Resonance between Birth Charts of Friends: The Development of a New Astrological Research Tool on the Basis of an Investigation into Astrological Synastry

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Abstract—In traditional astrological frameworks of interpretation, resonances between positions of astrological planets in the birth charts of friends (called "candidates" and their "partners") are assumed to play a decisive role. In the study presented here, this general claim is investigated at different levels of sophistication. For this purpose, five main hypotheses are formulated, all of which are different versions of the general assumption that there are more resonances between birth charts of friends than can be expected randomly. The material on which the study is based is taken from a questionnaire concerning the dates of birth of candidates to whom the questionnaire was distributed, as well as those of their partners. Having gained interesting results with partially supporting evidence, but also with elements that did not support the hypotheses, the experiment was repeated with a second sample. It failed to replicate the results of the first experiment.

Keywords: astrology—synastry—astrological resonance—friendship—astrological aspects

Introduction

Scientific efforts to investigate the correlation of astronomical factors and terrestrial events have not yielded much convincing evidence for the astrological hypothesis ("as above, so below"). Occasionally there are, indeed, some studies with "positive results" claiming supporting evidence. However, they often turn out to be methodologically flawed or based on incorrect assumptions, as is the case, for example, in the majority of studies investigating correlations between astrological signs of the zodiac and

for example personality traits, occupational choice, and so forth.[1] Thus, the situation does not show great promise for research aiming to produce evidence for the astrological hypothesis (see Dean 1977, Kelly 1979, and Eysenck & Nias 1982, for comprehensive overviews of many older studies. A statement in accord with this by five prominent researchers in astrology and which takes more recent research into account is given in Phillipson 2000:142ff. Dean, Mather, & Kelly (1996:71–77) provide a meta-analysis of astrological studies).[2]

These discouraging facts are in opposition to the subjective (personal) evidence of many academically educated people who analyze horoscopes astrologically.[3] Thus there are, on the one hand, experiences of (subjective) evidence based on the application of experience-based assumptions (the application of traditionally handed-down rules of interpretation, of which some have been used successfully for hundreds of years),[4] and, on the other hand, almost every attempt to prove these rules has statistically failed to date. Skeptics perceive this as an indication of psychological processes (false attributions, the Barnum effect, etc.) playing a decisive role in the formation of experiences of astrological evidence (Dean 1999). This is a crucial point, of course, which has to be considered. However, it concerns mainly those kinds of astrological experiments that focus on the astrologer–client interaction, i.e. the interpretations of horoscopes as well as their communication (by the astrologer) and the understanding of them (by the client). Accordingly, the affirmation by a client that a horoscope interpretation is appropriate and consistent meets no reliable criterion for the validity of the astrological hypothesis (cf Niehenke 1987:98–99, Dean & Mather 1994:16). As a consequence, choosing empirical facts (e.g., career choice, suicide, car accidents, (bad) luck in love, etc.) for testing this hypothesis seems to be a better approach. Such an approach has been chosen by many researchers, and much literature on this topic has been written (cf Dean 1977, Eysenck & Nias 1982). Two kinds of research methods have been, generally speaking, applied to such investigations. The first is matching experiments, i.e. astrologers have to assign horoscopes to corresponding people (e.g., Steffert 1983, Böer, Niehenke, & Timm 1986, Dean 1986, Nanninga 1996/1997, Ertel 1998). This method is very time-consuming and strongly dependent on the skills of the astrologers concerned. The samples usually remain small. The second method often extracts single astrological factors from the overall context of the chart to test them for correspondences with empirical facts such as those given above (e.g., Gauquelin, 1978, 1983, 1988a, 1988b, Niehenke, 1987, Kollerstrom & O'Neill 1992, Sachs 1998, Denness 2000, Ruis 2007/2008). The approaches do not give consideration to the complexity of the astrological context of a chart and the sym-

bolic ambiguity of the astrological factors (Koch 2002). Furthermore, some of the investigated "facts" such as personality traits or statements on (bad) luck in matters of love are based on self-characterizations (e.g., Smithers & Cohen 1982, Steffert 1983, Dean 1985a, 1985b, 1986, Niehenke 1987). As demonstrated by various studies, a rudimentary knowledge of the characteristics of one's own astrological sign has an influence on self-characterization, for example in questionnaires on personality (Eysenck 1981, Eysenck & Nias 1982:50–60). In addition to this possible bias, the characterization of one's own behavior, feelings, and perceptions which is often asked for in such studies confronts the researcher with possible discrepancies of self-perception, self-portrayal, and actual behavior of the participants which are based on insufficient self-reflexivity, projections, etc. (cf Klein 1988, on this topic).[5]

Considering these problems, we developed a new research design that attempted to avoid some of the main weak points of previous studies:

- The complexity of astrological charts should be considered more adequately by not focusing solely on single constellations, and thereby taking the multiplicity of astrological aspects into account.
- A quantitative method should allow bigger samples than those possible with the usual matching test design.
- Problems occurring with the operationalization of psychological characteristics of participants should be largely avoided by avoiding verbal self-characterizations or characterizations by others. Instead, biographical facts should be elicited.

Synastry as an Object of Research

To take the last of the above-mentioned points into account (asking for biographical details), we directed our attention toward the field of friendships and long-term relationships. Personal relationships of this kind are highly personality-driven biographical facts, in contrast to more culturally determined biographical data (e.g., school-leaving exams); they are established on the basis of complex conscious and unconscious dispositions; we assume that the *engagement* in those relationships is to a lesser extent affected by self-perception than is the case with statements about one's own personality traits or about the subjective assessment of the quality of one's own relationships. As a rule, it also takes at least a little engagement of the related person of someone to call him or her a friend or lover. Therefore two people must be involved to establish a friendship or long-term relationship whereas self-characterizations (as gathered with personality inventories) de-

pend strongly on self-perceptions which can be strongly biased (see above). Thus, one deals with biographical facts that can easily be elicited, and which need little interpretation: A friendship exists or, respectively, existed or not. However, the assessment of the *quality* of the relationships itself is not objective.

In astrology, the technique of synastry is fundamental to the analysis of personal relationships. Using this technique, astrologers make statements regarding the quality and intensity of the interpersonal and interpsychical dynamics between two people (e.g., Davison 1983, Meyer 1976, Arroyo 1978). One can even find this technique, in a rudimentary form, in the work of the ancient astrologer Ptolemy (Ptolemy & Ashmand 1822:124–128). Several scientific studies on synastry exist—one need only think of the famous astrological experiment made by Carl Jung (Jung & Main 1997:109–118). The results were inconsistent (Müller 1957, Eysenck 1983a, 1983b, Shanks 1983, Kuypers 1984, Shanks & Steffert 1984, Klein 1988, O'Neill 1986, 1989, 1990, 1995, Ruis 1993/1994, 1994, 1994/1995) but nevertheless had at least some promising approaches (Ruis 1993/1994, 1994, 1994/1995).

