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Analyzing the Validity of Nadi Coordinates Using Astrology Software for Marital Predictions

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Abstract

In Ashtakoota horoscope matching, Nadi koota carries 8 of the 36 points, and a same-Nadi result (Nadi coordinates) is often taken as a reason to turn down a marriage proposal. The verdict rests on a single computed value: the sidereal longitude of the Moon at each partner's birth, as returned by astrology software. This study asks whether that value is stable enough to support a marital prediction. We generated 20,000 birth instants between 1970 and 2005 at ten Indian cities. For each one we computed the Moon's longitude with two independent ephemeris engines, five ayanamsa conventions, geocentric and topocentric positions, and birth-time shifts of 5 to 60 minutes.

The two engines agreed to within 32 arcseconds and changed only 0.02% of Nadi assignments. Software conventions mattered far more. Moving from the Lahiri to the Raman ayanamsa changed the Nadi of 8.0% of individuals and reversed the Nadi coordinates verdict for 9.9% of 10,000 simulated couples (Cohen's $\kappa = 0.77$). Topocentric correction changed 3.1% of Nadi assignments, about as many as a 60-minute error in birth time (3.0%). In a Monte Carlo analysis, verdict disagreement at this level reduced a true odds ratio of 2.0 to about 1.7 and lowered statistical power from 0.64 to 0.43 in a sample of 300 couples. A Nadi verdict therefore depends partly on how the software is set up. Any empirical test of Nadi-based marital prediction has to fix and report these settings before its outcome data can be read.

Keywords: Nadi koota, Ashtakoota, horoscope matching, ayanamsa, ephemeris, measurement reliability, marital prediction

1. Introduction

Horoscope matching is still a routine step in many arranged marriages in India. The usual method is Ashtakoota (eight-fold) matching, also called Guna Milan, which scores a couple out of 36 points on eight factors. Nadi koota is the heaviest of these at 8 points. Each of the 27 nakshatras (lunar mansions) belongs to one of three Nadis, Adi, Madhya or Antya, in a repeating 1-2-3-3-2-1 sequence around the zodiac. When both partners share a Nadi, the couple scores zero on this factor and is said to share the same Nadi coordinates. Many families treat this as a serious obstacle, although classical texts list several conditions under which this result is cancelled.



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Nobody observes a person's Nadi directly; software computes it. The program takes the date, time and place of birth and calculates the Moon's tropical ecliptic longitude. It then subtracts an ayanamsa, the offset between the tropical and sidereal zodiacs, and divides the result into 27 segments of $13^{\circ}20'$. Each step involves a choice. The program may use one ephemeris or another, one of several ayanamsas, and a Moon placed either at the Earth's centre or at the place of birth. The birth time itself may be exact or rounded. Users rarely see these choices, and programs make them differently.

These choices bear directly on claims about marital prediction. A test of whether Nadi coordinates predicts divorce or marital dissatisfaction can be no better than the Nadi classification it starts from. If two reasonable settings put the same couple in different categories, then part of any association a study finds (or fails to find) comes from the software and not from the couple. Reliability of measurement is a precondition for predictive validity, and it can be studied without any outcome data.

Earlier scientific tests of astrology examined outcomes such as personality, intelligence and Sun-sign compatibility. We are not aware of a published study that measures how stable the computed Nadi value is across the settings used in common software. This paper addresses that question. Its four objectives were:

1. to measure how far two independent ephemeris engines disagree on the Moon's longitude, and how often the difference changes the nakshatra or Nadi;
2. to measure how often the choice of ayanamsa, geocentric or topocentric position, and birth-time error changes an individual's Nadi;
3. to estimate how often a couple's Nadi coordinates verdict reverses under each of these sources of variation; and
4. to show by simulation how this unreliability weakens a study that tests Nadi coordinates against marital outcomes.

2. Review of Literature

2.1 Controlled tests of astrological claims

The best-known double-blind test is Carlson's (1985). Twenty-eight astrologers nominated by the National Council for Geocosmic Research tried to match natal charts with California Psychological Inventory profiles. They did no better than chance, and their confidence ratings bore no relation to their accuracy. Dean and Kelly (2003) reviewed several decades of similar research, including studies of "time twins" born minutes apart, and found that such people were no more alike than chance would predict.

