

Online time of slovak and czech adults and its relation to big five

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INTRODUCTION: In the present article, we focused on the relationship between time spent online and factors of Big Five in the population of adults. We assume that there exist the specifics of time spent online in the relation to age, sex, residence and nationality as mediating variables. Our main assumption was focused on the predictors of the time spent time which we identified in basal personality tendencies – factors of Big Five. **METHODS:** Our research sample consisted of 2,501 adults in the Slovak and Czech Republic, ranging in age from 18 to 99 ($M = 39.02$, $SD = 20.15$). We collected data using 2 questionnaires: Internet use questionnaire for adults and Big Five Inventory BFI 10. Used methods were available in both Slovak and Czech language.

RESULTS: The main result of our statistical analysis is the output from the regression analysis. We found that the age and the conscientiousness are strong predictors of the time spent online by the adults. The nationality, sex, residence and neurotism are also the predictors of some variables covering time spent online. **CONCLUSION:** Our data supported the predicted relationship between time spent online and factors of Big Five, concretely the conscientiousness

and the neurotism. The adults spend more time online if they are Slovak (social networks in workdays), men (internet using and gaming), younger (all areas) and live in rural environment (internet using and social networks during the weekends).

Keywords | Big Five – risk behaviour – internet using – adults – time spent online

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1 INTRODUCTION

The personality theory reflecting the five basic personality structures known by the acronym CANOE first appeared in 1994 (Costa & McCrae, 1994). It was the outcome of a long-standing effort to identify a set of universal traits sufficient for a comprehensive evaluation of human personality. Its origins trace back to the seminal lexical analysis by Allport and Odbert in 1936, which was followed by extensive statistical analyses conducted by Cattell during and shortly after World War II (e.g. Cattell, 1943; Cattell, 1946). Up until the 1980s, there was ongoing debate regarding the number and nature of universal personality traits. In 1981, Goldberg introduced the Big Five model in the form we recognize today, and around the same time, McCrae and Costa concluded that five factors are sufficient for describing personality. Over the following decade, they developed a statistical model that evolved into the Five Factor Theory of Personality (McCrae & Costa, 1999), the current form of which is presented in Figure 1.

The core components of personality are represented by rectangles (basic tendencies, characteristic adaptations, and self-concept), while peripheral components are depicted as ellipses (biological basis, objective biography, and external influences). Arrows represent dynamic processes and indicate the direction of causal influence. For example, the objective biography (i.e. life experiences) results from the interaction between characteristic adaptations and external influences. The biological basis is the sole source of basic tendencies (i.e. personality traits). The personality system can be interpreted either cross-sectionally (as it functions at a given time) or longitudinally (as it develops over the lifespan). Every causal influence is dynamic, meaning it changes over time.

Basic tendencies form the universal foundation of personality capacities and dispositions, which are generally inferred rather than directly observed - that is, they are hypothetical constructs. These tendencies may be inherited, shaped by early experience, or modified through illness or psychological intervention, yet at any point in life they define an individual's potential and developmental direction. They include the core personality traits: conscientiousness (C), agreeableness (A), neuroticism (N), openness to experience (O), extraversion (E). The defining features of basic tendencies are their biological grounding and temporal stability.

Characteristic adaptations are acquired personality structures that develop as individuals adjust to their environment. The primary distinction between basic tendencies and characteristic adaptations lies in flexibility: while basic tendencies are stable, characteristic adaptations are shaped by external influences—such as learned skills, habits, attitudes, and interpersonal relationships—that result from a person's interaction with their social context. All acquired and specific abilities, such as competence in English or proficiency in statistics, fall under characteristic adaptations.

Self-concept is defined as a distinct type of characteristic adaptation. It encompasses one's knowledge, beliefs, and evaluations of the self—from factual information about personal history to identity, which provides coherence and meaning to life. Beliefs,

attitudes, and emotions that a person holds about themselves are characteristic adaptations that influence behaviour in specific contexts. For instance, the belief that one is intelligent may increase one's willingness to engage in intellectually demanding situations. McCrae and Costa (1999) included personal myths within the construct of self-concept, thereby acknowledging that aspects of how we perceive ourselves may be unconscious, inaccurate, or distorted.

Biological basis. The Five Factor Theory attributes a single causal influence to the development of personality traits - namely, biology. The principal biological mechanisms shaping basic tendencies include genes, hormones, and brain structures. However, McCrae and Costa (1999) did not specify which particular genes, hormones, or neural structures are involved in personality development.

Objective biography refers to the entirety of what an individual does, thinks, and feels throughout their life. It focuses on what actually occurs in a person's life (objective experience), rather than on how these experiences are perceived or interpreted (subjective experience). Every behaviour or reaction becomes part of this cumulative record.

External influences. Individuals constantly exist within physical or social environments that influence the personality system. The ways in which people respond to opportunities and demands in their surroundings constitute external influences. McCrae and Costa (1999) posit that behaviour results from the interaction between characteristic adaptations and external influences.

