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Is Astrology Relevant to Consciousness and Psi?

Abstract: *Many astrologers attribute a successful birth-chart reading to what they call intuition or psychic ability, where the birth chart acts like a crystal ball. As in shamanism, they relate consciousness to a transcendent reality that, if true, might require a re-assessment of present biological theories of consciousness. In Western countries roughly 1 person in 10,000 is practising or seriously studying astrology, so their total number is substantial. Many tests of astrologers have been made since the 1950s but only recently has a coherent review been possible. A large-scale test of persons born less than five minutes apart found no hint of the similarities predicted by astrology. Meta-analysis of more than forty controlled studies suggests that astrologers are unable to perform significantly better than chance even on the more basic tasks such as predicting extraversion. More specifically, astrologers who claim to use psychic ability perform no better than those who do not. The possibility that astrology might be relevant to consciousness and psi is not denied, but such influences, if they exist in astrology, would seem to be very weak or very rare.*

Introduction

Astrology has one sure thing in common with parapsychology — a highly visible outpouring of market-driven nonsense that threatens to bury the work of serious researchers. Just as parapsychology means ghost busting and psychic phonelines to the ordinary person, so astrology means sun signs and newspaper columns. Here we ignore the latter view in favour of serious astrology, the study of purported relationships between the heavens and earthly affairs. The case for astrology was lucidly put by Charles Carter (1925), the leading British astrologer of his day, as follows:

Practical experiment will soon convince the most sceptical that the bodies of the solar system indicate, if they do not actually produce, changes in: 1. Our minds. 2. Our feelings and emotions. 3. Our physical bodies. 4. Our external affairs. (p. 14)

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However, the appeal to 'practical experiment', or experience, is not as straightforward as it may seem. Astrology can be applied to anything that is born or begins independent existence, such as a person, company, ship, nation, animal or idea; and the astrologer begins by calculating the birth chart or horoscope, a stylized map of the heavens at the moment of birth (think of a wheel covered in strange symbols) as seen from the place of birth. Then comes the interpretation. But after twenty centuries of practice, astrologers still cannot agree on what a birth chart should contain, how it should be interpreted, or what it should reveal. Nor do they agree on how astrology should be tested, or even (despite what Charles Carter says) on whether it can be tested in the first place. As a result, even to astrologers, 'astrology is almost as confused as the earthly chaos it is supposed to clarify' (Dobyns and Roof, 1973, p. 4).

For our present purpose this disagreement and confusion are of little concern. As we shall see, what matters is that some astrologers claim that astrology involves an altered state of consciousness, and many more claim that astrology involves some degree of psi. So if astrologers can perform as they claim, we might be on to something. We look first at the claims (these occupy roughly half of what follows) then at the empirical studies.

Astrology and Consciousness

We know that brain processes are related to consciousness, the difference between being awake and being asleep. But is consciousness a biological process needing a biological brain, or is it merely a by-product of complexity needing only sufficient complexity, as in some futuristic computer program? As yet nobody knows for sure. But if astrological links with human behaviour are real, they might provide clues.

Unfortunately astrologers themselves provide more confusion than clues. For example some astrologers see astrology as describing 'the mind stuff which shapes and informs all of life and consciousness' (Harvey and Harvey, 1999, p. 31). Others see consciousness as just one more thing shown by the birth chart; for example the quintile aspect 'introduces a new dimension of consciousness' so you 'experience subtleties of thought transcending the usual', while Jupiter leads to 'expansions of consciousness' (Moore and Douglas, 1971, pp. 586, 707). Precisely what all this means is hard to say, for such talk raises more questions than it answers.

Our best clue concerning consciousness comes from horary astrology, where a client's question is said to be answered in the birth chart calculated for when the astrologer receives the question. Ordinary astrology sees the birth chart as existing independently of the astrologer, whereas an horary birth chart does not exist until the astrologer becomes involved by receiving the question. Some astrologers such as Jeff Mayo (1964) find it is:

sheer nonsense for anyone to believe that a question . . . has its correct answer wrapped neatly in cosmic vibrations tuned in to when the letter is opened on

Wednesday 9:03 am — or, if the recipient's train was held up on the way to his office, at 9:14 am. Horary astrology makes a mockery of a serious subject. (p. 184)

But for British astrologer Geoffrey Cornelius (1994), a teacher and practitioner of divinatory astrology, the actual involvement of the astrologer, as opposed to being a mere interpreter, suggests that astrological 'connections' are less a gift of nature and more a product of the astrologer's mind; that is, of consciousness. In this 'all in the mind' view of astrology there is nothing actually 'out there' that involves planets. Instead what matters is the mental state of the astrologer. The technique used for reading the chart is then merely a ritual that leads to the right mental state. Just as astrologers differ, so will techniques, but all techniques will necessarily work no matter how much they may seem to disagree.

British astrologer Charles Harvey (1994) points out that such a view has the advantage of elevating the internal confusions of astrology above criticism, and the disadvantage of denying any way for astrology to be improved over, say, tea-leaf reading, or to have been discovered in the first place. He argues that there can be a psi component to astrology (a point most astrologers would agree with, see later), but not to the extent claimed by Cornelius, simply because some computer-generated chart readings 'can prove remarkably to the point' (p. 398). Nevertheless, despite the disagreement, such a view provides a clue too good to ignore. To see how astrology might be nothing more than the right mental state, we can look at shamanism.

Parallels with Shamanism

To shamans or medicine men, purportedly obtaining information from the spirit world to benefit their community, everything provides knowledge about everything else, but only via symbols that have to be interpreted to make sense. In shamanism:

Symbols . . . serve as keys that unlock the door to . . . another order of reality . . . The image-schemas [symbol systems] of shamanic practitioners were especially adept when prediction was demanded. Game needed to be located, weather patterns needed to be forecast, enemy movements needed to be anticipated . . . the shamanic fine-tuning of image-schemas through heightened perception and/or changed states of consciousness may have assisted this assignment (Krippner, 2000, pp. 102, 114).

Astrologers work in a similar world of symbolism and 'image-schemas', where everything interacts with everything else and has to be interpreted to make sense. In place of the frenzied dancing, drumming and mushroom-eating used by shamans to achieve their 'shamanic consciousness', there is concentration on the birth chart and its highly complex symbolism based on analogy, mythology, numerology, sympathy and ancient ideas generally, with each symbol being applicable at different levels such as inner, outer and physical, which in turn will depend on age, maturity, gender and so on. The complexity of the birth chart is thus almost without limit, which is why the best readings are said to require the aid of psi to sort out the confusion. For many astrologers a chart reading involves

no more than ordinary concentration, so 'shamanic consciousness' hardly applies to them. But for others it is different.

Consider what American clinical psychologist Ralph Metzner (1971), a former editor of *Psychedelic Review*, says in his book *Maps of Consciousness*. For six years he explored 'the extraordinary inner worlds opened up for me by the psychedelics' (these worlds are similar to shamanic experiences), after which he began to see how astrology and other divinatory systems 'were originally intended to be used as maps for the path of the evolutionary development of consciousness' (p. vii). He is careful to distinguish between a model (simulates how you behave) and a map (try it and see how you feel) (p. 10). More to the point:

Like . . . other mantic [divinatory] procedures, astrological horoscope casting is in one way a framework for intuitive perception. I know of one clairvoyant astrologer who simply looks at the actual horoscope diagram [birth chart] and then begins to 'see' the inner life, the thought forms, and emotional patterns of her client, almost as if she were gazing into a crystal ball (p. 111).

