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Research Article

Do Astrological Beliefs Reflects Systematic Bias in Personality Measurement?

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ABSTRACT

Personality is a complex concept specified by many factors and separated from character concept in many ways. Astrology is an ancient study that involves classifications based upon the zodiac and regarded now as a pseudo-science. In this study, aim was to investigate the effect of the astrological personality on the personality characteristics, which were measured by the Five Factor Personality Model. The research studies finding that the pre-scientific beliefs had an effect on personality measurements, motivates to accept the astrological groupings as a factor on explaining the personality and trait. The significant effects indicates either a direct reasoning or a systematic bias without questioning the belief of respondent.

Keywords:

Personality, Personality Characteristics, Five Factor Personality Model, Astrology, Astropsychology, Multivariate Analysis of Variance



1. Introduction

The concept of personality derives from the word “persona” as “The combination of characteristics or qualities that form an individual's distinctive character” (Oxford Dictionary, 11 April 2016). According to Tutar (2012), personality is “all that includes the individual's distinctive and discriminative behavior”. It is difficult to specify personality precisely when the concern is in the field of behavioral sciences chiefly because there are many factors to determine and the community cannot arrive at a comprehensively accepted definition. Because of the varying characteristics that result in the absence of an agreed definition and which are not open to generalization, therefore, it does not seem right to consider the concept of personality as a single entity. Nevertheless, the personality studies concern two important arguments. First, the personality shows inter-individual differences, and second, it has generalizable features (Güney, 2011).

Personality is one of the main concerns of astrology. Indeed, astrology is generally categorized as a pseudo-science (Allum, 2010) as far with Barnum effect and Mars effect (Nias, 2016). The aim of the present study, therefore, is to enquire into the possibility of establishing a basis for the subject to be examined scientifically in the context of the qualitative and quantitative studies of the social sciences.

The empirical aim of this study is to compare personality traits of individuals as measured with personality structures of characteristics as defined by their astrological signs. Regarding the traits side of this, the concept of personality constructed under six main headings, in line with various studies in fields, listed as biological, socio-cultural, family, social structure and status, geographical and other factors. From an astrological point of view, the universal structure of sun and rising signs at birth time influence the personality characteristics. There are very few field researches on Muslim societies beside the related literature in western counterparts.

2. Personality and Astrology

Personality-related researches differ in many ways due to the individually differentiated characteristics (Şimşek and Eroğlu, 2013; Nias, 2016). Recently, many studies start with the approaches of philosophers, which varied according to their main concern. Plato, for example, considered the human as the center of personality, while Aristotle argued that it was reason of personality. Then, theories are applied that focus on the personality traits and factors that categorize individuals by identifying behavioral interventions that motivate the individual (Whitworth, 2008; Steyn, 2011). These theories may be summarized under four headings below.

The parts and processes that constitute the human psyche examines the field of personality theories in order to understand the personality traits associated with astrology. This area refers as “astro-psychology”. The general name of the constellations, Zodiac represents the twelve signs moving through the individual horoscope, stimulates mainly the motivation of human attitudes according to the supposition of Hall and Lindzey (1978) that the ruling planets define a comprehensive model of the psyche cited by Perry (1992). In addition, each horoscope is characterized by one of four elements “fire, earth, air and water”, as specified by the rising sign (Jung and Yang, 2015). Carl Jung (1947) further used inward-facing and outward-

oriented concepts to establish four basic personality traits, which were intuition, sensation, thinking and feeling.

In astrology, the planets represent different psychological states, which is another, crucial factor in determining personality trait. In the management of the psychological and psychological anatomies of a person, the characteristics of the planets are the basic function, in fact. The psychological processes and functions of the planets have called as “psychological forces”, which have been defined by their names and taken to be expressive of inherent properties (Perry, 1992). The belief in astrology expressed generally the adherence to authoritarian values (Allum, 2010) and as follows:

“When we look at the stars in the sky, we see a mess of sparkling ots. Nevertheless, many people throughout history have believed that even stars can tell us something about our life on earth. Apparently there are politicians who consult astrologers before taking an important decision even today” (Gaarder, 2013).

This mentioned statement based on the teachings of the ancient philosophers Aristotle and Protagoras. These doctrines were the mean of Protagoras’ idea, that “human is the measure of everything” (Özgür, 2006). Aristotle's expression was in contrast, “in order to understand the human actions and the human structures such as the society or the state, first the human being must be determined and the human soul must be solved because the human being is first of all the soul”. The superstitious, magical and paranormal beliefs have been assumed to affect the core of intuitive knowledge about psychological entities (Lindeman & Aarnio, 2007), which leads confusion of reality and intentional disparities (Aharoni et al., 2011).

