Belief in Astrology

A Test of the Barnum Effect

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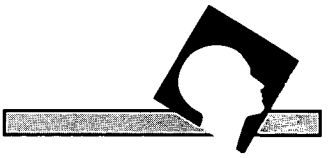
There is no empirical support for the claims of traditional astrological theory (see Culver and Ianna 1988; Dean and Mather 1977; Eysenck and Nias 1982; Gauquelin 1979; Jerome 1977; Kelly 1979; Startup 1984). Despite this, the level of belief in astrology in the general population is high and shows no sign of declining. Most people who have their horoscopes cast perceive those horoscopes to be an accurate description of their personalities. Why should this be?

Several factors have been suggested as playing a role in forming and maintaining a belief in the validity of horoscopes (Dean 1987; Tyson 1982). One of the most well known is the so-called Barnum effect, the tendency for people to accept vague, ambiguous, and general statements as descriptive of their unique personalities.

There are two differing reasons given in the literature for naming this inclination to believe "the Barnum effect," although both are based on quotations from P. T. Barnum. The first is that the famous circus-owner maintained that his secret of success was always to have a little something for everyone. Likewise, the typical astrological personality profile consists of a collection of statements carefully selected to enable everyone to see something of themselves in the description. The second, more cynical reason is that Barnum's most infamous phrase was, of course, "There's a sucker born every minute."

The best way to appreciate the force of the



The simple Barnum effect provides the best explanation for belief in astrology, regardless of the professed level of belief.

Barnum effect is to actually read a typical Barnum profile. Try it:

> You have a great need for other people to like you and admire you. You have a tendency to be critical of yourself. You have a great deal of unused capacity which you have not used to your advantage. While you have some personality weaknesses, you are generally able to compensate for them. Your sexual adjustment has presented problems for you. Disciplined and self-controlled outside, you tend to be worrisome and insecure inside. At times you have serious doubts as to whether you have made the right decision or done the right thing. You prefer a certain amount of change and variety and become dissatisfied when hemmed in by restrictions and limitations. You pride yourself on being an independent thinker and do not accept others' statements without satisfactory proof. You have found it unwise to be too frank in revealing yourself to others. At times you are extraverted, affable and sociable, while at other times you are introverted, wary and reserved. Some of your aspirations tend to be pretty unrealistic. Security is one of your major goals in life.

Typically, a naive subject reading the personality description above would be impressed by its accuracy if told that the description was based upon his or her horoscope. This profile was actually first used in a study some 40 years ago (Forer 1949), but its appeal is as strong today as it was then.

It is important to realize that the Barnum effect does not apply only to personality descriptions supposedly based upon horoscopes. The effect is found if the profile is said to be based upon any form of personality assessment, including palmistry, objective psychological tests, projective tests, personal interview, graphology, or Tarot cards. A considerable amount of research has been done on the psychological factors that influence the Barnum effect. Although a detailed review of these studies is beyond the scope of this discussion (see Dickson and Kelly 1985; Furnham and Schofield 1987; Snyder, Shenkel, and Lowery 1977), it is clear that the effect is an important factor in the acceptance of horoscopes (see, e.g., studies by Rosen 1975; Snyder 1974; Snyder, Larsen, and Bloom 1976).

However, not all statements in horoscopes are Barnum-type statements. For example, the typical "Aries" is said to be bold, energetic, assertive, selfish, insensitive, and aggressive. Surely, not everyone would see themselves as fitting this description. But, as Sundberg (1955) pointed out, Barnum profiles consist of a variety of statements:

> Vague, e.g., "You enjoy a certain amount of change and variety in life"; double-headed, e.g., "You are generally cheerful and optimistic but get depressed at times"; modal characteristics of the subject's group, e.g., "You find that study is not always easy"; favorable, e.g., "You are forceful and well-liked by others."

The typical horoscope is a mix of general statements and rather more specific ones. People tend to be impressed by the specific details that appear to fit (and pay less attention to those that do not), while the general Barnum-type statements provide readily acceptable "padding."

