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Disconnected in a Connected World: The Loneliness Paradox of Excessive SNS Use and FOMO

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Abstract:

The use of social media platforms such as Instagram, Facebook, and Twitter for communication and information sharing has become widespread. However, the interplay between the cognitive and behavioral aspects of this phenomenon, particularly in terms of negative effects and within the context of mobile technology, has largely been neglected in research. This study seeks to address this gap by reviewing existing literature on the excessive use of social networking sites (SNS) across social, hedonic, and cognitive dimensions, and by examining how issues in work, family, and personal health relate to these factors through the mediating effect of the fear of missing out and loneliness. The theoretical framework is supported by the Stimulus-Organism-Response (SOR) theory, which posits that various environmental elements serve as stimuli (S) that impact an individual's internal states, acting as organisms (O), which in turn influence behavioral responses (R).The survey population includes respondents from Malaysia, China, and Pakistan, using a single wave research strategy where all measurements were taken simultaneously. Our findings support previous research suggesting that a larger social network increases the risk of social overload. Additionally, the survey results indicate that excessive use of social media for hedonic and social purposes positively affects sense of loneliness. Organizations and health professionals

could benefit from this study through identifying the potential impact of social media on employee productivity and mental wellbeing, implementing more beneficial workplace policies on digital wellbeing.

Key Words: Social Networking Sites; SOR Theory; Sense of loneliness; Fear of Missing Out; Technology-FWP friction; Excessive Use of SNS

1. Introduction

The use of social networking sites such as Instagram, Facebook, and Twitter for communication and information sharing has become a commonplace. Studies from different parts of world; shows that 70% of the youngsters frequently use SNS and among them more than 40% of the youngsters spend more than two hours on the social networking sites on a regular basis (Hunt, Marx, Lipson, & Young, 2018). Despite the fact that large number of recent studies are enthusiastically discussing the positive impacts of using SNS and related modern technologies (Sarwar et al., 2023) but not all of those impacts are positive; among some of them are negative as well. The continuous usage of SNS technology can cause negative psychological problems (Luqman, Cao, Ali, Masood, & Yu, 2017) and can create problematic behavior issues in the individuals. Naturally the usage of SNS technology boosts up the enjoyment level and convenience level of the users by giving them free pass to use it as much as they like to. But, impulsive and inappropriate usage of social media can result in online bullying and other negative consequences (Gámez, 2019; Chen, Strong, Lin, Tsai, & Leung, 2020).

The linkage between the cognitive and behavioral aspects of this particular phenomenon has been neglected before in the past literature with respect to the negative consequences and particularly in context of mobile device technology. Previous literature has studied and shed light on the problematic usage of mobile devices technology through the lens of psychiatric, psychological and social psychological point of view. Similarly, few of the past read studies have laid emphasis on the demographical and personality traits of mobile phone technology users(Ayesha, Luqman, Feng, & Ali, 2020), their diagnosis and treatment related to the addiction of technology (Muntinga & Taylor, 2018), and certainly have debated on the dimensions and measurements of instruments regarding problematic use of mobile device technology.

Social networking sites can be defined as virtual communities based on web that allows building up of an individual and partially web world profile. It has observed that technology along with work friction, family friction and personal health problems have great impact on stress but previous literature didn't study about the negative effects of stress related to ongoing use of it (Marino, Gini, Angelini, Vieno, & Spada, 2020). This study aims to work on the research gap that has been found by reading out past literature regarding the excessive use of SNS in context of social, hedonic and cognitive perspective. It further explains how the work/study, family and personal health problems can be linked through the mediating role of fear of missing out on the loneliness.

Fear of missing out (known as "FOMO") has become the most important indicator of SNS usage along with its negative impacts or darker aspects (Tandon, Kaur, & Dhir, 2020).

FOMO is characterized as "an unavoidable anxiety that others may be having compensating encounters from which one is missing" and is "described by a craving to remain consistently associated with others. It can be treated as a kind of inspiration or expectation to interface with others (Hunt, Marx, Lipson, & Young, 2018; Chen, Strong, Lin, Tsai, & Leung, 2020).