The basic elements of the concept of personality examined under several headings. The character defined according to the social norms and ethical rules as the opinions and behaviors of the individual. It is not the same as the concept of personality, yet nor is it possible to think of the two independently. Character contains important elements of personality. We can define the concept of talent as a person’s skills and the areas to which the entity is predisposed (Güney, 2011). Nature is an outward representation of the individual’s qualities, dispositions, characteristics and skills. In short, it is the expression and representation of all the personality and psychological characteristics of individuals.

These dimensions might stated both as the starting point of the studies for understanding the concept of personality and as the basis of the discipline of “clinical psychology”. They could have examined under four theory headings. According to Eysenck, personality expressed as the whole of human beings' real or hidden behavior structures (Tutar, 2012). According to Cattell, the distinctive features are constant tendencies that show consistent behavior from one state to another or from one moment to another (Hjelle and Ziegler, 1992: 30). The humanistic theory states that for the determination of personality traits, it is not sufficient to explain only the determinants. It also emphasizes at the same time, there is need to reveal the hidden characteristics of the individual i.e. besides the basic needs (Rogers 2011). Characteristics Approach Theory (Five Factor Personality Approach) examines the distinctive characteristics of individuals that differentiate them from one another, apart from the characteristics of human nature. Nomotetic and Idiographic

approaches distinguish between the universalizing and the detailed personality. According to Windelband, the nomothetic approach leads to knowledge of the general and the idiographic approach is directed to the knowledge of the specific (Propat and Corr, 2015).

3. Method

The main question for an approach to personality theory concerns the features defining and distinguishing among individuals. The most commonly used personality assessment tool is the Myers-Briggs Indicator. This indicator includes the evaluation of the trait of 16 people classified according to the dimensions used by the personality types of Jung (Buck, 2018; Aşan & Aydın, 2006). Personality psychologists have reached a general agreement on the Five Factor Model, which provides meaningful and useful classification for the regulation of the complex structure in personality identification (Taggar, Hackett, & Saha, 1999). McCrae and Costa built the Five Model Personality Model in 1985, known as the 'Ocean Model', which constitutes different personality traits, for openness, consciousness, emotional stability, agreeableness and neuroticism and studied afterwards for developments (Digman & Inoyue, 1986; Costa, McCrae & Dye, 1991; Saucier & Goldberg, 1996).

Personality inventories, which are a scale of behavior, consider by measuring the content of characteristics in terms of feelings, behavior and thought. They do not provide information about the reasons for these characteristics. It is possible to examine the differences between the groups by determining the properties through application to an adequate sample of individuals in a short time (Basım et al. 2009; Doğan, 2013).

This study is a descriptive and causal research, examining the directional interactions of external factors and astrological groupings on the five factor personality traits. Personality-related factors have been considered, as gender, educational status and income status. In this sense, the method integrates the Galtonian personality descriptions by explaining them through Wundtian approach with pre-scientific thought (Poropat & Corr, 2015).

With convenience sampling method sample consists of 500 individuals with different economic and social backgrounds. A sampling error occurs when the determined sample is not capable of representing the population, as opposed to a sufficient sample, one that contains enough units to provide reliable results (Young, 1968). The general rule states that at least 10 observations require for each variable in a multivariate analysis (Velicer and Fava, 1998).

First, a pretest was applied in order to understand how individuals perceived and defined the concept of personality. The question 'What is Personality' was directed to 50 individuals by face-to-face technique without gender or age discrimination. The responses from individuals included ideas like human behavior, individuality and attitudes, which are definitions of temperament, personality, nature and character. The conceptually true definition of personality responded with 42% rate. However, most of the individuals perceive and define the personality as the sub dimensions of it or other concepts related with personality. Women defined the concept of

personality more accurately, but men defined the personality more as character or temperament issues (Aarnio & Lindemann, 2005).

The male-female ratio of the respondents distributed equally in the sample to represent the population and to avoid gender bias throughout the analyses. Table 1 shows the sampling demographic distributions.

Gender	%	Educational Status	%	Birth year	%	Income Status	%
Female	50	Primary	7.0	1992-99	31.6	Low	21.6
Male	50	High School	27.4	1984-91	47.8	Lower Mid	18.6
		Undergraduate	48.2	1976-83	12.0	Mid	22.0
		Graduate	17.4	1968-75	5.0	Upper Mid	37.8
				1960-67	3.6		

Table 1. Demographic characteristics of the sample

Theoretically, the birth years of individuals showed homogeneity with the population for age distribution, and each generation group should contain the twelve horoscope groups equally. Thus, a chi-square homogeneity test was applied to birth-year groups against the sun and rising signs, revealing statistically homogenous distributions ($p=0.081$ and $p=0.702$, respectively females and males).