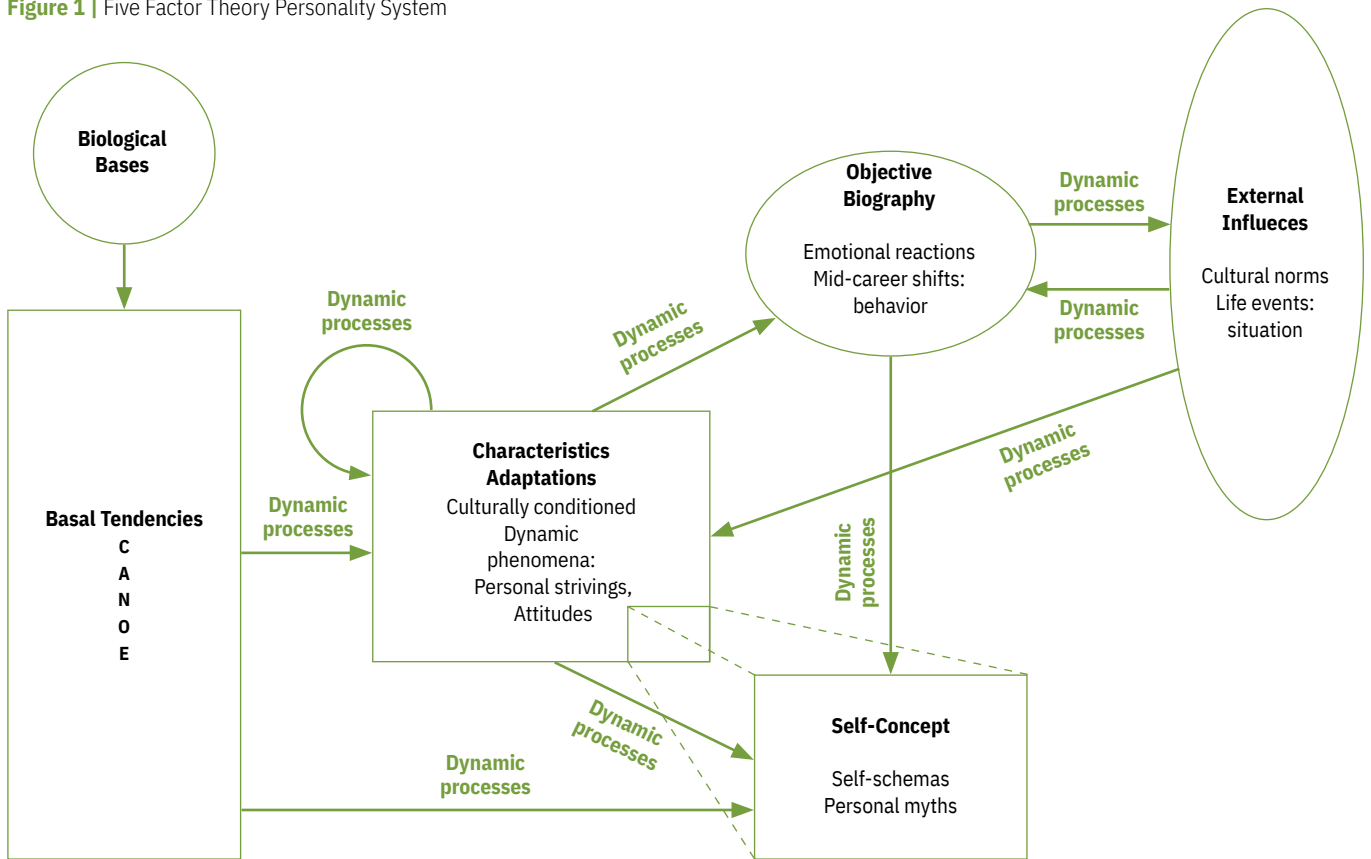
A key integrative component of this model (McCrae & Costa, 1999) is the concept of self-concept as the outcome of human epigenesis - that is, the interaction between biological potential and environmental context. Self-concept is best understood as the individual's life narrative at a specific moment, shaped by prior experiences and their accessibility in memory. In psychology, this perspective should inform the psychologist's approach, particularly in relation to the need for individualized understanding.

Yet, a central question remains: is individual experience, as represented by self-concept, related in any meaningful way to the universal personality structures defined by the Big Five (i.e. basic tendencies) and to the characteristic adaptations that are currently subject to massive external influence in the form of a growing shift of our reality into the online environment? We therefore ask: "Are basic personality tendencies associated with the amount of time that adults spend online?"

According to the Digital 2023 report, the global average time spent in the online environment exceeds six and a half hours per day, with approximately two and a half hours devoted to social media and over one hour to gaming. More than 92% of users are permanently connected via mobile phones.

Data from the Statista platform (2025) further indicate that people most frequently spend their online time, always consistently reported by over 50% of users, searching for information, maintaining contact with family and friends, reading news, and

Figure 1 | Five Factor Theory Personality System



source: McCrae and Costa (1999, 142); modified

watching videos or tutorials. However, it is also well known that a substantial portion of online activity involves unproductive behaviour.

Given the massive increase in internet-connected devices, currently over 40 billion globally (Rodseth, Rothkugel & Meyer, 2024), and the enormous financial investment in internet and communication technologies, measured in trillions of dollars, it is unsurprising that commercial internet use, under certain conditions and in specific contexts, can escalate into problematic use. This has led to a growing number of individuals developing dependence on the internet or on specific internet-related activities.

A meta-analysis by Meng et al. (2022) yielded prevalence estimates for various types of addiction. The reported rates were as follows: 26.99 % (95 % CI: 22.73–31.73) for smartphone addiction, 17.42 % (95 % CI: 12.42–23.89) for social media addiction, 14.22 % (95 % CI: 12.90–15.65) for internet addiction, 8.23 % (95 % CI: 5.75–11.66) for cybersex addiction, and 6.04 % (95 % CI: 4.80–7.57) for gaming addiction.

The growing availability and diversity of online content, including social networking, online shopping, news consumption, cybersex, e-sports, and gaming, has led to a need to distinguish between specific and generalised internet-related addictions (Davis, 2001). Both, however, are closely related to the amount of time spent online and to the degree to which individuals engage in time-wasting behaviours.

Specific pathological internet use (SPIU) refers to individuals who are dependent on a particular function or activity facilitated by the internet. Clinical and media research has highlighted excessive use (or misuse) of online sexual content/services, online auction platforms, stock trading, and internet-based gambling. These dependencies are content-specific and would likely exist even without the internet; however, internet accessibility significantly facilitates them. Specific internet-related addictions are thus linked to activities that were not originally bound to the digital environment. They include a broad range of behaviours, most commonly addiction to virtual sexuality, virtual relationships, internet-related compulsions (e.g. shopping or trading), information overload, and computer dependency (e.g. gaming) (Young, 2004). This classification has also been validated by an analytical study by Müller et al. (2022), which led to the development of the diagnostic tool Assessment of Criteria for Specific Internet-use Disorders (ACSID-11).

