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Original Research

Solutions for Social Media Harms: A Media ecological perspective

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Abstract

The present study aims to work out solutions for reducing Social Media(SM) harms based on the media ecological perspective. According to media ecology perspective, SM should be addressed at micro-, meso-, exo-, macro-, and chrono-levels. Drawing on meta-synthesis method, Magiran, SID, Noormags, ScienceDirect, Wiley, Springer, Ebscohost, and Sage databases were searched for the data using related keywords. Accordingly, a number of 129 articles were retrieved from the databases. Further analyses on the article titles, abstracts and full texts led to the exclusion of 47, 26, and 14 articles from the set, respectively. Eventually, 42 articles were selected and analyzed as the research sample. The eligibility criteria included peer-reviewed journal articles or full conference papers on social media harms or abuse, published between 2002 -2020, available in English and Persian. As other sources (e.g. dissertations) are not peer-reviewed, and we aimed to identify rigorous best practice literature, we excluded these. The results showed that solutions could be worked out by studying the why and how to use and to participate along with the harms simultaneously. The why and how to use as well as the harms may be determined at micro-, meso-, exo-, macro-, and chrono-levels so that solutions could be proposed at five levels including nurturing time management skills; promoting critical thinking; encouraging family, peer, and colleagues' participation in creating recreational, sports and leisure contexts; teaching media literacy; passing binding and persuasive laws, then review the historical trend of technology adoption.

Keywords: Social Media, Ecology, Meta-synthesis, Cyberspace

Introduction

Technologies have played an important role in social development by increasing human agility, accuracy and strength. As a soft and intellectual technology, information and communications technology (ICT) has shown enormous capability in facilitating information access and communication. Multimedia, communicative, customizable and interactive capabilities of ICT along with facilitated Internet access and emergence of open source social

software have contributed to providing access to ICT among various social groups (Ahn, 2011). Facebook, Myspace, LinkedIn, Twitter, Flickr, YouTube, Telegram, Instagram, and Google meeting and some others are social medias that allow users to invite other users, create groups, interact, and discuss in the form of text, video, picture or audio (Ellison & boyd, 2013). Durkheim divides communities *into* physical and mental or relational communities. According to that idea, berg *(*2003) considers virtual communities as relational communities. These *communities* are formed based on the common interests and ideas of individuals. As with physical spheres, hierarchies and roles, interests, meeting venues and etiquette rules develop in social media sites based on members' needs; however, SMs differ from real world in terms of affiliation type, expressions, members' participation in problem solving, and information flow (Jenkins, Purushotma, Weigel, Clinton & Robison, 2009; Underwood, et al., 2015).

Social media are Internet sites where people interact freely, sharing and discussing information about each other and their lives, using a multimedia mix of personal words, pictures, videos and audio (Kaplan & Haenlein, 2010). According to Bradley (2010), social media is a set of technologies and channels targeted at forming and enabling a potentially massive community of participants to productively collaborate. Social Media are classified into collaborative projects, blogs and micro blogs, content communities, social networking sites, virtual game worlds, and virtual social worlds based on their interactive capabilities and degree of realness (Kaplan & Haenlein, 2010). Collaborative projects include text-based networks such as wikis and bookmarking tools (e.g. Delicious) that allow users to post, edit, delete, send and rate contents. Content communities refer to such tools as Flickr, YouTube and SlideShare that allow for content sharing and interactions among users. Social networking sites allow users to create and update personal profiles, add friends, and send instant messages. Facebook, Telegram and Instagram are examples of social networking sites. Virtual game worlds and virtual social worlds are other variants of social networking sites that create pseudo-real environments such as Second Life and virtual games through 3-D features (Kietzmann, Hermkens, McCarthy & Silvestre, 2011). These tools provide various interaction tools including member-group interactions, admin-member interactions, content-group interactions and inter-group interactions (Dorn, Taylor & Dustdar, 2012). In developing user-oriented SM, the principles of adaptability, updatability, categorization, trust, signposting, attention to context, attention to limitations, community building, emphasis on interaction, and scalability are applied to facilitate and encourage cooperation and interactions among users (Dorn & Labitzke, 2011).

These features encourage people to spend part of their daily time participating in online groups, in information sharing, and in playing computer games. Young adults aged 20-29 constitute 57% of the Internet users in Iran (Ghayuomi, Farhangi & Hoseini Dana). The negative and positive outcomes of such communications are considerable from cognitive, emotional, social, ethical, and normative aspects (Zach & Lissitsa, 2016; Hamid, Ishak & Yazam, 2015; Kalogeropoulos, Negredo,, Picone & Nielsen, 2017; Kang & Wei, 2020). Based on Uses and gratification theory, social media are designed to respond to user needs and intend easily (Chen, 2018). The theory of user as actors refer to the freedom of users' practice in applying varied possibilities (Chouchani & Abed, 2018). On the other hand, the media richness theory emphasizes the possibilities and tools available in social media (Ishii, Lyons & Carr, 2019). The Hyper-Personal Perspective also focuses on the release of user action in the selection and power of his or her interpretation in the message (Sumner & Ramirez, 2019).