According to the doctrine of astrological synastry, the qualities of a relationship between two people are largely reflected in the interaspects of the two birth charts.[6] We may clarify this with the following example using astrological assumptions: If the zodiacal position of Saturn in the first chart is the same as the position of the Moon in the second one (astrologically signified as the constellation "Saturn in conjunction to Moon"), the first person will have a relatively high influence on the mood of the second person. The birth chart can be interpreted as a diagram of an individual "frequency response system" which is based on the different periods of revolution of the planets, and which can be seen, in some respects, as an analogy to a chord in music. We are calling the "superposition" of the "frequency response systems" of two people *astrological resonance*, in accordance with musical or physical phenomena. Thus two related people with a high resonance have many interaspects, whereas a low resonance is characterized by relatively few interaspects between the two charts. The accuracy of an interaspect contributes to the level of the resonance, and a higher accuracy causes a higher resonance. In our opinion, the aspect of class plays a minor part in this conception. Most of the previous investigations into astrological synastry focused on married couples (e.g., Jung & Main 1997, Van de Moortel 1998). We did not want to limit our study to this kind of relationship defined by a formal criterion (although it would be a "hard fact") because of our assumption that there is a significant number of married couples who have motivations for the relationship other than an attraction on a psychical level.

This concerns marriage data from many years ago (e.g., such as that used by Gauquelin) above all. If astrological interaspects actually correlate with relationship motivations, the level of the astrological resonance of friends and long-term partners should therefore be higher than the resonance between chance pairs of people. That was the basic assumption of our research project. In addition, we assumed that this effect will increase with those relationships that are characterized as *particularly intensive* by the participants.

Method

Relationships Questionnaire

We developed a questionnaire to collect the birth dates of the participants (referred to as *candidates*) and their friends and long-term partners respectively (referred to as *partners*). A particular paragraph was devoted to the individual understanding of the quality of a relationship, that is the question of how a close friendship is characterized. We phrased our criteria broadly because people have very different attitudes concerning this matter, and only excluded relatives. In addition to the dates of birth of the partners, the candidates had to specify the sex of each partner, and to note if they characterized a relationship as particularly intensive. Some of our colleagues raised doubts as to whether certain candidates' previous astrological knowledge could lead to a particular partner choice strongly based on astrological criteria with the result that our data would be biased in a substantial way. Although the consideration of astrological criteria may be crucial for the partner choice by some strong adherents of astrology, we were of the opinion that this would not systematically bias our data. The instruction for the participants remained vague regarding the investigated hypotheses, and our method of data processing did not allow the outcome to be estimated. Therefore the probability that an intentional manipulation of the provided birth dates or selection of partners (e.g., in order to support the astrological hypothesis) would bias the outcome was certainly negligible.[7] Nevertheless, to take this point into account, we added two further questions in order to give an indication whether the candidates already had astrological knowledge, namely: *"Have you already have read a book on astrology?,"* and: *"Is the Sun sign an important factor for you regarding the choice of your friends?"*

In a second phase of data collection as part of the conceptual replication using the Internet, we modified the questionnaire slightly and added a second part for exploratory purposes. The modification of the first part concerned the indication of previous astrological knowledge and included three statements to be answered with "yes" or "no":
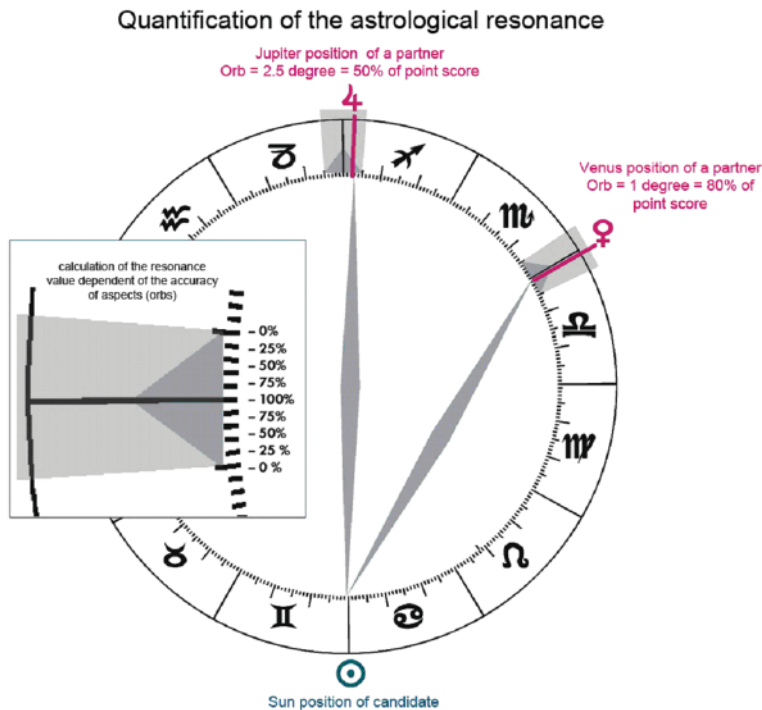
Figure 1. Quantification of the astrological resonance *R* between the candidate's Sun and two of the partner's planets

a) *I know the properties of my Sun sign well,*
b) *I know my ascendant,* and
c) *I know the zodiacal position of the Moon at the time of my birth.*

The second, optional, part of the questionnaire was only accessible when the first part had been completed. It provided the opportunity to give information on the kind of relationships (love, work life, friendship, recreational activities), their importance, their duration, and the frequency of contacts. Furthermore, information could be given about different aspects of life with regard to the relationships (erotic/sexual, emotional closeness/intimacy, good conversations, shared ideals, joint activities, learning from the partner).
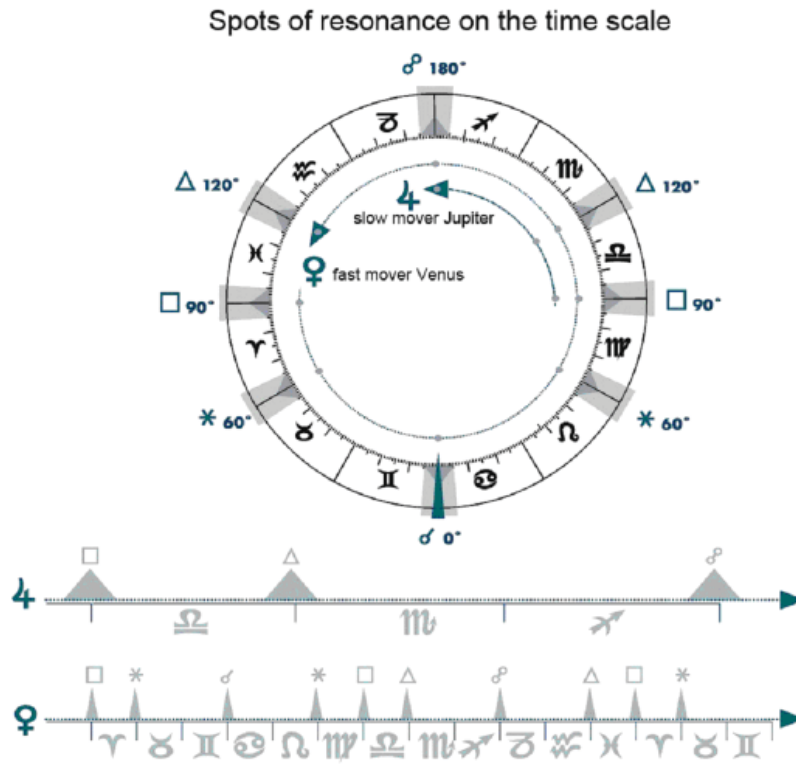
Figure 2. Points of resonance in the zodiacal circle that have been considered in our study (aspects)
Shown are two time scales of Jupiter and Venus which exemplarily demonstrate the different velocities of the planets Jupiter and Venus, and with that the different numbers of points of resonance during a period of time.