It seemed possible to us that different psychological mechanisms might be required to explain the formation and maintenance of belief in strong believers compared with moderate believers. One possibility was suggested by Goldberg (1979). Some "Virgos" actually will, by chance alone, have the personality character-

istics typically associated with that sun-sign, and similarly for all of the other sun-signs. Such people will be constantly amazed at the accuracy of horoscopes based upon this information and are far more likely to take their interest in the subject further than those who feel that the personality descriptions typical for their sun-signs are not appropriate—such as a timid "Aries." The believer is likely to buy popular books on astrology and be attracted to others with an interest in astrology, and some of these others will by coincidence be typical examples of *their* sun-signs, providing for the believer seemingly incontrovertible proof that astrology is valid. We shall henceforth refer to this model as the "Coincidence Hypothesis," as the original match between the typical sun-sign profile and the individual's personality is totally coincidental.

The scenario above, although speculative, seemed plausible to us and led to some testable hypotheses. If different mechanisms are responsible for producing different levels of belief in the way described, then we would predict that strong believers would show *less* acceptance of the Barnum-type profile than moderate believers, for the following reasons. Strong believers would be likely to have more knowledge of the typical characteristics associated with sun-signs, particularly the believers' own signs. Therefore they would be more impressed by reading a description that corresponded to this typical pattern and contained reference to specific expected traits than by the more general Barnum-type description. Furthermore, strong believers would rate horoscopes cast on the basis of their birth details (henceforth referred to as "genuine" horoscopes) as more accurate than randomly selected horoscopes ("false" horoscopes). Moderate believers, on the other hand, would not be as inclined to look for the typical profile because they are unlikely to possess detailed knowledge of typical sun-sign profiles. Moderate believers are likely to be more impressed by the carefully selected Barnum-type statements and to be less able to distinguish between genuine and false horoscopes. All of these effects would be relative, of course, since even moderate believers may have some knowledge of their typical sun-sign profiles.

An alternative hypothesis maintains simply that the Barnum effect will be equally strong for everyone and that some other (unspecified) factor is required to account for differences in belief between strong and moderate believers (see Dean 1987, for possibilities). In this case, one would argue that the effectiveness of horoscopes is due largely to the Barnum effect and that genuine horoscopes are effective only to the extent that they incidentally capitalize on the effect. We would predict a different pattern of results on the basis of this hypothesis. Both genuine and Barnum-type horoscopes would be judged as accurate by all believers, but the Barnum profile ought to be judged as more accurate, as the careful selection of statements would maximize the effect. Furthermore, there would be no difference in the perceived accuracy of genuine and false horoscopes. We shall refer to this hypothesis simply as the "Barnum Hypothesis."

A third hypothesis, which has already been thoroughly discredited, can also be outlined. The "Astrological Hypothesis" would maintain that the position of the stars and planets at birth really does influence the formation of personality as outlined in traditional astrology. If this were so, everyone, regardless of degree of belief, ought to rate genuine horo-

scopes as more accurate than either false or Barnum-type horoscopes.

In order to test these hypotheses, data were collected from 52 subjects, most of whom were attending a sixth-form college. Ages ranged from 16 to 35, with a mean age of 18. Thirty-five of the subjects were female. Subjects were told that the study was an assessment of three different computer programs for casting horoscopes and were initially asked to provide information on their date, time, and place of birth as well as information relating to their belief in and knowledge of astrology.

Several days after collection of the initial data, each subject was presented with a booklet containing a "genuine" horoscope, a randomly selected ("false") horoscope, and a Barnum-type horoscope. The order of the horoscopes was counterbalanced across subjects. The genuine horoscopes were cast using a modified version of the HOROSCOPICS program (Copyright 1983, Patched by PAS Inc., 306 S. Homewood Ave., Pittsburgh, PA 15208) run on an IBM XT personal computer. The program casts a horoscope on the basis of the date of birth only and produces a profile consisting of a dozen statements (a typical example of the output is shown in Figure 1). The program was modified to produce output consisting solely of the personality profile, omitting the astrological data upon which the interpretation was based. The false horoscopes were randomly selected horoscopes from the pool of genuine horoscopes, so that the two pools were in fact identical. The Barnum horoscope was the same as the one presented earlier except that one sentence ("Your sexual adjustment has presented problems for you") was omitted in order to equate the number of statements in each horoscope. The horoscopes were all presented on computer print-out paper with the same layout. Subjects were asked to read and rate each horoscope before considering the next one.

