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Who are those healthy behaved?
The analysis of the relationship between personality and health-related behavior

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Abstract

The paper is focused on health-related behavior. The study forms part of a large research project with the title "Health-Enhancing and Health-Threatening Behavior: Determinants, Models, and Consequences" (GA13-19808S). The purpose of this study is to find a relationship between personality variables (measured using GPP-I questionnaire) and health-related behavior (measured using the Health-Related Behavior Scale, Dosedlová et al., 2013). The research sample of this study consisted of N=650 undergraduates (61.1% women and 38.9% men) aged 18-26 years. In cluster analysis, three different life styles were defined using ten health-related factors. Super-healthy behaved students, unlike those healthy and unhealthy behaved, are represented much more frequently by women than men living in a partnership. Correlation analysis and analyses of variance were conducted to examine whether students with different health-related life-styles differ in chosen personal characteristics. As indicated by the results, there is a tight relationship between personality and life style. In university graduates, the strongest relationship was found between health-related behavior and personality traits: responsibility and stability (the lower the responsibility and stability, the more unhealthy the life style). A tendency connected with the sociability trait is interesting: the higher the sociability, the higher the tendency to produce some of the extreme behavior types (unhealthy or super-healthy). A hypothesis is formulated regarding the effect of increasing probability of the conception and protective action of the primary family setting on the choice of health-related behavior.

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Keywords: Health-related behaviour; personality traits; responsibility, emotional stability, sociability.

1. Introduction

The study is patterned on two essential principles of contemporary health psychology, which are based on the fact that an individual way of life (manifested in specific forms of behavior) is a determinant that affects the individual's health – positively or negatively (for example, Becker, Glascoff, Mitchell, Durham & Arnold, 2007). According to currently valid knowledge, the share of



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genetic predisposition in general health is approximately 10-20%; that of factors following from the environmental setting is 10-20%; that of availability and quality of health care services is 5-15%; but that of the behavior is about 45-60% (Conner & Norman, 1996; Mlčák, 2007; Burešová et al., 2016, etc.). Behavior is thus a crucial determinant of human health.

The study is, thus, constructed on models describing personality as the agent mediating health-beneficial or health-risky behavior (Smith & Williams, 1992). The study maps personality traits associated with healthy or on the contrary with unhealthy behavior (objective characteristics of health are not measured). The role of personality traits related to health-related behavior has been documented in a number of research studies (for example, Raynor & Levine, 2009). Most studies focused on the relationship between personality and health-related behavior are based on the Big Five theory (for example, Booth-Kewley & Vickers, jr, 1992; Hudek-Knežević & Kardum, 2009; Jerram & Goleman, 2010). The presented study provides the added value of (1) a different initial concept of personality created by Leonard Gordon (1967), used in practice as a supplement to the Big Five model, especially in the field of professional counselling or for the seeking and studying of talented individuals (see SOSIE measurement tool, Honey, 2016) as used in traffic psychology (for example, Šucha et al., 2013); this tool is also used in psychological research (e.g. Nunes et al., 2015); (2) an expanded health-related behavior model with the classic dyad (e.g. Kaptein & Weinma, 2004 or former studies of our research team, e.g. Burešová et al., 2016a,b), *health-risk behavior* (behavior which by its intensity or frequency increases the risk of health problems or injury) and *health-enhancement behavior* (activities which can prevent possible health difficulties, help to identify illnesses in their early stages, support and maintain health or decrease the risk of injury), completed with a third type – *health-directed behavior* derived from the group of goal-directed theories (for example, the theory of reasoned action by Fishbein & Ajzen, 1975 as cited in Colman, 2015 and other authors).

2. Aim of the research

The paper deals with the issue of health-related behavior. The study is part of an extensive research project “*Health-Enhancing and Health-Impairing Behavior: Determinants, Models, and Consequences*” (GA13-19808S). This paper answers the question: What is the difference in the personality of undergraduates manifesting health-enhancing behavior, health-impairing and health-directed behavior? The aim of this study is to identify the relationship between personality variables (measured by Global Gordon's Personal Profile Inventory, Gordon, 1982) and health-related behavior (as measured by the Health-Related Behavior Scale, Dosedlová & Slováčková, 2013).

3. Method

3.1. Research design

The research is designed as an extensive quantitative research study. All respondents will participate based on their voluntary consent to participate. A battery of paper-and-pencil type instruments will be administered to the respondents; the instruments are used to measure the followed constructs

(personality, well-being, optimism, health complaints and health-related behavior). A part of the research set is used in this study; the set includes precisely and only those research participants who were active university students at the time of administration of the instruments, and the acquired data are processed using the Health-Related Behavior Scale (Dosedlová & Slováčková, 2013).