Assessment of the Astrological Resonance

We quantified the astrological resonance (R) by adding the weighted interaspects of the planets of the candidates (C) and partners (P). We chose the main astrological aspects of 0, 60, 90, 120, and 180 degrees, with an orb of 5 degrees. All planet pairs are considered equally. The weighting was linear: An exact aspect of two celestial bodies (planets plus Sun, in the following referred to as *planets*) received a value of 100 points. The value decreased linearly with an increasing orb and was given a value of 0 points at an orb of 5 degrees (see Figure 1 and Figure 2). The individual value used for the respective statistical operation depended on the selection of the planets which varied according to the hypothesis.

Hypotheses

We formulated five hypotheses with sub-hypotheses that all are variations of our basic assumptions, and, therefore, were highly dependent. The first hypothesis concerned all of the "classical" planets of the candidate (except for Uranus, Neptune, and Pluto) and all of the "classical" planets of the partner (except for the Moon and the Trans-Saturn planets):[8]

1. ***All candidate planets (except Uranus, Neptune, Pluto), all partner planets (except the Moon) (H 1):***
   There is no more resonance than to be expected randomly between all planetary positions of the candidate and all planetary positions of the corresponding partner.

   We limited the number of planets of the candidate to the Sun, Moon, Mercury, Venus, and Mars.

2. ***Individual candidate planets (prespecified), all partner planets (except the Moon) (H 2):***
   There is no more resonance than to be expected randomly between positions of the Sun, the Moon, Mercury, Venus, and Mars of the candidate and all planetary positions of the corresponding partner.

   With the third hypothesis we directed our attention to the positions of particular planets of the partners. Saturn, for example, is said to be of particular importance relating to persistent and deep relationships:[9]

3. ***All candidate planets, individual partner planets (prespecified) (H 3):***
   There is no more resonance than to be expected randomly between all planetary positions of the candidate and the position of Saturn of the corresponding partner.

   The fourth hypothesis refers to a widespread astrological concept, that most people are searching for a specific "planetary quality" in relationships: One may, for example, look for, above all, structure and trust in relationships—a quality of Saturn—whereas another may focus their attention on mainly aspects of harmony and hedonism—a quality of Venus—etc. Thus, we chose the individual planet of every candidate which had the largest resonance with his partner's planets:

4. ***Individual candidate planets (not prespecified), all partner planets (except the Moon) (H 4):***
   There is no more resonance than to be expected randomly between

> *the "most resonant" planet of the candidate and all planets of the corresponding partner.*

The significant element in this hypothesis is that the "most resonant" planet of the *candidate* is not prespecified. The hypothesis refers to the significance of the resonance value of this "most resonant" planet, no matter which one it is. In order to determine the "most resonant" planet, we computed the averaged R of every candidate's planet to all partners' planets. The "most resonant" planet is the candidate's planet with the highest ranking (see Mathematical Appendix, Equation 2).

With the fifth hypothesis we refer again to the concept of a specific "planetary quality" in relationships, but we change the perspective, looking at the individually preferred planet of the *partners*. First, we computed the resonance of every partner planet to the "classic" planets of the candidate. Then we averaged the single resonance values of every partner planet. We chose the individual planet of the partners with the highest mean resonance value regarding all the "classic" planets of the candidate for statistical computation (see Mathematical Appendix, Equation 3):

5. ***All candidate planets (except Uranus, Neptune, Pluto, individual partner planets (not prespecified) (H 5):***
   There is no more resonance than to be expected randomly between all planets of the candidate and the "most resonant" planet of the corresponding partner.

As mentioned above, we assumed that relationships which are characterized by the candidates as *particularly intensive* would correlate with higher resonance values than for other relationships. This assumption was the basis of the five sub-hypotheses:

> ***Intense relationships do not show significantly higher resonance values than less intense relationships.***

Assessment of Chance Expectancy (Reference Values)

The problem of estimating correct expectation values of complex astrological constellations adequately is not insignificant.[10] Using control groups is appropriate if distributions in the general population are known. This is not the case with complex astrological constellations.

O'Neill (1986, 1989, 1990) deals with this problem in his studies on synastry with eminent married couples by using another kind of "control." He built his "control" couples by "recomposing" birth data from his database

taking the same age of the new partners (approximately, and taking the mean age difference of the whole sample of pairs into account). In a similar way, Ruis (1993/1994) built new pairs in his re-analysis of the Gauquelin data of married couples by combining all male subjects with all female subjects considering specific age-groups, likewise in order to estimate the theoretically expected aspect frequencies. In a second step, Ruis (1994, 1994/1995) used a "shifting method" suggested by Ertel to eliminate possible artifacts associated with the age-difference between partners.[11] With this technique, the birth dates were shifted by a constant number of days in both directions. The results were in the expected direction, that is the grand total of synastry aspects decreased with the increasing shift of the birth dates—but only for the first days of shifting. Ertel recommended this "shifting method" to us to avoid the problem of having to estimate the expectation values of complex constellations (personal communication). The candidate's date of birth and all of the partners' dates of birth should be stepwise shifted on the time scale (see Figure 10 in the Mathematical Appendix).

In our opinion, this method is not suitable for complex astrological constellations because it assumes a homogenous astrological time line. It follows the idea that the constellation actually found is a "perfect" constellation. Accordingly, the shifting of the dates of birth should lead to a lesser degree of R—comparable with the astrological idea of decreasing effect of an aspect corresponding with its increasing inaccuracy (orbs). This argument is flawed because it is based on the idea of a homogeneous time scale. This is not the case. We do not have an interval-scaled dimension which unproblematically allows diverse mathematical operations. That is to say, every point on the time scale has its own resonance value in relation to every other point, which is defined as the superposition of the angular aspects in the respective planet constellation. These resonance values exhibit complex temporal dynamics resulting from the planetary revolutions.

