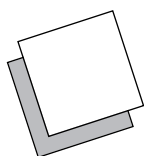


*An executive summary
for managers and
executives can be found
at the end of this article*



Sun-sign astrology in market segmentation: an empirical investigation

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Introduction

Mitchman (1991) argues that the great diversity of consumer lifestyles in the 1980s and 1990s has made market segmentation more difficult in many markets. The general increasing wealth of Western countries, the continual move of consumers toward more psychological value of products, increasing competition, better-tailored marketing mixes and more awareness of how to evaluate segmentation variables, are pushing marketers to develop more precise and more effective segmentation variables. One development has been to explore psychographic segmentation. However, numerous problems exist still over the cost of scale development and interpretation, as well as measurement validity and reliability issues; all of which are magnified if the more predictive bespoke psychographic scales that focus on a specific product area are utilized. Despite these problems, when psychographic data

contain just the right amount of surprise ... they can be very useful indeed, even when correlations *with behaviour* are not high and even when questions about reliability and validity cannot be answered (Wells, 1975, p. 211).

In an ideal world, the holy grail to marketers wishing to benefit from psychographics would be to identify a variable which was simple to measure, was valid and reliable and above all cheap to collect, but which provided significant insight into the psychology and lifestyles of consumers. In this paper we propose that such a variable exists in the form of *date-of-birth*, when this is interpreted through the psychographic framework of astrology. The paper reports on an empirical study into date-of-birth effects on consumer behavior in three markets (see Appendix 1), and discusses the potential use of astrology in marketing communications and segmentation.

Psychographics

Basic demographic variables such as age and sex can discriminate well in certain markets, but they often result in fairly sizeable groups within which there can be considerable variation in terms of consumers' needs and outlooks. Although highly reliable in measurement terms, demographic data, as some authors have commented, have generally failed to explain consumer behavior (Mitchman, 1991), particularly brand choice (Sheth, 1977). More and improved information about target segments allows marketers to tailor their marketing mixes more closely to any segment's needs. Psychographic variables, which include aspects of personality, motivation, and lifestyle, can provide this additional insight, and numerous comparisons show that the predictive validity of psychographic variables is likely to be substantially higher than that of demographic variables (see e.g. Burger and Schott, 1972;

Basic demographic
variables

The authors wish to thank four anonymous reviewers for their comments and suggestions.

Psychographic and lifestyle data

Few reported replications

King and Sproles, 1973; Nelson, 1971; Wilson, 1966). However, several problems exist with using psychographics.

First, there is still no single widely-accepted definition. Wells's (1975) critical review of the subject found no fewer than 32 definitions in 24 articles.

Second, the time and money involved in developing questionnaires and obtaining, analyzing, and interpreting psychographic and lifestyle data can be significant. Researchers attempting to graph the psychology of consumers have measured a wide range of aspects including activities, opinions, attitudes, interests, values, hobbies, preferences, needs, and personality traits. Some have used standard personality tests and incorporated them into a wider assessment, and others have developed their own variables unique to their purposes. Either way, the dominant method of developing psychographic measures has been to use long scales and a familiar set of statistical procedures, usually involving factor, cluster and multiple discriminant analysis. All of these stages require highly skilled researchers and can take considerable time.

Third, lifestyle and value-based segmentation have been criticized for being too general to be of great use, and their international application is limited as lifestyles vary from country to country (Sampson, 1992). Sampson argues that it is possible to understand human social behavior only to a limited degree by studying values, because values are general and therefore cannot deal with issues that relate to specific product consumption and brand-choice behavior in different markets. He claims psychological segmentation is superior to lifestyle and value-based segmentation because people are people the world over and there is greater similarity of psychological make-up in terms of people's loves, hates, fears, hopes, aspirations, and hang-ups than there is of their lifestyles.

Fourth, are the issues of reliability, validity, and generalizability. It is difficult to draw firm conclusions based on the results of any single study, and there are few reported replications of psychographic studies which would allow patterns to be discerned (see e.g. Novak and MacEvoy, 1990). The consumer research literature contains several articles which question the reliability (and validity) of psychographic concepts and measures (see e.g. Lastovicha, 1982; Wells, 1975). Although reliability issues are being addressed (e.g. by Boote, 1981; Burns and Harrison, 1979; Edris and Meidan, 1991), it seems that with each minor advance in demonstrating the reliability of a scale, another new scale appears which needs assessing. Whether or not psychographic scales are valid is a question which cannot be answered simply. Wells (1975) suggested that the use of painstaking, item-by-item and scale-by-scale, convergent and discriminant validation, such as that proposed by Campbell and Fiske (1959) to establish construct validity, would be a substantial contribution to the literature. This has seldom been done over the intervening 20 years. He questioned also the existence of some of the segments proposed, saying that few studies have used hold-out samples to cross-validate the initial segments, and even fewer have gone further and applied their results to the whole population. A difficult task indeed, and it is easy to see why it has been tried so infrequently.

The problems with the psychographic measures discussed prompted a search for an easier, less costly method of obtaining psychological insights. The next section considers the background to a new framework, not previously mentioned in the marketing literature, and discusses its potential effect on consumers' psychology.

Initial studies on using astrology

Astrology

Astrology is described as

the art or science, opinions differ on this point, of describing the character or destiny of a person by observing the position of the stars at the moment of the person's birth (Gauquelin, 1991, p. 13).