Consider also how American astrologer Jane Evans (1979) describes reading the birth chart as 'a ritual carrying a magic dimension', with clear shamanic parallels:

As the astrologer works with the ancient symbology giving it interpretation more suitable to this age, it becomes an active entering-into, a deep participation with those symbols and the personality/Self of the [horoscope's owner] . . . When that participation is achieved there is a breakthrough. The astrologer can be taken . . . inward to realization. Like a lightning flash that reveals a whole landscape formerly in darkness, insight suddenly illuminates the horoscope giving pattern and meaning to what was hitherto just a collection of symbols . . . A door opens to communication with the Inner Self, whether your own or that of the person whose horoscope is being studied (p. 5).

Much the same applies to this description of reading the birth chart by British astrologer Rose Elliot (1974):

First of all, I like to absorb the chart completely; like to look at it, not analysing it but allowing the different factors to sink into my subconscious. When the time comes actually to interpret the chart, I concentrate on the centre of the chart, which appears as a kind of golden orb; concentrating on this point in the chart, I feel as if I am *inside* the chart, standing in the centre, with all the planetary forces around the chart playing on me like the rays of the sun . . . At a certain point the golden orb I have described opens out, and I find myself standing in a sort of corridor. This corridor represents time . . . I can look back down this corridor into the past, and forward to the future. As I do so, certain 'rooms' which open off the corridor, become lit up and I look into them and see a picture, like a cinema . . . These always have a bearing on the chart (pp. 12–13).

Elliot would not be your usual everyday astrologer. Her experiences could of course arise not from shamanic ecstasy but merely from a fantasy-prone personality (one that fantasizes vividly during much of waking life). But proneness to fantasy seems to be an essential ingredient of shamanism (Krippner, 2000, p. 96), so for our purpose it may not matter. The point is, both groups (shamans

and astrologers) relate consciousness to a transcendent reality that, if true or even partly true, might require a re-assessment of present biological theories of consciousness. Just as shamanism can be seen as relevant to consciousness, so might astrology, especially as our principal concern here is validity, which seems to be rarely considered in shamanic studies.

Furthermore, Freeman and Núñez (1999, p. xi) note that the mind–body split stems from the magic–science split in world views, typified by astrology on the one hand and Newtonian physics on the other. So astrology might lead us to useful pre-split insights. At which point we move on to consider psi.

Astrology and Psi

The parapsychologist John Beloff (1994) argues that the existence of psi suggests that the mind can ‘extract information from objects other than its own brain’. Similarly, whether the heavens actually correlate with human behaviour, or are merely a means of attaining the right mental state, as variously claimed by astrologers, it suggests that minds might be affected by things other than brains (and vice versa). It might also be evidence for paranormal happenings that might be related to psi.

As a bonus, astrology brings advantages shared with parapsychology — testability (at least in principle), promise of new knowledge and (according to astrologers) positive results. Many methodological and conceptual problems are common to both, for example compare the psi review articles and commentaries in *Behavioural and Brain Sciences* (1987) with their astrological equivalent in *Correlation* (1994–8).

The bonus would be even better if astrologers had genuine psychic ability, which they see as a gift synonymous with intuition that mysteriously pops things into their minds. They know without knowing how they know (and without knowing that they could very well be wrong). However, only psychic ability, if it exists, is without a scientific explanation, whereas intuition may be due to the unconscious processing of previous experience (Eysenck, 1995, pp. 170–201; Myers, 2002). But here the distinction is less important than establishing whether something unusual is happening.

Do Astrologers have Psychic Ability?

Sigmund Freud was a corresponding member of the Society for Psychical Research from 1911 until his death in 1939. In 1921 he told how a patient of his had given a birth date to a renowned lady astrologer in Munich, who predicted that after a few months the person would die of crab or oyster poisoning. In fact the prediction was wrong, although the person had almost died of crab poisoning at the same time a year earlier (which might be unremarkable if the person often ate crabs). As shown by the following quote, Freud says he doubts whether astrology could discover anything as specific as crab poisoning:

Let us not forget how many people are born on the same day. Is it conceivable that . . . the date of birth would include such details? . . . On the other hand, her client did possess this information. The occurrence can be fully explained if we are willing to assume that . . . thought transference exists . . . the purpose of the astrologer's work was to divert her own intra-psychic forces, and to occupy them innocuously. This made it possible for her to become receptive and permeable to the impact of the thought of others (Freud, 1921/1955, pp. 181–3).

Fifty years later much the same view was put forward by psychic researcher Alan Vaughan (1973), who comments 'My own small experience with astrologers has given me the impression that their best hits are psychic rather than astrological, though in truth it is very difficult to separate the one from the other' (p. 103).

Most astrologers would not disagree with this view. A chart is so complex that American astrologer Doris Chase Doane (1956) says 'it is almost impossible to read a birth-chart . . . without exercising in some degree, Extra-sensory Perception' (p. 3). According to Moore and Douglas (1971) 'some astrologers are clairvoyantly gifted. Using the horoscope as a psychometric tool, they may be spectacularly successful in describing the specific details of a person's life' (p. 8). Cornelius (1994) argues that some unknown element 'is involved in the astrological interpretation . . . [and] is broadly but consistently characterized by astrologers and researchers alike, as either ESP or intuition' (p. 70). A survey of two hundred and fifty astrologers, mostly American, found that over half claimed to use psychic ability in their chart readings (Moore, 1960, p. 127). Like Freud, astrologer Dal Lee (1964) concludes that astrological meanings are too broad to allow specific statements unless some ESP faculty is used, and that some astrologers have ESP at least some of the time, often getting a perfect hit but hardly knowing where it comes from. Let us look more closely.

Hidden Persuaders

Examples of what seem to be perfect hits are seeing abuse at age thirteen, seeing the location of a lost shawl in a French restaurant (Phillipson, 2000, pp. 64, 71) and guessing sun signs correctly. Such hits lead to the claim that astrologers proudly and repeatedly make, that astrology is unassailable because it is based on experience, which echoes our opening quote from Charles Carter. But the claim is untenable because astrologers are generally unaware of the many hidden persuaders that can make them see hits where none exist (Dean, Mather and Kelly, 1996, pp. 89–93). Examples are the Barnum effect (reading specifics into generalities), cognitive dissonance (seeing what you believe), cold reading (let body language be your guide), nonfalsifiability (nothing can count against your idea) and operant conditioning (heads you win, tails is irrelevant). There are many more. Technically these hidden persuaders can be described as 'statistical artifacts and inferential biases'.