Carr (2010) addressed the cognitive impairments of synchronous and asynchronous communications over social media. He emphasized that skimming, receiving clipped information, diminution in memory due to availability of high-capacity external storage, and distraction due to various interesting resources may gradually reduce people's mental, cognitive and cerebral capacity. In his theory of lucid identity, de Mul (2005) asserts that cyberspace bears nonlinear, interactive and non-real substantive features so that it leads users to a milieu where they can actively internalize these features and hence they experience changes in their identity. The users of social media and computer games are influenced by the anonymity, personae, and the flexible, unreal and reversible structure of cyberspace. According to this theory, the flexible and reversible structure of cyberspace along with attractive content and handy features affect users' behavior and habits, forging a new identity in them different from their real identities. Pornography, plagiarism, blackmail, sexual abuse, and insult to personal dignity are some of the moral abusing in social media. Too much involvement in cyberspace propels people toward Internet addiction, less family relations, and divorce. Like any other media, SMs follow political, economic, cultural and tuition, ideological and stereotypical agendas using different techniques. They have secured a niche among users by applying various information processing, storage and dissemination techniques for creating groups, networks, and communities of users. How is it possible to reduce the harms of SMs? This study aims to provide a framework for adopting solutions for VSNs. Thus, the following questions are addressed in steps throughout the study:

1. Why and how do users use SMs? (Answering the how and why can reveal the sources of some harms)
2. What harms do users face in SMs?
3. What solutions are in decreasing SM harms?

Materials and Methods

Meta-synthesis research method was used in this study, which provides for effective extraction of data from previous research findings, theories and patterns. Walsh & Downe (2005) suggested a 6-step model for meta-analysis, which includes determining study goals, systematic search for relevant studies, examining search results, extracting the content relevant to the goals, content analysis and interpretation of findings. In this regard, identification of the solutions for reducing SM harms was determined as the research goal in the first step. Accordingly, the causes, uses and harms were selected as the factors for which to identify solutions. In the next step, the keywords "effect of social media", "dimensions of social media use", "use of social media", "pathological Internet use", "social media abuse", " social media moral issues", "social media and educational problems" were used to search in ScienceDirect, Emerald, Proquest, Wiley, Ebscohost, Sage, Eric, ebrary, and Springer databases. The inclusion criteria for the articles included being peer reviewed Journal and conferences articles, related to social media using harms and their abuses, and written in English or Persian, within the time range of 2002–2020. Theses, dissertations, and books related to social media using harms and abusing were excluded from the study.

Accordingly, a number of 129 articles were retrieved from the databases. In the third step, 47 irrelevant articles were removed from the set following a critical examination. Furthermore, the article abstracts were studied by two researchers so that 26 articles were identified as irrelevant and excluded from the set. In the next step, the full texts of articles were studied by

the two researchers and 16 irrelevant articles were identified and removed from the set. Finally, the articles were evaluated based on their bibliographic information and 14 low-impact articles were excluded from the set. Thus, a number of 42 articles were eventually selected as the research sample. The selected articles were studied to identify the how and why of SM use and harms as well as to determine solutions based on the media ecology perspective. To ensure data quality and reliability, the two encoders examined and coded the papers. Then, using the inter-rater method, the agreement was calculated and showed that of all 149 extraction codes, two encoders were in agreement with each other in 125 cases where the agreement coefficient between them was 83.89percent. Given that this reliability value exceeds 70%, it can be assumed that the reliability percentage between the two coders is acceptable in this study.

Results

Post-Screening Papers Selected for Coding presented in table1

Table1
Papers selected for coding

Article code	Source	Title	Year
1	Enikolopov, Makarin & Petrova	Social media and protest participation: Evidence from Russia	2020
2	Kang, J., & Wei	Let me be at my funniest: Instagram users' motivations for using Finsta (aka, fake Instagram)	2020
3	Kalogeropoulos, Negredo, Picone & Nielsen	Who shares and comments on news?: A cross-national comparative analysis of online and social media participation	2020
4	Vraga & Tully	News literacy, social media behaviors, and skepticism toward information on social media.	2019
5	Tamplin, McLean, & Paxton	Social media literacy protects against the negative impact of exposure to appearance ideal social media images in young adult women but not men	2018
6	Talib	Social media pedagogy: Applying an interdisciplinary approach to teach multimodal critical digital literacy	2018
7	Daneels & Vanwynsberghe	Mediating social media use: Connecting parents' mediation strategies and social media literacy	2017
8	Solmaz	Adapting new media literacies to participatory spaces: Social media literacy practices of multilingual students.	2017
9	Manca & Ranieri	Networked scholarship and motivations for social media use in scholarly communication	2017
10	Al-Quraan, Abu-Shanab, Banitaan & Al-Tarawneh	Motivations for using social media: comparative study based on cultural differences between American and Jordanian students.	2017
11	Khan	Social media engagement: What motivates user participation and consumption on YouTube?	2017
12	Donelan	Social media for professional development and networking opportunities in academia	2016
13	Rajani & Solanki	Motivations for Using Social Media: An Exploratory	2016

