

An Empirical Test of Popular Astrology

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Introduction

Astrology is everywhere. It permeates contemporary American culture. Newspapers and magazines, ranging from the conservative *National Enquirer* to the radical *Berkeley Barb*, talk about it endlessly. Horoscopes are now carried by 1,250 daily newspapers, that is, by two out of every three papers in the United States. The average citizen can't help but be inundated by the flood of articles and syndicated columns.¹

Such a state of affairs is amply borne out by recent Gallup polls. George Gallup reports that over three-quarters of American adults know their astrological sign. Furthermore, he finds that more than one adult in four embraces astrology. This means that there are between 30 and 40 million believers nationwide. So astrology has millions more followers than most religious denominations.²

The San Francisco Bay area, the focus of my study, is an astrologer's paradise. Telephone directories list thirty-four professional astrologers and astrological schools in the immediate vicinity of San Francisco and Berkeley. The vicinity also features eleven astrology shops and bookstores. Glock and Wuthnow of the Survey Research Center report that nine out of ten bay area residents know their sign—a saturation level rarely encountered in polling research. Only three out of ten bay area adults are firm disbelievers.

Bay area lifestyles reflect this. An ABC affiliate, KGO-TV, sponsors astrologer Joyce Jillson on its morning news and interview program "A.M. San Francisco." The Oakland Athletics, an American League baseball

team, employs astrologer Laurie Brady to consult with team players and help them throughout training. Students at U.C. Berkeley complain that bay area employers use an individual's astrological sign, deduced from one's birth date, to discriminate among job applicants. It's just too bad if you're Scorpio or Taurus—you won't get the job.

The Need for an Empirical Test

To counter astrology's evident popularity, nearly 200 scientists in 1975 signed a manifesto sponsored by *The Humanist* magazine deploring any recognition whatsoever of astrology as a science. The scientists described the astral art as characterized by "irrationalism" and "obscurantism." Included among the signers were 19 Nobel laureates.³

In response to the lament of the scientists, a San Francisco Bay area newspaper angrily cited arguments in defense of astrology. Its editors concluded by flinging down the gauntlet with a challenge: "With the availability of accurate measure of the universe and computers, the time to test astrology, including all its symbolism, has come."

I agree. Given the widespread popularity of astrology, a test of a few of its major tenets is certainly called for. An empirical testing of *all* facets of astrology would necessitate a lifetime of work and countless volumes of data and interpretation. That is not my goal. What I plan is considerably more modest. What I shall do is examine a few of the basic assumptions of popular astrology—that form of astrology in which over 30 million Americans believe.⁴

Popular Astrology and Judicial Prediction

I would describe popular astrology as a nontechnical and indiscriminate form of traditional, judicial astrology. It is judicial in that it attempts to foretell terrestrial life from the movements of celestial bodies. By contrast, natural astrology was used to foretell the movements of the heavenly bodies themselves. Natural astrology has quietly evolved into the science of astronomy and astrophysics.

Of the many, many types of judicial astrology that pertain to the "vitasphere," only a few directly relate to my testing. Of less concern to us are the ancient schools of (1) mundane astrology, (2) naturalist astrology, (3) agricultural astrology, and (4) astro-meteorology, or meteorological astrology. These attempt to forecast historical events and natural disasters of

worldly import. They try to predict wars, earthquakes, weather changes, plagues, assassinations, droughts, conspiracies, famines, and revolutions.

Of more direct interest to us are the schools of (5) genethliacal astrology, (6) electional astrology, and (7) horary astrology. These attempt to forecast human events in more personalized terms. They try to predict a wide array of human characteristics, particularly personality traits.

The discipline of genethliacal astrology is also called genethliology and natal horoscopy. Genethliacal astrologers construct and interpret personalized, lifelong horoscopes known as "natal charts." Estimates of an individual's destiny are computed on the basis of longitude, latitude, and precise time of birth.

The discipline of electional astrology is the horoscopic art of choosing exactly the right moment for a person to pursue an enterprise. Astrological "election" provides advice about when an individual should hold a wedding ceremony, assume public office, begin a voyage, or lay the foundation-stone for a new building.