2. Theoretical Support

Excessive use of SNS's and its emotional dependency on technology is psychological condition of an individual (Sarwar et al. 2020; Sarwar et al. 2023; Yang et al. 2020). A study conducted by Longstreet, Brooks and Gonzalez(2019) explain that using social media too much can mess up family relationships and make employees less efficient at work. It can also lead to mental health problems like anxiety, agitation, and loneliness (Sabahat et al., 2023). Information and social overload; due to excessive use of SNS's can cause stress, anxiety and psychological problems in an individual's life (Asad, Yasir, Abdul, & Hassan, 2019).

In this regard, SOR theory has been used to support the theoretical framework. SOR model states that different facets of the surroundings can play the role of stimuli (S), affecting individual's internal states and can perform as organisms (O) which as a result move to their behavioral responses (R) (Mehrabian & ' Russell, 1974). Terminology of organisms belongs to a person's inner states which contain perceptions and affect as well as feelings (Bagozzi, 1986) which further effects over an individual's behavior. This model significantly explains an excessive usage of smartphone based social media for two particular reasons: the first one is that this model has been used frequently in predicting the usage pattern of social media (Casale & Fioravanti, 2020). This particular has been employed before to discover the features of creators of techno stress, their side effects on that individual's inner states as well as used to find out the subsequent impact on the individual's rational behavioral aims. The second purpose is with the progress present day smartphone technology, also mobile SNS platforms can serve us the same purpose that a personal computer can provide to an individual (Nasir et al. 2022).

3. Conceptualization of SOR Theory

3.1 Stimulus (S)

Previous studies on social media have stated the technological aspects of social networking sites revolving around three important essentials namely as social, hedonic and cognitive uses (Luqman, 2017). The social use refers to the features of mobile SNS that supports a condition of being friendly, where different people can link and intermingle with each other in order to develop new relations and keep mainlining the existing ones (Wan, Lu, Wang, & Zhao, 2017). Talking about the hedonic element that relates to the superficial enjoyment or fun or we can say pleasant feeling while using the mobile phone SNSs in order to play games also share funny content and videos too. Using SNS through smartphone, users can easily seek any sort of information they want including looking for trends surfacing the web when using different SNS (Guo, Liu, & Liu, 2016; Peris, de la Barrera, Schoeps, & Montoya-Castilla, 2020).

The three important psychological states as a result arising from the experience of SNS users are known collectively as T-FWP friction or conflict also serves the purpose as stimulus factors. The first one is the conflict between technology and family friction or we can say conflict that can be defined as conflict or friction between family related tasks and the specific persistent technology liking usage of mobile device during dinning with family (Bonnaire & Baptista, 2019). The next in line is friction between work and technology and that refers to conflict or friction between tasks that belongs to school or work that are important and at the same time usage of specific persistent technology (Mei, Xu, Gao, Ren, & Li, 2018). Last but not least is fiction between technology and personal health that can be defined as health and physical issues related poor quality of sleep and exhaustion that is derivative of the usage of particular persistent technology. For instance, dedicating so much time while using smartphone technology has been related to certain health problem such to be known as loss of sleep and back issues (Liang, Zhu, Dai, Li, & Zheng, 2021).

3.2 Organism (O)

This particular model advocates that there is some indirect effect of stimuli on the SNS user's behavior due to the stimulus being mediated by the organism (Amendola, Spensieri, Guidetti, & Cerutti, 2019). In terms of the usage of smartphone based SNS, many technological functions and conflicts (frictions) are likely to leave mark on user's internal states which as a result of that influences a person's behavior. Person's strain catches the mental significances of unpleasant circumstances alongside the assistance of enthusiastic depletion which stimuli it portrays sentiments of being genuinely overextended (Asad, Yasir, Abdul, & Hassan, 2019). With regards to SNS use strain is viewed as a mental response to negative natural improvements ascribed to the utilization of SNSs. Besides work stress from things like too much work and communication issues, this study focuses on the idea that using social media too much for socializing, fun, or thinking causes tension between work and personal life, which then increases stress levels (Luqman, Cao, Ali, Masood, & Yu, 2017; Apaolaza, Hartmann, D'Souza, & Gilsanz, 2019).