When hidden persuaders are prevented, the hits generally disappear, as for an American astrologer who publicly challenged sceptics to test his predictions of appearance (Ianna and Tolbert, 1984), a French astrologer who claimed to

diagnose medical conditions (Gauquelin, 1987), and when guessing sun signs was found to depend on cue leakage (Dean, 1983). Offering cash prizes of up to \$US5,000 did not improve the hit rate (Dean, Mather and Kelly, 1996, p.71). As an example, in 1927 thousands of astrologers attempted to win \$US1,000 (then roughly the average annual wage) by correctly describing three people from their birth data, but the result was conspicuous disagreement — ‘they not only contradicted themselves, they were unanimously unsuccessful in describing the three people’ (Miller, 2002). Such a situation will be familiar to any investigator of paranormal claims.¹

Of course this does not deny the possibility that astrologers could have genuine psychic ability. Indeed, most astrologers aggressively ignore such problems in favour of seeing astrology less as a set of rules and more as something akin to divination, where ‘its reliability depends on the quality of the astrologer’s intuition’ (Phillipson, 2000, p. 167). Some even see astrology as a link to the spirit world, a view we now explore.

Help from Spirit Guides

Some astrologers claim they are helped by spirit guides, for example they will feel somehow ‘directed’ to focus on particular chart factors, or something in a birth chart will suddenly jump out at them. American astrologer Gary Keen (1988) describes the effect of such guidance on the astrologer:

He knows he has stepped across a divide that separates the material from the mental or unknown [spirit] world . . . He will attempt to develop some form of association with this unseen magical power that resides within, around and above the horoscope he holds in his hand (pp. 19–20).

Such effects explain why some astrologers see the birth chart as a mandala or magical diagram, a means to contact spirit powers that guide and direct a person.

[1] The same hidden persuaders explain how phrenology, once more popular and far more influential than astrology is today, could be accepted as completely valid even though it is now known to be completely invalid (Dean, 1998). The point is, hidden persuaders are generally not noticed, yet they can be totally compelling. For example Aphek and Tobin (1989), in a survey of fortune-telling techniques, cite a case where a young lady PhD in psychology was amazed when an astrologer told her things that the astrologer ‘could not possibly have known’. But on analysing the tape recording she realized that ‘in every case she had herself supplied the cues that enabled the seer to proceed’ (p. 180).

Interestingly, it is not uncommon for astrologers to make a seemingly accurate reading for a client only to discover later that it was based on the wrong birth chart. For example one British astrologer notes how it has ‘happened to a lot of astrologers. Some of the best readings have been with wrong charts.’ But he ignores the logical conclusion (that astrology is dominated by hidden persuaders, so any chart will do), adding only: ‘I think a lot of what you get from astrology is actually psychic ability’ (in Phillipson, 2000, p. 118).

The power of hidden persuaders to lead us astray is illustrated by American psychologist Ray Hyman (2003, p. 22), who as a teenager began reading palms to earn extra income. He was highly praised for his accuracy, even on specific matters such as health, and became a staunch believer. But when he gave readings that were the opposite of what the palm indicated, his accuracy was as highly praised as before. Dean (1987) found the same for reversed birth-chart readings. Clearly no sensible person will consider a paranormal explanation of astrology and palmistry hits unless hidden persuaders have been eliminated. For more on how seers capitalize on hidden persuaders see Hyman (1977) and Steiner (1989).

Note again the parallel with shamanism, where ‘practitioners deliberately alter or heighten their conscious awareness to enter the so-called “spirit world”, accessing material that they use to help and to heal members of the social group that has acknowledged their shamanic status’ (Krippner, 2000, p. 98). Indeed, American astrologer Barbara Clow (1988) emphasizes the astrologer’s ‘shamanistic duty’ to place a client in contact with spirit forces, thus making the chart ‘a unified energy field of consciousness’ (p. xv).

According to Burgoyne (1889/1982, p. 84), an astrologer and medium, to really learn astrology one must be able to contact spirits and thus receive occult knowledge. Of nine randomly-selected lecturers at a major American astrology convention in 1988, seven claimed to have spirit guides or were spiritists, and another was involved with spiritistic literature (Ankerberg and Weldon, 1989, p. 219). Some astrology books have purportedly been dictated by spirit guides, and some have been dedicated to spirit guides, for example Joan Hodgson’s *Reincarnation Through the Zodiac* (1978) is dedicated ‘with deep love and gratitude’ to her spirit guide White Eagle. When the seer Edgar Cayce was asked if it was proper to study astrology, his spirit guide answered: ‘When studied aright, very, very, very much so’ (Gammon, 1973, p. 15). Even John Addey, the leading British astrologer and empirical investigator of his time, was of the view that planets are ‘spiritual existences or substances and their influence is universal’ (Addey, 1996, p. 9).²

In short, such views hold that spirits are the real basis of astrology, and that planetary ‘energies’ are really spirit energies, whatever that means. Spirits might of course be psi in disguise, which would make them open to the same objections, for example the absence of criteria for deciding whether psi is present or absent (Alcock, 1987, 1990), and the severe incompatibility of psi with the findings of neuroscience (Beyerstein, 1987; Kirkland, 2000). In effect they replace one mystery with another and thus make the situation worse for astrology rather than better.

* * *

To recap, we have seen how various astrologers claim that consciousness, psi and spirit guides are relevant to astrology. In general they provide no evidence for such claims, only speculation, and are unaware that their claims are confounded by hidden persuaders and fantasy-prone personality. Nevertheless let us accept that astrologers may use some sort of intuition or psychic ability when reading a birth chart. Also, because the incidence of astrologers and serious students of astrology is roughly 1 in 10,000 of the general population (Dean, Mather

[2] Having a spirit guide would seem to be a private matter not readily disclosed, like tax evasion, so that estimating the proportion of astrologers with spirit guides is a risky business. In our experience it is not high. Nevertheless many examples of such astrologers are given by Ankerberg and Weldon (1989, pp. 201–55), while former astrologer Charles Strohmmer (1988, p. 61), unaware of hidden persuaders, claims that evil spirits (not just spirits) lie behind the hits in every system of divination including astrology. Furthermore the incidence of fantasy-prone personality in the general population (about 4%) is much higher than the incidence of astrologers (about 0.01%). So who knows?

and Kelly, 1996, p. 60), it is not inconceivable that astrologers might form some sort of 'psychic elite' where the chance of detecting psi and anomalous states of consciousness is correspondingly increased — an opportunity not to be lightly passed by. But before we look at the empirical evidence, we must ask why astrology has been generally neglected by psi researchers, even those who do not confuse astrology with sun signs.

Why has Astrology been Neglected by Psi Researchers?

The answer seems simple enough. Astrology is based on the untenable *Principle of Correspondences*, so it is not worth the bother.³ It is like believing in fairies. There is also the question of evidence. In his 1930 presidential address to the Society for Psychical Research, in the days before the advent of sun signs, Dr Walter Franklin Prince put it this way:

I myself, at the risk of appearing ridiculous even to my colleagues, have for fourteen years held my archives open for astrological evidence, and have collected many exhibits of what was offered as evidence by supposed experts . . . [I know] of no evidence which is not the result either of a forced application of the rules to human careers already known, or of a careful culling of 'hits' from preponderating numbers of 'misses'. I do not think that any psychical researcher in forty-eight years [since the SPR began in 1882] has given attention to the claims of astrology and has not definitely cast the pretended science on the dust heap (Prince, 1930, p. 294).

