Behavioral and Motivational Patterns of Internet Users: A Logico-Categorical Analysis

Review of International Studies

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Abstract. The ongoing digitalization is giving rise to new sciences, such as psychoinformatics which studies the links between digital footprints and individual psychological characteristics. According to top-level researchers, the most important problems to be solved in the nearest future are to understand how new forms of self-perception, -reflection, and -presentation affect social communication; find strategies to foster flow experiences (states in which humans are totally absorbed into the task at hand) in times of a fragmented life style; investigate how the interaction with digital worlds shapes human brains and how we can hinder detrimental effects on the human brain; design digital worlds according to our emotional evolutionary heritage to foster well-being in digital societies; and find meaningful rules for social communication in times of abundant available access to digital distractors.

Internet use behaviors can be prosocial or antisocial, depending on the extent to which the existing social norms are accepted or rejected. Users engaging in the two types of Internet behavior differ in their online communication strategies and manifest specific cognitive, motivational and emotional characteristics.

The goal of this study was to review international findings in order to identify and analyze the logico-categorical characteristics of online antisocial behavior associated with specific motivational patterns of Internet users.

As a result, internal and external determinants of online antisocial behavior have been identified. Significant correlations have been found between pathologic Internet use and user's communicative, emotional, motivational, and cognitive psychological characteristics. A promising direction, in terms of con-

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structing Internet behavior models and designing initiatives to tackle online antisocial behavior, may consist in exploring the links between users' behavior on websites of different purpose and content with their individual psychological characteristics.

Keywords: Internet behavior, Internet use, antisocial behavior, web content, motivation, Internet addiction, self-harm, radicalization.

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Today, we are witnessing a unique process, the inception and structural evolution of a digital environment. Elements of the social environment have gone a long evolutionary way, arranging themselves into social institutions and stable links to which certain rules and regulations apply. Abundant research has been done on the emergence, development and functioning of various types of human behavior in the conventional social environment. The digital environment, however, is only in its nascent stage of development, and little is known yet about the influence of its elements on human behavior and psychological well-being.

Digitalization presents new challenges not only to psychologists and educators but also to scholars studying all kinds of aspects of life. New research disciplines emerge, such as psychoinformatics, which studies the links between digital footprints of Internet users and their psychological characteristics. It turns out that classic psychological methods are able only in part to analyze data derived from digital technologies. As a consequence, psychologists must enrich their scientific methods through the inclusion of methods from informatics [Montag, Duke, Markowetz 2016].

The Digital environment opens up new opportunities for assessing human behavior through the application of psychological targeting. This form of assessment makes it possible to influence the behavior of large groups of people by tailoring digital data to the psychological needs of the target audiences [Matz et al. 2017].

Researchers identify the following most important research avenues to be tackled in the near future [Montag, Diefenbach 2018]:

- Understand how new forms of self-perception, -reflection, and -presentation affect social communication;
- Find strategies to foster flow experiences (states in which humans are totally absorbed into the task at hand) in times of a fragmented life style;
- Investigate how the interaction with digital worlds shapes human brains and how we can hinder detrimental effects on the human brain;
- Design digital worlds according to our emotional evolutionary heritage to foster well-being in digital societies;

Table 1. **Internet use behavior characteristics**

Characteristic	Pattern	
	Prosocial	Antisocial
Communication	No psychological pressure = acceptance and support from others	Psychological pressure in online communication (bullying, etc.)
Cognition	Seeking and providing reliable information	Providing unreliable information (deceit, misinterpretation of information, etc.)
Motivation	Focus on maintaining a healthy lifestyle	Addictions; self-harm and/or incitement to self-harm
	Focus on socially approved activities (charity, volunteering, etc.)	Recruitment to antisocial and/or criminal organizations (e. g. religious cults, AUE, etc.)
Emotion	Neutral or positive connotations of the content consumed and/or distributed	Negative connotations of the content consumed and/or distributed (aggressive, depressive, etc.)

- Find meaningful rules for social communication in times of abundant available access to digital distractors.

To coordinate the efforts of different research teams in solving the problems set forth above and to allow for comparability of research findings obtained by different authors in the same field, conceptual clarity should be provided in describing the characteristics, structures, types and correlations of Internet use behavior. At present, the same terminology is applied to describe phenomena that differ in their sets of parameters, which inhibits the development of unified diagnostic criteria and reduces the congruence of research findings as well as their prognostic value [Griffiths 2015; Lee et al. 2018; Mihajlov, Vejmelka 2017; Nadhirah et al. 2018; Pedro Anderson Ferreira Quirino et al. 2019; Poli 2017].

The goal of this study was to review international findings in order to identify and compare the logico-categorical characteristics of online antisocial behavior associated with specific motivational patterns of Internet users.

1. Internet Behaviors

Conceptually, engagement with Internet content is an externally observable human activity, or behavior, in the digital environment.