Article code	Source	Title	Year
		Study	
14	Shenoy, Mahendra, & Vijay	What social media sites do college students use most?	2016
15	Evers, Albury, Byron, & Crawford	Internet use and leisure time physical activity of adults–A nationwide survey.	2016
16	Dyson et al	A systematic review of social media use to discuss and view deliberate self-harm acts	2016
17	Hamid, Ishak & Yazam	Facebook, youtube and instagram: exploring their effects on undergraduate students' personality traits	2015
18	O'Neill	Ecological perspectives and children's use of the Internet: exploring micro to macro level analysis	2015
19	Al-Menayes	Motivations for using social media: An exploratory factor analysis	2015
20	Rae & Lonborg	Do motivations for using Facebook moderate the association between Facebook use and psychological well-being?	2015
21	Hamid, Ishak & Yazam	Facebook, youtube and instagram: exploring their effects on undergraduate students' personality traits	2015
22	Boulianne	Social media use and participation: A meta-analysis of current research.	2015
23	Abdulahi, Samadi, & Gharleghi,	A study on the negative effects of social networking sites such as facebook among asia pacific university scholars in Malaysia.	2014
24	Sahu	The impact of social media on university learning	2014
25	Buitendijk et al	Secondary analysis of exiting research on the face book social network.	2014
26	Loader, Vromen& Xenos	The networked young citizen: social media, political participation and civic engagement.	2014
27	Livingstone	Developing social media literacy: How children learn to interpret risky opportunities on social network sites	2014
28		Young people, social media, social network sites and sexual health communication in Australia:" This is funny, you should watch it.	2013
29	Seidman	Self-presentation and belonging on Facebook: How personality influences social media use and motivations	2013
30	Whiting & Williams	Why people use social media: a uses and gratifications approach	2013
31	Jung & Moro	Cross-level analysis of social media: Toward the construction of an ecological framework	2012
32	Ahn	The effect of social network sites on adolescents' social and academic development: Current theories and controversies	2011
33	Kim., Sohn,& Choi	Cultural difference in motivations for using social network sites: A comparative study of American and Korean college students.	2011
34	Williams &	iFamily: Internet and social media technology in the	2011

Article code	Source	Title	Year
	Merten	family context	
35	Utz & Beukeboom	The role of social network sites in romantic relationships: Effects on jealousy and relationship happiness	2011
36	Kaplan & Haenlein	Users of the world, unite! The challenges and opportunities of Social Media	2010
37	Johnson	Internet use and child development: The techno-microsystem	2010
38	Pempek, Yermolayeva & Calvert	College students' social networking experiences on Facebook	2009
39	McHale, Dotterer & Kim	An ecological perspective on the media and youth development	2009
40	Barnes	Understanding social media from the media ecological perspective	2008
41	Lerman	User participation in social media: Digg study.	2007
42	Jordan	The role of media in children's development: An ecological perspective	2004

Table 2 summarized the results of the analysis of papers. In the first step, the open codes were extracted. Then to determine each axial code, the open codes were examined and those that resembled each other were grouped. Afterward, homogeneous axial codes were categorized to establish selective codes.

Table 2
Open, Axial and selective coding social media papers

selective codes	Axial codes	Open codes	papers code
Why to use	Learning	Achievement, learning experiences, learning success, academic development, help to learning.	6,9,10,12,14,16,19, 21, 24, 30, 32, 38,
	Entertainment	Varity in entertainments, ease and free access to entertainments.	2,11,15, 28, 30,
	Psychological	no embarrassment, meet emotional needs, emotional supports, Satisfy desires and expectations	1,13,16,17, 19,20, 29, 30, 35
	Sociological	Belonging to group, membership, effecting of peers, receiving others comments, discussion, establishing and maintains of social relationships.	4,7,21,24, 30,33,
How to use	Active	Critiquing, reviewing and evaluating comments, creating contents, active commenting, discussing ideas,	1, 8,10,11,12, 26, 40.
	Passive	Receiving information, collecting, passive distribution, no spending time for hearing or watching audio and video.	3, 10, 22, 28, 36, 40.
What harms	Internet addiction	Lack of interaction with others and family members, Weakness in doing homework	21, 36.
	Cognitive	Surface processing, reducing memory	24, 28, 37.

selective codes	Axial codes	Open codes	papers code
	harms	engagement and Habit of using fragmented content	
	Physical harms	decreased physical activity, poor diet, poor sleep quality, Eye pain, anorexia or overeating, obesity, crooked or humpback, pain in arms, legs and neck muscles	23, 25.
	Family harms	Reduce opportunities for interaction between family members, Lack of monitoring each other's virtual activities or conversely, extreme and incorrect control, Generation gap, Consumerism and shaking of family values and its restructuring	5,22, 34,
	Lying and cheating	Loss of private information such as bank card number, Publish private photos, pornography	23.
What solutions	Filtering	Closing inappropriate sites, restrict access to inappropriate images, videos, and fake news	23.
	Media literacy for individual, families.	Learning how to use social media, critique it, create and share content, participate in content production, ways to search for relevant content	4,5,7,8, 23, 27, 34,
	Holding Media ecological perspective	Emphasis on micro and individual instructional methods, encourage families and peers to make good use of social media in meso level, establishing a suitable space and proper terms and conditions in the city and living space for the use of social media at the exo level, Review of macro-social and economic structures in line with the evolution of social media	4,6,15, 27, 31, 39, 40, 42