3.3 Response (R)

In view of SOR research, "the conduct reaction mirrors the conduct toward the boost induced by the mediating living being reaction" (Mehrabian & ' Russell, 1974). In the cell phone based SNS setting, a client is presented to different innovative boosts as far as the stage's social, decadent, and intellectual use highlights. Utilization of these highlights makes fluctuating degrees of T-FWP contact and strain which actuate client social expectations. Social expectations are firmly connected with the mental experience of utilizing a SNS, which may be certain or negative (Lo Coco, et al., 2020). The SOR paradigm speaks to the total pattern of SNS selection to end which adds to our comprehension of the stopping conduct of SNS clients.

4. Literature Review

By building and maintaining virtual personal profiles, social networking sites are becoming more popular as an online medium for interacting with friends and family (Bersani, et al., 2021) as well as making new contacts based on shared interests (Chamberlain, Ioannidis, & Grant, 2018; Asad, Yasir, Abdul, & Hassan, 2019). This has been argued that excessive usage of social technologies can raise problems for young generation (Pettorruso, et al., 2020). The new generation is inclined to use SNS for socialization which often leads to the type of use where they also have been spending time just to keep their accounts on social networking sites updated (Metin-Orta, 2020). Online platforms are used by them basically to socialize or remain socially active but excessive use of SNS displays the possibilities of being addicted to it (Dhir, Yossatorn, Kaur, & Chen, 2018). The process slowly transforms into excessive or additive socialization or use of SNS (Elhai, Gallinari, Rozgonjuk, & Yang, 2020).

4.1 Excessive Hedonic use of SNS

The hedonic use of social media or SNS refers to use these sites for the sake of pleasure or just for entertainment (Tandon, Kaur, & Dhir, 2020). The hedonic use includes playing online games, watching and making videos, etc (Pettorruso, et al., 2020). Hedonic use appears to be the cause of in a way that it comes with reward-based system and encourage participating and continuing using the SNS to the excessive levels (Caoa & Yub, 2019). It appears to be rewarding in such a way where using it as a stress relieving mechanism and trigger the part where it enhances the sense of pleasure (Masood A. , Luqman, Feng, & Ali, 2020; Caoa & Yub, 2019). But an excessive use of SNSs for fun, enjoyment and the source of entertainment may result in instant fulfillment and gratification but if used for longer intervals in such a way it can cause serious damage as the aftermath of excessive use (Caoa & Yub, 2019; Gioia, Rega, & Boursier, 2021). It is evident that usage for the sake of enjoyment and pleasure builds a stronger intention of use of SNS than use it for utility purposes (Caoa & Yub, 2019; Sarwar, Zulfiqar, Aziz, & Chandia, 2019). Building up on the definition of the Hedonic usage and adding it with the technologies that are the basis of social networking sites that its value is defined by the level of fun or enjoyment that the user experienced from it. So, any research or model that intends to explore hedonic usage of SNS should consider the impact of fun and enjoyment it comes with (Asad Javed, Muhammad Yasir, Abdul Majid, & Shah., 2019; Alalwan, Rana, Dwivedi, & Algharabat, 2017; Gioia, Rega, & Boursier, 2021).

4.2 Excessive Cognitive use of SNS

The use of social networking sites in creating new contents, sharing new ideas/opinions, developing new practices, using the content owned or shared by other content creators is the cognitive usage (Ofir Turel & Babajide Osatuyi, 2018). The excessive cognitive use of SNS refers to the process where the user gets the information out of newer interactive mediums of communication where users share their experiences, ideas, messages and all the other type of information including even gossips personal life stories, news and expertise about anything, etc.(Haapakangas, Hallman, Mathiassen, & Jahncke, 2019). The use of extra SNS leads to poor performance as it effects directly of a person's cognitive abilities and effects memory tasks and have a significant association between them even when the use of SNS are not

recorded during the task(Haapakangas, Hallman, Mathiassen, & Jahncke, 2019; Asad Javed, Muhammad Yasir, Abdul Majid, & Shah., 2019).