Generalised pathological internet use (GPIU) refers to a broad, multidimensional form of excessive internet use. It is characterised by time-wasting behaviour in the online environment without a clear goal. GPIU may be associated with compulsive online chatting or email checking and is believed to be closely linked to the social dimension of internet use. The need for social connection and positive reinforcement obtained online can lead to a desire to remain embedded in a virtual social life. In this sense, generalised internet addiction is more concerned with the avoidance of loneliness and the pursuit of social validation through online means.

Several theoretical models have been proposed to explain internet addiction or problematic online behaviour. The most frequently cited include the biological model, the cognitive-behavioural model, the component model, and the I-PACE model.

The biological model (grounded in neuroscience and neuroimaging findings; see Weinstein & Lejoyeux, 2020 for a recent overview) focuses on symptoms such as impulsivity, craving, and reduced dopaminergic activity. It explains internet addiction through changes in grey matter volume and increased activation in specific brain regions.

The cognitive-behavioural model (Davis, 2001) centres on maladaptive cognitive processes, particularly obsessive thoughts. It distinguishes between distal and proximal causes of internet addiction, which correspond to the previously discussed categories of specific and generalised internet use disorders.

The component model (Griffiths, 2005) focuses, as the name suggests, on the core components of addiction. These include salience, mood modification, tolerance, withdrawal symptoms, conflict, and relapse. According to this model, internet addiction is characterised by the presence and interaction of these components.

The I-PACE model (Interaction of Person–Affect–Cognition–Execution; Brand et al., 2016; see Figure 2) addresses the limitations of previous models while integrating many of their strengths. It offers a comprehensive interpretative framework that incorporates cognitive, affective, and motivational structures of personality. In relation to the research problem formulated in this study, it can be hypothesised that certain psychological variables may serve as predictors of the amount of time individuals spend online. Underlying heightened personal reactivity, subjective distortions in the interpretation of reality, ineffective coping strategies, or impaired executive functioning, we may identify, among other factors, anxious emotionality and low conscientiousness, which correspond to two of the five Big Five personality traits.

This assumption is supported by the findings of Zhou, Li, Han, and Yin (2021), who identified a strong relationship between conscientiousness, neuroticism, and pathological internet use in a sample of 16- to 24-year-old students. Loneliness was identified as a mediating variable.

Similarly, Akbari et al. (2021) found neuroticism to be a risk factor for online gaming, whereas conscientiousness acted as a protective factor. Their meta-analysis included 17 studies and a total of 25,634 individuals with a mean age of 26.55 years.

In an adult sample, Lin, Wang, and Sun (2024) examined the phenomenon of information sharing on social media. They found that both conscientiousness and neuroticism were negatively associated with this behaviour, while extraversion showed a positive association.

Kayis et al. (2016) conducted a meta-analysis which revealed that all five personality traits were significantly associated with internet use or time spent online: neuroticism was positively correlated, while the remaining four traits showed negative associations.

2 METHODS

2.1 Research Sample

The research sample consisted of 2,501 adult participants (of which 81.5 % females) aged 18–99 years ($M = 39.02$, $SD = 20.15$). 1,797 (68.4 %) participants were from the Czech Republic and 789 participants were from the Slovak Republic (31.6 %). The participants lived in urban ($N = 1,901$; 72.3 %) and rural environment ($N = 712$; 27.1 %). Most of them were single ($N = 1,067$; 40.6 %) and married ($N = 819$; 31.2 %), but we also identified partnership without formal legal status ($N = 357$; 13.6 %), widowed ($N = 193$; 7.3 %) and divorced ($N = 176$; 6.7 %). In the relation to economic activity of participants we identified employees ($N = 1,075$; 40.9 %), students ($N = 732$; 27.8 %), retired ($N = 520$; 19.8 %), people on maternity or parental leave ($N = 222$; 8.4 %), unemployed ($N = 49$; 1.9 %) and homemaker ($N = 25$; 1.0 %).

We applied a quantitative design in the present study, with data collection consisting of two research tools (questionnaires). Each of these research instruments was available in both Slovak and Czech language version so that we could survey participants in both countries. These questionnaires were identical in content. The two versions only differed in language of the target group (Slovak and Czech adults).

2.2 Research Methods

We used 2 research methods for data collection.