Indian astrology has also been tested directly. Narlikar et al. (2009) collected birth data for 100 children rated academically bright and 100 children from special schools. Twenty-seven astrologers each judged 40 randomised charts, and their average score of 17.5 correct was below the 20 expected from guessing. On marriage in particular, Voas (2007) examined the



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birth dates of about 10 million married couples in the 2001 census of England and Wales and found that Sun-sign pairings occurred at the rates chance would produce.

All of these studies test outcomes and take the astrological input as given. None asks whether the input itself can be reproduced.

2.2 Empirical work on Ashtakoota and Nadi coordinates

Peer-reviewed studies testing Ashtakoota scores or Nadi coordinates against marital outcomes are scarce. Most of the available material comes from practitioners and the popular press, and it states the rules without testing them. One reason is practical: a sound test needs many couples with accurate birth times for both partners and a measured marital outcome. A second reason is methodological, and it is the subject of this paper. Before any test can begin, the study must have a fixed and reproducible rule for deciding who has matching Nadi coordinates.

2.3 Sources of variation in the computed Moon position

Modern astrology programs rely on astronomical ephemerides. Many use the Swiss Ephemeris, which is based on JPL numerical integrations (Astrodienst, n.d.), while others use analytic lunar theories. The differences between them are a matter of arcseconds, which is negligible against a nakshatra $13^{\circ}20'$ wide.

The ayanamsa is a bigger problem because it is fixed by convention and cannot be measured. India's Calendar Reform Committee recommended the Lahiri (Chitrapaksha) ayanamsa (Government of India, 1955), and it is the most widely used in the country. Other systems remain in use, including those linked with B. V. Raman, K. S. Krishnamurti (KP) and Sri Yukteswar, as well as the Western sidereal Fagan-Bradley system. At J2000 their values run from about 22.41° (Raman) to 24.74° (Fagan-Bradley), a spread of more than 2.3° (LibEphemeris, n.d.).

Two further sources of variation are often overlooked. The Moon is close enough to the Earth that its apparent position can shift by up to about 1° depending on where the observer stands, an effect called lunar parallax, and programs differ on whether they correct for it. Birth times are also often rounded or recalled from memory. Since the Moon moves about 0.55° an hour, an error of one hour can matter for births near a nakshatra boundary.

2.4 Measurement error and predictive validity

Epidemiologists have long known that random misclassification of a binary exposure pulls its association with an outcome towards the null and reduces statistical power (Bross, 1954). Agreement between two classifications is usually measured with Cohen's (1960) kappa and judged against the benchmarks proposed by Landis and Koch (1977). As far as we know, these tools have not been applied to astrological classifications.

3. Methodology

3.1 Design

This is a computational reliability study. Each birth was held fixed while one software setting was varied at a time against a reference configuration: a geocentric Moon computed with



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PyEphem, the Lahiri ayanamsa and the recorded birth time. No human participants or personal birth records were used.

3.2 Sample of birth instants

We drew 20,000 birth instants at random, uniformly between 1 January 1970 and 31 December 2005 (UTC), using a fixed random seed so that the sample can be reproduced. Each birth was assigned at random to one of ten cities spread across India: Delhi, Mumbai, Chennai, Kolkata, Gwalior, Bengaluru, Guwahati, Jaipur, Thiruvananthapuram and Srinagar. The city matters only in the topocentric condition. For the couple analysis, the 20,000 births were paired at random into 10,000 couples.

3.3 Ephemeris engines

The Moon's apparent ecliptic longitude of date was computed with two independent programs. PyEphem 4.2 (Rhodes, 2011) uses an analytic lunar theory. Astropy 8.0 (Astropy Collaboration, 2022) was run with its built-in ERFA lunar model, and its output was transformed to the true ecliptic and equinox of date.