Discussion

Why to use

SMs are designed such that they can readily meet users' communicative, intellectual and information needs. Uses and gratification theory posits that the frequency with which users visit SM depends on the degree to which it can meet their needs. Moreover, users are active audiences that select SM on purpose in which to find satisfaction (Chuang, 2015). By emphasizing the integrity of the technical and social aspects of media, social informatics approach envisages technology users as the social agents whose characteristics, interests, values and actions should be identified by media developers (Sawyer & Tyworth, 2006). Chouchani & Abed (2018) propose that users are social actors that handle technologies consistent with social conditions, situations, processes and usage patterns. In media richness theory, it is suggested that a rich medium is one that provides the users with verbal and non-verbal features appropriately. In this regard, SM are considered as rich media by providing features such as picture upload, group selection and management, public and private chat, text messaging, video and audio upload, ubiquitous access to downloaded files, and customizable message presentation, storage and dissemination. In social identity theory emerged from the impersonal communication settings, a lack of some indications or distrust of them makes the

communicating parties enter into interaction quite impersonally and conservatively. Besides, in response to the anonymity of their interlocutor, they participate in communication act openly and confidently (Brinker, Gastil & Richards, 2015). Hyper-personal theory asserts that communication within a SM emanates from the status and situations of the network so that it is not limited to the communicating agent, and recipients of the messages may not selectively pick and interpret the received indications due to the absence of message sender. On the contrary, the sender may freely select and communicate the messages to the recipients. The third dimension of features is communication channel that enables synchronous and asynchronous text messaging, voice communication and video conferencing. The fourth dimension refers to the effect of feedbacks and features in the channel (Gulbrandsen & Just, 2011; Sumner & Ramirez, 2019).

By reviewing effective theories of SM designs, one can say that these networks are designed to meet users' mental and social needs in a social context so that the users can creatively use the features to fulfill their private, public, communicative and information needs. Research has shown that users use SM for the purposes of self-expression, leisure, access to information, belonging to the group and membership, influencing others, updating, and receiving other people's opinions on different issues (Sponcil & Gitimu, 2013). Bolton et al. (2014) reported that SM facilitate access to information, updates, dynamics of information, learning, questioning, interpersonal discussions, reflecting on issues, and discovery for users. From an emotional side, SM tend to meet emotional needs, support emotions and fulfill desires and expectations. From a sociological viewpoint, SM facilitate a sense of membership and belonging and meet the need for acceptance. Moreover, the networks help to entertain users and fill their free time. Capua (2012) showed that people used Facebook to create and maintain social relations, learn from others, understand their strengths and weaknesses (self-discovery), establish relations, influence others, gain new experiences interacting with people from different cultures and regions, and recognize their self-management skills and personal characteristics. In fact, self-assessment and feedback are the main reasons why people use social media sites. Sahu (2014) maintained that Dutch youth typically used social media sites to comment and receive feedback, to overcome social restrictions such as shame and standing on ceremony, and to have easier social relations. Buechel & Berger (2014) found that emotional stability skills improved in the students who used Facebook and Twitter. Considering the limit on the number of characters in Facebook and Twitter postings, users may only express themselves in a limited way, and this will contribute to their emotional stability. Cheng & Li (2014) pointed out that users use social media sites based on their mental and collective norms, social identity, perceived personal values, self-discovery, interpersonal relations, social understanding, leisure and social presence. Therefore, the emphasis of SM design theories on better capabilities to attract users along with SM recreational, information, feedback, interactive, and self-expressive as well as anonymous, asynchronous interaction usages appeal to users immensely. A number of questions may be posed to help identify the solutions: Do users use SM improperly due to their lack of time management skills, failure in critical or rational thinking, and a lack of management skills (at the individual and micro-level)? Do families, universities, and other peripheral settings contribute to users' preparation in optimal use of cyberspace (the meso-level)? Do the peripheral settings provide the necessary conditions and opportunities for recreation, self-expression, information access, and peer interaction (the meso-level)? Do non-peripheral settings such as provincial governments, municipalities,

cultural institutions, and the education system adequately play their role in preparing the users to enter the cyberspace (the exo-level)? Do the social, economic, and philosophical structures of the society direct the users toward inappropriate use of VSNs (the macro-level)? Does the history of technology import to Iran support the appropriate use of VSNs (the chrono-level)?

How to use

The way SM are used depends on the degree to which users participate in the production and dissemination of ideas, messages or information that is processed, stored and published in SM. Production and dissemination of information is a key feature of Web 2.0 and social media sites that provide users with numerous facilities to produce, edit, exchange and share messages at minimum cost and technical knowledge. With the development of such facilities, the cumbersome process of electronic content production was thought to gradually escape elites, authors, and experts and fall in the hands of general users. However, in addition to outreach, several factors such as age, sex, place of residence, income, race, education, marital status, living away from family, Internet-based jobs as well as individual and psychological factors such as internal and external motivation, computer self-efficacy, Web presence, technical skills, writing skills, Internet experiences, users' understating of content and message, audience analysis, and extension and deepening of information contribute to the production and exchange of information by SM users (Blank & Groselj, 2014). Correa (2010) observed that self-perceptions of ability and internal and external motivations are good predictors of users' participation in SM content production so that they are affected by important factors such as technological skills, technology acceptance, Internet experiences, people's understanding of content or messages, people's motivation or perception and self-efficacy in participation.