3.2. Research instrument

For the purposes of the study, results acquired using two research methods were processed:

- (1) Global Gordon's Personal Profile Inventory: GPP-I (Czech version: Gordon, 1982) used to measure personality variables;
- (2) Health-Related Behavior Scale – HRBS (Dosedlová & Slováčková, 2013) used to measure behavioral variables.

GPP-I: Gordon Personal Profile-Inventory (GPP-I) is an instrument requiring subjects to self-score themselves by selecting statements in a forced-choice tetrad format. The inventory measures eight personality traits: ascendancy (G1), responsibility (G2), emotional stability (G3), sociability (G4), cautiousness (G5), original thinking (G6), personal relations (G7) and vigor (G8). The inventory includes 80 items – ten for every followed trait.

HRBS: Health-related Behavioral Scale is a self-rating instrument consisting of 42 items. The instrument measures ten factors (see Dosedlová et al., 2016, in print): healthy nourishment (F1), positive experience (F2), habits – smoking (F3), daily regimen (F4), eating habits – regimen (F5), unhealthy nourishment (F6), alcohol consumption (F7), physical and exercise activity (F8), use of protection aids (F9) and avoiding harmful agents (F10).

3.3. Research sample

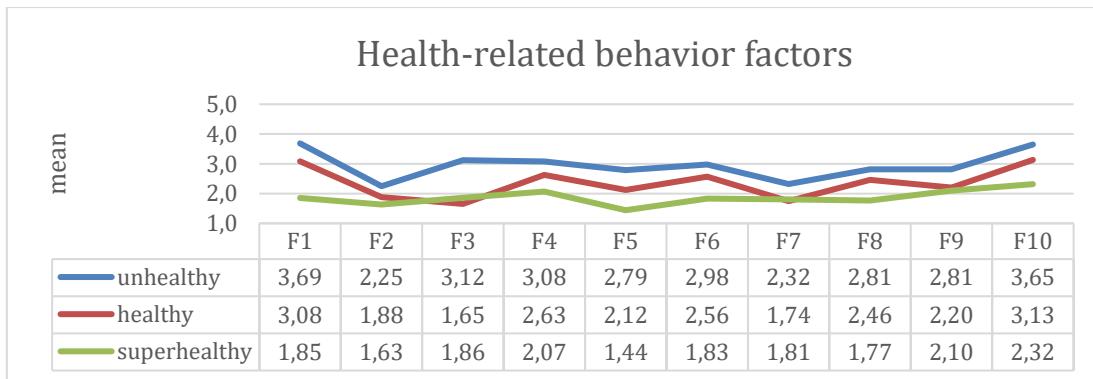
The research sample of this substudy consisted of N = 650 undergraduates (61.1% women and 38.9% men) aged 18-26 years. Of the total number of 650 respondents, 11.7% lived with a partner (0.6% in a marriage, others unmarried), 15.4% were living with a housemate of the same age (a same-age peer) and 35.5% reported believing in God. All respondents were students.

4. Results

The first phase of data processing: a two-step cluster analysis was undertaken at first. Based on its results, the respondents were assigned to one of three clusters.

Based on visual data inspection (see the graph) it was found out regarding the individual clusters that metric values acquired by the clusters for values of individual health-related behavioral factors directly corresponded to three different life styles and differentiated these different life styles well (with the exception of factors: 3 *Habits – smoking* and 7 *Alcohol consumption* where the mean values of clusters 2 and 3 overlap; these two factors of health-related behavior differentiate well only the third cluster from the other two). According to the level of the (lack of) benefit of the behavior for health, evoked by the measured values, the individual clusters were named as follows (with the short name of the cluster

in the parentheses): **cluster 1 – health-impairing behavior (unhealthy), cluster 2 – health-enhancing behavior (normal), cluster 3 – health-directed behavior (super-healthy).**



In terms of numbers, individual clusters are represented as follows: unhealthy $N=163$, healthy $N=353$, super-healthy $N=134$. Frequency representations indicate normal distribution (approximately one half of the respondents fall in the cluster that represents average approach to health, while each of the beyond the norm clusters is represented approximately by one quarter). Table 1 illustrates selected sociodemographic characteristics of individual clusters. The distinct disproportion of representation of men in the super-healthy cluster is very interesting – the number of men is significantly (by 2/3) lower here than in the remaining clusters, and this cluster can be considered as a “highly female” cluster. Also, this cluster shows a somewhat higher mean age and a higher representation of persons cohabiting with a partner.

Table 1. Sociodemographic data for individual clusters: descriptive statistics ($N=650$).