There were 9 items in the Five Factor Personality Inventory short form representing emotional balance, 8 items of extraversion, 6 items of compliance, 8 items of conscientiousness and 12 items of openness to experience, which surely led to a more limited examination of the personality traits. The last section of questionnaire includes six questions for nurture factors gender, social status and educational level, socio-cultural factors, birth-year and time were questioned, which were taken as representing the factors affecting the personality. Their beliefs or astrological groupings had not questioned to avoid the bias about the aim of the survey, despite the application to factorize the level of beliefs in personality researchs (Aharoni et al., 2011).

There were also restrictions regarding geographical factors, a possible determining factor of personality traits. Unfortunately, a geographically wide range has not sampled due of economic resources shortage. Another limitation is that the sample is highly educated compared with population, so the findings have been expected to result more rational. Individuals required a certain level of subjective perception and self-awareness. The significance level assumed 5 percent throughout the statistical tests.

MANOVA was the chosen method of statistical analysis to test the hypothesis that personality traits differ according to known factors together with astrological groupings. The primary aim here was to determine whether the personality traits that are the subject of research are congruent with astrological personality groups. The dependence structured model is general linear estimatable function where some or all the exploratory variables are nominal categories.

$$Y_{ijk} = \mu + \alpha_{ij}X + \varepsilon_{ijk}$$

The $X_{n \times p}$ design matrix can be defined in more detail as $A_{n \times (g+1)} \beta_{(g+1) \times p}$, where i is the number of observations $i=1,2,\dots,n_j$, j is the number of group $j=1,2,\dots,g$ and k is the number of variables $k=1,2,\dots,p$. The assumptions about the residuals for the fixed effect model were as follows:

$$\varepsilon_{ijk} \sim NID(0, \sigma^2)$$

$$E(Y_{ijk}) = \mu + \alpha_{ij}$$

$$V(Y_{ijk}) = V(\varepsilon_{ijk}) = \Sigma$$

The variables in this equation are:

Y_{ijk} : the value of the k . variable belonging to the j . group of the i . observation,

μ : overall average,

α_{ij} : effect of i . observation in j . group,

ε_{ijk} : the i . observation refers to the error in the k . variable values of the j . group.

The hypothesis and representation of the MANOVA model is written as follows (Jobson, 1992).

$$H_0: \begin{bmatrix} \alpha_{11} \\ \alpha_{21} \\ \cdot \\ \cdot \\ \alpha_{1p} \end{bmatrix} = \begin{bmatrix} \alpha_{21} \\ \alpha_{22} \\ \cdot \\ \cdot \\ \alpha_{2p} \end{bmatrix} = \begin{bmatrix} \alpha_{31} \\ \alpha_{32} \\ \cdot \\ \cdot \\ \alpha_{3p} \end{bmatrix} = \dots = \begin{bmatrix} \alpha_{g1} \\ \alpha_{g2} \\ \cdot \\ \cdot \\ \alpha_{gp} \end{bmatrix}$$

H_a : At least one of the mean vectors is different.

The Pillai's Trace test statistic interpreted for the evaluation the MANOVA model results. This is the most robust test statistic in case of deviation from the normal sampling distribution assumption and that especially variance-covariance matrices are heterogeneous as percent the Pillai-Bartlett statistics (Olson, 1974; Scheiner & Gurevitch, 1993).

4. Findings

A confirmatory factor analysis estimated with generalized least squares method to determine the factors of the five personality scale items. This method reduces the differences between observed and formed correlation matrices. If the data set is not suitable for multiple normal distribution, this method is also preferred for any consistency in terms of structure (Albayrak, 2006). The results of the factor analysis presented in Table 2.

Factor	Initial Values			Values after Factorization			Values after Rotation		
	Eigen-value	% of Variance	Cumulative %	Eigen-value	% of Variance	Cumulative %	Eigen-value	% of Variance	Cumulative %
1	3.309	24.061	24.061	3.309	24.061	24.061	2.510	18.731	18.731
2	1.754	11.692	35.753	1.754	11.692	35.753	2.230	14.870	33.601
3	1.453	9.688	45.441	1.453	9.688	45.441	1.457	9.711	43.312
4	1.222	8.144	53.585	1.222	8.144	53.585	1.352	9.015	52.327
5	1.088	7.250	60.835	1.088	7.250	60.835	1.276	8.508	60.835