In astrology, this "property" of time is often called the "astrological quality (of the moment) of time" (e.g., Niehenke 2002, Hyde 1992:127)[12] or "momentary quality" (e.g., Dean, Mather, & Kelly 1996:48). This "quality of time" can be definitely identified for every point in time on the basis of astronomical facts. Every day on the time line has its particular angular aspect structure between the planetary positions and, with that, its particular possibility of building specific angular aspects to the planets' position (R) at any other point on the time line. Our method of quantifying R allows us to calculate the resonance value of every point on the time scale corresponding to an individual horoscope. This calculation must be done separately for every candidate because of the particular astronomical situation on their date of birth.
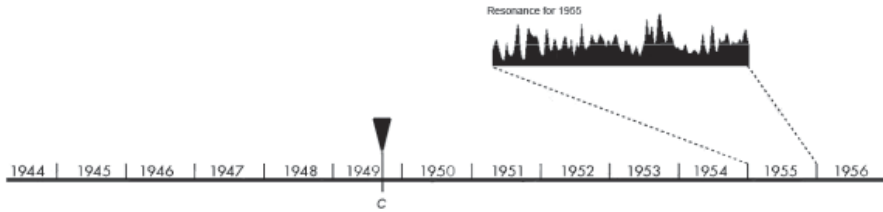
Figure 3. Time scale related to a candidate (C) with the fluctuation of the *R* in the year 1955 shown as an example
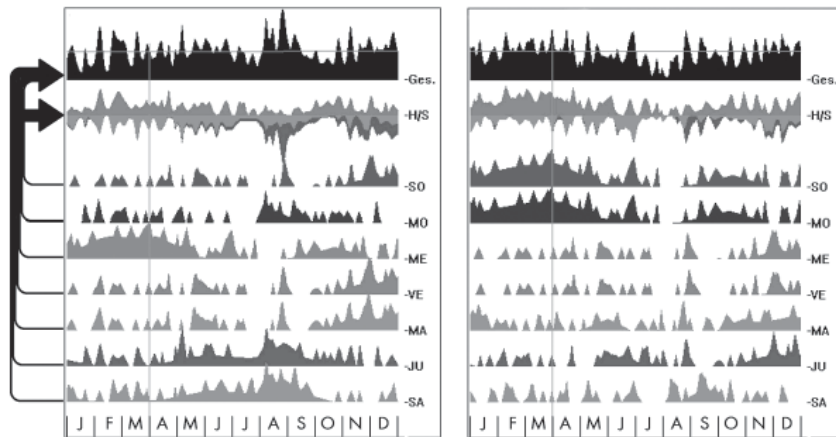

Figure 4. Example diagrams of resonance values from two different candidates A and B

The *y*-axis shows the degree of the quantified resonance; the *x*-axis shows the time segment of 1955 with the total of 365 days. The first row shows the total values of all planet resonances relating to the individual charts of A and B, respectively. The second row shows the total values separated into dissonant (light grey) aspects, harmonic (medium grey) aspects, and conjunctions (dark grey). The other rows show the resonance values of the single planets (Sun–Saturn). The diagrams clearly show the considerable daily fluctuation of the amount and the intensity of the interaspects. Short frequency fluctuations caused by the fast moving planets (Sun to Mars) are superposed by long frequency fluctuations caused by Jupiter, Saturn, and the Trans-Saturnal planets. It also becomes apparent how different the resonance values are for the two candidates A and B, depending on the birth charts. The vertical line in the diagram marks a single day at the end of March 1955 as an example to show the considerable individual differences of the resonance values.

The individual assessment of chance expectancy is necessary due to the inhomogeneity of the time axis, that is due to the permanently changing astronomical constellations of every point in time (date of birth). The values of individual chance expectancy can be assessed by calculating the R of a candidate's chart with the chart of every day on the time axis over a long period, and then by averaging the single resonances (see Figure 5, see Mathematical Appendix). Choosing a plus/minus 15-year period before and after a candidate's date of birth, the resonance value converges to a limit. This limit value can be interpreted as the individual value of chance expectancy (reference value) of the R accounting for the partners' dates of birth on a case-by-case basis because the dates of birth of all possible partners within this time period of 30 years have been taken into account with this procedure (see Figure 9).

However, there are further (socio-) psychological factors that have to be taken into consideration. People more frequently enter into loving relationships or relationships as friends when there is a relatively small difference between the ages of the partners. This is immediately evident: In school, in professional education, and in recreational activities, people come predominantly into contact with people of the same peer group. Indeed, there may be particular preferences in individual cases—for instance, being explicitly attracted to older people (see Figure 6). Thus, there are substantial uncertainties in estimating the "true" individual value of chance expectancy due to these factors which are difficult to manage. Therefore we developed a procedure in order to take such individual preferences and also general tendencies (peer group effects) into account: We considered the time segments around the dates of birth of the partners (current as well as previous) to assess the individual reference values by a randomized "blurring" of the partners' dates of birth (Monte Carlo method, see Mathematical Appendix) in accordance with a Gaussian distribution (computer simulations). With this method we were able to generate individual reference values that are not based on theoretical speculations about the chance expectancy of the choice of partners combined with the necessity of considering a wide variety of sociological and socio-demographical aspects. Instead, we gained this on a case-by-case basis of the possible birthdays of partners related to their chosen assemblage (the distribution of the actually indicated partners' dates of birth along the time axis).

One of the great benefits of this approach lies in the fact that all particular constellations in the chart of the candidate as well as all constellations of the relevant time periods are automatically taken into account because the selection of these time periods is prespecified by the birth dates of the particular candidates and of their actual partners.
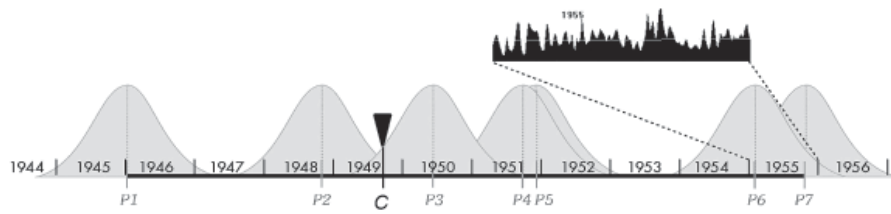
Figure 5. C is a candidate's date of birth, and P1–P7 are the partners' dates of birth
The *x*-axis, as a time axis, contains the individually calculated resonance curve of C over a long period of time (the enlarged black time segment demonstrates the course of the resonance curve). The *y*-axis shows the frequency distribution of the tests with single time points (dates of birth) within the simulation process statistics (grey curves).
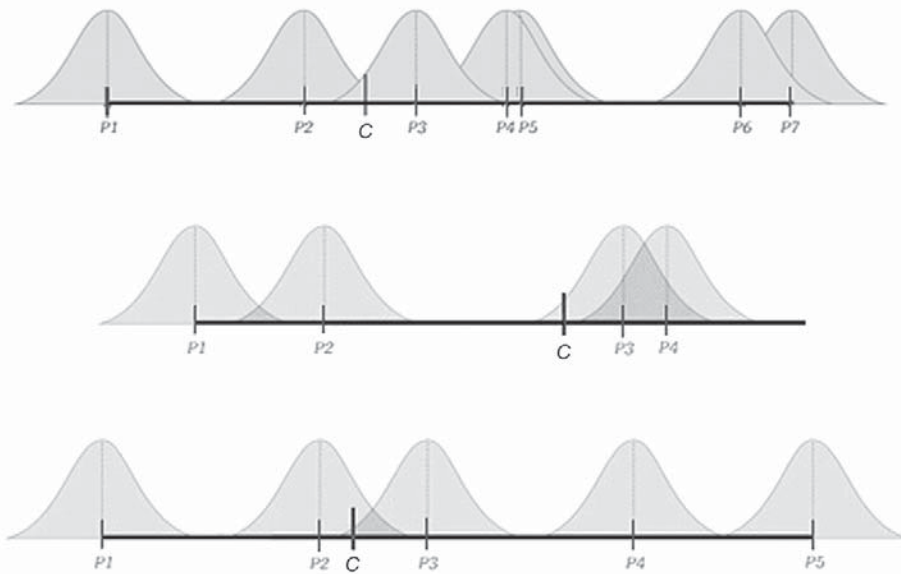

Figure 6. Different distributions of partners' dates of birth with three different candidates
The first candidate has seven, the second four, and the third five partners.