The discipline of horary astrology answers questions for the individual as they crop up on a daily basis. Mass-circulation newspapers have popularized this version of the astral art. As any frequent reader knows, such "horoscopes" offer day-to-day advice based solely on a person's astrological sign at the moment of birth. This sign is also sometimes referred to as a "zodiac sign" or "sun sign."⁵

Popular Astrology and the Traditional Perspective

The assumptions of popular astrology remain faithful to astrological tradition. The public is not at all troubled by the "precession of the equinoxes," that very slow shift in the night sky pattern (as observed from earth) taking 25,800 years to come full circle. But the precession of the equinoxes does bitterly divide present-day astrologers.⁶

The division arises because traditional astrology, also described as the "movable" or "tropicalist" perspective, uses as its reference point the vernal equinox. The vernal equinox moves eastward 1.4 degrees each century through the "fixed" stars of the familiar zodiac constellations. Since a shift of about 30 degrees has transpired in the past 2,000 years, traditional astrology suffers from ossification. Because zodiac signs refer to 30-degree sectors of the ecliptic and not to constellations, the traditionalist's sign of Aries now coincides roughly with the real constellation of Pisces. Traditional astrology relies on the same model of the night-sky constellations as

recorded two millennia ago by ancient stargazers.

Popular Astrology vs. Technical Astrology

Yet while these issues of astrological calculation rage wildly amid astrologists, the public remains largely unaware or indifferent. The reason for this is quite understandable: popular astrology is not only both judicial and tradition-bound, it is also relatively nontechnical. Most Americans' interest in astrology focuses only on their particular constellation of the zodiac, or "sun sign." The sun sign is designated on the day of one's birth by the sun's position within a 16-degree-wide path of the ecliptic, a path otherwise known as the zodiac (hence the term "zodiac sign").

Full-time astrologers, concerned with the intricate calculations necessary for natal charts and other forecasts, go far beyond mere consideration of the sun sign. To some astrologists, it is of only secondary significance. Astrologers usually take into account the longitude, latitude, and precise moment of birth. They also calculate such relationships as the position of the sun and moon in regard to each of the eight planets and to the "ascendant"—the celestial "house" rising above the eastern horizon at the moment of birth.

The maze of calculations that professional astrologers make are far too complex to be adequately reviewed here. Suffice it to say that most folks are struck dumb by such measurements. They do not care for technical astrology with its calculations of "cusps," "medium coeli," "imum coeli," "angles," "transit," "aspects," "opposition," "conjunction," "sextile," "square," "trine," "quintile," "sesquiquadrate," "quincunx," and "orb." All they want to know is their sign.

And with good reason. Astrologists are in rare unanimous agreement that knowledge of the sun sign provides valuable, predictive information—albeit incomplete, perhaps—about human psychology and behavior. Astrologists may quibble over whether the sun sign reflects an "astral influence" or a biological process of "synchronicity," but they affirm in unison that the motions of the stars with regard to the earth correspond to an important array of deterministic influences upon human behavior.

The Birthday Sample

To find out whether people do, in fact, differ according to their sun sign,

it was necessary to locate a survey sample in which respondents had been asked their birth date. Knowing both the day and month of birth for each pollee would permit accurate division of the sample among the twelve zodiac signs.⁷

The sample adopted for this study was drawn in 1971 by the Survey Research Center of the University of California at Berkeley. The center sampled the San Francisco Bay area, a five-county region of 2.5 million people and one million households. The Berkeley researchers used a cross-sectional, stratified cluster sample. The response rate was 75 percent. Interviews were completed with 1,000 adults.

Although the survey data were collected admittedly for reasons

List 1
The zodiac typologies and cutting points as defined by this study

Zodiac sign	Ruler	Element	Cutting points
1. Aries the ram	Mars	Fire	March 22 to April 19
2. Taurus the bull	Venus	Earth	April 21 to May 20
3. Gemini the twins	Mercury	Air	May 23 to June 20
4. Cancer the crab	Moon	Water	June 23 to July 21
5. Leo the lion	Sun	Fire	July 24 to August 22
6. Virgo the virgin	Mercury	Earth	August 24 to September 22
7. Libra the balance or scales	Venus	Air	September 24 to October 21
8. Scorpio the scorpion	Mars or Pluto	Water	October 24 to November 21
9. Sagittarius the archer or centaur	Jupiter	Fire	November 23 to December 21
10. Capricorn the goat or sea-goat or goat-fish	Saturn	Earth	December 23 to January 19
11. Aquarius the water-bearer	Saturn or Uranus	Air	January 21 to February 17
12. Pisces the fish	Jupiter or Neptune	Water	February 20 to March 19

other than my test of popular astrology, they will serve our purpose quite well. This is because the questionnaire included a large number of items on which astrologists have made explicit predictions.⁸

