

Chronotype, personality, personal values and mental health: BIG 5, depression, stress and anxiety.

Ana Julia Candida Ferreira ^a, Fernanda Aparecida Piovesan ^b.

^a Faculty of Psychology, Education Institute, Federal University of Mato Grosso, Cuiabá, Brazil, anajuliacandidaferreira@gmail.com.

^b Faculty of Psychology, Education Institute, Federal University of Mato Grosso, Cuiabá, Brazil, fernandaappiovesan@gmail.com.

Abstract. It is well known that each human being feels more energized at a given time of day, and is more likely to learn, to relate, and to perform daily activities on those periods. Human's circadian preferences as well as the search for its correlations with personality traits and personal values have gained extended interest in psychology research. In this study, we provide evidences that individual differences are correlated to personal values, dark triad traits and to the big five factors of personality. This study aimed to gather evidence of validity and accuracy of Dark Triad Dirty Dozen (DTDD). Therefore, two studies were performed. Study 1 consisted of 207 people from the general population who responded to the DTDD and the Five Great Personality Factors Inventory. A principal component analysis revealed a trifactorial structure: Machiavellianism ($\alpha = 0.85$), narcissism ($\alpha = 0.84$) and psychopathy ($\alpha = 0.72$), where these were negatively correlated with kindness. In Study 2, 300 people from the general population who answered the DTDD participated. Confirmatory factor analysis indicated that the best fit was the bifactor model (e.g., CFI = 0.95; TLI = 0.92 and RMSEA = 0.07). It is concluded that this measure presents acceptable psychometric parameters, justifying its use for research purposes.

Keywords. Chronotype, Mental Health, Personality.

1. Introduction

It is well known that each human being feels more energized at a given time of day, and is more likely to learn, to relate, and to perform daily activities on those periods [1]. Among chronobiological devices, chronotypes play a crucial role in determining the physiological difference that each organism presents at different times of the day, which consequently makes it able to respond to environmental stimuli (chemical, biological, physical or social) in a distinct way [2]. Thus, humans are classified between morning and evening according to their choice of sleep / wake time. Morning people have early biological clocks, choosing to sleep early (around 21 or 22 hours) and wake up early (6 hours), yielding more physically and psychologically in the morning. Already the afternoon choose to sleep and wake up late (1 hour in the morning and after 10 hours, simultaneously), obtaining higher income in the afternoon and early evening [3]. Morning individuals reach their ideal body temperature earlier [4] as well as their melatonin peak [5], presenting with a high cortisol level early in the morning [6]. Chronotype

differences are also associated with age and sex, with young children and the elderly being often morning oriented, while evening oriented adolescents [7], being oriented towards the morningness towards the end of adolescence [8]. When it comes to sex, girls and women are more morning oriented while boys and men are more evening oriented [9]. Eveningness in men is associated with more sexual partners [10], as well as higher testosterone levels [1]. A study has focused on M / E correlates with personality [1], but the relationship with DT has rarely been evaluated [11].

2. Literature Review

2.1. Dark Triad (DT)

The dark triad is a personality concept that theorizes the social callous facet of personality. Even being considered an aversive expression they are not abnormal in the human personality [12]. The three traits are: Machiavellianism, being the only one of the

triad that does not configure itself as a personality disorder, is characterized by manipulative and deceptive behaviors that are intermediate in the pursuit of a certain goal [13], which recalls Machiavelli's motto that "the ends justify the means"; psychopathy, which characterizes uninhibited, bold and cruel behavior [14], and may also lack empathy and remorse [15]; and narcissism, characterized by the 5th edition of the Diagnostic and Statistical Manual (DSM-V) as a personality disorder permeated by variations and vulnerabilities in self-esteem that, in an attempt to self-regulate, enters the constant search for attention and approval.