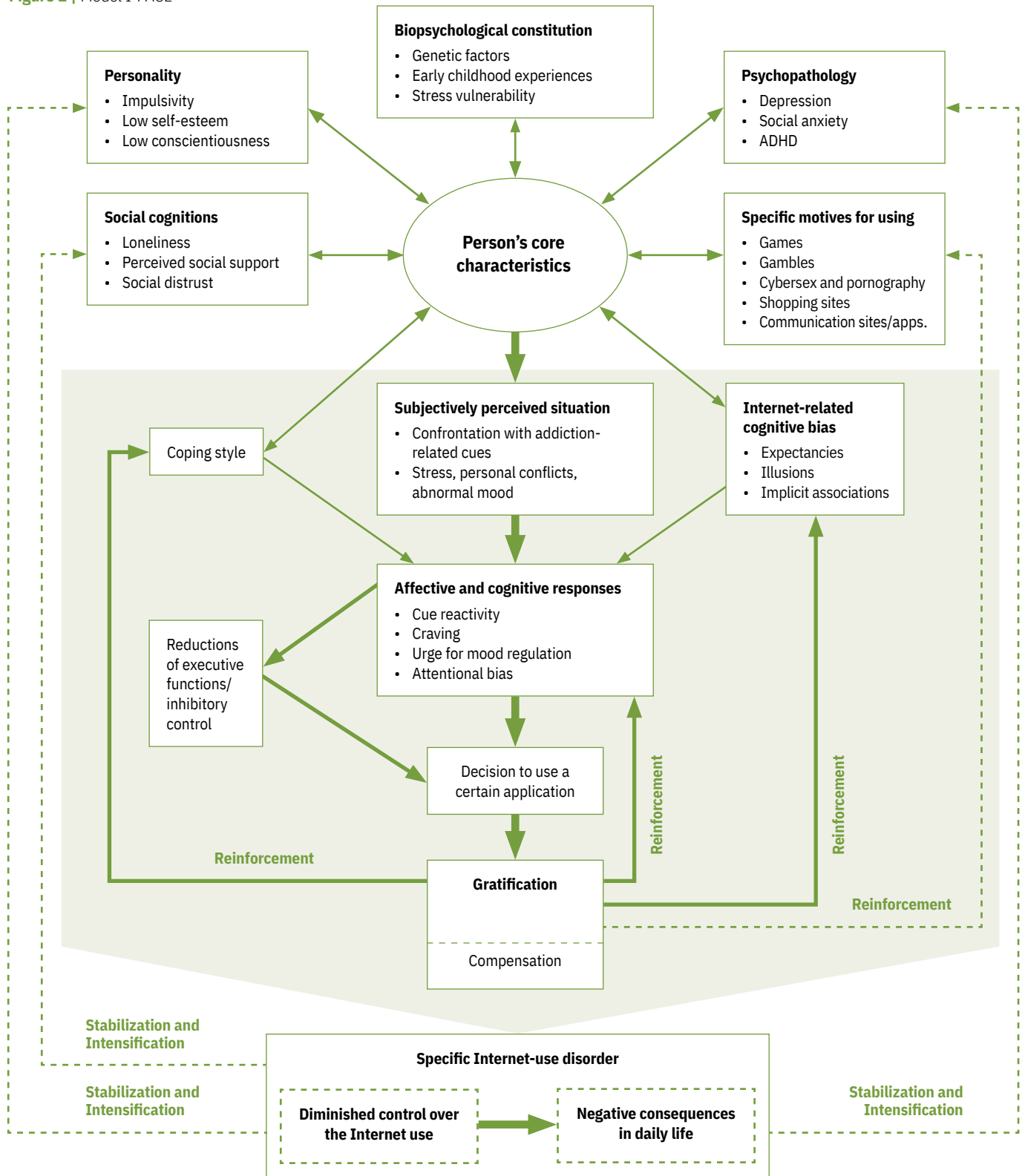
Big Five Inventory 10

The Big Five Inventory-10 (BFI-10), developed by Rammstedt and John (2007), is a questionnaire designed to measure the five personality traits of the Big Five model: openness to experience, conscientiousness, extraversion, agreeableness, neuroticism.

The BFI-10 is a shortened version of the original 44-item inventory. It was developed to address the need for a brief yet psychometrically valid tool for assessing the five personality traits. According to its authors, the questionnaire can be completed in just a few minutes (Rammstedt et al., 2012). Its predecessor, the NEO Five-Factor Personality Inventory (Costa & McCrae, 1992), includes 60 items and is considerably more time-consuming. The BFI-10 strikes a balance between methodological rigour and ease of administration and evaluation. It consists of 10 statements that describe whether or not the respondent possesses certain characteristics. Responses are given on a 5-point Likert scale ranging from “Strongly disagree” to “Strongly agree.”

For the purposes of the present study, the BFI-10 was translated into Slovak and the Czech version was revised. Reliability coefficients obtained from retesting were as follows: openness to experience = 0.74, conscientiousness = 0.77, extraversion = 0.84, agreeableness = 0.58, and neuroticism = 0.74 (Rammstedt et al., 2012).

Figure 2 | Model I-PACE



Source: Brand et al. (2016, 255)

Internet Use Questionnaire (DPI)

The Internet Use Questionnaire (Považanová et al., 2020) is an instrument created in 2020 by researchers at the Department of Psychology, Palacký University Olomouc. It consists of 28 items; respondents without accounts on social media platforms do

not complete items 20 to 28. The questionnaire was developed based on a literature review and analysis of how people use the internet and social media platforms. It also includes questions about computer gaming.

The method focuses on individuals' relationship to the internet and social media. For clarity, especially among younger respondents (adolescents), the commonly used term social networks was adopted to refer to social media. The questionnaire also includes other expressions that could be described as anglicisms, such as like and follower. Respondents are asked how they use the internet, who they consider role models, how many social media platforms they are active on, whether they adopt the views of influencers or public online personalities, what motivated them to create profiles on various platforms, and whether they have added family members to those networks.

The questionnaire also explores the amount of time spent online, on social media, and on digital gaming. In relation to social media platforms, respondents are asked how they behave on these platforms - for example, whether they watch or share videos that depict harm to humans or animals, whether they insult others, or whether they allow themselves to be provoked.

2.3 Methods of Data Analysis

In the paper, we presented the results of a frequency analysis of our participants' responses to the questionnaire items. Comparative analyses were conducted using the Mann-Whitney U test. Spearman's correlation coefficient was used to indicate the strength of the relationships. Predictors of time spent online were identified using regression analysis. We calculated the coefficient of determination to find the percentage of variability in risk behaviour explained by the relationship with the predictors we investigated.

2.4 Ethical Aspects of Research

The research methods in the present study followed the ethical standards and legal norms for working with participants and collaborating institutions, and working with data, as defined in the latest version of the Code of Ethics of the Psychological Profession (2017), and the Code of Ethics of the Slovak Chamber of Psychologists (2015).

Our questionnaire-based research methods fulfilled the criteria for anonymity and voluntary participation. All participants were over 18 years of age. By completing the questionnaire battery, they gave their consent for data processing. No in-kind or financial incentive was offered to the research participants. The questionnaire battery did not contain any personal information or identifiers through which members of the research team could identify the responses of any participant.

Data collection using questionnaires was conducted either online via social media or offline in the presence of a trained member of the research team. The data we collected were processed in accordance with the relevant legal standards (pursuant to Act No. 18/2018 Coll.; Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016) and ethical rules, ensuring data protection during and after data processing. The collected data are protected from unauthorized use. All completed questionnaire batteries were destroyed at the end of the research.

3 RESULTS

At the beginning of the statistical analysis process we tested the normality of research variables by Shapiro-Wilk test. All of the variables were not normally distributed. The values of the Shapiro-Wilk test were in the range from 0.447 to 0.915 at the level of the significance $\alpha < 0.001$. In nonparametric inference statistics we decided to use the nonparametrical tests. In the relation to this fact we have to choose the adequate parameters in descriptive statistics which are presented in *Table 1*.