Modernization of astrology, by people like Alan Leo (1860-1940), has led to a resurgence of interest in its ideas. There can be no doubt that astrology is a very popular concept. In 1982, 1,200 of the USA's 1,750 daily papers contained astrological features, producing a readership of 40 million (Weinman, 1982); 98 percent of the population knew their zodiac signs, 96 percent knew what a horoscope was and 66 percent read their star signs regularly, i.e. once a week. A recent UK public opinion study (Granada Television, 1995) found that over 50 percent of people questioned had read their horoscopes in the previous week. Weinman (1982) calculated there were approximately 10,000 full-time and 175,000 part-time astrologers in the USA. Figures for Britain have been estimated at 250 full-time astrologers and thousands of part-timers (Neustauer, 1992).

Astrology is no stranger to the business world, either. As far back as the 1970s, Herzberg (1973) recorded that astrologers were consulted on such problems as plant locations, recruitment, and changes in the marketplace. Initial studies on using astrology to improve the accuracy of selection methods have been disappointing (Knobil, 1989). However, astrological personality profiles have been used by companies to examine employees so that management can be "in tune with all their cycles" (*Economist*, 1991). The popularity of newsletters which give stock market predictions, such as the *Wall Street Astrologer*, *Astro-Cycles*, and *Astro-Market*, has prompted some companies to use astrology to evaluate business proposals. Computerized services which produce financial predictions and business advice for investors also are available. Its use in marketing and in particular market segmentation, however, has not been documented. Astrology's usefulness to marketing is reliant on two things:

- (1) its influence on consumption and,
- (2) its influence on consumers' psychology.

While little or no research exists on the former, some research evidence has been presented for the latter.

Astrology and personality

Mayo *et al.* (1978) found a significant correlation between positive and negative zodiac signs and their characteristics of extroversion/introversion and stability/emotionality. A study of 238 pairs of homo- and hetero-zygotic twins found that astrology differentiates each personality in a twin pair (Fuzeau-Braesch, 1992).

No significant difference

While some evidence has been produced, not all studies have reported significant findings. For instance, Shaughnessy *et al.* (1990) found no significant difference between astrological signs for the constructs of introversion and extroversion, though belief in astrology was associated with higher extroversion scores. Subjects with a positive sign were especially susceptible to such a cue. Eysenck (1982) has used evidence about children, whose knowledge of the sun-sign characteristics linked to their birth dates was limited, to suggest that adult responses are influenced by the traits adults think they are expected to show. Further research confirmed that people are influenced by knowledge of their sun sign (Eysenck and Nias, 1983; Van

Consumers' self-understanding

Rooij, 1994). In a review of the literature, Crowe (1990) concluded that popular and scientific astrology has no basis in scientific fact.

Although the predictive validity of astrology has not been demonstrated, it may be that astrology can alter consumers' self-understanding due to psychological processes such as self-attribution and selective self-observation (Van Rooij, 1994). Supportive findings for this have been reported in a study of astrological skeptics and believers' acceptance of generalized personality descriptions (Glick *et al.*, 1989). Skeptics who received favorable horoscopes became more positive in their opinions towards astrology. The notions of self-attribution and selective self-observation are described by Furnham (1991) as the "Barnum effect." It suggests, for example, that a Virgo, when reading about his/her tendency to be honest, would selectively remember occasions when he/she demonstrated this trait. The tendency of people to agree with astrological predictions regardless of their relevance was reinforced by studies in which the sample was sent an identical personality assessment, that of a mass murderer: 93 percent of the recipients claimed to recognize themselves in the description (Gauquelin, 1991).

Astrological propositions

An individual's zodiac or sun sign can be determined by date-of-birth: although regarded as the least accurate assessment – because sun signs ignore other important determining variables such as exact time and place of birth – they are nonetheless believed to indicate different personality characteristics, making them particularly relevant to psychographic segmentation. Many authors have written on the psychological interpretation of astrology and the traits each sign is supposed to demonstrate (e.g. Eysenck, 1982; Gauquelin, 1991; Geddes, 1980; Lloyd-Jones, 1978; White, 1987); and, in our discussion of the traits, we shall draw on the interpretations of these authors.

Psychological constructs

The psychological constructs which astrology claims to predict are numerous and diverse. They include dimensions such as sociability, emotional stability, propensity to worry, social acceptability, hedonism, individuality, cautiousness, social conscience, fashion orientation, assertiveness, selfishness, thoughtfulness, intellectuality, flexibility, sensitivity, propensity for boredom, optimism, indecisiveness, affectionability, ambitiousness, curiosity, broad-mindedness and eccentricity. It is beyond the scope of this article to give a detailed description of the characteristics of each sun sign as this is done elsewhere (see Mitchell, 1995), but Table I gives a very brief overview of some of the psychological characteristics which are most closely associated with each sign.

Several points need to be noted.

- That astrology may have some effect on the personality or on the purchasing behavior of consumers is an interesting and curious topic worthy of investigation.
- Previous psychological studies are of limited use to the marketer since they have not addressed purchase behavior differences. While demonstrating differences in consumption is not necessary for astrology to be of use to marketers, it would help in its implementation and credibility if differences could be demonstrated.
- Most previous studies of astrology have been based on student samples, with relatively small sample sizes of less than 500. Only one large-scale