Internet behaviors can be prosocial or antisocial, depending on whether the existing social norms are accepted or rejected by the user. Both patterns of Internet behavior have a number of character-

istics associated with online communication strategies of Internet users and their individual psychological differences of cognitive, motivational and emotional nature (Table 1).

The literature analyzed in this study contains no mention of the term "Internet behavior" as a set of characteristics that would describe Internet user behavior as a coherent system of actions associated with individual communicative, cognitive, motivational and emotional patterns. However, certain characteristics of Internet behavior have been explored intensely, first of all those of antisocial Internet behavior. Below, we discuss the available findings from research on the aspects of antisocial Internet behavior associated with individual motivational traits of Internet users.

2. Aspects of Antisocial Internet Behavior Associated with Motivation-Related Psychological Characteristics

Antisocial Internet behaviors associated with motivation-related psychological characteristics include Internet addictions, self-harm or incitement to self-harm, recruitment to antisocial or criminal organizations (such as religious cults, AUE, etc.), etc.[1]

2.1. Internet Addiction

2.1.1. Definition Problems

Internet addiction (IA) as a phenomenon has been explored extensively since the 1990s. It is generally understood as the inability of users to reduce the duration and/or frequency of their Internet activities, which results in such negative consequences as impact on job and educational performance, financial debt, problems in family and interpersonal relationships, etc. [Ching et al. 2017; Laconi, Rodgers, Chabrol 2014]. Psychologists and educators are concerned about the possible negative effects of pathological Internet use on physical condition and mental health of users [Mihajlov, Vejmelka 2017; Odaci, Celik 2016].

Today, researchers around the world still rely on different criteria in defining the concept of Internet addiction and use different terms to describe it, including Internet Addiction (IA), Internet Use Disorder (IUD), Pathological Internet Use (PIU), Problem Internet Use (PIU), etc.—and, subsequently, different diagnostic tools, such as Young's Internet Addiction Test (IAT), Chen's Internet Addiction Scale (CIAS), Davis's Online Cognition Scale (OCS), Günüç's Internet Addiction Scale, Generalized Problematic Internet Use Scale (GPIUS), Compulsive Internet Use Scale (CIUS), and others. This lack of conceptual clarity hinders comparability of the results obtained by different research teams, as they use different diagnostic criteria for Internet addiction. Conceptual ambiguity inhibits quantitative measurements, classification and construction of models to describe the emergence and development of Internet dependencies [Griffiths 2015; Pedro An-

[1] In this article, we focus on addictive behaviors. Similar extensive analysis of self-harm or incitement to self-harm as well as recruitment to antisocial or criminal organizations will be carried out in subsequent publications.

derson Ferreira Quirino et al. 2019; Poli 2017]. This inference is substantiated by the research findings presented further in this article.

2.1.2. Internet Addiction: Classifications and Diagnostic Challenges

Findings show that Internet users exhibit different behaviors depending on the type of content consumed (digital gaming, video gaming, social networking, etc.), which spurs debate in academia on whether specific behavioral patterns should be classified as Internet addiction.

Online gaming is one of the most popular forms of entertainment among young people today, as it is available anytime from any device [Xu, Chen, Adelman 2015].

The 11th Revision of the International Classification of Diseases (ICD-11) by the World Health Organization classifies gaming behavior under the subgroup of mental disorders *6C51 Gaming Disorder*, in particular *6C51.0 Gaming Disorder, Predominantly Online*, and provides three manifestation criteria for diagnosing digital or video gaming as a mental disorder [World Health Organization 2019].

The fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) by the American Psychiatric Association defines Internet gaming disorder as addiction to gaming and uses nine diagnostic criteria [American Psychiatric Association 2013; Griffiths 2015; Parekh 2018].

Table 2 provides a summary and comparison of the diagnostic criteria for Internet gaming disorder between the two classifications.

As can be seen from Table 2, some diagnostic criteria for Internet gaming disorder are relatively congruent between ICD-11 ad DSM-5, namely control over gaming (criteria 1 in ICD-11 and 4 in DSM-5), priority of gaming in the hierarchy of motivations (criteria 2 in ICD-11 and 1, 3, 5 in DSM-5), ignoring the negative consequences of gaming (criteria 3 in ICD-11 and 6, 9 in DSM-5). Some criteria contained in DSM-5 (2, 7, 8) are not found in ICD-11. These differences need to be taken into account when developing and validating diagnostic tools and interpreting the results in psychological research.

In the debate on criteria of categorizing different types of behavior as Internet addiction, some authors emphasize that the term "addiction" should only be applied to Internet gaming behavior, in the way that is it described in ICD-11 or DSM-5. Other scholars consider the medium of the Internet to be the main platform that unites different addictive Internet activities [Griffiths 2015; Young 2015]. The Internet is just a way through which people may access to whatever they want—not only gaming but also chatting, shopping, viewing sexually explicit material, etc. Therefore, users might be not addicted to the Internet itself but to some content or services that the Internet provides, which is not limited to games [Kim, Kim 2010; Pontes, Griffiths 2014; 2015].