The emergence of terms such as the "second-level digital divide", the "participation gap", and the "usage gap" denote the fact that, despite the development of Web 2.0 facilities, most of the users play a minor role in content production. In other words, they mostly consume or provide feedback to information. Sahu (2014) noted that most of the users merely read the postings on the SM and provide no feedback. Pempek, Yermolayeva & Calvert (2009) observed that Facebook users often read new posts but were less inclined to update or comment on posts. Suziki & Calzo (2004) pointed out that most of the forum audiences merely read posts and comments and left the page without providing feedback. Experts refer to the "new digital inequality" to characterize the marginal role of average users in producing content or information in SM. Hargittai & Shafer (2006) defined the concept of "second-level digital divide" to emphasize new inequalities among social media users with the emergence of Web 2.0 technologies and increased Internet penetration rate. The inequality lies in the way users use available features to present ideas and information to others. Thus, many users have no role in content production due to a lack of writing skills to expand the subject as well as a lack of technical skills, motivation and self-efficacy. Still, part of this digital inequality results from a lack of incentives to participate in content production, cultural and nonmaterial weaknesses, lack of material resources, and low media literacy. Abdollahyan, Semati & Ahmadi (2013) found that the social, personal and competency conditions did not favor a fair participation of students in social media although they had ready access to the Internet. Jenkins, et al. (2009) referred to the concept of "participation gap" denoting that average users typically serve no role in information production and creation of ideas so that they spend their time on SM by consumption and dissemination of information. They usually do not reflect over the foundations

of the content and merely share the postings. To understand the digital gap, one needs to go beyond a study of accessibility or polarity and adopt a panoramic perspective to address social, cultural, economic, psychological and personal characteristics of users. Moreover, Peter & Valkenburg (2006) refer to "emerging digital differentiation" while van Deursen & van Dijk (2015) propose the concept of "usage gap" and classified the digital gap into four categories including motivational aspects; physical access; technical, cognitive, and social skills; and differences in using technology. van Dijk & van Deursen (2014) showed that Dutch youth who had a lower educational and ideational status read and shared the content on SM more frequently than the elite and authors did. Blank (2013) classified the content on SM into skilled content, leisurely and social content, and political content. He asserts that skilled and leisurely contents are often created and shared non-professionally by novice users while political content is often produced and propagated professionally. Thus, the skilled and leisurely contents on virtual social tools are by far less technical and rich than the skilled content. Bernstein, Bakshy, Burke & Karrer (2012) noted that users work at four levels to create, maintain and direct social media sites. Some are linkers who have no contribution in content production, feedback provision, and critique. They do not even read some updates on the SM. The second groups are lurkers who merely search for, examine and read the posts on SM. The third groups are learners who read the posts on social media sites to gain knowledge but refrain to provide feedback, critique or analysis. The fourth are a limited number of leaders who create contents to lead the general sphere of the social media sites toward a certain path. Li, Bernoff, Fiorentino & Glass (2007) proposed a seven-level technographic ladder to map the way users participate in social media. The rungs of the ladder in an ascending order include the inactive, spectators, joiners, collectors, critics, conversationalists, and creators. They showed that American SM users used the social media sites for reading and sharing posts more than they did for content creation.

The concepts such as the second-level digital divide, participation gap, usage gap and seven-level technographic ladder acknowledge the fact that increased Internet penetration rate in different countries has only contributed to increased number of SM users but not to the ways social media sites are used. The diverse capabilities of SM, the way users use social media sites and their shares of the contents on the social media suggest that most of the users passively view, read and share the updates and posts. Only a small fraction of the users tends to create ideas and content. One can contend that the following social media users suffer various harms without taking a share in user content creation that use SM and features to fill their free time, Users that prefer SM over other settings for self-expression, Users that continue to interact with others on SM without proper time management and planning, Users that accept and share whatever content posted on SM without critical thinking. In relation with this theme, a number of questions are helpful: Do users have the necessary technical, cognitive, artistic and writing skills to create and exchange contents on SM (the individual and micro-level)? Can the users represent their ideas consistent with SM features (the micro-level)? Can the users exchange messages consistent with their goals and needs and their communicating parties (the micro-level)? Does the peripheral environment (e.g. home, university, and religious places) encourage users to produce and exchange new messages consistent with social norms (the meso-level)? Do the structures and rules governing the ultra-peripheral environment encourage users to produce and exchange new content (exo-level)? Do the social philosophy, values and norms facilitate or debilitate the production, exchange and consumption of contents on SM (the macro-level)? Do the cultural and historical backgrounds have the necessary capacity to use SM (the

chrono-level)?

What SM harms

Users that are fascinated by SM features and re-share the posts on social media sites without careful thought may suffer the following harms:

1) Internet addiction: too much and pointless use of SM is one of the most common issues, which was introduced as Internet addiction by Goldberg (Mitchell, 2000). Other researchers have used alternative terms to address the same issue including "pathological Internet use", "problematic Internet use", "compulsive Internet", and "compulsive Internet use". Due to too much involvement in SM, Internet addicts usually fail to do their routines, socialize with family members, interact with peers and colleagues, and do their homework. They do not have enough willpower to control, reduce or stop using the Internet and show aggressive behavior (Durkee et al., 2012). Cheng & Li (2014) studied seven regions of the world and found that 6 percent of Internet users were Internet addicts. Accordingly, northern and western Europe had the lowest Internet addiction rate (2.6%) while the Far East had the highest amount of Internet addicts (10.9%).

2) Cognitive impairments: Internet and social media induce shallow processing, less memory engagement, mental fragmentation, and getting used to clipped information (Carr, 2010). Skimming: the links and contents exchanged on social media are too bulky for users to cover; thus, they only click and browse the posts. Users spend 20 seconds on average to visit web pages, which indicates shallow browsing and skimming of web pages. Fragmented reading refer to multimedia contents combine various modes of presentation on the display including text, audio, video, and advertisements so that the meaning is fragmented, and users are distracted. The professional content on internet and SM are typically produced using persuasive techniques based on multimedia principles in order to readily code and present the desired information to the users. In turn, users decode, read and understand the content. In this method of content fragmentation, users fail to fathom out or build upon the content.