The Zodiac Typology as Independent Variable

From our knowledge of respondents' birth dates it was possible to allocate the respondents among the twelve sun signs. There developed one small wrinkle, however. Because, while the sun changes signs around the twentieth of each month, the exact date on which it changes for any given month is not identical year in and year out. Nor, for that matter, do all astrologers agree on what the precise changeover dates should be. The result is muddled confusion for those few respondents who have the misfortune to be born around the twentieth of each month.

To eliminate this nuisance, specific cut-off points were adopted for each of the signs so the problematic cases could be dropped from tabulation. A review of astrological literature led to the decision to exclude those 45 respondents (out of the sample of 1,000) who were born on one of 18 problematic days.⁹

The exclusion of 18 days from the entire year of birthdays is no great loss. Almost 96 percent of our sample remains intact. This solution ensures that astrologists need not worry that our zodiac categories have been polluted by misclassified members of adjacent sun signs. The twelve-category zodiac typology created for our test is free of such contamination. See list 1 for a complete listing of the zodiac signs and corresponding cut-off points.

The Content Analysis

But one last barrier faces us before we can conduct our experiment. The problem arises that not all astrologers agree on which human characteristics are to be attributed to each of the twelve signs. Astrologers constantly wrangle over such matters. To choose the sun sign interpretations of only one astrologer would inevitably prompt accusations that our analysis was parochial, selective, and inconsequential.

So a different approach was adopted. It was decided to conduct a thorough "content analysis" of popularly available books dealing with traditional, judicial astrology. A total of fourteen sources, representing several schools of thought, were ultimately selected for the content

analysis. Most of the sources can be succinctly described as reviews by professional astrologers of prior and contemporary writings. All were obtained from public libraries.

From the content analysis of astrological literature a grand total of over 2,375 sign-specific adjectives were tabulated. From this statement it can be seen that each of the twelve zodiac signs was described roughly 200 times by assorted adjectives. About 30 adjectives were cited twice or more per sign. A little less than 100 adjectives on average were singularly mentioned. Despite this immense variety of words, the content analysis shows a remarkable degree of qualitative and substantive agreement among traditional exponents of judicial astrology. Most of the adjectives describing any one sign are either synonyms or terms sharing similar (albeit not equivalent) meanings. Antonyms are negligible.

The General and Specified Hypotheses

Two hypotheses will be tested. The first we shall label the "specified" or "specific" hypothesis. The second we shall christen the "general" or "generic" hypothesis. The specified hypothesis postulates a priori what impact each of the zodiac signs is to have upon human characteristics. This hypothesis therefore necessitates some sort of content analysis. But the generic hypothesis does not. It stipulates merely that human characteristics should differ according to sun sign. It does not postulate a priori in what direction or form these differences should be. It is non-specific.

Popular astrology will be vindicated if our data buttress the specified hypothesis. But if our evidence fortifies the generic hypothesis without lending support to the a priori specification, then popular astrology's vindication will be only partial.

Leadership Ability as the Dependent Variable

We find from the content analysis that leadership qualities are attributed to the zodiac signs of Leo, Aries, Scorpio, Capricorn, and Sagittarius. People born under these signs are predicted to be unusually strong, domineering, authoritative, masterful, tough, and kingly. They are born to be leaders.

Nonleadership traits are attributed to the signs of Taurus, Pisces, Cancer, and Virgo. People born under these signs are timid, insecure,

shy, clinging, indecisive, and weak. They are born to be servants.

Examining a cross-tabulation where sign is the independent variable and "leadership ability" is the dependent variable, we find what appears to be initial confirmation of the specified hypothesis. Refer to table 1. Aries illustrates a disproportionate amount of leadership ability within the top row of the table. But, sad to say, the signs of Leo, Scorpio, Capricorn, and Sagittarius do not. Indeed, all four are actually below rather than above the mean percentage of the row. As for our negative predictions, we find that both Virgo and Pisces are indeed above the average percentage of the bottom row. But Taurus and Cancer, alas, are not. This is bad news. Our cross-tabulation provides no decisive evidence to buttress the specified hypothesis regarding leadership ability.