A study examining the interrelationship and the overlap between problematic Internet use and problematic online gaming in adolescents (2,000 participants) revealed notable differences between the two. Data showed that problematic Internet use was positively associ-

Table 2. **Comparing the diagnostic criteria for Internet gaming disorder**

Classification	ICD-11	DSM-5
Name of disorder	6C51.0 Gaming Disorder, Predominantly Online (https://icd.who.int/browse11/l-m/en#/http%3a%2f%2fid.who.int%2ficd%2fentity%2f338347362)	Internet Gaming Disorder
Diagnostic criteria	1) Impaired control over gaming (e. g. onset, frequency, intensity, duration, termination, context); 2) Increasing priority given to gaming to the extent that gaming takes precedence over other life interests and daily activities; and 3) Continuation or escalation of gaming despite the occurrence of negative consequences	1) Preoccupation with gaming; 2) Withdrawal symptoms when gaming is taken away or not possible (sadness, anxiety, irritability); 3) Tolerance, the need to spend more time gaming to satisfy the urge; 4) Inability to reduce playing, unsuccessful attempts to quit gaming; 5) Giving up other activities, loss of interest in previously enjoyed activities due to gaming; 6) Continuing to game despite problems; 7) Deceiving family members or others about the amount of time spent on gaming; 8) The use of gaming to relieve negative moods, such as guilt or hopelessness; and 9) Risk, having jeopardized or lost a job or relationship due to gaming
Diagnosis assignment requirements	• All manifestations are continuous or recurrent over a period of at least 12 months; • The required duration may be shortened if all diagnostic requirements are met and symptoms are of sufficient severity to result in significant impairment in personal, family, social, educational, occupational or other important areas of functioning	• Experiencing five or more of these symptoms within a year. The condition can include gaming on the Internet, or on any electronic device

ated with online gaming, online chatting and social networking, while problematic online gaming was only associated with online gaming, and also much more strongly associated with being male [Király et al. 2014].

Since problematic Internet use and problematic online gaming are not conceptually identical, it has been proposed to distinguish between generalized and specific Internet addiction [Montag, Bey, Sha et al. 2015]. Researchers must unite and start using the same assessment measures in diagnosing specific disorders, otherwise no conceptual clarity can be achieved regarding different types of Internet addiction [Griffiths 2015].

2.1.3. Challenges in Building Determination Models

Models describing the emergence and development of Internet addiction are based on determining a system of external and internal factors associated with specific patterns of dependency. This avenue of research lacks clarity, too.

2.1.3.1. External Factors of Internet Addiction

Researchers identify the following external factors associated with Internet addiction:

- Accessibility of the Internet, quality of Internet connection, type of device [Dwyer, Kushlev, Dunn 2018; Ergun-Basak, Aydin 2019; Kushlev, Dunn 2019; Singh et al. 2018];
- Educational attainment and field of study [Chaudhari et al. 2015; Ching et al. 2017; Younes et al. 2016; Zhang et al. 2018];
- Sociocultural environment, economic indicators and other country-specific characteristics [Campelo et al. 2018];
- Parental guidance, peer influence [Nadhirah et al. 2018], and other groups of factors.
- Various statistical indicators have been assessed as possible predictors of Internet addiction, such as the number of Internet users, smartphones and other digital devices in a country, the amount of time spent online, the number of online social contacts and types of online activities, accessibility of the Internet, etc.

The population of Internet users has been growing consistently and even explosively in some countries, such as India with its over 600 million Internet users, which is ranked only behind China (854 mln) [Statista Research Department 2020; Internet World Stats 2020; Kumar et al. 2019]. While at home, millennials are more likely to spend time online than with their parents or other family members [Anderson, Steen, Stavropoulos 2017; Malaysian Communications and Multimedia Commission 2017].

The time spent by minors on the Internet has been surging, sometimes reaching 39 hours per week [Nadhirah et al. 2018].

Most young people are involved in social networking[2] [Concepts Technologies 2017; Memon et al. 2018], using the Internet for academic or business purposes much less often [Mahamid, Bert 2018a; 2018b]. The prevalence of daily online activities is distributed from highest to lowest as follows: instant messenger (~91%) social networking (~65%), leisure, without purpose, emails, downloads, forums, blogging, shopping, listening to radio and gaming [Singh et al. 2018]. The rates differ somewhat across countries, but the general trends are persistent.