However, there are a few parameters that have to be determined partly on the basis of theoretical considerations and partly on the basis of empirical testing. One unproblematic point concerns the number of computations used to generate the reference values. We chose K = 5,000 computations (= 5,000 potential partner dates of birth per candidate distributed around the dates of birth of the actually chosen partners of the respective candidate) due to the observation that the changes in the results are negligible above this point.

The choice of the magnitude of the time periods around the partners' dates of birth ((modified) Gaussian distribution) which was used for the computer simulations was much more sophisticated, mainly because of the periods of revolution of the slower planets. On the one hand, the lower limits should not be too narrow because the slower planets should have the possibility of having an effect. On the other hand, the upper limits should not be wide because this would level off the particular patterns of partners. Another consideration concerns the question of whether it is reasonable to vary the time period corresponding to the age differences between the candidate and the particular partner. This may be plausible from an external point of view—from an astrological point of view it is not necessarily the case. Taking these considerations into account, we decided to use two different simulation models: one with a constant variance of two years around every partner's date of birth (SM 1—referring more to astrological reasoning) (see Figure 7), and one with a variable variance corresponding to the age differences, with a minimum time period of one year and a maximum time period of five years, and a linear gradient of 0.25 (SM 2—referring more to external criteria such as socio-demographical reflections) (see Figure 8).[13] For comparative purposes, we also performed computations with a constant time period of plus/minus 15 years (equally distributed) around the candidate's date of birth without accounting for the partner's date of birth (SM 3) (see Figure 9).

Data Collection

As mentioned above, the data was collected in two phases. The first sample was collected using paper questionnaires distributed among some *Deutscher Astrologenverband* (DAV) training centers and among our circles of acquaintances. We received 137 candidate questionnaires in response, with a total of 1186 dates of birth of partners (mean = 8.65 per candidate). 98 candidates were female, 36 were male, and 3 were not stated. 610 relationships were characterized as particularly intensive.

The second data sample for the conceptual replication was gained via the Internet. 227 participants responded (female = 168, male = 59) and
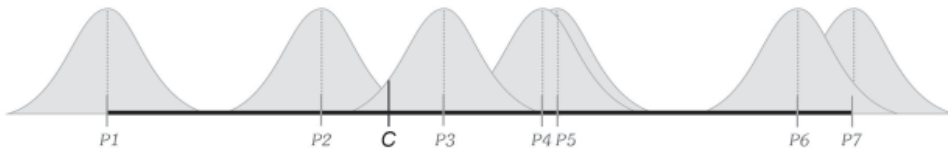
Figure 7. SM 1: Normally distributed, with a constant standard deviation of two years around every partner's date of birth (P1–P7)
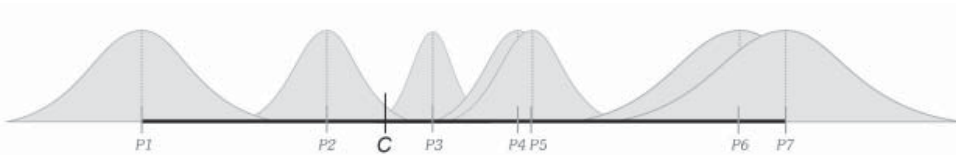C = candidate's date of birth.

Figure 8. SM 2: Normally distributed, with a variable standard deviation depending on age differences approximately proportional to age difference (see Mathematical Appendix)
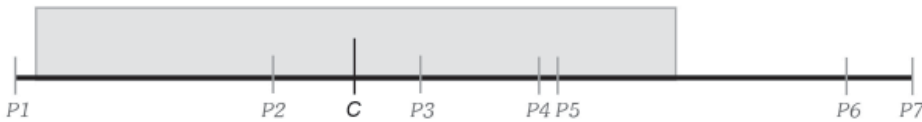
Figure 9. SM 3: Uniform distribution with a constant time period of plus/minus 15 years around the candidate's date of birth, without accounting for the partners' dates of birth (SM 3)

provided a total of 1649 datasets of partners (mean = 7.26 per candidate). A total of 610 relationships were characterized as particularly intensive. The statement concerning the knowledge of one's own sun sign was negated by 27 individuals, and should be interpreted as knowing little regarding astrology. 188 individuals indicated that they knew the zodiacal sign of their ascendant. 164 candidates mentioned that they have knowledge of the Moon position in their birth chart. Table 1 comparatively lists the data from both samples.

TABLE 1
Characteristics of the Two Samples

	Sample 1	Sample 2
Number of candidates	137	227
Female	98 (71.5%)	168 (74%)
Male	36 (28.5%)	59 (26%)
Mean age	41.6	39.1
Total amount of partners	1186	1649
Mean number of partners per candidate	8.65	7.26
Relationships characterized as particularly intensive	613 (52%)	917 (56%)
"I know the properties of my sun sign well"	Not surveyed	200 (88%)
"I know my ascendant"	Not surveyed	188 (83%)
"I know the zodiacal position of the Moon at the time of my birth"	Not surveyed	164 (72%)
"If I make friends with someone I ask about the person's Sun sign"	Not surveyed	122 (54%)
"Is the Sun sign an important factor to you regarding the choice of your friends?" *("Yes" responses)*	9 (7%)	Not surveyed
"Have you already read a book on astrology?" *("Yes" responses)*	102 (74%)	Not surveyed

Results

The analysis of the first sample provided some promising results, but also contained elements that did not support the hypotheses. We found a significant deviation of chance expectancy in the expected direction regarding the main hypothesis (H 1, computed with Simulation Model 1), that is there were more or more accurate interaspects between the chart of the candidate and the charts of their friends and people they were in a long-term relationship with than could be expected randomly (on the basis of individual reference values). Regarding the fourth hypothesis, the deviation of chance expectancy is of the same order as H 1, but just under the significance level of 5%, that is we found more resonance than could be expected randomly between the "most resonant" planet of the candidate and all planets of the corresponding partners. The results for the other hypotheses showed the same tendencies, but lower z-values (Table 2).

TABLE 2
Results for the Five Hypotheses
with the Three Different Simulation Models

Sample 1	SM 1	SM 2	SM 3
H 1: Resonance—total	1.7*	1.48	0.8
H 2: Resonance (prespecified)	1.48	1.46	1.03
H 3: Resonance to Saturn (partners)	1.14	0.75	−0.23
H 4: Most resonant planet (candidate)	1.56	1.44	0.99
H 5: Most resonant planet (partners)	1.38	1.21	0.77

N = 137 candidates; *t*-test; *z*-values; * = Significant at the 5% level. The data for SM 3 are provided for comparative reasons. The considerable difference between the results computed for SM 1/SM2 as opposed to SM 3 clearly shows the relevance of our specific method which takes the individual preferences, as well as socio-demographical factors, into account.