Although they are constructs of specific origins, they have certain features in common, such as manipulated behavior, feeling of greatness, and inclination to exploit others for their own benefit [16]. Studies show that the close interrelationship between such constructs, often even overlapping [17], which advocates the joint study of these three factors, ie, the dark triad of personality, which enables a greater and better understanding of its specificities [18]. All three of these factors share the characteristic of presenting a harmful component that affects social behavior, which provides an inclination to exploit and manipulate others when necessary, seeking some advantages, pleasure in the suffering of others by treating them as manipulative objects [19]. Some researchers have pointed a correlation between morning chronotype and future-oriented time perspective and evening are present-oriented [20], which corroborates the understanding of night-time being a period that assist the progress of cheater behavior practiced by humans with great levels of DT [21]. Furthermore, evening chronotype has also been linked to favorable outcome in short-term sexual relationships [10], tendency to act impulsively and to be risk-taking [22], to be extroverted [23], to be less conscious and agreeable [24], more neurotic, manipulative, and aggressive [25], being more common as well as in individualistic people there are self-oriented [26].

2.2. Big five

The big five traits of personality consist in five dimensions which delineate human personality and its individual differences. The five traits are: conscientiousness (hard-working, well-organized, and punctual behavior), extraversion (talkative, affectionate, active), neuroticism (worried, temperamental, emotional and self-conscious), openness (creative, original, curious and imaginative) and agreeableness (talkative, affectionate, active) [27]. The first studies (1980-2000) on this thematic aimed to show empirical correlations between chronotypes and personality traits. The first researches audited the relationship cited essentially centering on the Eysenckian three-factor mode, which three dimensions are: extraversion, neuroticism and psychoticism [3]. Some studies have showed positive relationship between evening types to be more extroverted [1], and neurotic [28]. There is evidence of positive

correlation between morningness and agreeableness and conscientiousness, whereas other studies presented higher level of neuroticism in morning types as well as low correlation with extraversion [29]. Related to openness, a few studies have presented negative correlations between openness to experiment and eveningness [30].

2.3. Personal Values

In addition to the correlation between circadian preferences and personality, when it approaches personal values, it was developed a theoretical method to arrange human values [31]. The four values presented are: openness to change, self-enhancement, conservation, and self-transcendence [32]. Formerly, researchers stated morning types to have correlation with conservation, collectivist, other-centered, autotranscendence and pro-social behavior along with higher acceptance to social values as safeness, conformity and tradition, optioning for conservatives values [26]. In addition, there were studies presenting evening types as having positive correlation with openness to change and self-improvement (individual independence) being more individualists and self-oriented; more risk-taking, impulsive, and innovative behavior, in conjunction with issues when dealing with social demands, score lower in harm avoidance, persistence, self-directedness [26].

3. Methods

3.1. Participants and data collection

Participants were 332 volunteers (244 females and 88 males), between High Schoolers and PhDs, aged between 17 and 56 ($M = 24.2$; $SD = 8.96$), majority women (73.3%) and single (77.5%). Only individuals at least 15 years old who provided informed consent were allowed to participate. Online surveys were established and distributed the link to the online research (hosted on Google Forms platform) around the country, via Facebook, e-mails, WhatsApp and Telegram. These online surveys asked for demographic data (gender, age, civil state), DT traits, morningness-eveningness, personal values and for Big Five personality traits. It is important to stress that this study was conducted in consonance to the ethical recommendations for human chronobiological research (Portaluppi et al., 2008), underlining that all subjects provided informed consent.

3.2. Reduced Morningness-Eveningness Questionnaire-rMEQ

The Morningness-Eveningness Questionnaire (MEQ), was originally developed by Horne & Ostberg [3], including 19 items. However, this scale was considered too long to be applied along other assessments and with time constraints (Burisch, 1997), formerly being reduced to a 5-item version called rMEQ [33]. The rMEQ consists in five items that

makes reference to morning fatigue and freshness, peak and rising time, as well as a self-evaluation of chronotype. This scale has shown its reliability frequently [1]. This scale has been adapted to a considerable number of countries and languages, including Portuguese [34]. We used an analogous response options to the original scale, meaning that a higher score number indicate predilection for an earlier rising and peaking time along with early retiring time. The alpha for the rMEQ was 0.745 in the present study.