[3] ¹The Principle of Correspondences, once widely accepted, was discredited after the seventeenth century. It involves argument by analogy, the assumption that things similar in some respects are also similar in other respects. Thus the changeable Moon indicates a changeable person, the number four and the fourth planet have the same qualities, and Aries indicates ramlike impulsivity. Such analogies have great flexibility, which astrologers see as a strength, for example the astrological element Water might relate to ambergris, breasts, crabs, fluctuation, gardens, ink, insecurity, the Moon, music, navigation, Neptune, pearls, poetry, pumpkins, sensitivity, tridents and turquoise, to mention only a few. But the Principle is untenable. The height of John Smith tells us nothing about the height of John Brown. No longer do we believe with Aristotle that death can occur only at low tide. No longer do midwives open the door to ease a painful labour. Nor do we have any immediate way of choosing between opposing correspondences. The Moon was male to the Babylonians but female to the Greeks. Is Mars unfortunate because red = blood (war) or fortunate because red = blood (life)? No wonder the Principle of Correspondences survives in Western education only as an example of fallacious reasoning packed with hidden persuaders.

We should not confuse the Principle of Correspondences with the physical analogies so useful in science, as when the analogy between the behaviour of light and the behaviour of waves led to the discovery of diffraction and other optical phenomena. But confusing them is easy because the first is experienced from infancy whereas physical analogies are not. To the child it may be the roundness of the pebble that makes it sink, or the yellowness of the Moon that stops it falling. In effect the Principle of Correspondences is something we have to unlearn in order to make sense of the world, which explains its appeal — it encourages us to do what in childhood comes naturally, like believing in Santa Claus. Remnants can survive in subtle ways. If you visit the Middle East, should you be more worried about dying in a terrorist attack than about dying generally? Is social collapse due to drug barons more likely than social collapse generally? Most people answer yes to both. But the second alternative includes the first, so the correct answer is no. The addition of a plausible correspondence has led our reasoning astray. Other remnants are less subtle, as when red hair is considered hot-tempered, or when dice are rolled vigorously to coax a high number, or when Eastern beliefs threaten rhinos with extinction, see Zusne and Jones (1989), Gilovitch and Savitsky (1996).

Prince was quite properly ignoring unsupported claims in favour of empirical research. To him the evidence (of which he had ‘collected many exhibits’) was clearly negative. More recently the same emphasis on empirical research has been made by the parapsychologist Carl Sargent (1986), but with a new twist:

Almost nothing can be concluded from this [present accumulation of empirical] research, since independent replications with standardized procedures are wholly lacking. For a sound research programme which does justice to the complex and dynamic interplay of horoscope factors which traditional astrologers emphasize, it would be necessary . . . to poll astrologers on which predictor variables would best predict a limited range of criterion variables (e.g., extraversion, aggressiveness, manifest anxiety) . . . and use multiple regression techniques . . . At present such a research programme has not been implemented (p. 348).

In other words the neglect of astrology by psi researchers might or might not be justified, but the appropriate tests had not been made. That was in the early 1980s. Today, thanks to advances in research, that situation no longer applies.

The Revolution in Astrological Research

Very few empirical studies of astrology existed before 1950. However, by 1975 there were more than one hundred studies in astrology journals and psychology journals, most of them little known. So Alan Vaughan (1973) could say ‘it seems astonishing to me that so few experiments in astrology have been attempted’ (p. 104). Today the number of empirical studies exceeds five hundred. They have revolutionized our understanding of astrology, but because about 80% of studies are not accessible via computerized abstracts such as PsycINFO, they are still generally unknown.⁴

Unfortunately this revolution in understanding has had little effect on astrological practice, simply because astrologers rely solely on experience, or what psychologists call ‘personal validation’. Garry Phillipson (2000, p. 168), after interviewing more than thirty leading astrologers, found that many (not all) regarded scientific studies as misguided. As British astrologer Roy Alexander (1983) puts it: ‘I take it for granted that astrology works, and that we have enough cumulative experience to know that it works, whether the computer studies and the scientists agree with us or not’ (p. xii). Similarly the parapsychologist Dean Radin (1997) notes that ‘Parapsychologists have certainly learned the folly of ignoring human experience just because current scientific theories cannot adequately explain those experiences’ (p. 179).

Indeed, as the journalist Neil Spencer found in his survey of modern astrology, so powerful is experience that astrologers carry on despite having ‘no rational

[4] Nor will you find them in most astrology books. Even for astrologers, ‘anyone used to reading books on or around our subject must have a mind which positively aches with the effort of keeping it open: a reader put off by *non sequiturs*, evidence which isn’t evidence at all, irrationality and eccentricity will not get halfway along the first shelf [at any astrology bookshop]’ (Parker, 1991). For comprehensive critical surveys of astrology, its problems and associated scientific research, including non-technical accounts for the general reader, see annotated entries in the list of references or visit <http://www.astrology-and-science.com/>

reason why it should work' (Spencer, 2000, p. 245). But experience is precisely where hidden persuaders operate, whose hidden nature might explain the apparent absence of any reason why astrology should work, especially as astrologers are generally unaware that hidden persuaders exist. Which brings us back to empirical studies.

Measuring Astrological Performance

As we noted earlier, if astrologers can perform as they claim, we might be on to something. In what follows we measure performance in terms of *effect size*, expressed as a correlation or similar measure, where 0 means no effect, 1 means perfect effect, and -1 means perfect inverse effect. We also submit sets of effect sizes to meta-analysis, which subtracts the sampling and measurement variability (something not possible with an individual effect size) to see if there is a genuine residual effect (Utts, 1991). The whole point of meta-analysis is that it reaches better conclusions than those reached in individual studies.

In astrology an effect size of, say 0.4, which is equivalent to 70% hits when 50% is expected by chance, would mean that birth charts can tell us something useful about people, albeit not very much. Similarly an effect size of, say 0.05 or 0.1, equivalent to 51% or 52% hits when 50% is expected by chance, would mean that birth charts are worthless except perhaps as a celestial inkblot test, even though it might still be evidence of something paranormal.⁵ Effect sizes even closer to zero (we shall be seeing plenty of these) have an additional problem because the sample size required to reliably measure effect size r varies roughly as $1/r^2$, so one-tenth the effect size requires one hundred times the sample size. Furthermore they are sensitive to the assumption that zero effect sizes and perfect randomness can exist in real data (which assumption may not be justified, see Gilmore, 1987), and they are also sensitive to artifacts (something spurious that mimics a genuine effect).

Artifacts in Astrology

As shown by the other articles in this *JCS* issue, the controversy over psi is largely about artifacts, or whether the allegedly paranormal phenomena could have non-paranormal explanations. Artifacts in astrology, just as in parapsychology, can be surprisingly subtle and resistant to detection, compared to which the everyday hidden persuaders are child's play. Some examples follow below, some of which became famous in their day as the best claimed evidence for astrology.