Sign	Characteristic
Aries (Ar)	Self-confident, independent, enthusiastic, assertive, determined, concealer of emotions, gregarious, selfish
Taurus (T)	Patient, calm, stubborn, home-loving, affectionate, thoughtful, security conscious, possessive
Gemini (G)	Versatile, imaginative, inquisitive, communicative, rational, variety-seeking, sociable, witty
Cancer (Cn)	Sensitive, emotional, pessimistic, insecure, given to worry, solitary, intuitive, imaginative
Leo (Le)	Proud, strong-minded, authority-seeking, trusting, calculating, ambitious
Virgo (V)	Methodical, logical, careful, health-conscious, active, dutiful, given to worry
Libra (Lb)	Diplomatic, fair-minded, sympathetic, negotiator, indecisive
Scorpio (Sc)	Ambitious, self-assured, obstinate, vindictive, passionate, non-gregarious
Sagittarius (Sg)	Tactless, creative, impulsive, generous, enjoys outdoors, needs diversity, enthusiastic
Capricorn (Cp)	Practical, cautious, persevering, organized, serious, respectful of authority, exacting, risk-averse, unemotional, proud
Aquarius (Aq)	Humanitarian, inventive, intelligent, academic, eccentric, honest, private, stubborn, unpredictable
Pisces (P)	Sympathetic, emotional, unconfident, temperamental, indecisive, unstable, flexible, creative

Table 1. Zodiac signs and their associated psychological characteristics

study, of 30,000 newspaper readers, was found; it revealed marked differences in lovelife, sexlife, and relationships across star signs (Mystic Meg, 1995).

The present study attempts to take a more scientifically rigorous approach, using a large sample and examining consumption differences of relevance to the marketer in a number of specific markets relating to the tobacco, leisure, and drinks industries. The first objective was to test whether date-of-birth has any effect on behavior. The second objective was to see whether any such observed effects could be interpreted in line with astrological predictions.

Results

Objective one was to test whether date-of-birth has any effect on behavior. The results obtained from the analyses (see Tables II-IV) show 33 significant differences in both samples (see Appendix 1 for the rationale for the dual samples). Many more significant differences were found, but only those differences which appeared in both independent samples are presented and discussed. The adherence to this rigorous double significance criterion was to guard against type-one errors and erroneous interpretation of individual significant results. In over half of the replications (18), exactly the same sign contributed the majority of the significance to the *p*-value. The number of significant results suggest that date-of-birth does have some effect on behavior. However, the real test is whether these effects can be explained using an astrological framework. This was objective two.

In the past decade there has been a dramatic increase in the awareness of the risks involved in smoking tobacco, and this is likely to affect some signs more than others. For example, as the results show, *Cancerians*, who are sensitive, pessimistic, insecure worriers, are less likely ever to have smoked, probably because they are more prone to health worries. Similarly, *Capricorns*, who are cautious and risk-averse, are less likely ever to have

Significant differences

Non-gregarious nature

Sex	Age	Social class	Variable	p-values for both 15,000 cases	Zodiac sign contributing most to significance
M	65+	A	Ever smoked cigarettes	0.050, 0.097	G(-),Aq(+)
M	16-24	C1-2	Ever smoked	0.007, 0.002	Cn(-),Cn(-)
M	16-24	C1-2	Type of cigarette smoked	0.003, 0.000	Lb(-),Lb(-)
M	45-64	D-E	Ever smoked cigarettes	0.036, 0.082	Ar(+),Ar(+)
M	45-64	D-E	Smoke cigars regularly	0.027, 0.094	Cn(+),P(+)
M	65+	D-E	Ever smoked	0.097, 0.032	Ar(+),Ar(+)
F	65+	A	Smoke cigars regularly	0.072, 0.061	Cp(-),Cp(-)
F	25-44	B	Type of cigarette smoked	0.028, 0.074	Aq(-),Le(-)
F	25-44	D-E	Ever smoked	0.018, 0.053	G(-),Cp(-)

Table II. Significant results for smoking behavior across star signs by subgroups

smoked or to have smoked cigars regularly, at least for older, upper-class females (See Table II). *Ariens*, on the other hand, are more likely ever to have smoked and are more likely ever to have smoked cigarettes. *Ariens'* self-confidence, independence and assertiveness are likely to make them less susceptible to peer pressure and the health risks involved.

From Table III we see that *Scorpios* are less likely to have drunk alcohol in the past four weeks. *Scorpios'* ambition and career concerns, together with their non-gregarious nature, mean they find it harder to mix with people, which might account for the reduced drinking. *Scorpios* tend also to prefer to pursue sporting activities in their leisure hours in order to release their great amounts of energy. In contrast, *Geminians* are significantly more likely to drink more frequently than are other signs, which may be attributable to their sociable, witty, variety-seeking, outgoing nature.

The leisure results in Table IV show *Virgoans* spend less time gardening, listening to records, and watching TV. This is likely to be because they are the most active of all the zodiac signs. Being worriers, methodical, careful and having a great sense of duty, they spend most of their time busy at work or at home and have very little time for leisure activities.

The inventive, intelligent, eccentric and unpredictable nature of *Aquarians* is suggested to explain why they are more likely to do DIY and less likely to

Sex	Age	Social class	Variable	p-values for both 15,000 cases	Zodiac sign contributing most to significance
M	16-24	B	Drank in past four weeks	0.000, 0.003	Sc(-),Sc(-)
F	65+	B	Drinking frequency	0.023, 0.036	G(+),G(+)
M	65+	C1-2	Drinking frequency	0.061, 0.027	Sg(-),Sc(-)
M	65+	C1-2	Believe drinking damages health	0.103, 0.073	Sc(+),Cn(+)
F	25-44	B	Drink wine	0.000, 0.023	P(-),P(-)
M	45-64	C1-2	Drink sherry	0.043, 0.037	Sg(-),T(-)
F	25-44	C1-2	Drink beer	0.022, 0.028	Le(-),Le(-)

Table III. Significant results for drinking-related variables across star signs by subgroups