3) Physical damages: Lin, Chen, Chang & Lin (2013) noted that too much use of the Internet and SM may lead to decreased physical and social activities, poor nutrition, and poor sleep, hence a bad lifestyle. Seraji & Alibakhshi (2015) showed that teenage social media users suffer ophthalmic, bulimia or anorexia, obesity, crooked back, Kyphosis, and pain in the hands, legs, or neck.

4) Family harms: in the age of social media, families face challenges such as less chances of interaction among family members, no mutual monitoring of virtual activities or extreme control, decreased social interactions in the family, generation gap, consumerism, violation of family values, and changes in family structure. Paknezhad (2016) narrates the life of a couple who went through an uncontested divorce after 15 months of marriage for one of them excessively used social media sites, friended many users of the opposite sex, exchanged love messages, and gradually failed interpersonal relationship.

5) Theft and fraud: Iranian Cyber Police has to deal with some offenses including loss of personal information such as passwords, debit card number or password; publication of private photos and messages; fraud; money laundering; sexual offences; and pornography.

6) Norm breaking and weakening of social norms: adaptation of technologies to social norms often occur with difficulty in the countries transferring and importing technologies. Social norms and values may suffer harms due to the growing chaos in SM sphere and a lack

of control over the production and exchange of content (Kaplan & Haenlein, 2010). Thus, SM are often used to circulate pornography, news, texts and images against the Iranian government to undermine Islamic values. Asking like the following questions will help better understanding of SM harms: Does inappropriate use of social media lead to Internet addiction (the individual or micro-level)? Does inappropriate use of social media cause eye injuries, physical damages, inactivity and obesity (the micro-level)? Does inappropriate use of social media damage family relations, increase sexual abuse, and cause theft and fraud (the micro-level)? Do the peripheral and ultra-peripheral settings as well as legal and structural deficiencies add to the SM harms? Does the dissemination of fake news on social media sites abuse public trust and people's trust in officials (the exo-level)? Do the SM weaken social values, history and philosophy (the macro- and chrono-levels)?

Media ecology perspective

O'Neil (2015) proposed a framework based on media ecology perspective at five levels including Micro-, Meso-, Exo-, Macro-, and Chrono-system, which may be used to adopt policies and operational measures at different levels to cope with SM harms. This approach posits that media engulf people's life and affect their perceptions, emotions, values and ethics. For cognitive, emotional and social development, people need complex interactions and continuous engagement with people, objects and environmental entities. These interactions occur around every individual in the form of periphery processes and function as the driving force of growth to affect the relations of the individual with family members, relatives, and friends; individual and group games; learning opportunities; problem solving; media access and use. These processes, however, are often unstructured and unstable. Moreover, their intensity and direction are different in different people and environments. SMs are in a growing chaos status due to their nonlinear, interactive and complex nature. Growing chaos is a situation where nonlinear, diverse and community-based features along with horizontal and user-centered thinking coincide with inherent features of media such as economic profits, promotion of consumerism, cognitive and social stereotyping, and latent ideological agendas to thwart any attempts at hierarchical control and top-down ordering. Therefore, policymaking and operational measures, aimed to reduce SM harms, should be comprehensive and multilayered and entail binding and persuasive legislation.

Micro-system refers to the world around every individual is surrounded by computers connected to the Internet, portable audio tools, software, digital televisions, e-books and digital resources. These facilities affect the individuals' relations with environmental, familial, and educational factors such as university, family, religious places, workplace, neighbors and peers. Every individual may manage their interactions with the media at the micro-level. Meso-system related to the interactions among environmental, personal and educational factors are considered at this level. Exhortative and abiding policies and actions should be galvanized on mutual and multilateral interactions among peripheral factors such as family-school, university-workplace, family-neighbors, university-religious places, university-peers, family-workplace, family-religious places, and family-peers' interactions.

Exo-system is a level could be considered as the individuals' indirect and non-peripheral environment, which involves institutions and factors such as subcultures, educational system, information technology, industry and business, transportation system, public institutions, leisure time sectors, and the mass media like television. Thus, one needs to understand and

adopt the required exhortative and abiding policies and actions vis-à-vis the role of subcultures; public institutions such as municipalities and governorships; ICT system such as electronic and Internet service firms such as Mobile Telecommunication Company of Iran (MCI), Irancell, and Rightel in content production and appropriate acculturalization; industrial and business system; transportation system; leisure time systems and mass media. In order to operationalize measures at the exo-system level, Internet addiction clinics are set up in China and Italy within the healthcare system. A congress law has restricted membership in social media sites to the adolescents above 13 years of age in the USA. Cheng & Li (2014) found a positive correlation between Internet addiction and transportation system such as urban traffic and air pollution.

Macro-system is social macro-factors fall in this subsystem, including lifestyle, customs, ideology and beliefs, social interaction patterns, norms, social structure, social opportunities, lifetime alternatives, political philosophy, economic models, and cultural values. Policymaking and operational measures are recommended at the social macro-level based on these factors. Abiding and exhortative decisions of the Communication Regulatory Authority of the I.R. Iran and the Supreme Council of Cyberspace apply at this level. Chrono-system refer to subsystem addresses the historical reaction of the society to technology, the way technology is dealt with, the status of technology in the lives of the ancestors, the process of technology acceptance, and the digitalization of organizations and people's lives. Societies that have historically been importing and transferring technology tend to deal with technology in a different way compared with the nations inventing technology. Therefore, the way nations have historically approached technology affects policymaking and operational measures in SM management. In this approach, the individual is the basis of policymaking and operational actions, playing an active role at various levels. In the traditional media types, the policymaking was carried out at macro-levels, and operational measures were taken at lower levels such as meso- and micro-levels. However, due to the growing chaos in SM, macro-policies should be adopted along with timely policymaking and subsequent abiding and exhortative measures at all levels. Figure 1 illustrates the associations of the five levels affecting SM.