A claimed correlation between planetary positions and radio propagation quality (Nelson, 1951) was due to the close but unequal spacing of planet days, which meant that the positions were bound to occur close to disturbed radio days

[5] We should not confuse a tiny *effect* with a tiny *effect size*. Although gravity has only a tiny effect on the bending of light, the effect size is 1, that is, if we know the gravity we can exactly predict the bending. Nor should we confuse contexts. A tiny but reliable effect size equivalent to 2% more hits than an expected 50% is of no use whatever if we wish to make accurate statements from a client's birth chart, but to a casino turning over millions of dollars a year it could mean the difference between profitability and ruin.

(Meeus, 1982; Martens and Trachet, 1998, pp. 174–9). Apparent support for astrology in the birth charts of married couples (Jung, 1960) arose because the charts had come from the files of an astrologer whose advice to the couples had nudged the sample into conformity; the effect did not replicate with artifact-free data (Dean, 1996). Claimed success in matching charts to case histories (Clark, 1961) was consistent with the use of tiny samples, typically ten birth charts, whose disproportionately huge sampling variations were mistaken for genuine effects (Eysenck and Nias, 1982, pp. 86–7), a point confirmed by later studies and meta-analysis (Dean, 1986). An apparent correlation between sun signs and extraversion (Mayo, White and Eysenck, 1978; Smithers and Cooper, 1978) disappeared in later studies when the subjects had no prior knowledge of astrology, which showed that prior knowledge can nudge a person's self-image in the direction of astrology (Eysenck and Nias, 1982, pp. 50–60; van Rooij, 1999). A tiny but consistent surplus or deficit of rising or culminating planets at the birth of eminent professional people in the nineteenth and early twentieth centuries (Gauquelin, 1983) was consistent with parents adjusting birth data to suit popular beliefs, which in those days could easily be done without detection (Dean, 2002). Many more examples could be cited.

The existence of artifacts does not deny the possibility of genuine effects. But unless research can confirm such effects when artifacts are controlled (which so far is not the case), we have good reason to suspend belief. Of course we can never be sure about failing to find tiny effect sizes of around 0.01, just as we can never be sure about failing to find whether surfing in Hawaii affects the waves in Australia; but we can be sure about failing to find effect sizes commensurate with astrological claims, say not less than 0.5, just as we can be sure about failing to find a cat in a shoebox.⁶

The above artifacts have effect sizes around 0.04 to 0.1, which are comparable with the effect sizes reported in parapsychology, albeit with ongoing controversy over their interpretation, for example 0.02 for throwing dice and guessing random numbers, 0.06 for distantly affecting skin conductivity, 0.08 for ESP, and 0.11 for telepathy under conditions of sensory deprivation (converted from the hit rates of Radin, 1997, pp. 141, 134, 154, 106, 88). So it is doubly essential to avoid artifacts in astrology lest they be seen as possible evidence for psi. Effect sizes in controversial areas that differ significantly from expectancy (in this case zero) must always raise worries about artifacts. In what follows we look first at the performance of astrology, for which the definitive test is time twins, and then at the performance of astrologers.

[6] An effect size commensurate with astrological claims can be estimated in two ways. Via astrologer estimates of chart accuracy, which translate to a mean of roughly 0.5 (Dean, 1986, p. 43), and via studies of people judging sets of data, which show that correlations have to exceed about 0.4 before they are detected by the average person (Jennings, Amabile and Ross, 1982; Oates, 1982). Even correlations around 0.7, which are considered strong by psychologists, are missed by one person in four. Only when correlations reach 0.85 are they detected by almost everyone. Astrologers claim to see correlations in every birth chart, so a commensurate effect size of not less than 0.5 does not seem unrealistic. Effect sizes are conspicuously absent from the writings of astrologers.

Time Twins, the Definitive Test of Astrology

Suppose that heavenly conditions correlate with earthly happenings to the strong extent claimed by most astrologers ('there is no area of human existence to which astrology cannot be applied' say Parker and Parker, 1975, p. 60). At one moment the heavens signify that people born at that moment will have trait *A*, the next moment it is trait *B*, and so on. Time twins (people born at the same moment) should therefore be more alike than expected by chance. Time twins are thus the definitive test of astrology because errors or uncertainties of birth chart interpretation are avoided.

How far apart can time twins be before they cease to be time twins? According to John Addey (1967), in perhaps the most extensive survey of time twins made by an astrologer, 'one would expect to find *really exceptional* [his emphasis] similarities of life and temperament only in those born almost exactly at the same time [within a few minutes] and in the same locality', nevertheless 'the tendency for similarities to appear in the lives of those born on the same day must remain strong and well worth investigating' (p. 14). So births more than a day apart might not qualify.

Time twins are surprisingly numerous. The spacing of human births in a large population is described by a Poisson distribution, which shows that every year in a city of one million people about 4,000 pairs of time twins are born 5 minutes apart or less. The number increases very rapidly as the city size or time interval increases; in a population of ten million the annual number of pairs is about 100,000, same as the number born 60 minutes apart or less in a population of one million. Increasing the interval to 24 hours pushes the total to many millions, but even this is only a tiny fraction of all possible birth pairs each year, which explains why the above survey by John Addey managed to locate only a few dozen pairs of time twins. Time twins are like needles in a haystack (there are very many needles but it is a huge haystack).

So time twins are not easy to find. Nevertheless the number of time twins that exist in Western history alone is so enormous (hundreds of millions or even more, depending on how time twins are defined) that many striking similarities in personality and events will occur by chance alone. Historically the most famous case is that of the prosperous London ironmonger Samuel Hemmings and King George III, said to have shared the same birth and death hours after lives showing many similarities such as being married on the same day. But chance is not the explanation here — a check of contemporary records showed that only the simultaneous death could be verified, and that the other events were most likely fabricated by astrologers (Dean, 1994).

Tests of Time Twins

The first systematic study of time twins was reported by British astrologers Peter Roberts and Helen Greengrass (1994). With help from the media they managed to collect a total of 128 people born on average just over an hour apart on six

dates during 1934–1964, or 1% of the 13,000 people then being born every six days in the UK. After interviewing 17 born on the same day (which gave 18 pairs born one hour apart or less) they found some evidence of similarities in interests and occupation, for example two born 15 minutes apart were respectively a bassoon player and a clarinet player, but there were no clear similarities in appearance, handwriting, names or life events. The strong similarities predicted by astrology were simply not there. Nevertheless the authors claimed that, in the full sample of 128 people (which gave 1,400 pairs born one day apart or less), the proportion of ‘close resemblers’ increased as the birth interval decreased. This suggests that only a few percent of time twins are similar, which would nevertheless provide some support for astrology, albeit not as generally conceived by astrologers. However an independent re-analysis found that the effect was due to procedural artifacts (French, Leadbetter and Dean, 1997). When these artifacts were controlled, the effect disappeared, see Table 1.