4.3 Sense of Loneliness

Loneliness originates when an individual experiences an unpleasant and troubling state of his/her social relationship after a thorough assessment. When the desired and perceived state of social relationship do not meet at the same level this results into reaction, known as loneliness (Moqbel & Kock, 2018). The gap is experienced between the relationship that is intended by an individual and the actual relationship is called loneliness (Mingming Deng & Wu, 2020). With the advent and then excessive use of SNS it has to be considered that if the SNS are making people more connected and lowers the feeling of loneliness (Apaolaza, Hartmann, D'Souza, & Gilsanz, 2019). The greater social cost of SNSs usage is also said to be a reason of lesser social involvement, decreased physical or face-to-face interaction among people using SNS and elevated feeling of loneliness or social isolation (Kexin, Yuxiang, & Zhang, 2018). The realization would come in such a way that there would be a lot of internet friends but there will lesser real friends (Bersani, et al., 2021).
Loneliness is being viewed here as a product of negative context of social exchange or of social relationships. So, the hypotheses are:

H1a: Excessive social use of SNS has significant impact on the sense of loneliness.
H1b: Excessive hedonic use of SNS has significant impact on the sense of loneliness.
H1c: Excessive cognitive use of SNS has significant impact on the sense of loneliness.

4.4Fear of Missing Out (FOMO)

FOMO is composed of irritability, anxiety, and feelings of inadequacy, with these emotions having a tendency to exacerbate when an individual log in to internet based life sites. Characterized the fear as "an inescapable fear that others may be having remunerating encounters from which one is missing (Dempsey, O'Brien, Tiamiyu, & Elhai, 2019). Fear of missing out (FOMO) is a more up to date character including hesitation to miss significant data, including social data. FOMO brings about the need to much of the time remain associated with interpersonal organizations (Bonnaire & Baptista, 2019; Dempsey, O'Brien, Tiamiyu, & Elhai, 2019). Individuals high in FOMO likely overuse their cell phones to fulfill the need to remain associated. FOMO seems to drive abuse of internet-based life dependent on web studies with undergrads and network members (Hou, Xiong, Jiang, Song, & Wang, 2019).

To the date, no investigation has exhibited how FOMO identifies with mental and physical wellbeing while additionally considering by and large online networking use (Sheldon, Antony, & Sykes, 2021). FOMO may enact the social monitoring system, as believing like one "missing out" what others are doing, compromises their social associations with others. The actuation of social observing frameworks can have physical impacts; for instance, when an individual foresees being dismissed from a gathering, they feel social torment. Fear of

missing out is absolutely associated and has its impact on the work tasks, personal relationships and personal health problems as well. The first part work or task friction and fear of missing out is related in a way that during work or performing any task some people are always eager to know that they should keep themselves updated with all trending news on the social network sites so through constant contact via smartphone based technology. The ultimate result comes as wastage of time, attention diversion, and incomplete job works, etc. The second part family relation friction refers to the interruption between the free times that individual should spend with his or her family to keep the bonds strong and healthy, and social media technology. Like in current scenario some people like to use of SNS on smartphone instead of spending time with family. Further, as it was discussed earlier that excessive usage of SNS can cause problems which can be related to health, for example sleep deprivation. Fear of missing out element in this particular situation can cause individual health problems just for the sake of keeping in touch with the current trending of social media sites.

H2a: Excessive social use of SNS has significant impact on Fear of missing out.
H2b: Excessive hedonic use of SNS has significant impact on Fear of missing out.
H2c: Excessive cognitive use of SNS has significant impact on Fear of missing out.
H3**:** Fear of missing out (FOMO) significantly mediates the relationship between excessive social use of SNS (H3a), excessive hedonic use of SNS (H3b), and excessive cognitive use of SNS (H3c) and sense of loneliness.

4.5 Technology-FWP friction (Family, Work and Health related friction)

The three important types of states that arise by using SNSs excessively from the individual's experiences; collectively known as T-FWP and in the previous studies they have also served as stimulus factors. So, the first is technology family friction which is defined as a conflict or a friction between tasks and the use of specific persuasive technology that can either be using of a mobile device while dinning with family (Qahri-Saremi, Vaghefi, & Turel, 2020). By using and relating to Bandura's concept of reciprocal determinism in social cognitive theory (Bandura, 1986) as per which one's conduct can change the way condition which can be either family or work is seen by an individual and the way that individual connects with nature. Expanded utilization of versatile SNSs will in general upset the public activity of a person which can be holding with the loved ones.