[2] Napoleoncat. Facebook users in State of Palestine, 2019. https://napoleoncat.com/stats/facebook-users-in-state_of_palestine/2019/07

External factors of Internet addiction may include easy access to the Internet from a variety of devices, diversity of locations providing Internet access, quality of Internet connection, etc. The most frequent Internet users are high school and college students aged between 16 and 24, who are at the critical stage of their social and emotional development. The majority of them possess personal computers and smartphones and can access the Internet from their classrooms and/or places of residence. Going online is largely convenient and free at that age, which increases the risk of developing an addiction [Chiu 2014; Concepts Technologies 2017; Nadhirah et al. 2018; Pesigan, Shu 2016]. Students who are addictive Internet users were found to show significantly higher Internet use in classrooms or campuses, higher use of emails, social networking, blogging, forums, leisure, surfing without purpose, shopping, downloading and higher cyber risk [Ergun-Basak, Aydin 2019; Singh et al. 2018].

Data on problematic Internet use in similar user groups (comparable by age, gender, educational attainment, field of study, country, etc.) is often inconsistent across studies (Table 3).

As shown in Table 3, some authors differ in their definition of Internet addiction, applying the term to high levels of dependency only. Diagnostic criteria are inconsistent across the studies: using the same assessment methods, some researchers classify respondents with a score of 46 to 60 as addictive Internet users ("high level") [Nadhirah et al. 2018], while others diagnose Internet addiction ("excessive user", "severe addiction") at the level of 80 to 100 scores [Kumar et al. 2019; Chaudhari et al. 2015; Zafari, Rafiemanesh, Balouchi 2018]. However, there is also an approach where Internet addiction is defined as a cumulative of all levels (high, medium, mild) except low (regular online users). The cutoff score differs across the studies even here though, suggestions including 49 [Singh et al. 2018], 43 [Ching et al. 2017; Younes et al. 2016] and 31 [Pedro Anderson Ferreira Quirino et al. 2019]. Respondents who score below the cutoff score are considered to be regular online users. Table 3 also displays incoherencies in Internet use data obtained for equivalent or similar samples within one country, across the countries, using different methods, etc.

Differences in definitions, diagnostic criteria and cutoff values make it challenging to compare empirical findings and analyze the influence of such external factors of Internet addiction as gender, age, educational attainment, field of study and socioeconomic status.

One of the recent departures in the Internet addiction field is dedicated to finding similarities and differences between Internet use disorder and smartphone use disorder.

A lot of researchers consider smartphone to be a critical factor of fast-tracking the design of digital worlds [Montag, Diefenbach 2018]. As of early 2020, there were 3.2 billion smartphone users in the world. If this trend persists, the number of smartphone users worldwide will reach 3.8 billion by 2021 [Statista Research Department 2020]. Reg-

Table 3. **External factors of Internet addiction** (country, age, gender, field of study, diagnostic tools)

Country	Sample	Diagnostic tools	Distribution of IA (%)	
Medical undergraduates			IA	No IA
India [Chaudhari et al. 2015]	N = 282 Males = 122 Females = 160 Age ~ 19.9	Young's Internet Addiction Test (YIAT)	58.87, of which: H—0 M—7.45 L—51.42	41.13
India [Singh et al. 2018]	N = 122 Age ~ 20.6	YIAT	H—0 M—19.7	80.3
Lebanon [Younes et al. 2016]	N = 600 Males = 182 Females = 418 Age ~ 20.4	YIAT	16.8 Males/females = 23.6/13.9	83.2
Cross-sectional study [Ching et al. 2017]	N = 426 Males = 156 Females = 270 Age ~ 21.6	YIAT	38.55 Males/females = 44.9/32.2	61.45
Malaysia	N = 237 (55.6%)		37.1	62.9
India	N = 31 (7.3%)		22.6	77.4
China	N = 148 (34.7%)		39.9	60.1
Other countries	N = 10 (2.3%)		30.0	70
Cross-sectional study [Zhang 2018]	N = 3,654	YIAT	32.2	
		Chen's Internet Addiction Scale (CIAS)	5.2	
Brazil [Pedro Anderson Ferreira Quirino et al. 2019; Silva et al. 2017]	N = 359 Males = 88 Females = 271 Age ~ 19.5	YIAT	44.28 Males/females = 51.1/48.9	
		Online Cognition Scale	62.9 Males/females = 54.5/65.7	
University undergraduates			IA	No IA
Iran [Zafari, Rafiemanesh, Balouchi 2018]	N = 9,161	YIAT	30.67, of which: H—4.67 M—25.32	69.33
Adolescents (middle and high school students)			IA	No IA
Malaysia (Kota Bharu, Kelantan) [Nadhirah et al. 2018]	N = 422 Males =150 Females = 272 Age = 13–19	YIAT	H—2 M—33 L—64	1
India (Kendriya Vidyalaya, New Delhi) [Kumar et al. 2019]	N = 426 (Grades 11 and 12): Males = 248 Females = 170	YIAT	H—1.41 M—30.28 L—23.94 Males/females = 40.43/31.33	44.37
Turkey (Malatya) [Aydemir 2018]	N = 3,442	Günüç's Internet Addiction Scale [Günüç 2009]	14.1 At-risk group—42.6 Males/females: higher in males	46.3