To test the general hypothesis we use the chi-square (χ^2) goodness-of-fit statistic. Chi-square measures the discrepancy from the null hypothesis. The null hypothesis, or H_0 , stipulates that the two variables being compared are statistically independent of one another, that there is absolutely no relationship whatsoever between the two. The chi-square statistic compares the cell frequencies observed within the rows and columns of the table with those predicted by the null hypothesis.

If the chi-square is quite large compared to the degrees of freedom, then the probability value and level of significance will be less than one percent.¹⁰ The null hypothesis is then rejected. The observed relationship is judged statistically significant.

But if the chi-square is small relative to the degrees of freedom, then the probability value and corresponding level of significance will be much greater than this percent. In that case, H_0 is accepted and the generic hypothesis is weakened. The observed relationship is deemed statistically insignificant. It is attributed to chance fluctuation.

For this particular cross-tabulation the chi-square statistic is relatively small. The relationships observed are not significant at even the .05 level. The distributions we see may be safely attributed to random chance. The data here fail to strengthen the generic hypothesis.¹¹

Political Stand as the Dependent Variable

The content analysis tells us that liberalism is associated with the sun signs of Aquarius, Aries, Gemini, and Sagittarius. Folks born under these signs are forecast as distinctly unconventional, rebellious, impatient, reformist, mutable, revolutionary, radical, rash, and liberal. They

Table 1

Cross-tabulation with astrological sign as the independent variable and "leadership ability" as the dependent variable

"This question concerns various talents and characteristics. Please indicate whether you think you have a lot, a fair amount, only a little, or none at all by circling the appropriate number next to each item:

Leadership ability (1) a lot, (2) fair amount, (3) only a little, or (4) none at all."

The a priori predictions of leadership qualities are capitalized.

The a priori predictions of servile qualities are in italics.

	ARIES	<i>Taurus</i>	Gemini	<i>Cancer</i>	LEO	<i>Virgo</i>	Libra	SCORPIO	SAGITTARIUS	CAPRICORN	Aquarius	<i>Pisces</i>	total
1)	34%	19%	13%	25%	18%	19%	26%	18%	20%	17%	16%	26%	21%
2)	39	54	60	48	51	51	40	52	48	50	53	32	48
3)	17	20	17	20	25	19	24	16	24	22	17	29	21
4)	10	8	11	7	6	11	11	14	8	11	15	13	10
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
N	70	65	79	81	88	90	76	77	79	88	76	84	953

degrees of freedom = 33.0

chi-square = 38.012

probability value = 0.25

are born to be leftists.

Conservative traits, on the other hand, are attributed to the signs of Taurus, Cancer, Leo, Virgo, and Capricorn. Such individuals are patient, traditional, cautious, conventional, tenacious, obstinate, persistent, and conservative. They are born to be rightists.

Looking at the cross-tabulation with zodiac sign as the independent variable and "stand politically on most issues" as the dependent variable, we find again what appears to be initial confirmation of the specific hypothesis. Refer to table 2. Aquarius, as predicted, is more liberal than average for the first and second rows. But Sagittarius, Aries, and Gemini are not. Overall, they are actually less liberal. As for the conservative predictions, we see that Virgo has easily the largest percentage for the bottom three rows. This makes it the most conservative of the signs. The figures for Capricorn are likewise greater than the typical percentages for these rows. Yet Taurus and Cancer are smaller than average. This will not do. The cross-tabulation presents no conclusive evidence to buttress the specified hypothesis regarding political stand.

To test the generic hypothesis we use the chi-square goodness-of-fit statistic. We see that for this cross-tabulation the chi-square is relatively tiny. Since the probability value is much larger than .05, the associations seen within the table are statistically insignificant. The frequencies we have observed can be attributed to chance fluctuation. The data fail to strengthen the generic hypothesis.¹²

Subjective Intelligence as the Dependent Variable

We learn from the content analysis that intellectual abilities are associated with the zodiac signs of Aquarius, Sagittarius, Aries, Gemini, and Virgo. Persons born under these signs are predicted to be exceedingly analytical, rational, logical, educated, intelligent, scientific, discriminating, ingenious, and intellectual. They are born to be academicians. Anti-intellectual qualities, on the other hand, could not be derived from the content analysis. It appears that none of the twelve signs is characterized by stupidity.