Table 2: Factor analysis dimension properties

The Cronbach's Alpha value of the factor analysis was 0.805 with the reverse coding of the reverse-expressions to enable linearity between the scale items (KMO statistic=0.846, Bartlett sphericity test p-value=0.000). The five artificial dimensions explained 60.835% of the information of the 44-item scale and the Varimax technique rotated the five dimensions with evenly eigenvalues meaning

discrimination power. The rotated factor dimensions includes to the original five factor model items. According to the generalized least squares varimax rotation result, the total explained variance via five factors is 60.835%. This shows that 60,835% of the information contained in 44 items is explained by five artificial variables, namely factors. The sub-scale items and all items empowered the linearity assumption in accordance with the Tukey's test of nonadditivity. The item scores prevent the unique individual differences in the evaluation phase and instead provide ease of interpretation. The results of normality and homogeneity tests according to sum scales presented in Table 3.

Test	All Items	Extroversion	Consciousness	Agreeableness	Openness	Neuroticism
Normality Mardia Skewness	0.2456	0.0003	0.0407	0.4229	0.0705	0.0912
Normality Mardia Kurtosis	0.9261	0.0000	0.1760	0.1148	0.2729	0.0531
Homogeneity Box-M	0.488	0.121	0.186	0.061	0.224	0.146

Table 3. Significance levels of assumption tests.

Although the homogeneity assumption was provided according to Box-M tests, there is a deviation in the assumption of multiple normality for extroversion and for consciousness. However, there are studies in the literature suggesting that it is almost impossible to achieve these assumptions, especially in human behavior studies, as they present an exponential curve rather than normal distribution (Micceri, 1989). The simulation studies also support that variance analyses and MANOVA are a robust technique for the estimation of effect sizes and statistical test statistics with adequate sample sizes, when the normality and homogeneity assumptions are not overly violated (Tabachnick & Fidell, 2013; Wilcox, 2012; Büyüköztürk, 1997).

Variable	Model	Whole Scale	Extroversion	Consciousness	Agreeableness	Openness	Neuroticism
Gender		0.000*	0.010*	0.160	0.655	0.007*	0.000*
Educational Status		0.098	0.270	0.067	0.065	0.090	0.027*
Income Status		0.016*	0.018*	0.002*	0.365	0.208	0.160
Birth-year		0.536	0.615	0.009*	0.979	0.799	0.029*
Sun Sign		0.180	0.132	0.001*	0.133	0.105	0.229
Rising Sign		0.302	0.146	0.116	0.047*	0.048*	0.047*
Sun Sign *Rising Sign		0.008*	0.021*	0.724	0.154	0.347	0.036*

Table 4. Significance levels of MANOVA effect coefficients (*: p-value<0.05)

The hypothesis tests in Table 4 show whether the feature makes a significant difference when other factors are controlled variables. Gender and income levels generally make a difference to the five-factor personality item levels. While gender does not make a difference to consciousness and agreeableness, income makes a significant effect on extroversion and consciousness. While neurotic tendency difference is determined according to educational level and gender, the generations determined according to birth year classes make a significant difference in terms of neuroticism and consciousness. When these effects are kept constant, the degree of consciousness appeared significantly affected with respect to the astrological signs. Openness, neuroticism and the five factor personality trait have been significantly affected by the interaction between the sun and rising signs. The scale mean scores calculated for each of the astrological signs in Tables 5 and 6.

Groups	Horoscope	Consciousness	Openness	Neuroticism	Extroversion	Agreeableness
Fire	Aries	3.6287	3.7531	3.1009	3.5925	3.6494
	Leo	3.5377	3.7733	3.1811	3.7607	3.8696
	Sagittarius	3.4000	3.8097	3.2848	3.6516	3.8203
Earth	Capricorn	3.5824	3.7340	3.0622	3.6526	3.7734
	Taurus	3.5636	3.8614	3.0561	3.6643	3.8461
	Virgo	3.5731	3.6667	3.2626	3.4733	3.6864
Air	Aquarius	3.3769	3.8353	3.1171	3.4822	3.7292
	Gemini	3.3649	3.7128	3.1403	3.7197	3.6121
	Libra	3.4326	3.8185	3.2619	3.2985	3.8315
Water	Pisces	3.4196	3.7449	3.1171	3.4180	3.6892
	Cancer	3.5081	4.0000	3.3960	3.4788	3.7405
	Scorpio	3.5706	3.7784	3.1786	3.6592	3.8739