Sex	Age	Social class	Leisure activity	p-values for both 15,000 cases	Zodiac sign contributing most to significance
M	45-64	A	Doing DIY	0.090, 0.104	Aq(-),Cp(-)
F	45-64	B	Doing DIY	0.017, 0.005	Aq(+),Aq(+)
F	16-24	C1-2	Doing DIY	0.075, 0.107	Sc(-),Sc(-)
M	16-24	B	Reading books	0.073, 0.036	T(-),Cp(-)
M	45-64	B	Reading books	0.023, 0.030	G(+),Le(+)
M	45-64	C1-2	Listening to radio	0.024, 0.020	Ar(+),Ar(+)
M	16-24	D-E	Listening to radio	0.002, 0.033	Le(-),Ar(-)
F	16-24	C1-2	Listening to radio	0.004, 0.009	Ar(-),T(-)
M	45-64	C1-2	Gardening	0.032, 0.004	G(+),G(+)
F	16-24	D-E	Gardening	0.002, 0.023	V(-),V(-)
M	16-24	A	Watching TV	0.014, 0.014	Aq(-),Aq(-)
M	45-64	A	Listening to records	0.024, 0.045	V(-),V(-)
M	65+	C1-2	Watching TV	0.014, 0.006	V(-),V(-)
M	25-44	D-E	Listening to records	0.012, 0.058	Aq(-),Aq(-)
F	25-44	C1-2	Listening to records	0.067, 0.052	Cp(-),Sg(-)
M	45-64	B	Visiting friends	0.041, 0.075	Sg(-),Sg(-)
F	25-44	C1-2	Going on holiday	0.011, 0.034	Ar(+),Le(-)

Table IV. Significant differences in leisure activities across star signs by subgroups

engage in more predictable mainstream leisure activities such as listening to records and watching TV (see Table IV).

The results show *Sagittarians* are less likely to spend their leisure time visiting and talking to friends. *Sagittarians* can be solitary, tactless and impulsive individuals who need diversity and prefer outdoor activities.

Finally, *Scorpios'* ambition and concern for career might explain their reduced participation in DIY.

Discussion

One question arises from the results: why are only some of the variables significant for some demographic subsets? The idea that astrology has no effect on behavior and that many of the significant results are simply random statistical errors can be discounted because of the replication analyses conducted. One possible explanation is that the effect of astrology may be context-dependent – dependent on such things as the person, place, product, etc., which mediate the overt astrological effect on consumption. Some consumers are perhaps more prone than others to astrological influence. For example, wealthier, younger, more-fashionable consumers may be more self-confident, more free and financially more able to express themselves in their purchases which could make them more prone to act as their sun sign dictates. The fact that significant results were spread evenly across the social-class groups provides little evidence to support income as being a mediating variable. However, men appear to show more effects than do women and those aged 16-24 years show more significant results than do other age groups. Both these findings give limited support to the idea that age and sex could be acting as mediating variables, perhaps working through a self-confidence framework.

Other explanations relate to which variables in the study were measured, and how:

Random statistical errors

- First, since the relationship between the brand and the individual is stronger than the relationship between the product category and the individual, analysis at the brand level may have been more revealing. Several studies using means-end chain analysis and transactional analysis have confirmed the strong relationship between brand-image and individual self-image (Guttman, 1991; Murphy, 1987).
- Second, only relatively few product types were considered. Many variables used in market segmentation are product-specific, and this is especially true for psychological variables. It may be that astrology could prove more successful in other product/service areas.
- Third, the analysis of subgroups meant that some samples were small (< 100) and therefore less likely to produce significant results. Tests using larger samples might show more effects.
- A fourth explanation is to consider the type of astrology used in the study. By necessity the study used very general sun-sign traits, which are the least accurate. To perform a more accurate and predictive analysis, information on an individual's place and time of birth is needed (see Further research).

Some consistent findings do not readily lend themselves to interpretation through the scant astrological framework we are using (see Tables II-IV). For example:

- middle-aged female *Pisceans* and *Librans* drank, respectively, less wine and beer than expected
- younger female *Scorpios* are less likely to do DIY
- young *Aquarian* upper-class males spend less time watching TV
- middle-aged male *Geminians* garden more and
- *Ariens* listen more to radio than do other sun signs.

This is not to say that these results do not have any astrological explanation. They may reflect simply the necessary limitations of this study in using a limited number of very general psychological traits, which are not indicative of all the traits which would be present in the rich complexity of a more detailed analysis. The results reported here, then, must be seen in that light, and are indicative and provocative rather than definitive.

Managerial implications and recommendations

Whether or not astrology's influence on consumers' personality and behavior is due to a "genuine", if unexplained, astral influence or is simply due to psychological processes such as self-attribution and selective self-observation, it can still be of use to the marketer. In particular, astrological insights can be used to improve communication from marketers to targets and to promote effective market segmentation.

Improved communications

The first use of astrology is to give greater insight into a target audience for designing more effective communications. Psychographic insights gained from astrology can be extremely useful to a whole range of marketing-related people, such as product designers, media analysts, product managers, package designers, copywriters, etc., all of whom are faced with the same basic problem of identifying the product features that will fit the lifestyle of the potential consumer and with which message the consumer will most identify.