Taking a close look at the cross-tabulation with sign as the independent variable and subjective "intelligence" as the dependent variable, we discover that Aquarius and Sagittarius lend support to the specified hypothesis. As predicted, Aquarius and Sagittarius both are more intelligent than average within the uppermost row. Note table 3. But

Table 2

Cross-tabulation with astrological sign as the independent variable and "stand politically on most issues" as the dependent variable

"Suppose that the line drawn . . . shows the range of political opinion in our country. Where would you say you stand politically on most issues?"

(1) radical, (2) radical/liberal, (3) liberal, (4) liberal/moderate, (5) moderate, (6) moderate/conservative, (7) conservative, (8) conservative/very conservative, or (9) very conservative."

The a priori predictions of liberal qualities are capitalized. The a priori predictions of conservative qualities are in italics.

	ARIES	<i>Taurus</i>	GEMINI	<i>Cancer</i>	<i>Leo</i>	<i>Virgo</i>	Libra	Scorpio	SAGITTARIUS	<i>Capricorn</i>	AQUARIUS	Pisces	total
1)	1%	3%	4%	8%	4%	5%	7%	3%	4%	6%	7%	4%	5%
2)	7	5	5	9	6	2	4	8	5	7	11	5	6
3)	12	16	24	22	23	23	18	24	22	14	18	21	20
4)	9	8	16	6	13	12	11	10	15	14	14	15	12
5)	42	43	29	41	33	25	38	26	31	37	34	29	34
6)	9	16	12	6	9	9	8	8	4	5	5	8	8
7)	20	8	9	5	11	21	11	15	13	15	10	15	13
8)	0	0	1	3	0	1	3	0	4	1	1	2	1
9)	0	2	0	1	2	2	1	7	3	2	1	2	2
N	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	69	63	76	79	86	87	76	74	78	87	74	83	932

degrees of freedom = 88.0

chi-square = 84.274

probability value = greater than 0.25

Table 3

Cross-tabulation with astrological sign as the independent variable and subjective "intelligence" as the dependent variable

"This question concerns various talents and characteristics. Please indicate whether you think you have a lot, a fair amount, only a little, or none at all by circling the appropriate number next to each item:

Intelligence

(1) a lot, (2) fair amount, (3) only a little, or (4) none at all."

The a priori predictions of intelligence are capitalized.

	ARIES	Taurus	GEMINI	Cancer	Leo	VIRGO	Libra	Scorpio	SAGITTARIUS	Capricorn	AQUARIUS	Pisces	total
1)	27%	22%	22%	26%	21%	23%	29%	33%	28%	25%	28%	23%	25%
2)	67	75	73	70	74	67	62	61	68	72	62	66	68
3)	6	3	5	3	6	9	9	7	3	3	11	8	6
4)	0	0	0	1	0	1	0	0	1	0	0	4	1
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
N	70	65	78	81	88	90	76	77	79	88	76	84	952

degrees of freedom = 33.0

chi-square = 35.371

probability value = 0.35

Gemini, Aries, and Virgo, alas, have percentages lower than average. This is quite unsatisfactory. Our cross-tabulation provides no conclusive evidence to support the specific hypothesis of subjective intelligence.¹³

To examine the generic hypothesis we apply the chi-square goodness-of-fit statistic. It appears that for this cross-tabulation also the chi-square is relatively small. The relationships we see in the table are not statistically significant at the .05 level. The cell frequencies we have observed should be attributed to random chance. The data do not strengthen the general hypothesis.¹⁴

Ascribed Intelligence as the Dependent Variable

Astrologists might contend that the previous test suffers from a reliance on subjective estimation by the respondent himself, that it does not rely on a more objective, outside appraisal. Luckily for our experimental design, a second item on the questionnaire asked the interviewer to judge the intelligence of the pollee as conveyed during the hour or two of questioning. Using the same derivations from the content analysis as earlier, we now have a second table against which to check our earlier predictions.