Table 5. Mean values of horoscope groups

Groups	Horoscope	Consciousness	Openness	Neuroticism	Extroversion	Agreeableness
Fire	Aries	3.5258	3.7030	3.0515	3.4903	3.6464
	Leo	3.5882	3.7795	3.3691	3.4516	3.7932
	Sagittarius	3.5292	3.8564	3.2144	3.6921	3.8603
Earth	Capricorn	3.2421	3.7176	3.2303	3.5318	3.8226
	Taurus	3.2538	3.7119	3.2045	3.5529	3.6457
	Virgo	3.5857	3.8568	3.1786	3.7120	3.8157
Air	Aquarius	3.5614	3.8730	2.9886	3.5795	3.8043
	Gemini	3.4505	3.6947	3.4016	3.6597	3.7376
	Libra	3.5150	3.8522	3.2091	3.5596	3.7198
Water	Pisces	3.4931	3.7167	3.1404	3.5548	3.7425
	Cancer	3.5505	3.7364	3.2132	3.5761	3.6770
	Scorpio	3.5292	3.9353	3.0641	3.5635	3.8602

Table 6. Mean values of rising sign groups

Fire Group: Sagittarius had the highest agreeableness in the group. While Leo had a lower rate, it was seen that it had a slightly lower neuroticism than the other two signs in the Aries group. The rising Leo has the highest neurotoxicity in the group. The rising Sagittarius had this feature at a lower level compared to the rising Leo, while the lowest level of the sign within the group was the rising Aries.

Earth Group: Virgo was the highest neurotic property in the group. Taurus and Capricorn had an agreeableness in close proximity to each other. The rising Capricorn was the highest neurotic sign in the group. Virgo and Taurus rising were found to be very close to the rising Capricorn.

Air Group: Aquarius had the highest neurotic property in the group. Libra had this feature at a level close to Aquarius, while Gemini have a lower level of neurotoxicity than the others. Gemini rising was the highest neurotic sign in the group. While Libra rising had this feature at a lower level than Gemini rising, it the lowest level sign within the group was the rising Aquarius.

Water Group: Cancer had the highest neurotic property in the group. Scorpio had a neuropathic property similar to that of Pisces, but had a relatively low level of Cancer. The rising Cancer had the highest neurotic property in the group. Pisces and Scorpio rising had a very close neurotic feature.

5. Conclusion and Discussion

It is known that the personality as defined in both individual and academic studies includes features that can be determined and generalised by society. These consist of a combination of biological, socio-cultural, family, social structure and status, geographical and other factors. One of the enormous number of studies done to determine human personality based on the predefined theories, the Five Factor Personality Model employs a hierarchical personality model, which apart from the general characteristics defined by human nature, has distinctive features that differentiate individuals. Similar and distinctive aspects of individual characteristics can be determined through the personality inventory.

In the field of psychological astrology, human personality and behaviours are examined astrologically. Astro-psychology is based on a comprehensive and systematic approach to the elements that constitute personality. Astrology, on the basis of all the factors mentioned in personality theories, states that the distinctive characteristics of personality are formed at the time of birth of the individuals, and that these are shaped by generalisable features as determined by society as well as later in personality theories.

Human behaviours, attitudes and mental abilities have been assumed to present a Gaussian distribution. However, deviations in the extroversion dimension have been observed. The attitudes are homogenous across all population subgroups and horoscopes. In this study, gender, marital status, level of education, income status and age group variables were nominated as socio-cultural factors. No variables to determine geographic factors were included. The performed analyses showed parallel results to generally expressed conclusions in personality theories. Education and generation had no effect on personality traits. This situation is not an expected result according to personality theory. However, due to the evaluation of the marginal effects of variables in the sample structure, it is thought that this might be explained by other variables. There was not a significant main effect for either the sun or rising signs. However, the interaction of sun and rising signs, which are used in the determination of personality in astrology, was found to significantly represent the personality traits of individuals.

The evaluation of astrology as (if) a science is considered as the most negative criticism of this study. The distinction between science and pseudo-science is expressed in the literature as a distinction problem. According to this concept, which is expressed as the problem of the boundaries of science, any field considered as supposed science in scientific studies should not coexist with another field of science. However, there are many studies in which astrological propositions are tested in the Western literature, including on the basis of statistical techniques. The basic idea in the conduct of these studies is not to reject that which is considered as the so-called a science without first examining the area.

Today, personality traits determined by personality tests used in recruitment processes are an important technique used to determine the suitability of candidates for an existing position. In the field of recruitment, which examines the personality as a whole together with the forming elements, this enables candidates to be evaluated not only by their professional qualifications but also by their personality

characteristics, because 'employees' achievements in the workplace are largely related to personality traits'. In this context, this study introduces the possibility that the combination of sun and rising signs may be used as an alternative technique in recruitment processes. Thus, it is possible to use it in choosing the right professions according to the personality traits of individuals and for placing them in the right positions in businesses.

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