Using role models

One way of achieving this is by using role models to portray the key characteristics. Role models work by allowing an individual to identify sufficiently with the model in order to make any comparisons meaningful, but being sufficiently different in some aspirational respect to make the individual wish to be more like the role model. In one sense, a person's sun sign might be seen as his/her aspirant group. For example, successful sportsmen and women, such as Michael Schumacher and John McEnroe, might appeal to *Ariens*, while *Leos* might be drawn to some of the stars of such programmes as *LA Law* or *Thirty-something* who demonstrate ambition, enjoyment of power, and lavish lifestyles yet retain a social conscience. *Librans* might be attracted by honest, fair-minded diplomats such as the former British Foreign Secretary, Douglas Hurd, or former US Foreign Secretary, Henry Kissinger. Baroness Thatcher displays many of the positive traits of *Scorpios*. Role models can also be fictitious. For example, Sherlock Holmes embodies many of the characteristics of *Aquarians*. The "Marlboro Man" image of a middle-aged, rugged-looking, independent, outdoor male on horseback set against a background of rocky terrain is likely to be attractive to male *Sagittarians* who enjoy the outdoors and diversity. Some products may be best promoted by a common aspirational group. Many people, when presented with positive characteristics of their sun signs, will often identify with these characteristics – this can be so even for those who claim not to believe in astrology (Van Rooij, 1994). Marketers could use positive *Arien* traits, for example, to promote a product to those consumers who aspire to be like *Ariens*. Just as lifestyle advertising has appeal to certain lifestyle segments and those who aspire to those lifestyles, so aspirational sun-sign advertising will appeal to specific zodiac segments and those who aspire to possess those traits.

Communications mix

Using role models is not the only way in which the communications mix can be altered. More subtle access to markets may be achieved with the use of symbols, colours, sounds, mood and image creation designed to appeal selectively to the personalities of specific zodiac groups. If a marketer decides to target a certain astrological segment, he/she needs to create a communications strategy to appeal to that target. *Ariens*, being bold, assertive and gregarious, like to be fashionable and will be more affected by the appeal of newness and style, while *Taureans*, who are more stable and home loving, will be more affected by promotional messages that stress security and reliability.

Finally, if it could be shown that different star signs favour different media, the choice of promotional medium as well as the message could be influenced also. As yet, this proposition has not been examined.

Effective market segmentation

The second use of astrology is in market segmentation. Several authors have identified requirements for effective market segmentation (Kotler, 1988; Mitchman, 1991). They claim that segments should be:

- distinguishable
- substantial
- measurable
- stable
- responsive and
- accessible.

A *distinguishable* market segment has clearly defined boundaries which set its members apart from any others; i.e. segments are mutually exclusive and

Psychographic techniques

exhaustive. Astrological segments have clearly defined boundaries, set by the day on which the individual was born, and there is no dispute regarding to which group an individual belongs.

Some psychographic techniques have limited application because they divide the population into too many groups of insubstantial and uneven size. Lannon (1991) refers to work in France which describes eight basic male and eight basic female types, and Voller and Winkler (1991) have identified 16 lifestyle groups. Sampson (1992) has commented that for many practical purposes this number of groups may be too large. If the group size is too small, the cost of devising and implementing a specific marketing plan may outweigh the possible gains. Astrological segmentation, however, divides the population into 12 evenly sized groups. This number of segments is manageable and helps ensure each group will be *substantial* enough to warrant targeting.

The *measurability* criterion is easily met, since zodiac groups are simple to measure; indeed this is a major advantage of astrology. Furthermore, information on consumers' date-of-birth is already collected by many organizations and this makes immediate testing of astrology's effect a realistic prospect.

Segments should also be relatively *stable* over time. Some psychographic variables provide little guarantee of their reliability or consistency over time. However, with astrology, since an individual's date-of-birth is fixed, his/her psychological profile can be determined accurately from the position of the planets at that time. In addition, as the positions of the planets alter, predictions can be made as to how consumers might change in the future – an advantage which few other segmentation variables can offer.

Segmented astrologically

The question of *responsiveness* is less easy to address. In order to establish that each astrological segment will respond differently to a marketing program, a market would need to be segmented astrologically, products designed to meet the needs of these segments and then their attitudinal and behavioral responses evaluated. Such application studies are seen rarely in the marketing literature, principally because of access, time, and cost constraints. In common with many other segmentation studies, the responsiveness of astrological segments remains an issue for future research. There is some evidence to suggest that response differences will be found. For example, in the research documented here, *Virgoans* showed less potential as a target market for manufacturers of tape recorders and record players; however, given their active, busy nature, they may have more potential for the manufacturers of *Walkman* cassette players. Since *Sagittarians* were found to be less likely to visit friends and more likely to spend their leisure time outdoors, companies providing activity holidays may find them a significant potential segment.

On a more general level, too, there is some reason to suspect that different star signs will behave differently. The high levels of activity which characterize cardinal signs such as *Aries*, *Cancer*, *Libra*, and *Capricorn* may predispose these signs toward leisure pursuits. Traits such as sociability, communicativeness, openness, and gregariousness might be predictors of leisure, entertainment and alcohol consumption. Sun signs prone to worry, e.g. *Cancerians* and *Virgoans*, may be more susceptible to health concerns, and consume greater quantities of products with health-related benefits.

Accessibility problems

Insecure signs such as *Taureans*, *Cancerians* and *Pisceans* may demonstrate more brand loyalty in their purchasing; while naturally-cautious *Capricorns* may need the reassurance of brand quality. Many of these associations are at present speculative, but they do seem intuitively reasonable and provide some propositions for future testing.

Finally, market segments should be *accessible*, i.e. be easily targeted and reached with promotional methods. Accessibility problems are faced by many psychographic segmentation studies; however, astrology has the major advantage of being linked to date-of-birth. Because respondents' dates-of-birth and addresses are commonly collected variables used in many market research and government surveys, and since many organizations already possess in-house customer databases or can obtain customer lists from brokers, there are opportunities for using direct mail. More traditional media decisions usually would rely on astrological segments being described in demographic terms to help identify which media to use, and when. Although as yet untried, future analysis of media usage by date-of-birth would be relatively simple to achieve, and is a priority for future research. Until it is, marketers will have to make do with profiling astrological segments using media-relevant variables and relying on educated guesswork, helped by the psychological profiles provided by astrologers. For example, *Ariens*, who are known to be bold, energetic, assertive, and enthusiastic and interested in competitive sports, may be more reachable by billboards at sporting events.