3.4 Ayanamsa conventions

Five ayanamsas were used, with the J2000 values tabulated for Swiss Ephemeris-compatible software (LibEphemeris, n.d.): Lahiri 23.8571°, KP 23.7602°, Raman 22.4108°, Yukteshwar 22.4788° and Fagan-Bradley 24.7403°. Each value was advanced from J2000 at a general precession rate of 5,028.8 arcseconds per century. Over the 1970 to 2005 period this linear model is accurate to well under one arcminute.

3.5 Nakshatra and Nadi assignment

Sidereal longitude λ was found by subtracting the ayanamsa from the tropical longitude. The nakshatra number k was then obtained as:

$$k = \lfloor (\lambda \bmod 360^\circ) / 13^\circ 20' \rfloor + 1$$

Nadi followed the standard scheme. Adi covers nakshatras 1, 6, 7, 12, 13, 18, 19, 24 and 25; Madhya covers 2, 5, 8, 11, 14, 17, 20, 23 and 26; and Antya covers 3, 4, 9, 10, 15, 16, 21, 22 and 27. A couple was classed as having matching Nadi coordinates when both had the same Nadi. Cancellation rules were left out because they differ between traditions and would add yet more variation.

3.6 Conditions compared

Each condition changed a single factor relative to the reference:

1. ephemeris engine: Astropy in place of PyEphem;
2. ayanamsa: KP, Raman, Yukteshwar or Fagan-Bradley in place of Lahiri;
3. position: a topocentric Moon for the birth city in place of a geocentric one;
4. birth time: shifted later by 5, 15, 30 or 60 minutes; and
5. random birth-time error: each partner's time perturbed independently by a normal error with a standard deviation of 20 minutes (couple analysis only).



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3.7 Measures

For individuals we report the percentage of births whose nakshatra changed and the percentage whose Nadi changed, along with the share of births lying within 0.25° and within 1° of a nakshatra boundary. For couples we report the percentage whose Nadi coordinates verdict reversed and Cohen's kappa between the reference verdict and each alternative.

3.8 Simulation of outcome studies

To see what this unreliability would do to an outcome study, we simulated cohorts of 300, 1,000 and 3,000 couples. Nadi coordinates matched in one third of couples, and the base rate of an adverse marital outcome was set at 15%. The true odds ratio for same-Nadi couples was set at 1.0, 1.25, 1.5 or 2.0. The observed Nadi label was either free of error or flipped at the rate measured for the Raman and Lahiri comparison. Each scenario was run 400 times, and we report the median observed odds ratio and the power to detect it at $\alpha = .05$ with a two-sided Wald test. The simulated outcomes illustrate the statistics only and contain no data on real marriages.

3.9 Software

All analyses were run in Python 3 with NumPy, PyEphem, Astropy and Matplotlib. The analysis script is available from the authors on request.

4. Results

4.1 Baseline properties

Under the reference configuration the three Nadis were evenly spread: Adi 33.4%, Madhya 33.3% and Antya 33.3%. Of the 20,000 births, 3.7% fell within 0.25° of a nakshatra boundary and 15.4% within 1° . These are the births most exposed to any change of settings.

4.2 Individual-level stability

The two engines differed by a mean of 11.8 arcseconds and at most 32.4 arcseconds in the Moon's longitude. That changed the Nadi of 4 of the 20,000 births (0.02%), so the astronomy is not where the instability lies. The software settings are. Table 1 and Figure 1 give the share of births whose nakshatra and Nadi changed under each condition.



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Table 1

Change in nakshatra and Nadi assignment relative to the reference configuration ($N = 20,000$ births)

Condition compared with reference	Nakshatra changed (%)	Nadi changed (%)
Raman vs Lahiri ayanamsa	11.17	7.97
Yukteshwar vs Lahiri ayanamsa	10.66	7.60
Fagan-Bradley vs Lahiri ayanamsa	6.64	4.52
Topocentric vs geocentric Moon	4.40	3.11
Birth time 60 min later	4.29	3.04
Birth time 30 min later	2.11	1.51
Birth time 15 min later	1.10	0.76
KP vs Lahiri ayanamsa	0.75	0.53
Birth time 5 min later	0.39	0.27
Astropy vs PyEphem engine	0.03	0.02

Note. Reference = PyEphem engine, geocentric Moon, Lahiri ayanamsa, recorded birth time. Computed by the authors.