The technology family friction occurs when the users neglect family or social relationships because of the habit of technology addiction (Shanique, Andrew, & LaMarre, 2019). Such sort of conduct may make or it can begin wellbeing related issue that is brought about by the over utilization of this innovation and can cause issues. Also, many activities that can be either sports, studying or hobbies conflict with family demands (Rodrigues & Pandeirada, 2020).

The second part of this tree is known as technology work friction refers to the conflict between work or school tasks and using a particular unavoidable innovation which can be nonstop commitment with versatile innovation to the detriment of school or business-related

significant errands (Rodrigues & Pandeirada, 2020). Addicted users often prioritize their excitement over doing their work or school tasks, which can lead to mistakes in their work or it can cause problems academic section (Haapakangas, Hallman, Mathiassen, & Jahncke, 2019). People who are dependent on SNSs would be relied upon to perform more awful at work in light of the fact that they will in general put more exertion and time in SNS at work or during study and disregard different exercises (Rodrigues & Pandeirada, 2020). Recent evidence has shown that the personal use of SNS (technology) in the work place slightly reduced the perceived performance (Rodrigues & Pandeirada, 2020). Past exploration has demonstrated that entrance to addictive upgrades evokes psychological deficiencies, for example, that on working memory (Haapakangas, Hallman, Mathiassen, & Jahncke, 2019) which would bring about overlooking how to play out specific undertakings, trouble with critical thinking and setting aside more effort to process new data.

Finally, the third consequences are technological- personal health friction that can be characterized as wellbeing and physical issues, for example, helpless rest quality and SNS depletion that is gotten from the utilization of explicit unavoidable innovation. Committing an excess of time to utilizing cell phone innovation has been appeared to cause a specific medical issue, for example, lack of sleep and spinal pains (Haapakangas, Hallman, Mathiassen, & Jahncke, 2019). A few late investigations have indicated that people who commit such a great amount of time to innovation will in general lose rest (Kexin, Yuxiang, & Zheng, 2018) have problems in their interpersonal interactions and interfere with their professional environment (Rodrigues & Pandeirada, 2020). Research has given clear proof that abuse or maladaptive utilization of innovation can effectively affect the prosperity and mental working of kids, teenagers and youthful grown-ups (Apaolaza, Hartmann, D'Souza, & Gilsanz, 2019; Caoa &Yub, 2019). Explicit individual defenselessness factors decide the conceivable negative mental impacts of SNS or innovation at such a youthful age (Tandon, Kaur, & Dhir, 2020), distortion of the web profile and existing mental health problems mainly depression (Błachnio & Przepiórka, 2018). The utilization of mobile technology or SNS is related with mental challenges, for example, low confidence, yet in addition with emotional wellness issues, for example, tension, sorrow and dejection (Bersani, et al., 2021).

H4a: Technology-Family friction positively moderates the relationship between fear of missing out and sense of loneliness.
H4b: Technology-Work friction positively moderates the relationship between fear of missing out and sense of loneliness.
H4c: Technology-Personal health friction positively moderates the relationship between fear of missing out and sense of loneliness.