In the next step we tested the differences in the research variables according to nationality, sex and residence. We used Mann-Whitney test. In *Table 2* we present the results of the comparison of the Czech and Slovak sample. We found out that participants of Slovak sample scored significantly higher in conscientiousness ($U = 592,416.5$; $p < 0.001$; $\Delta AM = 0.44$), neuroticism ($U = 580,843.5$; $p < 0.001$; $\Delta AM = 0.49$), dpi_12 ($U = 611,481$; $p = 0.005$; $\Delta AM = 0.17$).

Table 1 | Descriptives statistics of variables used in research

| | E | A | C | N | O | dpi_10 | dpi_11 | dpi_12 | dpi_13 | dpi_14 | dpi_15 |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| N | 2501 | 2501 | 2501 | 2501 | 2501 | 2501 | 2501 | 2501 | 2501 | 2501 | 2501 |
| Me | 6 | 7 | 7 | 7 | 8 | 4 | 3 | 2 | 2 | 0 | 0 |
| M | 6.10 | 6.74 | 6.87 | 6.60 | 7.55 | 4.20 | 3.83 | 2.11 | 2.32 | 0.36 | 0.70 |
| SEM | 0.04 | 0.03 | 0.03 | 0.04 | 0.03 | 0.06 | 0.06 | 0.04 | 0.04 | 0.02 | 0.03 |
| SD | 1.741 | 1.547 | 1.611 | 2.066 | 1.704 | 2.935 | 2.893 | 1.769 | 2.041 | 0.899 | 1.570 |
| Kurt | -0.554 | -0.284 | -0.347 | -0.879 | -0.385 | 1.548 | 3.212 | 8.425 | 3.712 | 38.819 | 17.896 |
| Skew | -0.036 | -0.284 | -0.131 | -0.119 | -0.478 | 1.14 | 1.466 | 2.004 | 1.567 | 4.735 | 3.650 |
| IQR | 2 | 2 | 2 | 3 | 3 | 4 | 3 | 2 | 2 | 0 | 1 |

Legend: E, A, C, N, O = factors of Big Five; dpi_10 = average of hours spent on internet during workdays; dpi_11 = average of hours spent on internet during weekends; dpi_12 = average of hours spent on social networks during workdays; dpi_13 = average of hours spent on social networks during weekends; dpi_14 = average of hours spent gaming on pc during workdays; dpi_15 = average of hours spent gaming on pc during weekends;

Table 2 | Comparison of Czech and Slovak sample

| country | E | A | C | N | O | dpi_10 | dpi_11 | dpi_12 | dpi_13 | dpi_14 | dpi_15 | |
|---------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--------|
| CZ | N | 1712 | 1712 | 1712 | 1712 | 1712 | 1708 | 1711 | 1692 | 1690 | 1692 | 1701 |
| | Me | 6 | 7 | 7 | 7 | 8 | 4 | 3 | 2 | 2 | 0 | 0 |
| | M | 6.07 | 6.74 | 6.77 | 6.77 | 7.54 | 4.25 | 3.92 | 2.06 | 2.30 | 0.35 | 0.73 |
| | SEM | 0.04 | 0.04 | 0.04 | 0.05 | 0.04 | 0.07 | 0.07 | 0.04 | 0.05 | 0.02 | 0.04 |
| | SD | 1.796 | 1.568 | 1.622 | 2.079 | 1.720 | 3.028 | 3.064 | 1.775 | 2.095 | 0.861 | 1.624 |
| | Kurt | -0.627 | -0.304 | -0.338 | -0.907 | -0.414 | 1.433 | 2.545 | 9.738 | 4.024 | 24.136 | 17.179 |
| | Skew | -0.014 | -0.296 | -0.079 | -0.181 | -0.457 | 1.073 | 1.366 | 2.077 | 1.608 | 4.061 | 3.590 |
| | IQR | 2 | 2 | 2 | 3 | 3 | 4 | 3 | 2 | 2 | 0 | 1 |
| SK | N | 789 | 789 | 789 | 789 | 789 | 798 | 794 | 776 | 772 | 782 | 776 |
| | Me | 6 | 7 | 7 | 6 | 8 | 3 | 3 | 2 | 2 | 0 | 0 |
| | M | 6.16 | 6.75 | 7.11 | 6.26 | 7.58 | 4.09 | 3.63 | 2.23 | 2.36 | 0.38 | 0.64 |
| | SEM | 0.06 | 0.05 | 0.06 | 0.07 | 0.06 | 0.10 | 0.09 | 0.06 | 0.07 | 0.04 | 0.05 |
| | SD | 1.614 | 1.502 | 1.565 | 1.995 | 1.670 | 2.724 | 2.474 | 1.749 | 1.919 | 0.976 | 1.445 |
| | Kurt | -0.395 | -0.241 | -0.307 | -0.758 | -0.313 | 1.757 | 5.230 | 5.620 | 2.667 | 56.644 | 19.444 |
| | Skew | -0.074 | -0.254 | -0.231 | -0.016 | -0.523 | 1.302 | 1.682 | 1.867 | 1.452 | 5.668 | 3.765 |
| | IQR | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 0 | 1 |
| U | 655118.0 | 674011.5 | 592416.5 | 580843.5 | 668092.0 | 663449.5 | 664185.0 | 611481.5 | 625643.0 | 651718.5 | 649843.0 | |
| p | 0.220 | 0.933 | <0.001 | <0.001 | 0.659 | 0.281 | 0.366 | 0.005 | 0.096 | 0.406 | 0.443 | |

Legend: E, A, C, N, O = factors of Big Five; dpi_10 = average of hours spent on internet during workdays; dpi_11 = average of hours spent on internet during weekends; dpi_12 = average of hours spent on social networks during workdays; dpi_13 = average of hours spent on social networks during weekends; dpi_14 = average of hours spent gaming on pc during workdays; dpi_15 = average of hours spent gaming on pc during weekends;