Most surprising were the results for our sub-hypotheses on the intensity of the relationships. We assumed that the resonance should increase correspondingly with intensity. This was clearly not the case. In contrast, we found highly significant differences in the unexpected direction (Table 3). These unexpected results from the first sample prompted us to do a conceptual replication of our study with an exploratory part to gain more detailed information on the specific nature of the relationships. We hoped that such

TABLE 3
Differences between the Resonance of "Normal" Relationships
and Relationships Characterized as "Intensive"

Sample 1	SM 1		SM 2	
	Normal N = 466	Intensive N = 613	Normal	Intensive
H 1: Resonance (total)	2.82**	−0.3	2.72**	−0.50
H 2: Resonance (prespecified)	2.8**	−0.49	2.8**	−0.46
H 3: Resonance to Saturn (partners)	2.09*	−0.54	1.84*	−0.77
H 4: Most resonant planet (candidate)	2.1*	−1.16	2.04*	−1.25
H 5: Most resonant planet (partners)	2.50**	0.38	2.49**	0.24

t-test; *z*-values; * = significant on the 5% Level, ** = significant on the 1% level

additional information could explain these inexplicable results regarding the sub-hypotheses, and additionally strengthen our main findings. Surprisingly, we received a much more unexpected picture with the new results: The main effects seen in the first sample disappeared, and that of the sub-hypotheses stood partly in contrast to the results of the first sample (Table 4):

TABLE 4
Results of Sample 2 for the Five Hypotheses
with the Three Different Simulation Models

Sample 2	SM 1			SM 2		
	All	Normal	Intensive	All	Normal	Intensive
H 1: Resonance (total)	0.27	−1.37	1.2	0.05	−1.56	1.04
H 2: Resonance (prespecified)	−0.22	−1.4	0.56	−0.26	−1.46	0.5
H 3: Resonance to Saturn (partners)	0.77	0.32	0.64	0.34	−0.05	0.37
H 4: Most resonant planet (candidate)	0.67	0.05	1.44	0.49	−0.08	1.35
H 5: Most resonant planet (partners)	1.12	−0.99	2.21*	0.91	−1.21	2.11*

t-test; *z*-values; * = significant on the 5% Level

Confronted with these contradictory findings, we speculated about the possibility that the second sample collected using the Internet differs considerably from the first sample. However, a closer look at some detailed results led us to the assumption that the significant correlations in the first sample most likely have to be ascribed to chance. Due to the fact that both samples were large enough, we decided to replicate the statistics with a split-half method. As can be seen in Table 5, the results of the halved samples show significant differences.

TABLE 5
Results of the Split Half Evaluation of Both Samples

	Sample 1		Sample 2	
	A	B	A	B
H 1: Resonance (total)	1.75	0.64	0.74	−0.44
H 2: Resonance (prespecified)	1.66	0.43	0.29	−0.64
H 3: Resonance to Saturn (partners)	1.71	−0.1	0.3	0.81
H 4: Most resonant planet (candidate)	2.12	−0.02	−0.12	1.11
H 5: Most resonant planet (partners)	1.18	0.73	0.85	0.61

SM 1; *t*-test; *z*-values

With these results our null hypotheses are confirmed: There is no more resonance than could be expected randomly between the charts of friends and people in a long-term relationship, respectively. This applies for "normal" relationships as well as for "intense" relationships.

Discussion

The findings differ from the expectations at the beginning of the research project. We were aware that if the astrological correspondence hypothesis is true we could not expect to see substantial effects: If everything is considered together, and, moreover, if important astrological factors for the analysis of astrological synastries are missing (e.g., the Moon positions), the result is inevitably a slightly faded image (cf Koch 2002:131). We nevertheless assumed that an effect would be apparent by using a large sample, or that at least a tendency would become visible which one could make distinct by adjusted methodological means. This, however, was not the case. Rather the contrary: The results of the split-half tests provide a picture that can be best described as fluctuation by chance. Further explorative analyses of subgroups (e.g., number of partners, sex of candidates and partners) did not give any indications as to systematic significant deviations from chance. Therefore the obvious conclusion seems to be that there exists no astrological effect. So if one does not want to abandon the general hypothesis of a significant correspondence of the choice of friends and long-term relationships and of the interaspects of their charts despite the findings, it is only justifiable under the assumption that the correspondence is much more concealed than we postulated in our hypotheses. Maybe we underestimated the impact of individual differences in assessing relationships. Another possibility is that the wide range of numbers of partners per candidate (from 1 to 22 partners in Sample 1; in Sample 2 the technically determined upper limit of partners was 12) led to an as yet uncontrollable bias.[14] To verify such possibilities one has to perform increasingly subtle tests with the data on an exploratory basis, for example by taking the kind of relationship (love relationship, business relationship, etc.) systematically into account (as a variable), but also to differentiate between hard and soft aspects, to include minor aspects, to weight the various astrological factors, etc. This work has yet to be done. The fact that the *t*-statistics assume relatively high values could be seen as an indication that there is some systematic factor at work. On the other hand, some large test values are to be expected due to multiple testing also when there is no effect.[15] The issue would require careful consideration in a study claiming positive evidence which is not the case here.

We have not found any significant impact of astrological knowledge of the participants in our results as we hypothesized because of the complexity

of the methodological design. If there had been attempts by participants to influence the results by preselecting the provided data in order to support the astrological hypothesis (based on hypotheses about the presumed aim of the astrological investigation), these attempts did not lead to a systematic unidirectional bias in the data. However, the impact of such strategies on the results is difficult to estimate. Maybe it represents such a hidden systematic factor.

Our investigation of a possible "as above, so below" association using a high complexity of astrological factors failed to provide corresponding evidence. Future studies on a similar topic might pursue the following two directions: One option would be to further increase the complexity by incorporating additional relevant astrological factors such as the Moon position, the ascendant, the descendent, and the 7th house (factors which are regarded as astrologically important for relationships). That would support the astrological hypothesis that the astrological factors are multifunctional and ambiguous to a certain extent: Different factors are said to have similar meanings or impacts, and one and the same factor has different impacts on different levels and in various contexts. With our methodological tool, the inclusion of further factors would not cause any difficulties, but the gathering of data is much more time-consuming. The second direction would be to place an emphasis on differentiating the relationships, enabling a more accurate characterization. This would imply a return to the method of relating particular aspects of the total complex of a birth chart to particular characteristics of relationships. Thus, a lot of explorative work has to be done.

Conclusion

Against the background of these results which are negative from the astrological perspective, the main—and absolutely positive—conclusion concerns, on the one hand, a better understanding of the complexity of the astronomical situation with regard to astrological investigation. The substantial differences between the first two simulation models related to individual patterns of choice of the partners, and the third model without that reference (see Table 2) clearly points to this. It results in empirical evidence regarding the necessity to consider the inhomogeneity of the time scale (in an astrological sense). This was not considered sufficiently in previous studies that had a related approach (e.g., Ruis 1994, 1994/1995).

On the other hand, we developed a new methodological approach for astrological research. The research tool created for our study is applicable for many other research issues: One could, for instance, reassess the astrological heredity hypothesis made by Gauquelin (1978:177–186) (see also Brady 2002) with our method of quantifying the astrological resonances of the charts of parents and their children. The horoscopes of married couples

could additionally be investigated regarding particular qualities and dynamics of the relationship and corresponding resonances of particular planets. The crucial differences to traditional approaches lie: (1) in the individual assessment of the chance expectancy of particular astrological constellations on a case-by-case basis, and (2) in the consideration of individual, social–psychological, and demographic influences by taking the actual (i.e. not hypothesized on the basis of statistical values) patterns of relationships with their individual structures of time distances into account. With this, we created a new approach to performing quantitative astrological studies without the necessity of making use of major speculations on either theoretically derived values of chance expectancy or on socio–demographical influences.