Full acceptance of astrological segmentation depends on astrology's claim to be a legitimate science. However, there are three levels on which astrology can be treated:

- (1) The most testing is to believe that astrology can accurately predict consumers' purchasing requirements, which in turn has significant impact on consumption of certain products. There is little evidence as yet to unequivocally accept this first level.
- (2) At the second level, we can remove the requirement that astrology has to affect consumption and simply use it as an additional variable when examining a segment's psychological profile. This might be of particular use when profiles need to be done very quickly, or when access to segments to collect the necessary psychological data is difficult or not possible.
- (3) The third level requires little or no belief in astrology and simply suggests the use of psychological profiles of astrological signs particularly suited to a brand's image in the brand's communication and positioning strategy. At this third level, astrology might also be used as a promotional or sales promotion tool, as has recently been done by a major UK building society in promoting pension plans. Astrology's usefulness at this third level does not require a great burden of proof and belief, and could be used by marketers without much further investigation.

Astrological segmentation presents some interesting opportunities for marketers, particularly in mature, declining, or highly competitive markets where there is a need for new promotional and segmentation ideas, and in industries which reflect lifestyles and personality, e.g. apparel, leisure, entertainment, food and drink.

Demographics less insightful

Summary

Although more popular and measurable, demographics are less insightful than are psychographics, which are less popular and more difficult to measure. Astrology is proposed as an easy-to-measure psychographic variable. A *prima facie* case is made for astrology's effectiveness as a segmentation variable, since it results in segments which are conceptually different from all other segments, easily measured, substantial enough to be worth pursuing, inclusive of every potential target member, stable over time, and, once profiled, likely to be accessible by various media. The main objective of this study was to examine the effect of date-of-birth on consumption behavior. By analyzing a large, unbiased, national data set on consumers' smoking, drinking, and leisure habits, the results showed significant differences in behavior across the zodiac signs, and for some variables the differences matched the astrological predictions. In markets where purchasing is strongly related to personality and lifestyle, astrology might allow marketers to gain more insight into current market segments very quickly, easily, and cheaply as well as providing a possible means to resegment a market. Even if astrology has no observable effect on consumer behavior, it can still provide a novel means of encapsulating psychological characteristics into promotional campaigns. However, much more work is required to explore both segmentation and communication issues. From a practical standpoint, astrological differences are relatively easily examined, especially by those organizations which already possess large databases on customers. It would be equally easy for any market research study to examine astrology's effect by including a date-of-birth question. In this final section, we explore some suggestions for the type of work which might be undertaken.

Psychological and behavioral effects

Further research

The two main areas for future research are the *psychological* and *behavioral effects* of astrology. A more systematic approach to assessing astrology's claims is needed, if astrology is to find a permanent place in the marketer's tool box. Recent work on the development of the concept and measurement of "vanity" gives examples of how this might be done (Netemeyer *et al.*, 1995). Initially, literature-generated descriptions of star signs could be tested against consumers' views to examine their levels of astrological awareness and understanding, which the marketer can then build on or modify according to the communication objective. The question put to respondents might be "Please provide a brief description of the personality characteristics and behavior that you would associate with a typical *Arien*." A series of adjectives could be given from which the respondent could choose the most appropriate. To increase validity and avoid abstract thinking, it may be worthwhile asking respondents to think of someone whom they already know to be the sign in question.

Astrology claims to predict differences over a wide variety of *psychological* traits, including: sociability, social conscience, hedonism, individuality, anxiety, social acceptability, fashion consciousness, emotional stability, to name but a few. Clearly, a scale to measure each of these would be required to examine how the traits vary across star signs. Some of the traits astrology claims to predict already have scales for their measurement; for example:

- body image in the "Body self-relations questionnaire" measuring body image (Cash *et al.*, 1986)
- the "Narcissistic personality inventory" (Raskin and Terry, 1988)

Simplicity as a means of measurement

- the “Need for achievement scale” (Bendig, 1964)
- the “Materialism scale” (Richins and Dawson, 1992)
- the “Social desirability scale” (Strahan and Gerbasi, 1972)
- the “Status concern scale” (Kaufman, 1957).

Two obvious directions for future research present themselves. First, existing psychological measurement tools could be used to examine differences between star signs. Second, a new composite scale could be devised to assess differences, which would accurately measure and reflect exactly those traits astrology claims to be best at predicting. It may be that rather than developing an individual scale for each trait, some composite of items taken from existing scales, supplemented by new items measuring the new traits, might be devised to cover the majority of astrological personality traits. The new composite scale designed to be sensitive to astrological personality dimensions would then need to be purified using principal component analysis, LISREL, and appropriate internal reliability checks. Netemeyer *et al.* (1995) provide an excellent example of how this can be done for a new concept. Validation of the scale, using known-group validity, should be more straightforward, because we know which group should score highly on what traits. To make the known groups even clearer, archetypal group members could be used, i.e. those born at the times and places which make them as similar to their star signs as they could possibly be.

At the end of such rigorous and detailed investigations, the scales can hopefully, and ironically, be discarded. If astrology is shown to be useful in psychological profiling, its greatest advantage is its simplicity as a means of measurement. Although there is a long way yet to go, the present unrealistic and incomprehensible goal of achieving a complex psychological profile with only a few easily-collected pieces of demographic information is surely worthy of further investigation.