Table 3 | Comparison of males and females

| sex | E | A | C | N | O | dpi_10 | dpi_11 | dpi_12 | dpi_13 | dpi_14 | dpi_15 | |
|--------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--------|
| male | N | 459 | 459 | 459 | 459 | 459 | 462 | 460 | 452 | 453 | 450 | 454 |
| | Me | 6 | 7 | 6 | 6 | 8 | 4 | 4 | 2 | 2 | 0 | 0 |
| | M | 6 | 6.56 | 6.57 | 5.89 | 7.36 | 5.00 | 4.52 | 2.08 | 2.20 | 0.68 | 1.40 |
| | SEM | 0.08 | 0.07 | 0.08 | 0.10 | 0.08 | 0.17 | 0.17 | 0.09 | 0.10 | 0.06 | 0.11 |
| | SD | 1.715 | 1.545 | 1.672 | 2.095 | 1.705 | 3.584 | 3.586 | 1.950 | 2.127 | 1.352 | 2.344 |
| | Kurt | -0.524 | -0.313 | -0.334 | -0.824 | -0.852 | 0.401 | 1.550 | 4.601 | 2.564 | 27.527 | 8.569 |
| | Skew | -0.006 | -0.181 | -0.043 | 0.192 | -0.185 | 0.890 | 1.241 | 1.842 | 1.547 | 4.065 | 2.576 |
| | IQR | 2 | 2 | 2 | 4 | 3 | 5 | 4 | 2 | 2 | 1 | 2 |
| female | N | 2042 | 2042 | 2042 | 2042 | 2042 | 2044 | 2045 | 2016 | 2009 | 2024 | 2023 |
| | Me | 6 | 7 | 7 | 7 | 8 | 3 | 3 | 2 | 2 | 0 | 0 |
| | M | 6.12 | 6.78 | 6.94 | 6.77 | 7.6 | 4.01 | 3.67 | 2.12 | 2.35 | 0.29 | 0.54 |
| | SEM | 0.04 | 0.03 | 0.04 | 0.05 | 0.04 | 0.06 | 0.06 | 0.04 | 0.05 | 0.02 | 0.03 |
| | SD | 1.747 | 1.546 | 1.590 | 2.025 | 1.701 | 2.735 | 2.689 | 1.726 | 2.021 | 0.745 | 1.286 |
| | Kurt | -0.558 | -0.264 | -0.349 | -0.842 | -0.243 | 1.683 | 3.458 | 9.695 | 4.045 | 24.175 | 18.359 |
| | Skew | -0.043 | -0.309 | -0.141 | -0.177 | -0.546 | 1.129 | 1.439 | 2.052 | 1.579 | 4.131 | 3.772 |
| | IQR | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 0 | 1 |
| U | 450247.5 | 429499.5 | 409252.5 | 357303.5 | 426709.5 | 403718.5 | 418065.5 | 431092.5 | 423706.5 | 382484.0 | 353802.5 | |
| p | 0.182 | 0.004 | <0.001 | <0.001 | 0.002 | <0.001 | <0.001 | 0.066 | 0.019 | <0.001 | <0.001 | |

Legend: E, A, C, N, O = factors of Big Five; dpi_10 = average of hours spent on internet during workdays; dpi_11 = average of hours spent on internet during weekends; dpi_12 = average of hours spent on social networks during workdays; dpi_13 = average of hours spent on social networks during weekends; dpi_14 = average of hours spent gaming on pc during workdays; dpi_15 = average of hours spent gaming on pc during weekends;

Table 4 | Comparison of urban and rural sample

| residence | E | A | C | N | O | dpi_10 | dpi_11 | dpi_12 | dpi_13 | dpi_14 | dpi_15 |
|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--------|
| urban | N | 1815 | 1815 | 1815 | 1815 | 1815 | 1815 | 1780 | 1781 | 1790 | 1788 |
| | Me | 6 | 7 | 7 | 7 | 8 | 4 | 3 | 2 | 2 | 0 |
| | M | 6.17 | 6.72 | 6.92 | 6.58 | 7.63 | 4.22 | 3.77 | 2.09 | 2.26 | 0.33 |
| | SEM | 0.04 | 0.04 | 0.04 | 0.05 | 0.04 | 0.07 | 0.07 | 0.04 | 0.05 | 0.02 |
| | SD | 1.707 | 1.549 | 1.637 | 2.054 | 1.676 | 2.957 | 2.888 | 1.771 | 2.003 | 0.843 |
| | Kurt | -0.515 | -0.296 | -0.394 | -0.878 | -0.366 | 1.352 | 3.221 | 9.592 | 3.052 | 47.480 |
| | Skew | -0.065 | -0.284 | -0.156 | -0.119 | -0.515 | 1.077 | 1.469 | 2.071 | 1.479 | 4.922 |
| | IQR | 2 | 2 | 2 | 4 | 3 | 4 | 3 | 2 | 2 | 0 |
| rural | N | 672 | 672 | 672 | 672 | 677 | 677 | 674 | 668 | 670 | 675 |
| | Me | 6 | 7 | 7 | 7 | 7 | 4 | 3 | 2 | 2 | 0 |
| | M | 5.92 | 6.79 | 6.74 | 6.69 | 7.35 | 4.15 | 3.99 | 2.19 | 2.51 | 0.42 |
| | SEM | 0.07 | 0.06 | 0.06 | 0.08 | 0.07 | 0.11 | 0.11 | 0.07 | 0.08 | 0.04 |
| | SD | 1.822 | 1.542 | 1.543 | 2.094 | 1.759 | 2.873 | 2.903 | 1.764 | 2.132 | 1.034 |
| | Kurt | -0.650 | -0.238 | -0.192 | -0.883 | -0.426 | 2.181 | 3.266 | 5.455 | 4.947 | 25.401 |
| | Skew | 0.062 | -0.294 | -0.084 | -0.139 | -0.359 | 1.331 | 1.475 | 1.843 | 1.755 | 4.305 |
| | IQR | 3 | 2 | 2 | 4 | 3 | 3 | 3 | 2 | 2 | 0 |
| U | 560371.5 | 596870.5 | 569954.5 | 590969.5 | 554449.0 | 606566.5 | 582397.5 | 578498.0 | 549519.0 | 582010.5 | |
| p | 0.002 | 0.405 | 0.011 | 0.230 | <0.001 | 0.622 | 0.043 | 0.161 | 0.003 | 0.117 | |