Notes: ***IA***—Internet addiction; ***IA*** *males/females*—gender distribution of Internet addiction; *H*, *M*, *L*—high, medium and low levels of Internet addiction.

ular users spend about 2.5 hours daily on their smartphones, mostly engaging in social networking [Montag, Błaszkiewicz, Sariyska et al. 2015]. The right amount of smartphone use makes humans more productive [Montag, Walla 2016], while problematic use reduces productivity and concentration [Duke, Montag 2017; Kushlev, Proulx, Dunn 2016], creates the capacity for "absent presence" [Kushlev et al. 2019], has negative effects on social connectedness with children [Kushlev, Dunn 2019] and undermines the quality of interactions with friends and family [Dwyer, Kushlev, Dunn 2018].

Research on the impact of smartphones on cognitive performance is scarce and requires not only considering the amount of time spent on smartphone use but also distinguishing between specific types of smartphone usage—social activities such as text messaging, email and social media use will have different impacts than gaming or browsing the web [Wilmer, Sherman, Chein 2017].

The prevailing trend of the past decade in the research on external factors of Internet use disorder consists in shifting the focus from frequency to content as the main characteristic of Internet addiction and considering both factors in analysis [Lee et al. 2018; Mihajlov, Vejmelka 2017; Nadhirah et al. 2018]. Special emphasis has been placed lately on the risks associated with online content. They include, in descending order of frequency, blocking of mail because of unknown sender/inappropriate content, receiving false information, pretending to be someone else online, sharing the password, etc. The risks are additionally increased by the lack of cyber safety awareness [Singh et al. 2018].

Therefore, comparison of findings on the impact of external factors on Internet addiction is complicated by the lack of conceptual clarity, uniform tools and a uniform diagnostic approach.

2.1.3.2. Internal Factors of Internet Addiction

Internal factors of Internet addiction are psychological characteristics of Internet users. There is empirical evidence confirming that Internet used disorder (IUD) and smartphone use disorder (SUD) are correlated significantly with:

1) Low life satisfaction and lack of empathy [Lachmann, Sindermann, Sariyska et al. 2018];
2) High levels of social anxiety and impulsivity [Peterka-Bonetta et al. 2019];
3) Low self-directedness—lower willpower anchored in the trait of self-directedness may reflect the core of digital additive tendencies [Lachmann et al. 2019];
4) Specific personality traits (the NEO FFI's Big Five: neuroticism, extraversion, openness, agreeableness and conscientiousness). In particular, available findings revealed the following trends:

- Higher IUD/SUD are associated with low conscientiousness and high neuroticism [Peterka-Bonetta et al. 2019];
- Tendencies toward IUD and SUD are associated with high neuroticism and both low conscientiousness and low agreeableness;
- IUD (but not SUD) tendencies are negatively related to extraversion and SUD (but not IUD) tendencies are negatively associated with openness;
- Overall, IUD has stronger correlations with the personality traits of addictive Internet users than SUD [Lachmann et al. 2019].

Studies involving school and college students demonstrate significant correlations between Internet addiction and a number of indicators describing the personality and learning processes of adolescents and young adults, in particular the following:

1) Low level of emotional intelligence [Oskenbay et al. 2015];
2) Excessive amount of time spent online (one of the dependency patterns) and perceived self-efficacy (a significant negative correlation). These findings are critical as low self-efficacy is known to be a risk factor in both symptoms of depression and suicidal ideation in late adolescence [Berte, Mahamid, Affouneh 2019; Yao, Zhong 2014];
3) Low general, social and family-home self-esteem. Social self-esteem is associated with adequate social behavior and has a decisive influence on the ability to control one's Internet use [Aydin, Sari 2011];
4) Increased feelings of loneliness. Online social contacts with friends and family were found to be not an effective alternative for offline social interactions in reducing feelings of loneliness. Furthermore, while an increase in face-to-face contacts could help to reduce symptoms of Internet addiction, this effect may be neutralized by the increase in online social contacts as a result of excessive Internet use. This results in a worrisome vicious cycle between loneliness and Internet addiction [Yao, Zhong 2014]. Reduced frequency of in-person interactions and the growing prevalence of online interactions in adolescents, associated with the feelings of loneliness, are not induced by individual characteristics but represent a specific characteristic of Generation Z [Twenge et al. 2018; Twenge, Martin, Campbell 2018];
5) Low academic performance, insomnia, symptoms of anxiety and depression [Ching et al. 2017; Hunt et al. 2018; Laconi, Rodgers, Chabrol 2014; Maroma, Karega, Oteyo 2019];
6) Personality disorders [Zadra et al. 2016];
7) Burnout among high school students, the connection being stronger in the male group [Tomaszek, Muchacka-Cymerman 2019].