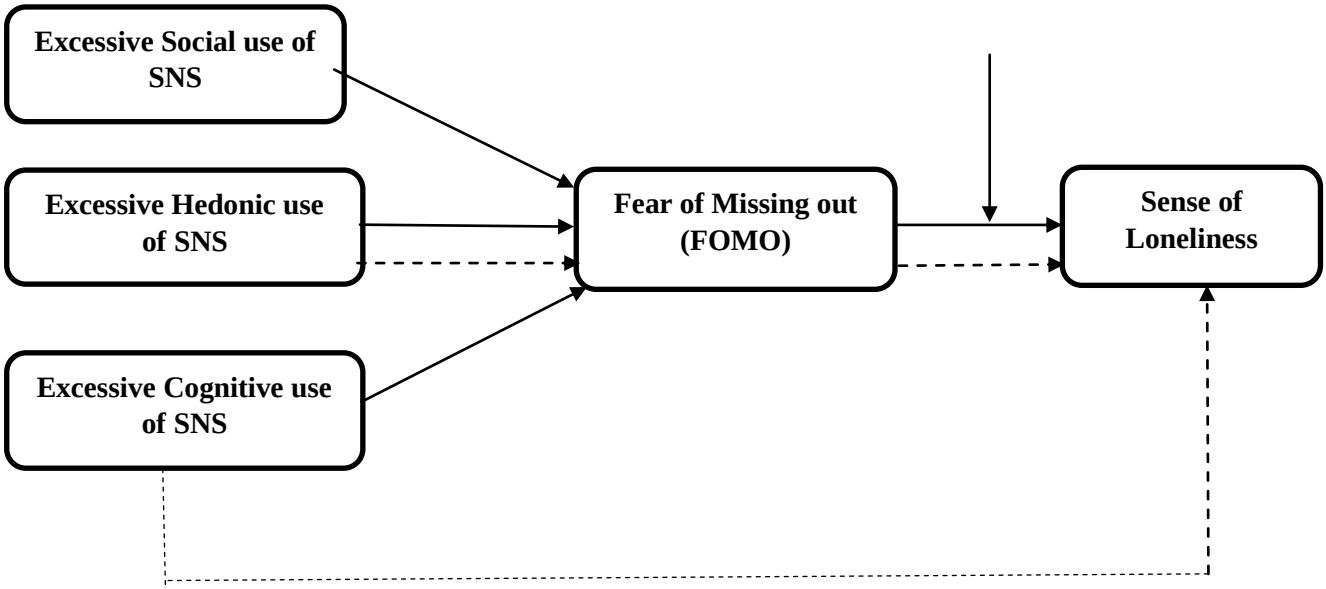

Fig 1. Proposed Research Model

5. Research Methods and Data Collection

Data was collected from individuals who are frequent users of social networking sites through employing snowball sampling technique. The population includes respondents residing in Malaysia, China, and Pakistan. The chosen criterion is based on the educational background holding graduate, master and PhD degrees, working or non-working individual from service/manufacturing sector. Inclusion of respondents was based on access and willingness in response to our request for data collection for the study. Researchers in past have also agreed that studying single kind of sample bounds the generalizability of its findings (Ohly & Fritz, 2010). The study employed single wave research design where each measurement point was measured at the same time.

To address issue of same source, authors conducted field survey with data tapped from multiple respondents respectively. Specifically, we measured the exogenous and endogenous variables Excessive (Social, Hedonic and Cognitive) use of SNS with SOL, moderating role of T-WFP Friction and FOMO as intervening variable simultaneously from the respondents through self-reports. The sample size was based on Morgan's table which stated that the maximum number of respondents must be 384 that is considered as a sufficient amount for data analysis (Krejcie & Morgan, 1970). Each survey was allotted unique code and was tagged to personal information of the participants to make it convenient.

5.1 Construct Measurements

The following measures were employed for the study constructs:

Excessive social use of SNS construct was measured using (Ali-Hassan, 2015) scale based on 5 items. Respondents answered their usage of smartphone based SNS for the hedonic purposes based on Maier's scale (2015) comprising 3 items. Excessive cognitive use of SNS

was measured by combining items using (Maier, Laumer, Eckhardt, & Weitzel, 2015) and (Luqman, 2017) 4 item scale. Sense of Loneliness; the Social and Emotional Loneliness scale also known as (SELS) was taken to measure the general loneliness and it was developed by Adoric Cubela and Nekic (2002).Fear of Missing out (FOMO) construct was measured by using 10 item scale from (Przybylski et al., 2013). Technology family friction smartphone based SNS users rate their technology family friction using (Turel, 2016) 5 items scale. Technology work friction was evaluated by respondents using (Hong, 2012) scale which is based on 4 items. Technology personal health friction was measured by the respondents using 5 point scale obtained by combining items employed in two studies (Maier, Laumer, Eckhardt, & Weitzel, 2015) (Zheng, 2016).