Legend: E, A, C, N, O = factors of Big Five; dpi_10 = average of hours spent on internet during workdays; dpi_11 = average of hours spent on internet during weekends; dpi_12 = average of hours spent on social networks during workdays; dpi_13 = average of hours spent on social networks during weekends; dpi_14 = average of hours spent gaming on pc during workdays; dpi_15 = average of hours spent gaming on pc during weekends;

The comparison of the males and females (*Table 3*) also showed significant differences. The females scored significantly higher in agreeableness ($U = 429,499.5$; $p = 0.004$; $\Delta AM = 0.22$), conscientiousness ($U = 409,252.5$; $p < 0.001$; $\Delta AM = 0.37$), neuroticism ($U = 357,303.5$; $p < 0.001$; $\Delta AM = 0.88$), openness to experience ($U = 426,709.5$; $p = 0.002$; $\Delta AM = 0.24$), dpi_10 ($U = 403,718$; $p < 0.001$; $\Delta AM = 1.01$), dpi_13 ($U = 423,706.5$; $p = 0.019$; $\Delta AM = 0.15$). The males scored significantly higher in dpi_11 ($U = 418,065.5$; $p < 0.001$; $\Delta AM = 0.85$), dpi_14 ($U = 382,484.0$; $p < 0.001$; $\Delta AM = 0.39$), dpi_15 ($U = 353,802.5$; $p < 0.001$; $\Delta AM = 0.76$).

The comparison of the participants living in urban and rural environment (*Table 4*) showed following results. The participants living in urban environment scored higher in extraversion ($U = 560,371.5$; $p = 0.002$; $\Delta AM = 0.25$), conscientiousness ($U = 569,954.5$; $p = 0.011$; $\Delta AM = 0.18$), openness to experiences ($U = 554,449$; $p < 0.001$; $\Delta AM = 0.28$). The participants living in rural environment scored higher in dpi_11 ($U = 582,397.5$; $p = 0.043$; $\Delta AM = 0.22$) and dpi_13 ($U = 549,519.0$; $p = 0.003$; $\Delta AM = 0.25$).

Table 5 | Correlations among Big Five factors, age and DPI items 10-15

| | dpi_10 | dpi_11 | dpi_12 | dpi_13 | dpi_14 | dpi_15 |
|-----|---------|---------|---------|---------|---------|---------|
| E | -0.007 | -0.086 | 0.011 | -0.036 | -0.047 | -0.077 |
| A | -0.083 | -0.041 | -0.026 | -0.002 | -0.001 | -0.004 |
| C | -0.232* | -0.282* | -0.228* | -0.261* | -0.161* | -0.176* |
| N | 0.133 | 0.225* | 0.199* | 0.249* | 0.029 | 0.094 |
| O | 0.084 | 0.061 | 0.050 | 0.045 | 0.014 | 0.036 |
| age | -0.401* | -0.494* | -0.492* | -0.547* | -0.064 | -0.166* |

Legend: E, A, C, N, O = factors of Big Five; dpi_10 = average of hours spent on internet during workdays; dpi_11 = average of hours spent on internet during weekends; dpi_12 = average of hours spent on social networks during workdays; dpi_13 = average of hours spent on social networks during weekends; dpi_14 = average of hours spent gaming on pc during workdays; dpi_15 = average of hours spent gaming on pc during weekends;

* = $p \leq 0.01$ and ($p > 0.15$ or $p < -0.15$)

Table 6 | Predictors of time spend online

| | | predictors | | | | | |
|--------|---|-------------|-----------|-----------|-----------|-----------|----------|
| | | nationality | sex | age | residence | C | N |
| dpi_10 | B | 0.016 | -0.122*** | -0.383*** | -0.052** | -0.103*** | 0.008 |
| | t | 0.843 | -6.498 | -19.456 | -2.821 | -5.270 | 0.427 |
| dpi_11 | B | 0.011 | -0.117*** | -0.380*** | -0.016 | -0.151*** | 0.091*** |
| | t | 0.583 | -6.369 | -19.893 | -0.861 | -7.986 | 4.730 |
| dpi_12 | B | 0.091*** | 0.008 | -0.393*** | -0.023 | -0.099*** | 0.059** |
| | t | 4.889 | 0.400 | -19.944 | -1.239 | -5.064 | 2.985 |
| dpi_13 | B | 0.069*** | 0.017 | -0.407*** | 0.000 | -0.130*** | 0.109*** |
| | t | 3.839 | 0.914 | -21.328 | 0.004 | -6.855 | 5.678 |
| dpi_14 | B | 0.043* | -0.158*** | -0.056** | 0.041* | -0.124*** | 0.025 |
| | t | 2.147 | -7.726 | -2.630 | 2.014 | -5.846 | 1.158 |
| dpi_15 | B | 0.006 | -0.207*** | -0.132*** | 0.009 | -0.123 | 0.070*** |
| | t | 0.314 | -10.317 | -6.311 | 0.476 | -5.939 | 3.333 |

Legend: C, N = factors of Big Five; dpi_10 = average of hours spent on internet during workdays; dpi_11 = average of hours spent on internet during weekends; dpi_12 = average of hours spent on social networks during workdays; dpi_13 = average of hours spent on social networks during weekends; dpi_14 = average of hours spent gaming on pc during workdays; dpi_15 = average of hours spent gaming on pc during weekends;

* = $p \leq 0.05$; ** = $p \leq 0.01$; *** = $p \leq 0.001$

We tested the remaining relations by Spearman correlation rho. We present the result in *Table 5*. In relation to sample size a lot of correlations closed to zero were significant. We decided to accept minimal value of correlation 0.15. We found out a strong correlation among dpi items, age (ρ range from -0.166 to -0.547) and two factors of Big Five: conscientiousness (ρ range from -0.161 to -0.282) and neuroticism (ρ range from 0.199 to 0.249).

The last of our analyses was the linear regression (*Table 6*). As the predictors resulting from our analysis we identified the nationality, sex, age, residence, conscientiousness and neuroticism.

The significant predictors of dpi_10 (time spent on internet during workdays) were sex, age, residence and conscientiousness. The value of adjusted R^2 was 0.189, Cohen's $f^2 = 0.233$. The model was significant ($F(6) = 94.365$; $p < 0.001$).