Of the 52 subjects, 7 stated that they believed in astrology "strongly," 31 "moderately," and 14 "not at all." There was a striking difference in distribution between male and female subjects. All 7 strong believers were

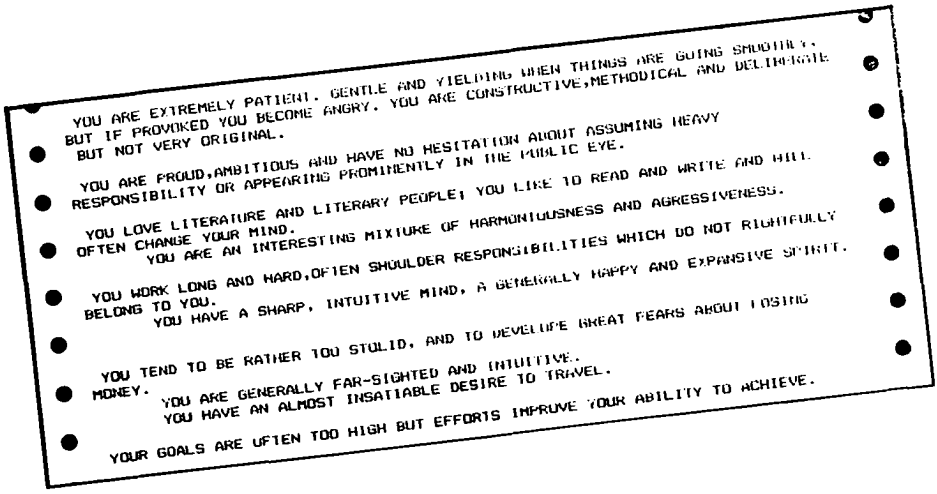


FIGURE 1: A typical example of the computerized horoscope used in this study.

female, as were 25 out of 31 moderate believers. Only 3 of 14 disbelievers were female (chi-square = 19.3, df = 2, $p < 0.0001$). This finding is in line with previous research showing that more women than men believe in astrology and are interested in their horoscopes (e.g., DeFrance, Fischler, Morin, and Petrossian 1971; Gallup 1975; Sobal and Emmons 1982; Wuthnow 1976).

As would be expected, level of belief was significantly correlated with self-reported frequency of reading newspaper horoscopes, with self-assessed knowledge of astrology, and with self-assessed influence of astrology on subjects' everyday lives. The initial questionnaire also included a question asking subjects to write down their sun sign, ascendant, and moon sign, if known. This allowed for a maximum score of three on this rather crude measure of astrological knowledge, which was also found to correlate significantly with belief.

The second questionnaire asked subjects to rate how accurate they felt each horoscope was on a scale from one (not at all accurate) to five (completely accurate). The mean ratings of each group are shown in Table 1.

In order to test the experimental hypotheses, data were subjected to a two-way analysis of variance with type of horoscope and level of belief as factors. The only significant effect was related to type of horoscope ($F(2, 98) = 4.95$, $p < 0.01$), and reflected the fact that the Barnum horoscope was rated as much more accurate than the other two. No significant difference was found between the ratings of the genuine and false horoscopes and no interaction was found between type of horoscope and level of belief.

It might be objected that the reason that people so readily accept the Barnum profile is that the statements in it actually *do* apply to everyone. If so, then people are behaving quite rationally in rating its accuracy so highly. It is therefore important to show that people rate the Barnum profile as highly accurate while at the same time not realizing its general applicability. Therefore we asked subjects to rate how general they found the horoscopes on a scale from one to four (1 = very general; 2 = quite general; 3 = quite applicable to you personally; 4 = very applicable to you personally). Mean ratings are presented in Table 2.