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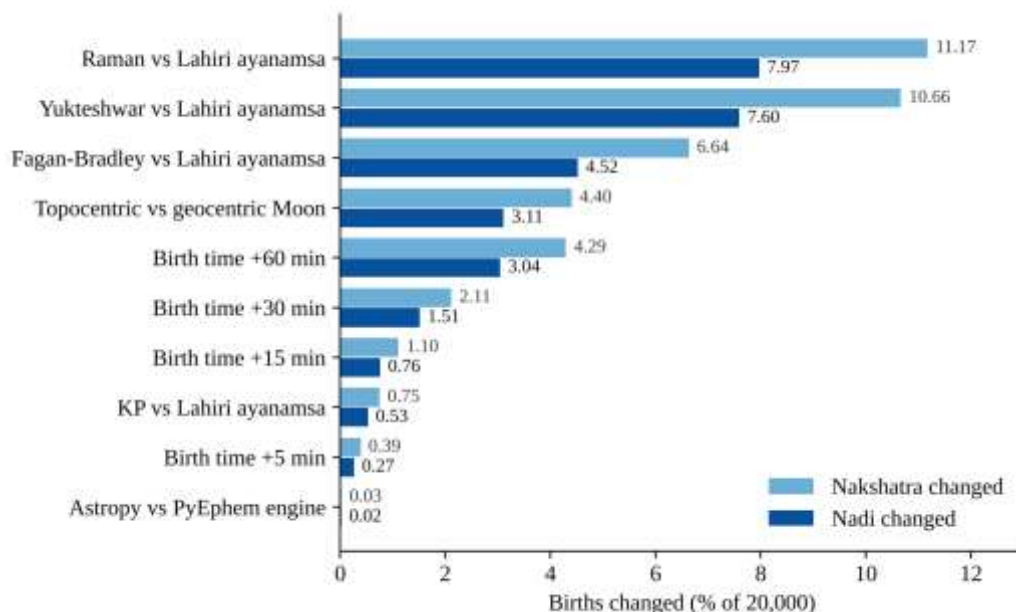
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Figure 1

Percentage of births whose nakshatra and Nadi changed under each condition



Source: Computed by the authors from 20,000 simulated births (1970 to 2005, ten Indian cities).

The Raman ayanamsa moved 11.2% of births into a different nakshatra and changed the Nadi of 8.0%, and the Yukteshwar ayanamsa gave much the same result. KP, which lies only about 0.1° from Lahiri, changed 0.5% of Nadis. Topocentric correction changed 3.1%, roughly the same as a one-hour error in birth time. The effect of birth-time error grew almost in proportion to its size, from 0.3% at 5 minutes to 1.5% at 30 minutes.

Under every condition the Nadi changed less often than the nakshatra, which follows from the Nadi sequence. Eight of the 27 nakshatra boundaries separate two nakshatras of the same Nadi, so only about 70% of nakshatra shifts (19 in 27) move a person to a different Nadi.

4.3 Couple-level verdict reversals

With the reference settings, 32.1% of the 10,000 couples shared Nadi coordinates, close to the one third expected. Table 2 shows how often that verdict reversed.



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Table 2

Reversal of the Nadi coordinates verdict across 10,000 simulated couples

Comparison with reference	Verdict reversed (%)	Cohen's κ
Raman vs Lahiri ayanamsa	9.89	0.77
Both births 60 min later	3.92	0.91
Topocentric vs geocentric Moon	3.70	0.92
Both births 30 min later	1.93	0.96
Random time error, SD 20 min, each partner	1.07	0.98
KP vs Lahiri ayanamsa	0.63	0.99

Note. Reference = PyEphem engine, geocentric Moon, Lahiri ayanamsa, recorded birth time. Computed by the authors.