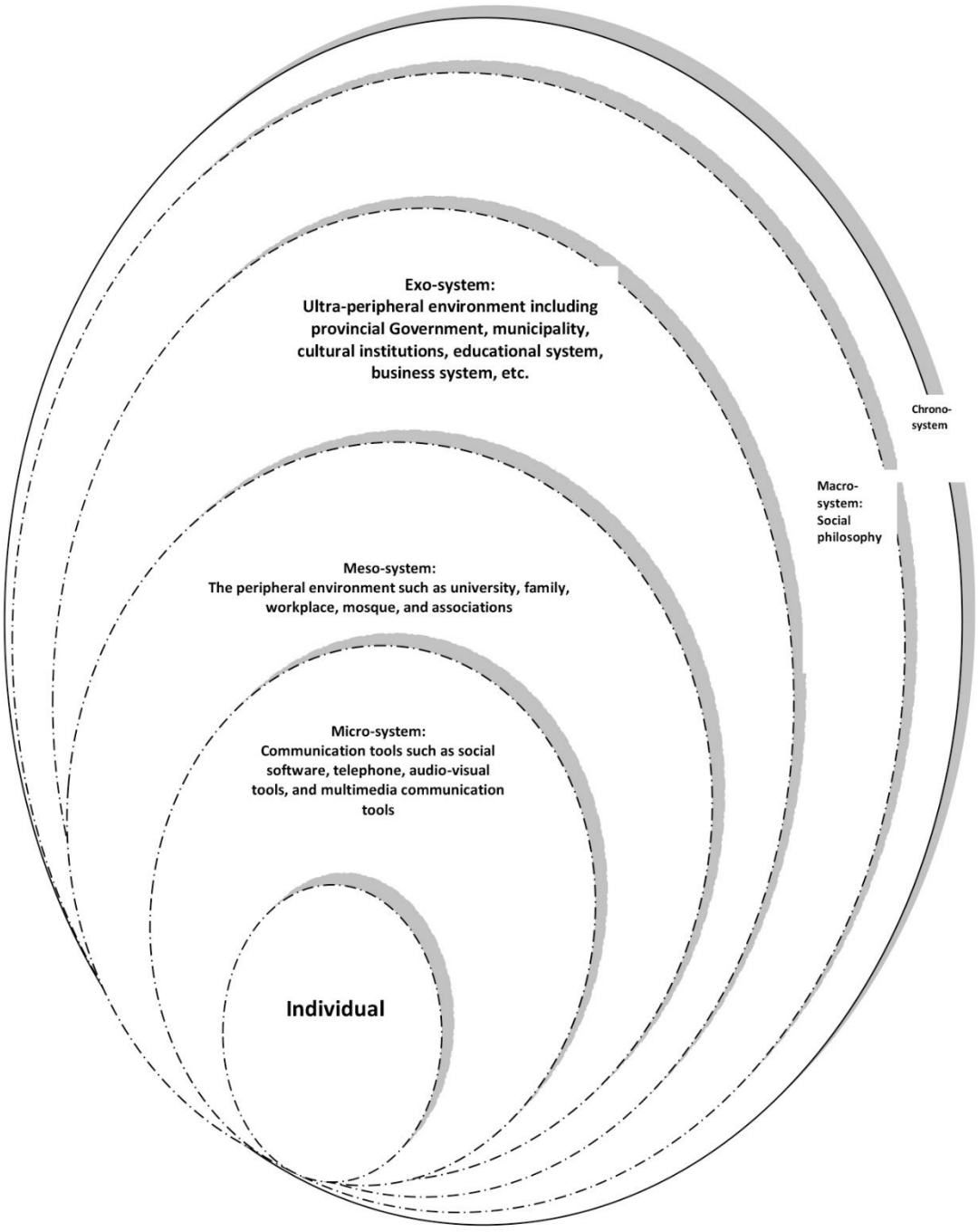

Figure 1. The associations of the five levels affecting SM use in the media ecology perspective (adapted from O'Neil, 2015)

The majority of social media users such as weblogs, Facebook and Twitter used to be students, academics and the educated people in Iran. However, with the emergence of Viber and Telegram, the range of users was extended to different social groups including housewives and workers. This growing trend has encouraged the users to use cyberspace for information, communication, online banking services, online shopping, and e-government services. Despite the considerable advantages of SM adoption, users may suffer numerous harms as well. Therefore, the present study aimed to provide solutions to deal with social media harms. Accordingly, four relevant questions were posed as follows: 1) why do users use SM? 2) How

do users use SM? 3) What harms may affect SM users? 4) What solutions can be worked out to alleviate SM harms? In Japan, Canada, and the USA, media literacy education at schools is one of the common ways of reducing social media harms. Media literacy constitutes training on how to understand, analyze, and comment on media messages and on how to plan and manage media usage (Chen, Lin, Li & Lee, 2018). SM users use these to receive updates, collect information, express themselves, participate in discussions, interact with friends and expand their social relations. Users often exchange specialized, leisurely, social and political content. Average users typically re-share or read but do not create the content on social media networks. The reasons for using SM involve not only the inherent charm and features of these media but also the malfunction of institutions in charge of leisure time, employment and education. How these media are used implies a set of deficiencies and gaps among users, i.e. new digital gaps. These gaps are beyond technical limitations and instrumental features and often relate to individual, mental and social factors. Therefore, some users come to various harms in using social media including Internet addiction, weakened cognitive power, destabilized identity, family problems, physical feebleness, and weakened social values and norms. However, these harms may occur to the users tacitly and inadvertently.