Negative feelings, negation of self-worth, cognitive mistakes (need for approval, inclination to blame, perfectionism) can be predictors of problematic Internet use, especially in males [Ergun-Basak, Aydin 2019].

In a study of addictive young people's perceptions of the Internet, both positive (prosocial) and negative (hyperactivity, emotional, conduct and peer problems) impacts of Internet use were reported by students, yet the overall impact was assessed as negative [Kumar et al. 2019]. Importantly, while representing an Internet addicted user as a person who spends most of their time surfing on the Internet, as well as a person who sleeps less because of their compulsive Internet addiction, adolescents make a distinction between daily uses of the Internet (e. g. seeking information on the Internet) and behaviors associated with Internet addiction. In the examination of attitudes toward Internet addicted users, girls showed higher levels in items referring to compulsive use and decreased functionality, while boys showed higher levels in recommendations relating to self-awareness of dependency and the protection of privacy in the Internet [Τσουβέλας et al. 2015].

Research on the internal factors of Internet addiction yields more consistent results than research on the external ones. The findings available in literature may serve as a basis for designing mental therapy programs to help addictive Internet users, yet they require further reflection and analysis to be included in the models of Internet addiction emergence and development.

2.2. Self-Harm

Self-harm is another type of antisocial Internet behavior, the prevalence of which in the Internet has been alarming parents, psychologists, educators and physicians.

2.2.1. Definition Problems

Self-harm is broadly defined as intentional injuring of one's own body tissue. There is an ongoing debate in literature on defining the phenomenon. Various terms are used, including self-destructive behavior, self-injury, self-harm, self-inflicted violence, self-mutilation, self-aggression, parasuicide, etc. Conceptual ambiguity complicates the study of self-harm and the development of valid and reliable diagnostic tools.

2.2.2. Self-Harm and the Internet

A number of researchers draw parallels between the considerable rise in social media use among adolescents and young adults and the steady increase in the suicide and non-suicidal self-injury (NSSI) in youths.

Some studies report direct associations between greater time spent on online social networking and self-harm behavior and suicidal ideation in vulnerable adolescents [Baker, Lewis 2013; Memon et al. 2018]. Adolescents with a history of NSSI are more active on social media than adolescents with no NSSI history [Memon et al. 2018]. Daily social media use of more than two hours was also independent-

ly associated with poor self-rating of mental health and experiences of high levels of psychological distress and suicidal ideation in Canadian youth [Sampasa-Kanyinga, Lewis 2015].

Analysis of Instagram as a popular social media site among adolescents showed that NSSI content is very popular on Instagram, being often veiled by ambiguous hashtags [Moreno et al. 2016].

Social networking websites are utilized by self-harming youth not only as a medium to communicate with and to seek social support from other users but also as a source of negative content associated with promotion and exposure of self-harm [Brown et al. 2018; Memon et al. 2018]. Adolescents explicitly report a desire to post negative thoughts ("stressed posting") in social media as a way for emotional release or "call for help" and to seek social support from other users [Radovic et al. 2017]. There is evidence for a direct correlation between frequency of exposure to NSSI and engagement in NSSI among adolescents [Zhu et al. 2016].

The vast majority (93.1%) of NSSI pictures posted by adolescents depict cuts of varying severity (based on 2,826 pictures on Instagram), which accounts for approximately 93% of all pictures that directly depict wounds [Brown et al. 2018]. Analysis of NSSI-related hashtags showed that just over half (54%) of the images did not explicitly represent the act of self-harm. The images that did portray self-harm predominantly displayed self-injury (29%), nearly all cutting. Other forms of self-harm included eating disorders, bruising, scratching and substance use. A third of posts contained no representation of a human form at all. Where people were represented there was a much higher proportion of females than males (33% of all images compared with 9.5% males) [Shanahan, Brennan, House 2019].

Research findings on Internet behaviors of users with a history of self-harm, the content consumed by them and their ways of digital maneuvering may be used in designing digital targeting programs to assist users with such behavior disorders.

2.3. Recruitment to Antisocial Organizations

The use of the Internet to promote radicalization of users and recruit adolescents and young adults into antisocial organizations has been a legitimate public concern. Studies show that most adolescents have been exposed to online hate material, and about one fourth of the respondents have been victimized by such material [Costello et al. 2016; Oksanen et al. 2014].