	Original study (1994)				French <i>et al.</i> (1997)			
	0.3	3.2	11.5	21.5	1.5	5.2	10.2	17.8
Mean hours between births	0.3	3.2	11.5	21.5	1.5	5.2	10.2	17.8
$N =$ No of time twin pairs	98	493	688	121	360	341	352	347
Close resemblers, pairs	4	15	17	2	10	12	11	5
Close resemblers) as %	4.1	3.0	2.5	1.7	2.8	3.5	3.1	1.4
Next closest) of N	9.2	15.8	16.1	12.4	13.3	17.0	15.6	15.0

Table 1

A claimed astrological effect in 128 time twins born <1 day apart disappeared on re-analysis

Original analysis and re-analysis of Roberts and Greengrass’s (1994) sample of 128 time twins, which gave 1,400 pairs of time twins born <1 day apart. **Left:** The claimed effect is in the fourth line — as the mean interval between births increases from 0.3 to 21.5 hours, the proportion of close resemblers (the most alike pairs*) decreases smoothly from 4.1% to 1.7% in the direction predicted by astrology. But the numbers underlying the 4.1% and 1.7% are much too small for comfort, and (last line) the effect is reversed for the next-closest resemblers, so the result might be a statistical artifact. **Right:** Suspicion confirmed. When the 1,400 pairs are re-analysed with less variable N ’s, the effect disappears and (last line) it stays that way. French *et al.* found it was no better for individual scores (a , b , c or d) or for tests of serial correlation.

* Close resemblers, 3% of the 1,400 pairs, are those with $\sqrt{(a^2+b^2+c^2+d^2)} < 3$, where $abcd$ are the scores (each out of 12) for extraversion, neuroticism (emotional stability), psychotism (tough–tender), and social conformity on the short form Eysenck Personality Questionnaire (Eysenck, Eysenck and Barrett, 1985). The next closest, 15% of 1,400 pairs, are 3 to 4.9. For all 1,400 pairs the mean is 7.8, standard deviation 2.9.

A more powerful test was made possible by data from a study unconnected with astrology (Dean, forthcoming) involving 2,101 persons born in London during 3–9 March 1958. They were born on average 4.8 minutes apart, so they were precisely those for which Addey had predicted ‘*really exceptional* similarities of life and temperament’. Measurements at ages 11, 16 and 23 had provided for each person 110 relevant variables including test scores for IQ, reading and arithmetic; teacher and parent ratings of behaviour such as anxiety, aggressiveness and sociability; physical data such as height, weight, vision and hearing; self-ratings of ability such as art, music and sports; and various others such as

occupation, accident proneness and marital status; all of which are supposed to be shown in the birth chart. Included as a control were sixteen variables for the mother such as age, blood pressure and length of labour; seven leading astrologers agreed unanimously that these sixteen variables would definitely not be shown in the birth chart of the child.

About 92% of birth times had been recorded to the nearest 5 minutes, the rest to the nearest minute. Before analysis the subjects were arranged in chronological order of birth. This gave 2,100 successive pairs of time twins; 73% were born 5 minutes apart or less, and only 4% were born more than 15 minutes apart. The similarity between time twins for each variable was then measured as the serial correlation between successive pairs *AB*, *BC*, *CD* and so on. Here serial correlation is a direct measure of effect size and is extremely sensitive due to the large sample size. Unlike the Roberts and Greengrass approach (count each time twin against every other time twin within one day, which would have produced nearly 600,000 pairs), serial correlation counts each time twin once only, thus minimizing the risk of artifacts. So the test conditions could hardly have been more conducive to success. But the results are uniformly negative, see Table 2. The effect size due to astrology is 0.00 ± 0.03 .

The above result is consistent with empirical studies of signs, aspects and so on, which when free of artifacts have consistently failed to find effects commensurate with astrological claims (Eysenck and Nias, 1982; Culver and Ianna, 1984; Dean, Mather and Kelly, 1996; Martens and Trachet, 1998; Dean *et al.*, 2002). It disconfirms the idea of sun signs (2,101 Pisceans evidently had few similarities) and Jung's idea of synchronicity. Here, however, such a result is actually good news, because if artifact-free tests of astrologers are found to give positive results it might suggest the existence of human abilities of interest to parapsychologists.

Serial correlation in original data and two controls								
Source of variables	Variables <i>N</i>	Mean subjects	Original data		Randomized		Equated every	
			Mean	sd	Mean	sd	50th	25th
Mother	16	2066	0.001	0.029	-0.001	0.022	0.017	0.038
Subject	110	1393	-0.003	0.028	-0.001	0.028	0.018	0.036

Mean subjects is less than 2,101 due to missing data. Randomized means are for 2,000 replications. Equated = every 50th or 25th subject is made the same as the next to simulate astrological effects.

Table 2

Astrological effects for 110 variables were not detectable in 2,101 time twins born 5 minutes apart

According to astrology the serial correlation in this data should be strongly positive for subject variables and zero for mother variables. But both **original** means are effectively zero. The difference (-0.004) is in the wrong direction and non-significant ($p = 0.56$ by t-test). Nor do the 110 individual serial correlations (not listed) show any support for astrology — 5 are significant at the $p = 0.05$ level vs 5.5 expected by chance. The **randomized** means and standard deviations agree with the expected values $-1/(s-1)$ and $1/\sqrt{(s+1)}$ respectively, where s is the number of subjects, so the data are well-behaved. There is nothing here that would deny the previous indication. Furthermore the **equated** means after equating every n th subject are in good agreement with the expected

increase $1/n$, which confirms that the test is sensitive and working. A serial correlation of 0.001 is equivalent to getting 50.05% hits when 50% is expected by chance.

Tests of Astrologer Accuracy and Client Discrimination

Tests of astrologers can be divided into tests of accuracy, discrimination, agreement, intuition and confidence. In parapsychology, tests of accuracy (as in counting hits) are generally too insensitive to reliably detect weak effects, at least not without huge sample sizes, whereas tests of reaction time (as in recognizing words with and without someone else thinking about them) promise greater sensitivity (Hines, Lang and Seroussi, 1987). But interpreting a birth chart is not the same as recognizing words, so tests of reaction time seem inapplicable in astrology, at least as presently practised.

Tests of accuracy generally involve astrologers matching birth charts with information such as personality profiles or case histories. To date more than forty studies have been reported totalling nearly 700 astrologers and 1,150 birth charts. Meta-analysis gives a mean effect size of 0.051, standard deviation 0.118, for which $p = 0.66$. Visual plots indicate the existence of a publication bias against negative results, which probably accounts for the weak positive direction (Dean and Kelly, 2001, p. 198; Dean, Mather and Kelly, 1996, p. 76). There is clearly nothing here to suggest that astrologers can perform usefully better than chance, once hidden persuaders are controlled.

Tests of discrimination involve subjects picking their own chart interpretation from typically three to five others, all of which must be free of give-away cues such as dates and planetary positions. Selection can be biased by generality (the statement cannot fail to fit) and social desirability (we are generous, they are extravagant). But when each interpretation doubles as a control, as is usual, such biases tend to cancel out. To date ten studies totalling nearly 300 subjects have been reported in which give-away cues such as sun sign descriptions were reliably absent. Meta-analysis of first choices gives a mean effect size of 0.002, standard deviation 0.038 (Dean, Mather and Kelly, 1996, pp. 74–5). There is nothing here to suggest that your own chart interpretation fits you better than someone else's.