Examining the cross-tabulation with sun sign as the independent variable and "intelligence quotient" as the dependent variable, we discover that Sagittarius once again lends credence to the specified hypothesis. As predicted, Sagittarius is more intelligent than average within the top row. But our prediction this time is even further off the mark than on the last occasion. Aries, Gemini, Virgo, and Aquarius have fewer intelligent people than average. If these particular zodiac signs really do indicate intelligence, one might conclude that their members cleverly hide it from both themselves and others. They may indeed be intelligent, but neither they nor anybody else apparently realize it. Suffice it to say that such an empirical result, however explained, is unsatisfactory. Our cross-tabulation undermines the specified hypothesis regarding ascribed intelligence. Examine table 4.

Once again we apply the chi-square goodness-of-fit statistic to test the general hypothesis. But the chi-square is too little. The relationships observed within the cells of the table are not significant at even the .05 level. The frequencies we have observed can be attributed to chance fluctuation. For the fourth time the data weaken the generic hypothesis.¹⁵

Table 4

Cross-tabulation with astrological sign as the independent variable and ascribed "intelligence quotient" as the dependent variable

"How would you rate the respondent's I.Q.?"

(1) far above average, (2) somewhat above average, (3) about average, (4) somewhat below average, (5) far below average."

The a priori predictions of intelligence are capitalized.

	ARIES	Taurus	GEMINI	Cancer	Leo	VIRGO	Libra	Scorpio	SAGITTARIUS	Capricorn	AQUARIUS	Pisces	total
1)	6%	15%	8%	8%	10%	7%	9%	7%	11%	8%	8%	12%	9%
2)	50	28	43	40	40	43	40	47	33	41	41	39	40
3)	43	52	44	45	42	49	46	38	48	38	50	44	45
4)	1	5	5	6	6	1	3	8	8	13	1	2	5
5)	0	0	0	1	1	0	3	1	0	1	0	2	1
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
N	70	65	77	80	87	89	76	77	79	88	76	82	946

degrees of freedom = 44.0

chi-square = 48.199

probability value = 0.31

Astrological Belief as the Dependent Variable

If people with ordinary senses are consistently unable to detect their own true traits—as some astrologists might indeed surmise from our evidence—then perhaps at least the sensually gifted will differ. We can hope that people with occultist and similar extrasensory abilities will be able to divine the truth on such matters.

From the content analysis we find that occultist qualities are attributed to the sun signs of Pisces, Scorpio, and Aries. People born under these signs are predicted as unusually clairvoyant, shrewd, mystical, magical, spiritual, psychic, and occultist. They are born to be astrologers. Anti-occultist properties could not be derived from the content analysis. It would appear that the occult has only friends, and no enemies, among the twelve zodiac signs.

Examining the cross-tabulation with sign as the independent variable and “belief in astrology” as the dependent variable, we find what looks like initial confirmation of the specified hypothesis. See table 5. Pisces and Aries display higher percentages of astrology-prone belief than the overall mean of the top and second rows. But Scorpio, alas, displays a lower percentage. This is tragic. It sure beats me why so, so many people with occultist insight should disbelieve in astrology. Once again, it must be noted, the inconsistency within the cross-tabulation undermines the specific hypothesis.

To test the generic hypothesis we use the chi-square goodness-of-fit statistic. Our chi-square here is relatively small. The relationships seen in the table are not at the .05 level of significance. The distributions within the cross-tabulation should be attributed to random choice. The data once again, for the fifth time, undermine the generic hypothesis.¹⁶

The Twenty-eight Additional Variables

To supplement the five dependent variables already cited, twenty-eight additional items were run and then examined for statistically significant results. Nine of these additional items tap other personality traits. The nine are subjective measurements of one's (1) music ability, (2) artistic ability, (3) ability to make friends, (4) ability to organize well, (5) ability to feel deeply, (6) ability to make things, (7) self-confidence, (8) creativity, and (9) gift of gab.

Six additional questionnaire items tap feelings toward the occult.

Table 5

Cross-tabulation with astrological sign as the independent variable and "belief in astrology" as the dependent variable

"People who believe in astrology claim that the stars, the planets, and our birthdays have a lot to do with our destiny in life. What do you think about this:

Are you (1) a firm believer in astrology, are you (2) somewhat doubtful, are you (3) very doubtful, or are you (4) a firm disbeliever?"