Sociodemographic data	Unhealthy	Healthy	Super-healthy	Whole set
Persons in the cluster	163	353	134	650
Mean age	20.79	20.82	21.59	20.97
Representation of men	38.90%	32.00%	13.40%	30.20%
Living with a partner	11.70%	9.30%	18.70%	12.00%
Living with peers	15.40%	11.30%	11.20%	12.50%
Believing in God	32.10%	38.00%	33.60%	35.50%

The second phase of data processing: scores were calculated for individual followed personality traits. Mean values for individual clusters are shown in Graph 2. Visual inspection of the data enabled us to formulate the general conclusion that the healthier the behavior, the higher is the score achieved for the given personality trait (cluster on average). This claim definitely applies to the super-healthy cluster. However, an interesting change occurs in the health and unhealthy clusters for the personality trait G4 sociability. A description of this trait is literally provided by (Gordon, 1999, p. 8): *high scores are characteristic for individuals who prefer company and working with other people, who are social and sociable. Low scores indicate a lack of sociability and general limitation of social contacts (or avoiding contacts in extreme cases)*. As indicated by our results, students of the healthy behaved group are least social.



The analysis of variance was conducted to examine whether students with different health-related lifestyles significantly differ in the chosen personal characteristics. All 8 followed characteristics indicated statistically conclusive differences among the groups ($F=3.61$ to 18.59 ; $df=2$; $p<0.05$) while post hoc tests (Bonferroni) indicated statistically conclusive differences among 34 of the 48 tested couples of relationships. Exceptions where no significant differences were found include differences in personality traits G1 (unhealthy-healthy), G4 (unhealthy compared to both remaining ones), G5 (healthy-super-healthy), G6 (unhealthy-healthy), G7 (healthy-super-healthy), G8 (unhealthy-healthy), while most are predictable already based on visual inspection of Graph 2. It thus seems that traits G2 and G3 exhibit the clearest correspondence to the level of the produced health-related behavior.

5. Discussion

Based on the values obtained for the Health-Related Behavior Scale, three groups of respondents / behavior types were revealed using the two-step cluster analysis: unhealthy, healthy and super-healthy. Approximately one half of the respondents represented the healthy cluster where persons produce healthy behavior in a normal range, and both beyond the norm clusters were represented approximately by one quarter of the respondents. Sociodemographic data differ for the three groups. **Super-healthy behavior** seems to be characteristic for women; compared to the other clusters, it is represented by older persons who more often coexist in a partnership. This information could be generalized (with a certain level of distortion) – i.e. that older female students living in a partnership take care of their health more consciously and have a tendency to produce health-directed behavior. This conscious choice can be presumed to be affected to a certain extent also by a higher probability of conception (given that they are usually older female students with a partner), and in the Euro-American culture the motherhood is associated with a transfer of responsibility of the future mothers for their own and their children's health; as a rule, girls and women strongly identify themselves with this attitude (for example, Stotland & Steward, 2001). In the Czech Republic, preparation for motherhood is part of the educational process starting from the elementary school (for example, the subject Family Education)

and it is also strongly promoted by the media (both directly, for example, in discussion programs or commercials focused on nutritional supplements recommended to women before conception, as well as indirectly, for example, in the behavior of heroines in TV shows, series or sitcoms, comp. Stašová, Slaninová & Junová, 2015). The hypothesis of a relationship between increased probability of motherhood and super-healthy behavior should be confirmed through further research. The finding that women (especially middle class one) produce healthier behavior is consistent with the results of other studies (e.g. Chrisler, Golden & Rozee, 2012). Some authors have found that healthy behaved tend to recommend healthy behaviors and healthy alternatives (e.g. preference for complementary and alternative medicine before conventional medicine) to others (Pokladníková & Désirée, 2011).

The form of health-behavior shows a certain link connection to some personality traits. The existing research (especially in the university population) confirms a close relationship, for example, between health-promoting behavior in the form of reduced binge drinking and drug use, and the trait of agreeableness; between health-promoting behavior in the form of increased fruit and vegetable consumption and the personality traits of extraversion and openness; on the other hand, neuroticism was linked to health-deterring behaviors that included a lack of exercise and drug use (Cauchi & DeGiovanni, 2015, p. 56). Results of another research showed that low conscientiousness and high neuroticism correlate with health-behavior (were the best predictors of poor sleep hygiene, low sleep quality, and increased sleepiness, Duggan, Friedman, McDevitt & Mednick, 2014). Some studies expand the relationship between personality and behavior; for example, Cheng, Weiss & Siegel (2015, p. 21) specify that: "*health behaviors are important correlates of three dimensions of wellbeing over and above the effects of personality traits.*" However, most research projects focused on the health-behavior and personality relationship are based on the Big Five model.