Tests of Astrologer Agreement

The failure of astrologers to get correct answers when reading birth charts under blind conditions could of course be the result of asking the wrong questions. (It could not, as some astrologers claim, be due to some property of astrology that makes it untestable by science, because this would immediately deny their experience that astrology works, just as our experience that a TV set works would be denied if we could not tell *works* from *does not work*.) However, correctness is irrelevant when testing agreement among astrologers, just as using feet or metres is irrelevant when testing agreement among surveyors. Because problems of correctness are avoided, tests of agreement are more straightforward than tests of accuracy. This is a valuable advantage.

To date twenty-five studies have been reported involving a total of nearly 500 astrologers. Meta-analysis gives a mean agreement (as an effect size) of 0.101, standard deviation 0.064 (Dean and Kelly, 2001, p. 200; Dean, Mather and Kelly, 1996, p. 78), which is essentially no agreement at all. By contrast, tests intended for application to individuals, as astrology traditionally is, are generally frowned upon by psychologists unless the agreement between test and re-test, or between one practitioner and another, is 0.8 or better. Perfect agreement would of course be 1. We say more on agreement later, under 'Tests of Astrologer Confidence'.

Tests of Reported Intuition

To date the most systematic investigation of astrologer variables including the reported use of intuition is that of Dean (1985), who had 45 astrologers from the USA, UK, Australia and Europe predict the direction (+ or -) of E and N in 160 extreme subjects as measured by the Eysenck Personality Inventory (Eysenck and Eysenck, 1964).⁷ To make each direction clear-cut, the subjects were the top and bottom *fifteenth*s from a sample of 1,198 students and ordinary people ranked by E or N score, which well exceeds the usual approach in psychology of taking the top and bottom *third*s. Their mean age was 30 (range 15–66), 46% were university students, and 72% were female. Each extreme (E+, E-, N+, N-) had 40 subjects, total 160, of which 40 were E only, 40 were N only, and 80 were both E and N, so each astrologer had to make a total of 240 judgments. The mean score of the (+) extremes was typically 7 standard deviations from the mean score of the (-) extremes, so in each case the direction (+ or -) was exceptionally clear-cut. As in the previous test of time twins, the conditions could hardly have been more conducive to success. Some of the results were not reported in Dean (1985) and are published here for the first time.

On average the 45 astrologers had ten years of experience (range 1–36 years), spent nearly 5 minutes on each judgment (range 0.5–15), and were generally confident of success (only 21% of judgments were made with low confidence). But despite these encouraging signs, the mean effect size for hits was only 0.01, less than the 0.14 for judgments made using the subject's age (based on the slight decrease in E and N with increasing age, namely 'if over 35 years then E- and

[7] This follows the convention among psychologists. E is extraversion (sociability) and N is neuroticism (emotional stability). N is not the same as *N* (in italics), which is the sample size. Both E and N exist as a continuum between (+) and (-). E+ is sociable and outgoing, E- is quiet and reserved. N+ is emotional and easily upset, N- is calm and not easily upset. (Also, later, P is psychoticism, where P+ is tough-minded and uncaring, P- is tender-minded and caring.) E and N were chosen because they are among the most major and enduring of known personality factors (Eysenck and Eysenck, 1985). Thus they emerge from personality and laboratory tests of all types, even those without E and N in mind; and they are found in all cultures including non-Western cultures. Furthermore they are visible in ancient personality descriptions such as the four temperaments (which match the astrological elements fire, earth, air and water), which makes them even more suitable for testing astrology. Indeed, in a separate survey, 86 astrologers had rated E and N as respectively easy and moderately easy to discern in birth charts (Dean, 1986, p. 20). Note how this fits the earlier 'sound research programme' of Carl Sargent, where he had suggested the testing of manifest anxiety (same as N) and extraversion (obviously the same as E), and the polling of astrologers.

N-, else E+ and N+'); and less even than the 0.02 for 45 controls making the same judgments without birth charts, showing if anything that judgments were made worse by looking at birth charts. The reported use of intuition (or what astrologers saw as intuition) had no effect, see Table 3.

Reported use of intuition	Number of astrologers	Effect size for hits and agreement			
		Is the subject an extreme (+) or (-)?			
		Extraversion		Neuroticism	
None	9	-0.00	0.12	0.02	0.04
Hardly any	16	0.01	0.17	0.03	0.05
Some	13	-0.01	0.17	-0.01	0.02
Lots	5	0.02	0.17	0.01	0.00
Hits, 1st vs 2nd half	45	-0.13	—	0.02	—

Reported use of intuition	Number of astrologers	Effect size for hits and agreement			
		Is the subject an extreme (+) or (-)?			
		Extraversion		Neuroticism	
None	9	-0.00	0.12	0.02	0.04
Hardly any	16	0.01	0.17	0.03	0.05
Some	13	-0.01	0.17	-0.01	0.02
Lots	5	0.02	0.17	0.01	0.00
Hits, 1st vs 2nd half	45	-0.13	—	0.02	—

Table 3

Use of intuition did not improve judgments by 45 astrologers of E and N in 160 extreme subjects

First figure in each pair is the mean effect size for hits, second figure is the mean agreement between astrologers. Because both E and N are said to be easily discernible in birth charts, we expect good hits and agreement. But both are negligible. The agreement is slightly better for E, in keeping with its higher rated discernibility, but that is all. In the last line, contrary to what the use of intuition might predict, astrologers getting high scores for the first half of their judgments show no tendency to get high scores for the second half. With or without intuition, these astrologers could not tell one extreme from another. An effect size of 0.01 is equivalent to getting 50.5% hits when 50% is expected by chance.

Of course the reported use of intuition does not mean that intuition or psychic ability was genuinely present. Nevertheless a genuine presence might be most likely where judgments show good agreement. But when the judgments were ranked by agreement, the effect size for E hits was a negligible 0.01 for the top third (mean agreement 0.38), hardly different from -0.01 for the bottom third (mean agreement -0.01). The effect sizes for N hits were no better. Note that if astrology (or anything) is false, then it cannot provide valid data for unconscious processing, so any success would by definition be due to psychic ability rather than intuition.

Scores on the Eysenck Personality Questionnaire were available for 41 of the 45 participating astrologers. Those reporting use of intuition tended to be N+

(effect size 0.33, $p = 0.04$) and P+ (0.31, $p = 0.05$) but not especially E+ (0.02), whereas values of 0.15–0.20 are typically reported between E+ and apparent ESP performance (Utts, 1991, pp. 376–7). The correlation between time taken and perceived difficulty was surprisingly low (0.29, $p = 0.07$). Compared to the 15 male astrologers, the 26 female astrologers tended to be more N+ (0.25) and more P– (0.14), which is in accordance with previous gender findings (Eysenck and Eysenck, 1985). In accordance with the popular stereotype they also reported using more intuition, albeit only slightly (0.12). But in mean effect size for hits, females (0.01) hardly differed from males (–0.00).