Once again, these data were analyzed using a two-way analysis of variance with type of horoscope and level of belief as factors and, once again, the only significant effect was that the Barnum profile was rated as *more* applicable than the other two ($F(2, 98) = 5.35$, $p < 0.01$). The genuine and false horoscopes did not differ in applicability ratings.

A final question on the questionnaire asked subjects, for each horoscope, if they felt that it constituted evidence for astrological belief. Twenty subjects out of 52 felt that the Barnum profile constituted such evidence, whereas only 12 and 11, respectively, felt this way about the false and genuine horoscopes. These proportions are significantly different (Cochran's Q = 10.43, df = 2, $p < 0.01$).

There can be no doubt that this experiment offers strong support for the Barnum Hypothesis and no support whatsoever for the Coincidence Hypothesis or the Astrological Hypothesis, at least for the sample under study. It might be objected that the group of strong believers was small in comparison with the other two groups; but as examination of the tables reveals, there was no sign of a trend in favor of either of the latter hypotheses. In fact, this group tended to be more influenced by the Barnum

TABLE 1
Means (and Standard Deviations) for Accuracy Ratings (on a Scale of 1 to 5) for Barnum, False, and Genuine Horoscopes

	Barnum	False	Genuine
Strong Belief (N = 7)	4.14 (1.07)	3.29 (1.11)	3.29 (0.76)
Moderate Belief (N = 31)	3.77 (0.85)	3.00 (1.06)	3.16 (0.90)
No Belief (N = 14)	3.29 (1.49)	3.07 (1.14)	2.79 (1.25)
Entire Group (N = 52)	3.69 (1.09)	3.06 (1.07)	3.08 (0.99)

TABLE 2
Means (and Standard Deviations) for Applicability Ratings for Barnum, False, and Genuine Horoscopes

	Barnum	False	Genuine
Strong Belief (N = 7)	2.96 (1.08)	2.33 (0.96)	2.42 (0.94)
Moderate Belief (N = 31)	3.29 (1.11)	2.86 (0.90)	2.57 (0.79)
No Belief (N = 14)	2.97 (1.05)	2.26 (0.93)	2.48 (0.85)
Entire Group (N = 52)	2.79 (1.19)	2.21 (1.05)	2.21 (1.19)

profile than the other two groups, although this effect did not reach statistical significance. The nonbelievers tended to be least influenced by the Barnum effect. Perhaps with larger samples these effects would have reached significance.

To summarize, the Barnum profile was rated as most accurate and most personally applicable by all groups, as predicted by the Barnum Hypothesis. Furthermore, a significantly greater number of subjects felt that the Barnum profile, compared with the other two horoscopes, constituted evidence in favor of astrology. No interaction was found between level of belief and type of horoscope, thus failing to support the Coincidence Hypothesis. No support was found for the Astrological Hypothesis. No group was able to differentiate the genuine from false horoscopes, which were both rated as less accurate and less applicable than the Barnum profile.

For this sample, then, the Barnum effect offered the best explanation of belief in astrology. However, we may need to be cautious in generalizing these results too widely. The strong believers did claim and demonstrate more knowledge of astrology than the other two groups, but their level of knowledge was still not very great, as might be expected in a study where the average age of the subjects was 18. A more refined version of the Coincidence Hypothesis would recognize the many levels of astrological knowledge attainable and the possibly complex interactions that this could produce in studies like this one when applied to different subject groups.

At the lowest level are those who profess no knowledge of astrology. Next are those who have some vague notion of their sun-sign and its associated characteristics, followed by those who may take astrology seriously enough to buy popular books on the subject. The Coincidence Hypothesis as outlined earlier in this article applies to these three levels. However, beyond sun-sign astrology we have what Dean (1986-87) refers to as "the real thing," involving a consultation between a professional astrologer and a client in which the

astrologer's interpretation is based upon as many as 40 interacting chart factors, of which sun-sign is only one. As Eysenck and Nias (1982) discuss, it is possible that those who are very knowledgeable would not be so influenced by consideration of the sun-sign, recognizing instead that "real" astrology is a much more complex enterprise.