3.3. Dark Triad Dirty Dozen - DTDD

The Dark Triad Dirty Dozen, scale elaborated by Jonason e Webster [35], it is composed by 12 itens that assesses the Dark Triad Personality Traits. Items are evenly distributed into three traits: Machiavellianism (Items 1-4), Narcissism (Items 9-12), and Psychopathy (Items 5-8). Participants are ordered to indicate their level of agreement with this factor on a 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

3.4. Big Five Inventory – BFI

In attempt to measure Big Five personality, the short version of the original Big Five Inventory was used. This is a 10-item questionnaire that presents two items for each personality dimension, which includes Extraversion, Agreeableness, Openness, Neuroticism, and Conscientiousness. The scale has a five-point Likert rating and one of each two items per dimension is reverse coded. By the fact that this scale uses only two items do measure each dimension, some researchers have indicated that the alphas of scales with small number of itens are often misleading [36].

3.5. Basic values survey (BVS)

The Basic values survey (BVS) [37] is an 18-itens scale that has seven-point Likert rating varying between 1 (Totally not important) to 7 (Extremely important), to express the level of importance each value has as a guiding principle to the person's life. This questionnaire evaluates six psychosocial functions with 3 itens for each function (Experimentation, Realization, Existence, Superpersonal, Interactive and Normative). The values presented along the questionnaire are: social support, success, sexuality, knowledge, emotion, power, affectivity, religiosity, health, pleasure, prestige, obedience, personal stability, intimacy (socializing), beauty, tradition, survival and maturity.

3.6. Statistical analysis

Data analyses were conducted using SPSS 25. We performed correlational analyses to assess the relationship between chronotype and personality traits and values. We used Pearson's correlations and bar graphics to investigate the relationship between chronotype, Dark Triad, The Big Five factors of

personality and Personal Values.

4. Results

Among the studies carried out, some proposals for the participation of settled women in politics to be even more effective, suggesting: the creation of a future rural feminist agenda; carrying out work on masculinity; address issues related to rural spaces, such as: internal migration, leisure, care for the elderly, all with a gender focus [38].

We investigated the relationship between chronotype, Dark Triad, The Big Five factors of personality and Personal Values. We conducted series of Pearson's correlation. The results indicated strict correlation between morningness, neuroticism and agreeableness; and between eveningness and conscientiousness. Through our analyses, the validity of the construct showed only 4 constructs, merging extroversion and openness, confirming the finding of authors that indicate the test fallibility in small samples. The composite Big Five Pearson's Correlation score: Extroversion (Pearson's Correlation: ,075), Openness (Pearson's Correlation: ,075), presenting a significant correlation on: Neuroticism (Pearson's Correlation: ,233**), Agreeableness (Pearson's Correlation: ,145**), and Conscientiousness (Pearson's Correlation: -,127*).

The composite Dark Triad Pearson's Correlation score on Machiavellianism (Pearson's Correlation: -,141*), Psychopathy (Pearson's Correlation: -,161**), and Narcissism (Pearson's Correlation: -,068). The composite Basic Values Survey: Experimentation (Pearson's Correlation: -,143**), Realization (Pearson's Correlation: -,034), Existence (Pearson's Correlation: ,083), Superpersonal (Pearson's Correlation: ,025), Interactive (Pearson's Correlation: ,187**), Normative (Pearson's Correlation: ,214**).

5. Conclusions

Thus, it can be concluded that individuals who present greater characteristics of neuroticism and agreeableness had higher levels of mental health, as well as fewer symptoms of anxiety, stress and depression. Furthermore, they had low levels of insomnia. On the other hand, conscientious individuals presented high levels of insomnia, stress, depression and anxiety, which is probably due to the social and cultural organization for people who are more organized, active and end up receiving different tasks. Based on previous evidence, the present study provides the adaptation of a brief, valid and precise measure that quantifies individual differences related to personality traits, in addition to providing data that corroborate some previous findings in the literature. Furthermore, we found that the data reported here go in the same direction as metaanalytic evidence that indicates the important role of personality traits in understanding the mental health of individuals. Despite the promising results,

there is still a lot to be done, checking new evidence from Confirmatory Factor Analysis, exploring the individual parameters of the RMEQ items via Item Response Theory (IRT), as well as expanding the chronotype correlates, knowing their relationships with other personality models, such as HEXACO and the Dark Triad, and with other variables that characterize psychological distress (eg, suicidal ideation, substance use and abuse).

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