Tests of Astrologer Confidence

If we have a genuine judgment skill, psychic or non-psychic, our accuracy should increase as our experience-based confidence increases. In the present study, each astrologer had indicated their confidence (high, medium, low) for each of their 240 judgments. But judgments made with high confidence were no more accurate than those made with low confidence, see Table 4. Judgments of the 80 subjects who were extreme on both E and N showed negligible correlation (0.02) between E hits and N hits, which correlation should exist even if astrology worked only for some people, but not if astrology did not work at all. By contrast, the correlation between E confidence and N confidence was highly significant (0.34, $p = 10^{-90}$), and persisted even when birth charts were not used (0.27, $p = 10^{-55}$), suggesting that it was more a product of the astrologers' imagination than of anything in the birth chart.

Rated confidence	Mean number of judgments	Effect size for hits and agreement			
		Is the subject an extreme (+) or (–)?			
		Extraversion		Neuroticism	
Low	1125	0.00	—	0.05	—
Medium	2430	0.03	—	0.02	—
High	1845	–0.02	—	–0.04	—
Mean agreement on confidence		—	0.02	—	0.00

Table 4

Confidence did not improve judgments by 45 astrologers of E and N in 160 extreme subjects

Same study as Table 3. All effect sizes are again negligible. We might expect effect size to increase with confidence but if anything it goes the other way, which is incompatible with these astrologers having valid judgment skills whether psychic or non-psychic. In the last line, the mean agreement on confidence is negligible, less even than the negligible mean agreement on judgments (which is 0.16 for E and 0.04 for N). When variables as fundamental as E and N produce consistently negligible effect sizes and agreement, it suggests there is no hope for more complex variables such as those that fill astrology books.

The above tests of agreement and confidence overcome any concerns about the validity of E and N for testing astrologers. Even if E and N were meaningless, this is of no consequence provided E and N are held to be discernible in birth

charts — and the astrologers would hardly have proceeded if it were otherwise. The point is, we might conceivably explain away poor effect sizes for hits, but not poor agreement or the inconsequence of confidence. If astrologers cannot agree on what a birth chart indicates, or on their confidence in that indication, then what price astrology and the supposed intuitions of astrologers?

When Astrologers Receive Everything They Ask For

The same inconsequence of confidence was found in matching tests where the astrologers received everything they asked for. In an American test they received subjects with diverse backgrounds, certified birth times precise to 5 minutes or better, case files that included results from two personality tests, responses to their own 61-item questionnaire covering everything from height and hobbies to favourite colours and family deaths, and two photographs of the subject. Six professional astrologers selected for competence by their peers matched case file to birth chart for 23 subjects, all aged 30–32 years to avoid age cues, which took each astrologer 12–24 hours of work. Their confidence was generally high but the mean effect size for hits was a negligible 0.02 and the mean agreement between astrologers was an equally negligible 0.03. One non-astrologer tried the matchings and scored three hits, the same as the best astrologer (McGrew and McFall, 1990).

In a similar Dutch test involving seven birth charts, 5,000 Dutch guilders (about \$US3,000) was offered to any astrologer who could successfully match all charts to their owners. Of the 44 astrologers who took the test, at least half had read more than one hundred charts and were very experienced, while one-third were frequently paid for their services. Half expected 100% hits and only six expected less than 60%, so again their confidence was high. But their mean effect size was -0.04 , not even in the right direction, and the mean agreement between astrologers was 0.01. The best astrologer scored three hits, as did one non-astrologer (Nanninga, 1996).

In both of these tests the astrologers' confidence presumably included their confidence in intuition or spirits or psychic ability, whose role they would have maximized by their method of working. So the results allow no reason to suppose that astrology capitalizes on or focuses such influences, which (if they exist) would seem to be either very weak or very rare. This does not deny the possibility that shaman-type superstars may exist as cited under 'Parallels with Shamanism', but until they come forward for testing we should remain sceptical.⁸

[8] ⁸ Is there a sidereal connection? Spottiswoode (1997) looked at the location and start time of all available remote viewing and ganzfeld trials. The effect size showed a reproducible four-fold peak within a two-hour window centred on 13.5 hours local sidereal time, which is roughly when the constellation Virgo (or tropical sign Libra) is overhead. Are emanations, or lack of them, from Virgo/Libra causing something? (An astrologer might ask why Libra and not Pisces, the sign usually connected with intuition and psychic ability.) But if the Spottiswoode effect is real, and if astrologers are as psychic and as attuned to the stars as they claim, we might expect the effect to have entered astrological tradition, say as a rule that urges astrologers to work only when Virgo/Libra is overhead. But we found no hint of such a rule in astrology books. For example, in his 850-page *Christian Astrology*, the renowned

Support for such a view is provided by the Dutch parapsychologist Hendricus Boerenkamp (1988). He monitored a total of more than 130 readings by twelve of the Netherland's top psychics, and then rated their accuracy against matched groups of non-psychics who were given the same task as the psychics. Typically each reading involved 60–90 statements spread over personality (35%), general circumstances including occupation (25%), relationships (15%) and physical matters such as health (25%), much the same as for a typical astrology reading. Nearly 10,000 statements were obtained, of which 10% were sufficiently specific to be tested, of which 14% turned out to be correct; that is, only 1.4% of all statements were both specific and correct, and for every such statement there were six that were both specific and incorrect. Unknown to the psychics, the same person was sometimes the target in two successive readings, but no psychic noticed it, and the second reading was often in conflict with the first. Furthermore there was no appreciable difference in hit rate between psychics and non-psychics, which would seem to deny that psychic ability (or at least claimed psychic ability) could play a role in astrology. Boerenkamp concluded that the accuracy of psychics was no better than that of non-psychics, but their sensitivity to human ills and their huge experience (their own lives were often traumatic) made them useful counsellors.

Conclusion

Our concern in this article has been to measure the performance of astrology and astrologers. A large-scale test of time twins involving more than one hundred cognitive, behavioural, physical and other variables found no hint of support for the claims of astrology. Consequently, if astrologers could perform better than chance, this might support their claim that reading specifics from birth charts depends on psychic ability and a transcendent reality related to consciousness. But tests incomparably more powerful than those available to the ancients have failed to find effect sizes beyond those due to non-astrological factors such as statistical artifacts and inferential biases. The possibility that astrology might be relevant to consciousness and psi is not denied, but if psychic or spirit influences exist in astrology, they would seem to be very weak or very rare. Support for psychic claims seems unlikely.

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Articles marked with an asterisk are available at <http://www.astrology-and-science.com/> as either an extended abstract (*) or an expanded article (**).

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British astrologer William Lilly (1659/1985) gives students detailed advice on chart interpretation 'and whatever else is fit for the Learner to know before he enter upon judgment'. His advice includes the need to be mentally prepared: 'be thou humble . . . form thy minde according to the image of Divinity', which of course may merely reflect his need to escape censure by showing how astrology was compatible with Christianity (hence his title). But he says nothing about the best time to 'enter upon judgment', even though his reputed success in horary astrology might imply a psychic ability potentially open to Spottiswoode effects. In fact his practice would have been much too busy to allow restricting it to the 2 or 3 hours in every 24 when Virgo/Libra was overhead.

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