The fact remains, however, that most people who profess a belief in astrology, whether strong or moderate, do not possess much knowledge of the subject. It is of great interest to understand the factors that produce belief in such individuals, and the current study strongly suggests that we need look no further than the basic Barnum effect.

References

Culver, R., and P. Ianna. 1988. *Astrology: True or False?* Buffalo, N.Y.: Prometheus Books.

Dean, G. 1986-87. Does astrology need to be true? Part 1: A look at the real thing. SKEPTICAL INQUIRER, 11:166-184.

———. 1987. Does astrology need to be true? Part 2: The answer is no. SKEPTICAL INQUIRER, 11:257-273.

Dean, G., and A. Mather. 1977. *Recent Advances in Natal Astrology: A Critical Review 1900-1976.* Subiaco, Western Australia: Analogic.

DeFrance, P., C. Fischler, E. Morin, and L. Petrossian. 1971. *Le Retour des Astrologues.* Paris: Cahiers du Club Nouvel Observateur.

Dickson, D. H., and I. W. Kelly. 1985. The 'Barnum effect' in personality assessment: A review of the literature. *Psychological Reports,* 57:367-382.

Eysenck, H. J., and D. K. B. Nias. 1982. *Astrology: Science or Superstition?* London: Temple Smith.

Forer, B. R. 1949. The fallacy of personal validation: A classroom demonstration of gullibility. *Journal of Abnormal and Social Psychology,* 44:118-123.

Furnham, A., and S. Schofield. 1987. Accepting personality test feedback: A review of the Barnum effect. *Current Psychological Research & Reviews,* 6:162-178.

Gallup, G. H. 1975. Thirty-two million Americans express belief in astrology. *Gallup Poll.* Institute of Public Opinion. October 19.

Gauquelin, M. 1979. *Dreams and Illusions of Astrology.* Buffalo, N.Y.: Prometheus Books.

Goldberg, S. 1979. Is astrology a science? *The Humanist,* 39(2):9-16.

Jerome, L. 1977. *Astrology Disproved.* Buffalo, N.Y.: Prometheus Books.

Kelly, I. W. 1979. Astrology and science: A critical examination. *Psychological Reports,* 44:1231-1240.

Rosen, G. M. 1975. Effects of source prestige on subjects' acceptance of the Barnum effect: Psychologist versus astrologer. *Journal of Consulting and Clinical Psychology,* 43:95.

Snyder, C. R. 1974. Why horoscopes are true: The effect of specificity on acceptance of astrological interpretations. *Journal of Clinical Psychology,* 30:577-580.

Snyder, C. R., D. K. Larsen, and L. J. Bloom. 1976. Acceptance of general personality interpretations prior to and after receiving diagnostic feedback supposedly based on psychological, graphological, and astrological assessment procedures. *Journal of Clinical Psychology,* 32:258-265.

Snyder, C. R., R. J. Shenkel, and C. R. Lowery. 1977. Acceptance of personality interpretations: The "Barnum effect" and beyond. *Journal of Consulting and Clinical Psychology,* 45:104-114.

Sobal, J., and C. F. Emmons. 1982. Patterns of belief in religious, psychic, and other paranormal phenomena. *Zetetic Scholar,* 9:7-17.

Startup, M. J. 1984. *The Validity of Astrological Theory as Applied to Personality, with Special Reference to the Angular Separation Between Planets.* Ph.D. thesis, Goldsmiths' College, London University; 350 references.

Sundberg, N. D. 1955. The acceptance of "fake" versus "bona fide" personality test interpretations. *Journal of Abnormal and Social Psychology,* 50:145-147.

Tyson, G. A. 1982. Why people perceive horoscopes as being true: A review. *Bulletin of the British Psychological Society,* 35:186-188.

Wuthnow, R. 1976. Astrology and marginality. *Journal for the Scientific Study of Religion,* 15:157-168.

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