Changing from Lahiri to Raman reversed the verdict for about one couple in ten. A kappa of 0.77 counts as "substantial" agreement on the Landis and Koch (1977) scale, which is a low bar for a verdict that may decide whether a marriage goes ahead. The smaller effects add up as well. A family that consults two programs with different defaults could get opposite verdicts about the same couple.

4.4 Effect on outcome studies

Table 3 shows what verdict disagreement at the Raman and Lahiri rate would do to a hypothetical study of marital outcomes.



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Table 3

Median observed odds ratio and power by true effect and sample size (400 simulations per scenario)

True OR	Couples	Observed OR, error-free	Observed OR, with disagreement	Power, error-free	Power, with disagreement
1.00	1,000	1.02	1.01	0.04	0.05
1.25	1,000	1.25	1.20	0.26	0.17
1.25	3,000	1.25	1.18	0.58	0.35
1.50	300	1.47	1.41	0.26	0.20
1.50	1,000	1.50	1.37	0.65	0.45
1.50	3,000	1.50	1.38	0.99	0.89
2.00	300	2.02	1.73	0.64	0.43
2.00	1,000	1.96	1.71	0.99	0.89

Note. Simulated outcomes with a 15% base rate, for illustration only. Disagreement = verdict reversal rate of 9.89% from Table 2. OR = odds ratio.

When there was no true effect (OR = 1.0), misclassification did not create one, and the false-positive rate stayed near 5%. When a true effect existed, misclassification shrank it by between 4% and 15% and cost a large share of power. A study of 1,000 couples testing a true odds ratio of 1.5 would detect it 65% of the time with error-free labels, but only 45% of the time if its labels disagreed with the true convention at the Raman and Lahiri rate.

5. Discussion

The Nadi value can be reproduced only within a fixed software convention. The astronomy is sound: two unrelated ephemeris engines agreed to within about half an arcminute, far finer than a nakshatra requires. The variation comes from choices that users usually never see, namely the ayanamsa, the parallax correction and the accuracy of the birth time.

The ayanamsa result needs particular attention. An astrologer who follows Raman or Yuktishwar has made no technical error; he is working within a different tradition. Even so, about one couple in ten gets the opposite Nadi coordinates verdict depending on which tradition the program follows. No observation can show which ayanamsa is correct for predicting marriages, because the ayanamsa is a starting assumption of the system and is never derived from its results. Until that assumption is fixed in advance, a prediction that changes with it cannot be called valid in the measurement sense.



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The topocentric result is less widely known. Parallax can move the Moon's apparent longitude by up to about a degree, and in our data that alone changed the Nadi of about 3% of people. Two programs that differ on this one setting will disagree about those people even when every other setting matches.

Birth-time error is the most familiar problem and, at realistic levels, the least serious. With a random error of 20 minutes in each partner's time, the verdict reversed for only about 1% of couples. The error becomes important when times are recalled only to the nearest hour or recorded in the wrong time zone.

The simulation links these findings to the question in the title. If Nadi coordinates did carry real predictive information, unreliable measurement would hide part of it, and a modest effect would often go unnoticed in a study of a few hundred couples. The same logic applies in reverse. A null result from a study that does not report its software settings is weak evidence against Nadi coordinates, because misclassification lowers power. Either way, an outcome study cannot be interpreted until its classification rule is fixed.

This study does not test whether Nadi coordinates predict marital outcomes and makes no claim either way. It shows that the input to such a test is less stable than users assume, and it measures how unstable it is. Read alongside earlier controlled tests that found no astrological effects (Carlson, 1985; Narlikar et al., 2009; Voas, 2007), the results suggest that families should be careful about treating a single program's verdict as final.

6. Conclusion

Software-computed Nadi assignments are precise as astronomy but unstable as convention. The choice of ayanamsa alone reverses the Nadi coordinates verdict for about 10% of couples, and topocentric correction and birth-time error add smaller shifts. Before Nadi koota can be tested as a predictor of marriage outcomes, a study must fix its ayanamsa, its positional model and its rules for handling birth time in advance, and report them. Software developers could help by printing these settings on every matching report. Users and counsellors should read a single program's Nadi verdict as the output of one convention and not as a fixed fact about a couple.

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