In ecological perspective, it is a complicated and multilayered process to provide solutions to reducing SM harms so that users' reasons and causes of using social media, the methods of their participation, and cyberspace harms should be identified at five levels. Accordingly, one can propose solutions including policy decisions and operational measures to reduce SM harms at the five levels. Table 3 illustrates a two-axis matrix to identify the solutions to SM harms. The four "WH" questions including why to use, how to participate, what harms, and what solutions are measured on the horizontal axis. The vertical axis represents the micro-, meso-, exo-, macro-, and chrono-levels.

Table 3
The four "WH" matrix in media ecology perspective to identify solutions to SM harms

Level	Why to use	How to use	What harms	What solutions
Micro	A lack of critical thinking skills; a lack of planning and time management skills; Family and peers' unawareness of SM harms	Reading contents and postings without providing feedback and critique	Cognitive and procedural weaknesses; vision impairment; physical damages	Making operational decisions at home, among peers, and at workplace to decrease or rationalize SM use
Meso	Parents' preoccupations; apartment living; a lack of sports and recreational spaces	Disseminating information among family members, friends, and colleagues irrespective of their validity; a lack of contribution in producing ideas and content	Distrust in the social system and values; instability	Family determination to create healthy recreations; development of individual and collective recreations; development of reading culture; setting out and observing rules among peers, families, and at workplace about VSN use; cultivation of thought, ideas, and technical skills
Exo	A lack of spaces for self-expression	Unclear duties of social and cultural subsystems in producing content for social media; attention	Debilitation of social structures; cultivation of distrust; decreased participation in	Media literacy education at school; development of sports and recreational centers by municipalities and provincial governments; development of theatre and shows by cultural

Level	Why to use	How to use	What harms	What solutions
			actual environment; moral deviation; fragility of family structure	institutions; boosting employment and understanding the relationship between unemployment and VSN harms; creating structures and systems consistent with new conditions
Macro	Anonymity and abuse potential			Recognizing the role of social, cultural and economic macro-systems in reducing SM harms
Chrono	Fascination with technology			Criticism of past policies and decisions regarding technology transfer methods; determining future policies on SM

Conclusion

The purpose of this research was to identify ways to reduce the SM using harms. in dealing with SM harms, the media ecology perspective provides a comprehensive and systemic view at five levels, which includes culture-building decisions such as media literacy education as well as preventive and mandatory measures such as control and filtering. This approach considers decisions and measures at micro-, meso-, exo-, macro-, and chrono-levels consistent with the characteristics of each level. According to the proposed framework, the users should be educated at the micro-level on how to use SM features effectively and to have critical thinking, logical thinking, time management and planning skills. At the environmental or meso-level, persuasive and preventive policies should be adopted in family, university, workplace, peer groups, public places and mosques to reduce VSN harms so that necessary measures could be taken accordingly. At this level, the exhortative and limiting policies of SM usage should be consistent and comply with media literacy characteristics. The policies and measures of ultra-peripheral institutions, that affect the why and how to use social media, are considered at the exo-level. At this level, the institutions in charge of leisure time, employment, education, culture, and public transportation, and the Islamic Republic of Iran Broadcasting should adopt policies and take measures to reduce inappropriate SM uses. At the macro-level, the social macro-decisions, philosophy, and social values and norms should be developed consistent with SM development to facilitate the appropriate use of social media proportional to exhortative and limiting policies and measures. At the chrono-level, one should look at the historical reactions to technological development within the social context. The countries importing or transferring technologies often have difficulties adapting technologies to their specific needs.

Present research with emphasize on relationships between the users' motivation and participations on SM seek to suggest some solutions for SM harms. These solutions focused mainly on media literacy education and using media ecology perspective. Identifying of these solutions is the contributions of this research in developing body of knowledge in this field. In media ecology perspective, the micro-, meso-, exo-, macro-, and chrono-levels can contribute to both the causes of and the reduction in SM use, the manner of use, and the creation or prevention of harms. Thus, in order to propose solutions to SM harms, one should juxtapose the reasons for and the manners of SM use along with the harms. At the individual micro-level, the users should reinforce time management, logical thinking, and critical thinking skills along with criticism, analysis and evaluation skills. At the environmental meso-level, family, peers and peripheral environments should expand the recreational and self-expressional spaces in

order to regulate the appropriate use of social media. At the exo-level, the education system should incorporate media literacy training, and social, cultural and economic institutions should develop alternative cultural activities and hobbies. At the macro-level, the capacities of the dominant social philosophy should be employed to review and use social networking opportunities. Therefore, one can assert that SM are multifaceted and complicated media that constantly push their users to new situations. It is, thus, not solely the users' responsibility to decide to use the SM appropriately; rather, all social layers and systems should intervene to help users use SM opportunities and shield themselves from harms.

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