The a priori predictions of occultist abilities are capitalized.

	ARIES	Taurus	Gemini	Cancer	Leo	Virgo	Libra	SCORPIO	Sagittarius	Capricorn	Aquarius	PISCES	total
1)	9%	5%	6%	14%	9%	9%	13%	9%	6%	8%	8%	10%	9%
2)	46	45	44	30	47	37	39	39	36	33	45	51	41
3)	28	19	22	20	25	18	20	26	24	26	23	16	22
4)	18	32	28	37	19	37	29	26	33	33	24	24	28
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
N	68	65	79	81	88	90	77	77	78	88	74	83	948

degrees of freedom = 33.0

chi-square = 33.043

probability value = 0.47

The six are subjective measurements and evaluations of one's (10) knowledge about astrology, (11) knowledge about horoscopes, (12) knowledge about one's own astrological sign, (13) interest in one's horoscope, (14) experience with extrasensory perception, and (15) type of ESP experience.

Four items tap the respondent's social philosophy and outlook on life. Three measured the degree to which the pollee felt that (16) most of life is decided for us rather than by us, that (17) some people are born lucky and others are born unlucky, and that (18) people suffer because they haven't learned to find inner peace. The fourth (19) recorded the respondent's view of the purpose of life.

Three items tap sociological characteristics. The three are categorical variables describing the subject's (20) occupation, (21) religion, and, if Protestant, (22) denomination.

Lastly, five items describe the respondent's physical appearance. Four were judgments by the interviewer of the respondent's (23) attractiveness, (24) physical disabilities, (25) height, and (26) weight. The fifth (27) was a subjective evaluation of one's good looks.

None of these twenty-seven supplemental variables yielded results that were statistically or substantively noteworthy.¹⁷ No support was found for either (a) the general hypothesis or (b) the specified hypothesis within any of the twenty-seven supplemental cross-tabulations.

But since astrological prediction depends so much on the date of birth, it was suggested that age in years be used as a control variable. Although neither technical astrology nor popular astrology presupposes any zodiac irregularities according to age, this seemed a reasonable request given the time-dependent nature of the astral art. Running chi-square for each of the five original and twenty-seven supplemental variables while controlling for age again produced statistically uninteresting results. The sixty-two partial tables created in this endeavor yielded no surprises.

Conclusions

Popular astrology is clearly rooted in traditional, judicial astrology. It should not be confused, however, with the technical astrology of some proponents of the astral art.

Our empirical test of popular astrology confirms neither (a) the general hypothesis nor (b) the specified hypothesis of astrological predic-

tion. The test sustains the null hypothesis.

The impotence of the general hypothesis was repeatedly documented by the chi-square goodness-of-fit statistic. An examination of thirty-three variables, measuring everything from physical attractiveness to belief in astrology, found no variable that was statistically significant at the .01 level when cross-tabulated with the astrological sign of the respondent. Indeed, thirty-two of the thirty-three were not significant at even the .05 level, an outcome fully in accord with probability theory. All of our results can be attributed to random chance.

An intensive look at five dependent variables for which content analysis permitted detailed a priori prediction found the specified hypothesis to be lacking in every instance. The null hypothesis was sustained in each of the cases. The five measured (1) leadership ability, (2) political stand, (3) subjective intelligence, (4) ascribed intelligence, and (5) astrological belief.

From such results one can only conclude that quite a number of the tenets of popular astrology are untenable.

To the good-humored scientist and layman alike, I wish to end with a note that my test has been thoroughly scientific. My dispassionate approach has been broad-minded, detached, unprejudiced, and unbiased. The methods I have used have been logical, rational, and trust-inspiring. I have incorporated my natural intelligence, genius, brilliance, and inventiveness in this truth-thirsting endeavor. Above all else, I have remained sincere, honest, idealistic, and serious in my never-ending quest for the truth.

It could not be otherwise. Because I am an Aquarian. And Aquarians are like that.

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Notes

1. The best-selling astrological periodical in the nation is *Horoscope*, published by Dell. *Horoscope* has a monthly circulation of a quarter-million, a readership many times larger than that of most astronomy and general science publications. Even so prestigious a group as the 6,000-member Association for Humanistic Psychology, publisher of the *Journal of Humanistic Psychology*, has flirted with the subject. Instruction in "Experiential Astrology" was sponsored by the AHP at its latest national convention.