Acknowledgment

Notes

[1] The main problem of the latter lies in the incorrect assumption that an astrological sign of the zodiac (which stands for a distinct characteristic of every segment of 30° with an abrupt change of its property at the transition points) is a concrete fact, comparable to facts such as biological gender, being married, or holding a high school diploma. For scientific purposes one has to deal with zodiacal signs as if they are mere human constructions of a highly hypothetical nature, and one has to account for this fact methodologically for example by testing the correlations found with the zodiacal division of the hypothetical circle against other circle graduations. Niehenke (1998) mentions this point in an exemplary way in his critique of the book *Die Akte Astrologie* by Sachs (1997) (translated and published in English under the title *The Astrology File* (Sachs 1998)).

[2] One of the important approaches in astrological research that provided the most convincing results with regard to the astrological hypothesis is the work done by the Gauquelins (1978, 1983, 1988b) which was followed by comprehensive re-analyses and complementary work/comments by Ertel and others (e.g., Ertel & Irving 1996, Ertel 2011). This tradition of research is only of minor relevance for our approach because the Gauquelin-type results do not fit into the usual astrological system of interpretation—at least not at first sight. Hence, Gauquelin proposed a new form of astrology which he called "Neo-Astrology" (1991).

[3] A prominent example is the famous German nuclear physicist and philosopher, Carl Friedrich von Weizsäcker, who got involved with the complex analysis of horoscopes in the 1940s, did a fair amount of his own practical work during this time, and who still advanced almost forty years later his opinion regarding his personal experience of evidence of astrological analysis—notwithstanding his critical attitude toward astrology as a social practice of counseling:

> I, as a physicist, have no rhyme or reason at all up to today what should be the case if astrology were empirically true. On the other hand, I got the impression—simply by my preoccupation with it—that there is something in it. (von Weizsäcker, quoted in Niehenke 1987:22, translation by the authors)

More references could be given but most of them are only private statements because scientists are reluctant to advocate astrology publicly. However, an academic education in natural sciences is no guarantee to be able to make qualified judgments outside one's studied discipline, of course.

[4] One could interpret this as a kind of proto-statistical procedure.

[5] A lot of typical arguments made by astrologers as well as critical researchers concerning the problems of astrological research are compiled in Phillipson (2000:passim).

[6] Of course, we are aware that from an astrologer's perspective the image of the partner and the motivation toward a relationship cannot be reduced to the interaspects of the two corresponding charts from an astrological perspective. However, it should be broadly accepted by astrologers that they make a substantial contribution to the choice of partners.

[7] This also concerns the above-mentioned sun-sign effect which has been found by Eysenck & Nias (1982) because our study is not based on a response to personality traits, but on the existence of a relationship. However, with regard to the assessment of the intensity of the relationship, the possibility of an influence of the sun-sign effect should be considered.

[8] The exclusion of the trans-Saturn planets was made to avoid long-term effects that influence a generational cohort. The exclusion of the Moon had to be made due to the fact that the time of birth of the partners was lacking. This was very unfortunate because the Moon plays an important role in relationships from an astrological perspective, but this could not be avoided for reasons relating to the practical execution of the investigation.

[9] For exploratory reasons, we additionally computed the other partner planets.

[10] Ashmun (1984) pointed out this problem in her critique of Carl Jung's astrological experiment and expresses her hope that computer technology will help in the future to solve this laborious task. A quarter of a century later, the latter point is not a problem anymore. Gauquelin's work provoked a lot of critical analysis on the topic of expectation values of astronomical/astrological frequencies. However, most of it does not consider complex astrological aspect constellations. In most of Gauquelin's works he focused on the expectation values of one planet in different horoscope sectors.

[11] Ertel applied this method in his investigation into the relation of planetary aspects with human birth dates (Ertel 1988). It was a suitable strategy for his research dealing with single aspects related to one date (date of birth).

[12] An astrological journal edited by the Österreichische Astrologische Gesellschaft (Austrian Astrological Society) is entitled *Qualität der Zeit* (Quality of Time). In English-speaking countries this expression does not seem to be as common as in German-speaking countries.

[13] From a socio-demographic viewpoint, the assessment of an age difference in partners' dates of birth is strongly dependent on the age of the candidate: If the candidate is, for example, 16 years old, one of his partners is 17, and the other 22 years old, the age difference of five years between the partners is regarded as more significant than if the one friend is 43 and the second 48 years old. As a result, an increasing standard deviation around the partners' dates of birth corresponding to the age differences from the candidate's date of birth is indicated (SM 2). From an astrological perspective, the variance around the partners' dates of birth has to be kept constant, independent of the age differences with the candidate's birthday because of the inhomogeneity of the above-mentioned time scale (SM 1).

[14] We considered this partly by an exploratory use of different basic units. Instead of the originally chosen groupwise evaluation (one candidate together with her partners as a basic unit—see Mathematical Appendix), we performed a pairwise evaluation (one candidate with one of her partners as a basic unit) with the different kinds of evaluation of the candidate–partner complexes (pairwise vs. groupwise). This difference is relevant because of the different numbers of partners provided by the candidates. In the groupwise mode, the relationships of a candidate with only a few partners are weighted more than those of a candidate with a lot of partners. In contrast, the pairwise mode places more weight on the candidates with a lot of partners. It is nearly impossible to predict the effect of these biases. However, the pairwise mode is not consistent with Hypotheses 4 and 5 because they are made relating to groups of partners. The results of

the pairwise evaluation differ slightly but not substantially from the results of the groupwise evaluation.

[15] The extent of the alpha error inflation is difficult to quantify properly because of stochastic dependencies between the test statistics. Some further comments on this point may be found in the Mathematical Appendix.

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MATHEMATICAL APPENDIX

Resonances

The basic units of the statistical analysis consist of a candidate together with her partners. Initially, each such unit is analyzed on its own. The combined results of the individual analyses then allow statements about the data base as a whole.

For a fixed unit, let CT denote the birth time of the candidate, and $PT_1, \ldots, PT_N$ the birth times of her partners, time being measured according to the Julian calendar. If only the birthday is known, the birth time is set to noontime. Given any two planets p_1, p_2 and any two time points t_1, t_2, let $\alpha = \alpha\,(p_1, t_1; p_2, t_2)$ denote the angle between the positions of planet p_1 at time t_1 and planet p_2 at time t_2 as seen from the earth. The resonance of such a constellation depends only on the angle α (taken modulo 180°). It is given by the resonance function $\rho(\alpha)$ which has a tent-like deflection at the astrologically meaningful angles of 0, 60, 90, 120, and 180 degrees, and is zero if α differs from all these by 5° or more.