2.3.1. External Factors of Radicalization

The recent years have seen an increase in studies exploring the relationship between Internet content and radicalism/extremism in adolescents. Such studies are designed to develop means of identifying radical Internet users (social media, forums, etc.) and ways of protecting users from the harmful influence of such content by detecting and blocking it. The following is analyzed:

- Part-of-speech tagging; volume, severity and duration of negative posts [Scrivens, Davies, Frank 2018];
- Images, streaming of violent online viral videos, glamorization of extremism in photo and video materials, hashtags, retweets and likes [Awan 2017];
- Content of posts in Twitter and other online social networks [Goodboy, Martin 2015; Klausen 2015].

Negative content is utilized by extremist users not only passively in the form of viral distribution but also actively during personal online interactions for the purpose of cyberbullying and promoting online hate [Goodboy, Martin 2015; Ojeda, Del Rey, Hunter 2019].

One of the negative external factors of radicalization is the situation of youth in the geographic areas of increased risk (such as occupied territories of Palestine), which is fraught with environmental stressors affecting personality development—not only militarization, poverty, lack of employment opportunities and cultural pressures but also few positive social outlets due to the restrictions on movement between communities. In this situation, it is likely that vulnerability to the easily accessible and unrestricted social networks of social media could lead easily to excessive and maladaptive use as an alternative avenue for socialization [Mahamid, Berte 2018a; 2018b].

2.3.2. Internal Factors of Radicalization

There is no consensus in literature over the psychological indicators of radical authors, either. Some researchers suggest that there is no simple typology that best describes radical users online [Scrivens, Davies, Frank 2018].

Others, meanwhile, suggest that radical users have a specific personality profile including the "Dark Triad" traits of Machiavellianism, psychopathy and narcissism, of which psychopathy is the most reliable predictor of cyberbullying [Goodboy, Martin 2015]. Seven key behavior characteristics and motivations have been identified for people engaging with Twitter and Facebook as a means to radicalize and target communities, either through specific pages, videos or comments and posts: (i) *cyber mobs*, personified through negative content retweets to create a mob mentality, (ii) *loners*, who interact with communities through individual posts and comments, (iii) *fantasists*, who blur the lines between reality and fiction to fantasize over radical movements, (iv) *thrill seekers*, who receive adrenaline rush by creating and distributing negative content; (v) *moral crusaders* talking about the moral duty to fight, (vi) *narcissists* who use radical content as a means to whip up a climate of revenge seeking, and (vii) *identity seekers*, who create and disseminate radical content as a means of searching for some form of identity or masculinity [Awan 2017].

A number of studies show that mental disorders may be a factor of youth radicalization, too [Campelo et al. 2018].

Exposure of adolescents to hate material is associated with high online activity, poor attachment to family and physical offline and/or online victimization [Oksanen et al. 2014]. Among young adults, higher levels of education, lower levels of trust in the federal government and proclivity towards risk-taking are associated with increased exposure to negative materials [Costello et al. 2016].

Research in this area is complicated by difficulties with accessing personal profiles of social media users and tracking their moves. The vast majority of data has been obtained for young people detained for or convicted of radicalism, i. e. retrospectively. Therefore, a lot of questions remain unanswered about the socio-psychological environments promoting or preventing radicalization of advantaged youths, and this avenue keeps being thoroughly investigated.

3. Conclusion

A review of international literature allows making the following inferences:

1. Digitalization has both positive and negative effects on physical and mental health at different stages of human life.

New scientific disciplines, such as psychoinformatics, open up new opportunities for assessing human behavior through the application of psychological targeting and influencing the behavior of large groups of people by tailoring digital data to the needs of Internet users.

2. Internet behavior is a new type of human behavior that requires targeted research, identification and analysis of logico-categorical characteristics, and construction of determination models of behavioral pattern emergence and development.

2.1. Considering the risks that the content of digital data may carry for users' mental and physical health, we suggest distinguishing between two types of Internet behavior, prosocial and antisocial. However, they should not be treated as a dichotomy, rather as a continuum between acceptance and rejection of social norms. Analysis of the relationship between digital footprints as externally observable behaviors induced by individual psychological characteristics may serve as a basis for constructing descriptive and determination models for the emergence and development of prosocial and antisocial behavioral patterns. Such models could be further used to design prosocial behavioral patterns to assist Internet users exposed to negative content online in overcoming their mental health problems.

2.2. The international literature analyzed in this study contains no mention of the term "Internet behavior" as a set of characteristics that would describe Internet use behavior as a coherent system of actions associated with individual communicative, cognitive, motivational and emotional patterns. However, certain characteristics of Internet be-

havior have been explored intensely, first of all those of antisocial Internet behavior:

1) Communicative: situations of psychological pressure in online communication (bullying, etc.);
2) Cognitive: providing unreliable information (deceit, misinterpretation of information, etc.)
3) Motivational: addictions, self-harm and/or incitement to self-harm, recruitment to antisocial and/or criminal organizations;
4) Emotional: negative connotations of the content consumed and/or distributed (aggressive, depressive, etc.).