The significant predictors of dpi_11 (time spent on internet during weekends) were sex, age, and conscientiousness. The value of adjusted R^2 was 0.236, Cohen's $f^2 = 0.309$. The model was significant ($F(6) = 124.712$; $p < 0.001$).

The significant predictors of dpi_12 (time spent on social networks during workdays) were nationality, age, conscientiousness and neuroticism. The value of adjusted R^2 was 0.199, Cohen's $f^2 = 0.248$. The model was significant ($F(6) = 98.938$; $p < 0.001$).

The significant predictors of dpi_13 (time spent on social networks during weekends) were nationality, age, conscientiousness and neuroticism. The value of adjusted R^2 was 0.248, Cohen's $f^2 = 0.330$. The model was significant ($F(6) = 130.671$; $p < 0.001$).

The significant predictors of dpi_14 (time spent gaming on pc during workdays) were nationality, sex, age, residence and conscientiousness. The value of adjusted R^2 was 0.051, Cohen's $f^2 = 0.053$. The model was significant ($F(6) = 22.300$; $p < 0.001$).

The significant predictors of dpi_15 (time spent gaming on pc during weekends) were sex, age and neuroticism. The value of adjusted R^2 was 0.093, Cohen's $f^2 = 0.102$. The model was significant ($F(6) = 41.729$; $p < 0.001$).

The values of Cohen's f^2 support the correctness of tested models. They represent at least small size effect. The exceptions are items dpi_14 and dpi_15 which are concerned with gaming. This is not a typical activity in adult age. In our research sample we found out the average time spent by this activity at the level of half an hour, respectively three quarters of an hour (*Table 1*). In these cases the models described only small percentage of variability (5 %, respectively 9 %).

4 DISCUSSION

Our findings can be summarised as follows: adults tend to spend more time online if they are Slovak (especially on social networks during workdays), male (general internet use and gaming), younger (across all domains), and reside in rural areas (internet use and social networks during weekends).

From the perspective of the Five Factor Theory of Personality (McCrae & Costa, 1999), this suggests that time spent online - particularly on social media and gaming - becomes part of an individual's objective biography through the process of adaptation to socio-cultural expectations. These expectations may

be captured by the implicit imperative: “You must own digital devices and use them frequently in order to feel connected to others.” This reflects a memplex (Dawkins, 2003) that likely also becomes embedded in the layers of self-concept (although this was not the focus of our study).

In addressing whether such interactions are shaped by core personality components, we can affirmatively state that they are. Specifically, neuroticism, strongly determined by biological factors, was a predictor in four of the studied variables, and conscientiousness, shaped by both biological and socialisation influences - predicted five variables. Thus, heightened anxiety (high neuroticism) combined with weak self-regulation (low conscientiousness) appears to be a combination that increases the likelihood of extended time spent in online environments. This may be because individuals with such profiles struggle to use time productively or to cope effectively with their worries.

Additional risk factors include being male (with slower development of self-regulatory capacities; see Cobb-Clark et al., 2022; Tetering et al., 2020), being younger (as clinical studies indicate higher levels of neuroticism in younger age groups; e.g. Bie et al., 2024; Xiang et al., 2024), and rural residence (which is inconsistent with the assumption about easier access to digital content and services; e.g. Doody et al., 2020; Lee et al., 2021).*

According to the I-PACE model (Brand et al., 2016) and selected components thereof, we may argue that biopsychological predispositions, such as high impulsivity (reflected in low conscientiousness) and low social trust (reflected in high neuroticism), form part of an individual’s core personality structure. These traits influence the subjective interpretation of one’s life situation, accompanied by affective and cognitive responses. The reduction of tension and anxiety in the online environment acts as a form of reinforcement, which, together with diminished inhibitory control, may lead to compulsive behaviours that easily develop into addictive patterns.

Our conclusions are consistent with the findings of Zhou, Li, Han, and Yin (2021), who highlighted the role of loneliness in the development of pathological internet use among adolescents. Similar patterns have been observed in adult populations (Lin, Wang, & Sun, 2024). Kayis et al. (2016) also reported negative associations between time spent online and other Big Five traits, including extraversion, agreeableness, and openness to experience.

* We can interpret this as rural residents exhibit higher online activity during weekends, potentially reflecting compensatory patterns of digital engagement in environments with fewer offline leisure alternatives.

According to World Population Review (2025), the percentage of internet users in Slovakia and the Czech Republic is roughly comparable (81.6 % and 79.5 %, respectively). Average usage data support this similarity, indicating that people in both countries spend approximately the same amount of time online. However, our statistical analysis revealed a significant difference in the amount of time spent on social networks during workdays (see Table 2). Nationality also emerged as a significant predictor in three of the variables related to online activity (see Table 6).

When interpreting the risks associated with time spent online, it is essential to consider the differing motivations and behaviours of men and women. Recent studies (e.g. Bünning et al., 2023; Gisbert-Pérez et al., 2024) show that men tend to spend more time online, start at a younger age, and display higher tolerance for violence and toxic content, whereas women are more focused on social communities. Nonetheless, gender differences appear to be narrowing over time.

Despite the correlations found, it is important to acknowledge that time spent online alone is insufficient to assess the risks or potential negative consequences for health. Burén, Nutley, and Thorell (2023) emphasise the importance of considering how such behaviour affects everyday functioning. They note that some individuals spend over 30 hours per week online without exhibiting any signs of pathology.

5 CONCLUSIONS

Time spent online is associated with basic personality tendencies as defined by the Big Five model, specifically neuroticism and conscientiousness. In addition to these traits, gender, age, and place of residence were also identified as significant predictors of this phenomenon.

Authors’ contributions: Authors BKP and MD designed the study and proposed the study design. Authors MČ and GK performed the statistical analysis and contributed to data interpretation and article preparation. Author GB drafted the article. Author MČ conducted literature review and prepared a summary of the relevant research. Authors MČ and BKP

supervised the statistical analysis and contributed to preparing the article. All authors contributed to creating the article and approved the final version of the manuscript.

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