2. According to Gallup, believers in astrology tend to be much less educated, without a higher-status job, nonwhite, poor, under 25 years old, single, and female. Studies of public opinion in foreign lands yield similar findings. They confirm the existence of millions of

believers in Australia, Brazil, France, Great Britain, India, Japan, and West Germany.

3. The manifesto, its signers, and their criticisms are cited by Bart J. Bok and Lawrence E. Jerome (eds.) in *Objections to Astrology* (Buffalo, New York: Prometheus Books, 1975).

4. I am treading in the footsteps of P. R. Farnsworth, J. A. Hynek, A. Müller, B. I. Silverman, M. Whitmar, and A. Standen. I shall try to avoid the pitfalls into which P. Choissard, K. E. Krafft, C. G. Jung, R. J. Pellegrini, and M. Gauquelin have fallen.

5. A good review of these and related subjects is given by Louis MacNeice in *Astrology* (Garden City, N.Y.: Doubleday, 1964), pp. 8-35.

6: The point of their disagreement is over how to handle the "synetic vernal point," that is, the degree and constellation in which the rising sun is located on the first day of spring (the vernal equinox, about March 21). Sidereal astrology, also known as the "fixed" perspective, argues that by using zero degrees Aries the traditionalists are two millennia out of date. The siderealists claim that the traditionalists have neglected to compensate for the movement of the earth's axis relative to the stars.

7. This method is much better than asking subjects what their signs are, since all too often they give wrong answers. For instance, within this particular sample, more than one person in twenty gave an incorrect sign. Moreover, one person in ten could not give any answer. Experimenters far too often neglect this problem.

8. As an aside, it should be noted that the researchers purposely overselected for young adults 30 years old and below. Respondents born between 1942 and 1957 numbered 565. Those born between 1880 and 1942 numbered just 435. A proportionately representative sample would have had 328 respondents 30 years old and under and 672 respondents over age 30. We shall examine the sample in its unweighted form to avoid any charge of unfair manipulation of the data. Although neither popular astrology nor technical astrology presuppose any zodiac irregularities according to age groups, we shall adopt age as a control variable later in our analysis to allay fears of a hidden distorter effect.

9. The excluded birthdates are April 20, May 21 and 22, June 21 and 22, July 22 and 23, August 23, September 23, October 22 and 23, November 22, December 22, January 20, February 18 and 19, and March 20 and 21.

10. The degrees of freedom is the product of (a) the number of rows minus one and (b) the number of columns minus one. It is usually expressed as $(r-1)(c-1)$.

11. This finding parallels one test of significance for the specified hypothesis. The test was run by collapsing the cross-tabulation into two rows and two columns, eliminating those three zodiac signs for which predictions were lacking. With 1.0 degrees of freedom and a chi-square of 0.135, the probability value was .72.

12. This finding parallels a test of significance for the specified hypothesis. The test was done by collapsing the table into two rows and two columns, eliminating those three signs for which predictions were absent. With 1.0 degrees of freedom and a chi-square of 0.400, the probability value was .53.

13. The cross-tabulation, however, does suggest why unintelligent qualities could not be derived from the content analysis. It would appear that stupidity is an amazingly rare trait—at least according to subjective estimates.

14. This finding parallels a test of significance for the specified hypothesis. The test was run by collapsing the cross-tabulation into two rows and two columns. With 1.0 degrees of freedom and a chi-square of 0.017, the probability value was .89.

15. This finding also parallels a test of significance for the specific hypothesis. The test was run by collapsing the table into two rows and two columns. With 1.0 degrees of freedom and a chi-square of 0.017, the probability was .89.

16. This finding, too, parallels a test of significance for the specified hypothesis. The test was run by collapsing the cross-tabulation into two rows and two columns. With 1.0 degrees of freedom and a chi-square of 2.903, the probability value is .09 (the best probability we have yet had, but still lacking statistical significance).

17. None of the 27 supplemental variables were significant at the .01 level. Indeed, 26 of the 27 were not significant at even the .05 level. Such results are in accord with probability theory. Needless to say, none of the 27 tables bore a relationship in harmony with the

predictions of astrologers.

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