Questions relating to *behavioral* differences are equally important. The study reported here needs to be replicated in wider and more diverse product markets, e.g. cosmetics, clothing and other conspicuous consumption items. In addition, since the products investigated here are closely associated with the personality variables of sociability and anxiety (about perceived health risk factors), and are highly visible, further research might also care to replicate the study with less visible products and include an assessment at the brand level.

The successful use of astrological segmentation depends in part on future research into the media behavior of different zodiac signs. Readership and viewership data need to be analyzed to see how a person’s sun sign affects media use. Such research would secure astrology’s place in the list of widely used segmentation descriptor variables and add greatly to the accessibility of astro-segments.

More detailed predictions

It is hoped that this study will act as a springboard for future research, using more accurate and detailed astrology frameworks which require subjects’ exact times and places of birth. More detailed predictions of consumer behavior can be made from working out a person’s ascendant sign, their house and aspect. Research into this more sensitive astrology is likely to be highly informative and useful in determining astrology’s true predictive worth. However, one limitation to this approach must be acknowledged: since people may not know exactly when and where they were born, its widespread use to marketing management may be limited.

Finally, while the discussion has focused largely on the UK and USA, foreign markets, e.g. France, where belief in astrology is particularly high, may provide new opportunities for companies to use astrological segmentation. In the Far East, too, astrology has a greater influence in people's lives, particularly for Hindus, and this may result in greater effects on consumption patterns. The Chinese have developed their own form of astrology which links the year of birth to psychological and behavioral characteristics. Future research in these countries would be an interesting and useful addition to the literature and any debate which this present article may generate. Looking further to the future, if astrology becomes established as a means of predicting behavior, there may be scope for considering the potential of other predictors of behavior that are given little credence currently, like Palmistry or Tarot cards.

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Appendix 1. The study

The leisure, tobacco, and drinks industries were chosen for five reasons:

- (1) Consumer behavior in these areas often is related more closely to personality and lifestyle than is the case in other product/service areas.

- (2) Certain sectors of these industries are either reaching maturity or are in decline, and new marketing strategies and insights could be extremely useful.
- (3) The industries are large and have significant influence on the economy, and, therefore, are of more general importance to marketers.
- (4) A large percentage of the population has been involved in some aspect of these industries, thus giving us a large sample with relevant experience.
- (5) Smoking, drinking, and leisure variables are available for study in one of the largest UK Government data sets, the *General Household Survey*, (HMSO, 1989).

First conducted in 1971, the *General Household Survey* (GHS) is an annual national survey containing information on living standards, health, education, employment, marriage, income, economic activity, family composition, leisure, drinking, and smoking. The stratified random sample consists of 10,000 private households (i.e. not institutions) which are selected from the Postcode Address File (PAF). Postcode sectors are used as the primary sampling unit (PSU) and these are distributed between 17 different regions in England, Scotland, and Wales. The PSU are stratified according to the proportion of socio-economic groups and types of housing contained within them, and a sample is drawn from each stratum. In 1989, the year used in this study, the response rate was 86 percent. The information is collected by personal interviews with all sampled household members over the age of 16 years, interviewed week-by-week throughout the year. Each year approximately 30,000 respondents are interviewed (further methodological details can be gained from HMSO (1989), Appendix C). It is important to note that the GHS interviewees were unaware that the information provided would be used for the purposes of this study. The data set used to examine the astrology proposition was therefore large, unbiased, and nationally representative.

The 1989 GHS variables used in the study are given in Appendix 2. The categorical variables, such as "Have you ever smoked?", were analyzed using chi-squared tests of significance. Ordinal variables, e.g. "How often have you had an alcoholic drink of any kind in the last 12 months?", were analyzed using the Kruskal-Wallis test. Interval variables, e.g. "How much beer have you usually drunk on any one occasion during the past 12 months?", were analyzed using a one-way analysis of variance with a multiple range Scheffé test. In order to reduce type-one errors and the misinterpretation of individual significances, all the analyses were first carried out on a randomly selected subsample of 15,000 cases. Only if variables produced significant results were analyses repeated on the second 15,000 cases. Such replication is in accordance with good scientific practice, but has been found to be a regrettably rare event in the marketing literature (Hubbard and Armstrong, 1994). It was thought unlikely that astrology would be a stronger determining factor in behavior than are some other demographics, such as age, sex, social class, etc.; therefore analyses were conducted on demographic subsamples, e.g. Males aged 65+, in social class A. The demographic categories used were: male/female; age-groups 16-24, 25-44, 45-64, 65+; social classes A, B, C1, C2, D, E. However, since half of variable/sub-sample combinations contained too few sample numbers to conduct a meaningful analysis, not all subsamples were analyzed.

Appendix 2. General Household Survey variables used in the study

Smoking

- SMOKEVER (Yes/No)
Have you ever smoked a cigarette, a cigar, or a pipe?
- CIGNOW(Yes/No)
Do you smoke cigarettes at all nowadays?
- CIGEVER (Yes/No)
Have you ever smoked cigarettes regularly?

Drinking

- DRINKNOW (Yes/No)
Do you ever drink alcohol nowadays, including drinks you brew or make at home?
- DRINKANY (Yes/No)
Could I just check, does that mean you never have a drink nowadays, or do you have a drink very occasionally, perhaps for medicinal purposes or on special occasions like Christmas or New Year?
- DRINK (Yes/No)
For the four weeks previous to the survey completion have you gone out for a drink (not in working hours)?