The planets entering the analysis differ across hypotheses and also between candidate and partners. For a given hypothesis H let CP and PP denote the set of planets that are relevant to the candidate and her partners, respectively. The basic resonance statistic for the given unit and the hypotheses H_1, H_2, H_3 then is the average resonance evaluated at the respective birth times,

$$R_H = \frac{1}{Nn_{cp}n_{pp}} \sum\nolimits_{p \in CP, p' \in PP} \sum\nolimits_{i=1}^{N} \rho(\alpha(p, CT; p', PT_i)) \quad (1)$$

Here n_{cp}, n_{pp} denote the numbers of candidate and partner planets, respectively. For $H3$, for example PP consists of Saturn only, so $n_{pp} = 1$. In Hypothesis 4 and Hypothesis 5, one of the two averages across planets is replaced by a maximum, for example

$$R_{H_4} = \max\nolimits_{p \in CP} \frac{1}{Nn_{pp}} \sum\nolimits_{p' \in PP} \sum\nolimits_{i=1}^{N} \rho(\alpha(p, CT; p', PT_i)) \quad (2)$$

$$R_{H_5} = \max\nolimits_{p' \in PP} \frac{1}{Nn_{cp}} \sum\nolimits_{p \in CP} \sum\nolimits_{i=1}^{N} \rho(\alpha(p, CT; p', PT_i)) \quad (3)$$

Reference Distributions and p-Values for a Single Unit

The above resonance statistics are evaluated at the actual ("observed") birth times of the candidate and her partners; we indicate this by writing RH^{obs}. Our reference distribution for this value is obtained by randomizing the partner birth times as follows. (The candidate birth time is kept fixed.)

Let $R_H(T_1, \ldots, T_N)$ denote the resonance statistic obtained when each partner birth time PT_i is replaced by some other time T_i. (Note that then $RH(PT_1, \ldots, PT_N) = R_H^{\text{obs}}$, according to our conventions.) Suppose the times $T_1, \ldots, T_N$ are statistically independent random variables with distributions $F_1, \ldots, F_N$ selected according to one of the three sampling schemes. (More details on this are given below.) When plugged into the resonance statistic, $R_H(T_1, \ldots, T_N)$ itself becomes a random variable. *Our reference, or null-distribution, D_0, then is defined as the distribution of this random variable, $D_0 = distribution\ of\ R_H(T_1, \ldots, T_N)$.* It represents the respective null-hypothesis in technical terms, and makes precise what we understand under chance expectation (for a given sampling model).

The distribution D_0 is very complicated and cannot be calculated explicitly. However, an approximation to D_0 is readily obtained by Monte Carlo simulation. Using a (pseudo-) random number generator one generates a large number K of partner birth time arrays $(T_1^{(k)}, \ldots, T_N^{(k)})$ according to the respective sampling model (here $K = 5000$). This gives a distribution D_0^* of K simulated resonance values $R_H(T_1^{(k)}, \ldots, T_N^{(k)})$ which we take as a substitute for the unaccessible "exact" null-distribution D_0.

The p-value, p_H, for testing the null-hypothesis H on the given unit is given by the upper tail of D_0^* beyond R_H^{obs}, i.e. by the fraction of simulated resonance values that exceed the observed value R_H^{obs}. As usual, a small p-value is speaking against the null-hypothesis H.

For an intuitive explanation, note that evidently from the wiggly time course of the resonance functions (see Figures 3 to 5), R_H^{obs} will be (relatively) large if the partner birth times happen to fall on peaks of the resonance functions. These peak times form a highly fragmented, finely structured subset of the time axis. Under the sampling models, alternative partner birth times are sampled much more homogeneously in time, thus reflecting the null-hyothesis that entering a relationship does *not* depend on temporally fine-structured astrological synastries.

Instead of p-values one also may consider z-values, defined as $z = (R_H^{\text{obs}} - \mu) / \sigma$ where μ and σ^2 denote the mean and the variance of the reference distribution D_0^*, respectively. It should be noted, however, that referring such a z-value to the standard normal distribution is meaningful only if D_0^* itself is close to the latter.

Let us yet point out a noteworthy consequence of the above: In contrast with the usual ensemble-based methods, our setting allows us to test astrological hypotheses at the level of a single candidate–partners unit. The aggregation of the individual test results is discussed next.

Overall Statistical Analyses

Everything thus far referred to a fixed candidate–partners unit. Overall significance across units was assessed as follows. Under H, the individual z-values z_j for the single units, though perhaps not normally distributed (see above), have mean zero and variance 1. By the central limit theorem, if the number J of units is not too small, the average z-value times $\sqrt{J}$, that is $\zeta := J^{-1/2} \Sigma z_j$, is approximately standard normally distributed, hence may be used as an (approximate) z-value. Slightly more cautiously, we based our significance tests on the t-statistic $\tau = \zeta / s$ where s is the empirical standard deviation of the z_j s.

Of course, since quite a number of tests have been carried out there is a multiple testing problem causing alpha error inflation. A Bonferroni correction could rectify this, but would tend to be overly pessimistic due to positive correlation of the test statistics. After all, clear support has not been found for astrological synastry, so we took a more liberal stance and reported individual test results without alpha correction. Denying the exploratory character of our study was not intended thereby. (The Mathematical Appendix writer's opinion is that the meaning of "significant" test results is often misrepresented, overdoing grossly what can be obtained from statistical analyses—which is not meant to say they are useless.)

Sampling Models

The sampling models determine the distribution G according to which alternative "surrogate" birth times are randomly drawn and substituted for the respective partner birth time PT.

SM1: G is the normal distribution with mean $\mu = PT$ and constant standard deviation $sd = 2$ (years).

SM2: G is the normal distribution with mean $\mu = PT$ and standard deviation sd depending on the (absolute) age difference $ad = |PT - CT|$ (years) to the candidate as follows: Starting from $sd = 1$ at $ad = 0$, sd grows linearly in ad with slope 0.25 until it reaches $sd = 5$ (at $ad = 16$), from where it remains constant.

SM3: G is the uniform distribution centered at the candidate's birth time CT with half-width 15 years.

Evidently, SM1 and SM2 roughly maintain the unit's particular birth time configuration whereas SM3 disregards it completely.

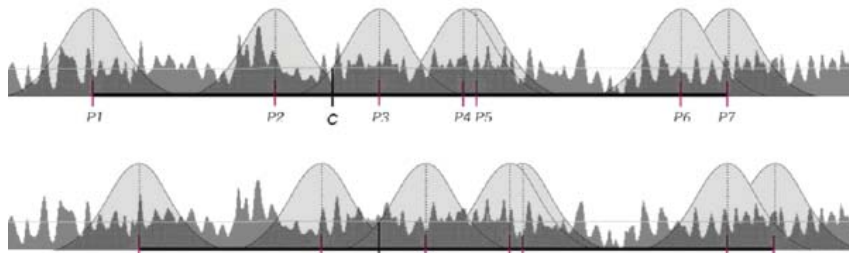### *Stepwise Shifting of Birth Dates on the Time Scale*

Figure 10. Method of time-shift (suggested by Ertel)
The date of birth of the candidate and all of the partners' dates of birth stepwise shifted on the time scale. This method follows the idea that the actually found constellation is a "perfect" constellation. According to this, the shifting of the date of birth should lead to a lesser degree of *R*— comparable with the astrological idea of decreasing effect of an aspect corresponding with its increasing inaccuracy (orbs). This idea is wrong because it is based on the idea of a homogenous time scale. This is not the case (see grey fluctuation of *R* in the background for illustration).