and that the fundamentally seasonal signs used have nothing to do with the background of so-called "fixed" stars and, consequently, nothing to do either with the "precession of the equinoxes" phenomenon.

On the other hand, it appears that the zodiacal signs of the Moon and Mercury are not related to sociability; that of Venus only moderately; but that of Mars to a great extent. This is not in conflict with astrological knowledge.

As for the planets situated at the astrological angles (that is to say, the Ascendant and Descendant points of the horizon, the Midheaven and Nadir of the meridian line), the results diverge from astrological data since only the Sun seems to be linked to increased sociability, while Jupiter, which is considered to correspond closely to such an increase, does not appear in a significant manner here.

Other data conflict with astrology; the latter definitely takes into account the zodiacal sign of the Ascendant in psychological interpretation, whereas only a few scattered links have been found here, sometimes even in contradiction with astrology, such as scores that are lower than the mean for Ascendants situated in the signs of Leo or Sagittarius.

A study of variations in sociability scores, according to the angles, from 0 to 360°, formed between the Sun and different elements of the sky produces interesting results for the planets Jupiter and Saturn, both traditionally associated with sociability. In both cases, a certain number of positions correspond closely to astrological data: increased sociability in the case of Jupiter and decreased sociability in the case of Saturn, but only for certain angles or "aspects"; others that have come to light show reverse tendencies. Of course, the comprehensive analysis required by traditional astrology calls for even finer and more synthetic notions which have not been tested in this study. This should be taken into account in the future.

Finally, it would be appropriate to make a few comments on the personality test. A number of psychologists have refused to validate this type of method, arguing that the subjects can deliberately or unconsciously answer in an erroneous manner, thus leading to significant biases. Yet it is known that this method continues to be used for practical purposes. Basically, it is difficult to believe that the subjects can succeed in "lying" deliberately to 630 questions, mainly about problems of everyday life which are often trivial. On the other hand, as far as the influence of the subconscious and the "image of oneself" are

concerned, the reply can be just as interesting and does not invalidate the method as a whole. Obviously, there are no perfect solutions, but we had a tool at our disposal which seemed worth testing.

The detailed scores of the personality test and the birth dates of the 524 subjects are available for further research to anyone who is interested.

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