3. The area studied most thoroughly is the patterns of antisocial Internet behavior associated with motivational characteristics of users: Internet addictions, self-harm or incitement to self-harm, recruitment to antisocial or criminal organizations.

4. The Internet addiction field still lacks conceptual clarity, which hinders comparability of the results obtained by different research teams, quantitative measurements, classification and construction of models to describe the emergence and development of Internet dependencies.

4.1. Findings show that Internet users exhibit different behaviors depending on the type of content consumed (digital gaming, video gaming, social networking, etc.). It is proposed to distinguish between generalized and specific Internet addiction and use different assessment measures in diagnosing them.

4.2. The following external factors of addictive Internet use in adolescents and young adults are identified:

- Accessibility of the Internet, quality of Internet connection, type of device;
- Amount of time spent online, number of online social contacts and types of online activities;
- Sociocultural environment, economic indicators and other country-specific characteristics;
- Age, gender, educational attainment and field of study;
- Parental guidance and peer influence;
- Content consumed.

Data on the influence that various groups of factors have on the level of Internet addiction is often inconsistent across similar user samples in different countries, which may be related to the lack of conceptual clarity, uniform tools and a uniform diagnostic approach. This results in a limited comparability of research findings on the impact of external factors on the emergence and development of Internet addiction obtained by different authors within the field.

4.3. There is empirical evidence confirming that Internet use disorder (IUD) and smartphone use disorder (SUD) are correlated significantly with the following internal factors of Internet addiction:

5) Communicative: reduced frequency of in-person interactions and growing prevalence of online interactions associated with increased feelings of loneliness;
6) Emotional: feelings of loneliness, low life satisfaction and lack of empathy, high levels of social anxiety and impulsivity, negative emotions, symptoms of anxiety associated with insomnia, low level of emotional intelligence, burnout;
7) Motivational: low perceived self-efficacy, low willpower, cognitive mistakes (need for approval, inclination to blame, perfectionism);
8) Cognitive: low self-esteem, low self-directedness, low academic performance.

Young people with a propensity to develop Internet and smartphone addictions are characterized by a specific Big Five personality profile: high neuroticism (emotional instability, anxiety, irritability), low conscientiousness and low agreeableness. Levels of introversion and openness show different patterns for Internet use disorder (high introversion) and smartphone use disorder (low openness). Overall, IUD has stronger correlations with the personality traits of addictive Internet users than SUD.

Adolescents report both positive (prosocial) and negative impacts of Internet use on their lives and make a distinction between daily uses of the Internet (e. g. seeking information on the Internet) and behaviors associated with Internet addiction.

5. The Internet is a new accessible medium that allows receiving negative content and information about ways of harming oneself. There is an ongoing debate in literature on defining the phenomenon of self-harm. Conceptual ambiguity complicates the study of self-harm and the development of valid and reliable diagnostic tools. The following has been established:

- Non-suicidal self-injury content is often veiled by ambiguous hashtags;
- NSSI content usually includes pictures depicting cuts of varying severity;
- Adolescents with a history of NSSI are more active on social media, spending more time on them and being more exposed to NSSI content, than adolescents with no NSSI history;
- Social networking websites are utilized by self-harming youth not only as a medium to communicate with and to seek social support from other users but also as a source of negative content associated with promotion and exposure of self-harm.

Research findings on Internet behaviors of users with a history of self-harm, the content consumed by them and their ways of digital maneuvering may be used in designing digital targeting programs to assist users with such behavior disorders.

6. The Internet has been actively used to recruit adolescents and young adults into antisocial organizations. Studies show that most adolescents have been exposed to online hate material, and about one fourth of the respondents have been victimized by such material.

External factors of youth radicalization include the content of materials disseminated online and the social situation of development. The following should be analyzed when designing de-radicalization policies:

- Part-of-speech tagging;
- Volume, duration and severity of negative posts, images, retweets and likes;
- Streaming of violent online viral videos, glamorization of extremism in photo and video materials;
- Social media sentiment (positive/negative) in different regions.

There is no consensus in literature over the psychological characteristics of Internet users as internal factors of radical Internet use or exposure to radicalism. Some researchers hold that people using social media to radicalize youth as well as those more vulnerable to negative content have specific personality profiles. Other, however, suggest that there is no simple typology that best describes radical users online.

Psychological research in this area has a number of objective limitations, such as the impossibility to access personal profiles of social media users directly or track their moves, the restriction of empirical basis to people under investigation or convicted of radicalism, etc.

7. A promising direction, in terms of constructing Internet behavior models and designing initiatives to tackle online antisocial behavior, is to explore the links between users' behavior on websites of different purpose and content with their individual psychological characteristics. Such models will allow identifying the personality profiles of users and at the same time customize digital data to their individual psychological needs, in particular to provide them with mental support.

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