- SHANDYAM
How much shandy have you usually drunk on any one occasion during the last 12 months?
- BEERAM
How much beer have you usually drunk on any one occasion during the last 12 months?
- SPIRITAM
How much spirits have you usually drunk on any one occasion during the last 12 months?
- SHERRYAM
How much sherry have you usually drunk on any one occasion during the last 12 months?
- WINEAM
How much wine have you usually drunk on any one occasion during the last 12 months?
- DRINKING FREQUENCY (1-5)
Which of the following fits you best?
 - Hardly drink at all 1
 - Drink a little 2
 - Drink a moderate amount 3
 - Drink quite a lot 4
 - Drink heavily 5
- DRINKEDAM, SMOKEDAM (1-5)
Do you think that drinking/smoking can damage people's health?
 - Yes (unqualified) 1
 - Yes (qualified) 2
 - No 3
 - Don't know 4
 - Other answer 5

Leisure

- HOLIDAY (Yes/No)
For the four weeks previous to the survey's completion, did you stay away from home for one night or longer on any kind of holiday in these four weeks?
- TV (Yes/No)
For the four weeks previous to the survey's completion, did you watch television?
- RADIO (Yes/No)
For the four weeks previous to the survey's completion, did you listen to the radio?

For the four weeks previous to the survey's completion, have you:

- RECORDS (Yes/No)
Listened to records or tapes?
- BOOKS (Yes/No)
Read books?
- VISIT (Yes/No)
Visited friends or relations or had them come to see you?
- FOOD (Yes/No)
Gone out for a meal to a restaurant, pub or club (not in working hours)?
- GARDEN (Yes/No)
Done any gardening?
- SEW (Yes/No)
Done any dressmaking, needlework or knitting?
- DIY (Yes/No)
Done any house repairs or do-it-yourself jobs?

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This summary has been provided to allow managers and executives a rapid appreciation of the content of this article. Those with a particular interest in the topic covered may then read the article in toto to take advantage of the more comprehensive description of the research undertaken and its results to get the full benefit of the material present

Executive summary and implications for managers and executives

I'm Larry, Pisces! So what?

In our skeptical and cynical times we approach the idea of astrology with incredulity and, in some cases, downright scorn. After all, how can the apparent configuration of some stars thousands of light years away have the slightest effect on people's character or behavior, let alone provide any hope of predicting what will happen on our planet? Mitchell and Haggett, however, ask us to suspend our disbelief and consider using astrological signs as a segmentation variable in consumer marketing.

Using astrology in business is not some deranged offshoot of new age spiritualism. For centuries businessmen, politicians and others have employed astrologers in order to provide another spin on their assessment of the future. Ronald Reagan was only the latest in a long tradition. Some cynics looking at the use of supposedly scientific forecasting models might observe that using astrology is perhaps more accurate. In our western culture we reject astrological predictions and other related methods as unscientific mumbo-jumbo. Yet we also read how, in Asian cultures, the use of astrology and other "magic" methods is a matter of routine. Nobody in Hong Kong would design an office without considering feng shui. Who is to say that the wise guesswork of the astrologer is less valuable than our scientific versions of their horoscopes – psychographics and psychometrics?

Even where we feel astrology is twaddle we cannot discount its importance. Mitchell and Haggett point out the sheer abundance of astrology in our society. Hardly a newspaper exists without a set of horoscopes, people buy books and pamphlets on the subject and the sun signs themselves have become one of the ways in which we try to understand ourselves. Therefore, we could argue that the broad generalizations of sun sign characteristics are related to the way in which people behave. Mitchell and Haggett comment that the fact of astrology's existence could in itself affect individual behavior by indicating how people born at that time of the year should behave.

So, should we take up the suggestion of using sun signs as a segmentation variable? Mitchell and Haggett find some evidence of differing behavior across the various sun signs. This could, as they admit, be an aberration but it could equally mean that the date of birth does affect character and behavior. Practical marketers are not especially concerned with the academic rigor or scientific justification for a technique. We want to know whether it works. If the combination of sun signs with other variables produces an improvement in performance, then should we worry much about its validity? And the popularity of astrology suggests its use in promotional activity. I can envision the mail order company producing a special catalog for each sun sign with merchandise selection reflecting the supposed character traits of each sign. And, I'm sure such an approach would appeal to customers – even if the astrology is open to scientific challenge.

From a practical point of view I would suggest that if you already have the information needed then use sun signs as a variable. You might get some insight into the nature of your customers and some stimulus for marketing thinking. But I wouldn't set out to gather date of birth information merely to analyze the information by sun sign. And remember that, whatever psychometric methods you use to segment, recency, frequency and value data plus demographics remain the core variables for customer segmentation. Past buying activity remains the best guide to future

purchases and those whose lifestyles are closest to your existing customers' are the best targets. There has never been, nor will there ever be, some perfect model for identifying the people who will buy from you. So the best place to start is by removing those least likely to buy.

Astrology, perhaps, provides something for marketers to play with and it seems there is an inkling of real differences determined by date of birth. If this is the case then it's nothing to do with the stars. Is it a response to being told that this is how Leos or Virgos behave? Or do we as parents treat children born at different times in different ways? Perhaps the time of starting full-time education affects children? We know that depression and suicide are more prevalent in countries with long dark winters, so perhaps that provides a possible way to understand why astrology has some validity. And finally, what about Australians? Do they have a wholly different astrology?

Mitchell and Haggett provide us with an interesting assessment of astrology as a variable. They point out that more research is needed to assess its potential and remark on the cynicism associated with its scientific validity. But they show that it might provide another arrow in the marketer's quiver of selection variables. Either as part of an overall scoring system or used carefully on its own, astrology might just provide a little extra edge to your marketing.

(This is a précis of the article "Sun-sign astrology in market segmentation: an empirical investigation." Supplied by Marketing Consultants for MCB University Press.)