In our study, we decided to analyze the followed relationship between health-behavior and personality on the background of Leonard Gordon's personality model (1999). As indicated by our results, essentially the healthier the behavior, the higher was the score achieved in the personality trait (cluster on average). This trend was most clearly confirmed (and statistically conclusively for all the followed groups) for the traits G2 responsibility and G3 stability. **Responsibility** is a trait described as an ability to persevere with any work and meet one's decisions; individuals with a high score are thus persistent, determined and responsible, while individuals with a low score are volatile and irresponsible. A relationship with health-related behavior is clear; individuals producing super-healthy behavior may be highly responsible up to perfectionistic (which is a trait characteristic also for individuals with an extraordinary intellectual talent, for example, Neumeister, 20015 – it would be advisable to verify the relationship between health-related behavior and intelligence level in subsequent research). Unhealthy behaved are least responsible and can be expected to show certain irresponsibility also in other areas of their behavior (for example, in their study, at their potential work or keeping their household clean, etc.). As experimentally shown by Nunes et al. (2015), in the group of university students the group educated in health-related behavior (total training 16 * 90 minutes) exhibited an increase in the mean score of SPV decisiveness. We can thus hope that this trait, similarly as health-related behavior, can be influenced through health-education.

Emotional stability is a scale where a high score indicates balance and high frustration tolerance, while a low score indicates excessive anxiety, hypersensitivity, nervousness and low frustration tolerance. Modern studies show, in addition, that “the emotional changes studied may provide vital information on behavioral and personality characteristics” (Kučera & Havíger, 2012, s. 40). As indicated by the results of our study, the healthier the behavior, the more emotionally stable the individual is, and vice versa, the less healthy the behavior, the higher is the tendency to anxiety, nervousness and the lower is the frustration tolerance. Stability has been confirmed to be a reliable health predictor by a number of other studies (for example, the study of 16,713 twins by Ropponen, Narusyte, Alexanderson & Svedberg, 2011), or lability and neuroticism as a predictor of less healthy behavior (Burešová et al., 2016). The obtained result can be related to theories that incorporate the effect of emotions in the process of decision making and indicate neurophysiological links in this process (for example, Gutnik, Hakimzada, Yoskowitz & Patel, 2006).

An exception in the described trend (the higher the GPP-I score, the healthier the behavior) is represented by the trait of **sociability** where the least scores were achieved by healthy behaved students on average. At the same time, living with peers and living in a partnership are least represented in their group. A part of these respondents seem to remain living in the primary family and a part of them live a solitary life. We presume that the first variant applies to most persons (in the Czech Republic, a tendency to stay within the primary family also in the course of the entire third decade has been observed in the long term analogically to Western European trends, for example, Lašek, Loudová et al., 2015); if this is so, we could hypothesize based on this fact that young people on the verge of adulthood who stay within the protective zone of their primary family during the university study (i.e. those not living with a peer or a partner) have a limited room for social communication with their peers, and thus their health-related behavior is more directed by stable influences of the family environment (the middle flow; limited or no fashionable excesses). We could also presume that adolescents with a low trait of sociability (less certain in, or directly avoiding social relationships) have a tendency to stay longer in their primary family and need more time to become emancipated from their family. The finding can also be formulated as follows: individuals with higher sociability have a higher tendency during their university study to apply one of the beyond the norm forms of health-related behavior. We presume that the pressure of the social group as a factor influencing the decision to adopt unhealthy or, on the contrary, super-healthy behavior will be crucial in this process during late adolescence and early adulthood and at the same time in the role of a university student (for example, Simons-Morton & Farhat, 2010).

6. Conclusion

The results indicate a close relationship between personality and health-related behavior or lifestyle. Approximately one half of the followed students aged 18-26 years produce healthy behavior, and the beyond the norm forms of behavior (unhealthy and super-healthy) are represented by one quarter each. The personality traits of responsibility and emotional stability are the most reliable indicators of the health-behavior (the stronger the trait, the healthier the behavior). The trait of sociability shows an

interesting relationship to health-behavior: based on the results of our study, persons with a stronger sociability trait exhibit an increased probability of producing one of the beyond the norm forms of health-related behavior (unhealthy or super-healthy). The healthiest behavior is produced by women and persons living in a partnership. One of the interpretations explains this fact in connection with a higher probability of conception and with the pressure of the current society exerted on responsibility (especially of women) for their own and their potential children's health and the necessity of taking care of their health already before conception. Some hypothesis were also formulated regarding the effect of the primary family and remaining "embraced" by the primary family on health-related behavior of young people. Undoubtedly, the topic has not been exhausted.

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