6. Data Analysis and Results

The Structural equation modeling technique was employed using Smart-PLS version 4. Using SEM technique, the relationship between the dependent, independent, and mediator is measured. For measurement analysis, outcome values of factor loadings were between 0.757 and 0.900 which were above threshold level (Hair, Black, & Babin, 2010).Reliability analysis is shown in table (1). The constructs of study composite reliability met the recommended threshold value of 0.70 (Hair, Black, & Babin, 2010). Values of 'Average Value Extracted' were also greater than 0.50 indicating discriminant validity (Fornell & Larcker, 1981). In contrast to that, correlation of study construct with others was less than 0.80, proving presence of discriminant validity (Fornell & Larcker, 1981) (Table 4). All values were above threshold levels, indication of no-cross loading issue, except from one item that we excluded from final analysis (Table 3). Square root of AVE value of each construct was greater than correlations between constructs giving presence of discriminant validityin table (2).

As the data were collected from multiple sources and cross-sectional so it might have been prone to the common method bias (Podsakoff & MacKenzie, 2012). The study employed Harman's single factor method to access six conceptual variables in theoretical model and found no CMB problem, as multiple factor explained only 25.5% of variance at maximum, lower than limit of 50%. The overall variance inflation factor to distinguish multi-collinearity between hypothesis was 1.27-1.57 less than proposed value of 10.0 (Hair, Black, & Babin, 2010). Table 5 shows model fit with given values.

Structural educational modeling was conducted through smart PLS-4 to measure hypothesis. Results showed proposed research model exhibits significant relationship among variables (Figure 2). Excessive social and hedonic use has significant association with sense of loneliness. However, Excessive cognitive use of SNS did not find significant relationship with fear of missing out and sense of loneliness. Fear of missing out significantly mediates the relation between excessive, hedonic and cognitive use of SNS and SOL. Technology Family, Health, Work -Friction has positively moderates the relationship between fear of missing out and sense of loneliness (Figure 3). Results are given in table (6).

6.1 Study Results

Table 1: Confirmatory Factor Analysis (CFA)

Construct	Item	Factor Loading	Average variance extracted (AVE)	Cronbach's Alpha	Composite Reliability
ESU	ESU1	0.757	0.698	0.856	0.883
	ESU2	0.900			
	ESU3	0.838			
	ESU4	0.842			
EHU	EHU1	0.779	0.640	0.818	0.832
	EHU2	0.804			
	EHU3	0.785			
	EHU4	0.831			
ECU	ECU1	0.870	0.805	0.919	0.921
	ECU2	0.899			
	ECU3	0.921			
	ECU4	0.898			
FOMO	FOMO1	0.894	0.780	0.906	0.912
	FOMO2	0.906			
	FOMO3	0.891			
	FOMO4	0.841			
SOL	SOL1	0.834	0.762	0.895	0.898
	SOL2	0.892			
	SOL3	0.898			
	SOL4	0.865			
TFWP	TFWP1	0.868	0.681	0.842	0.856
	TFWP2	0.842			
	TFWP3	0.866			
	TFWP4	0.715			

Table 2: Discriminant Validity: Heterotrait-monotrait ratio (HTMT) – Matrix

Construct	ECU	EHU	ESU	FOMO	SOL	TFWP
ECU	0.445					
EHU	0.424	0.416				
ESU	0.242	0.323	0.337			
FOMO	0.249	0.317	0.460	0.566		
SOL	0.258	0.310	0.395	0.807	0.620	
TFWP	0.172	0.112	0.140	0.472	0.372	0.490

***ESU**: Excessive social use of SNS; **EHU:** Excessive hedonic use of SNS**; ECU:** Excessive cognitive use of SNS**;FOMO**: Fear of Missing out; **SOL**: Sense of Loneliness; **TFWP**:Technology-FWP Friction*

Table 3: Cross Loadings of the Variables

Construct	ECU	EHU	ESU	FOMO	SOL	TFWP
ECU_1	**0.870**	0.379	0.379	0.189	0.201	0.230
ECU_2	**0.899**	0.342	0.312	0.195	0.187	0.185
ECU_3	**0.921**	0.331	0.325	0.211	0.206	0.203
ECU_4	**0.898**	0.341	0.311	0.204	0.220	0.199
EHU_1	0.317	**0.779**	0.254	0.189	0.222	0.198
EHU_3	0.316	**0.804**	0.286	0.217	0.229	0.189
EHU_4	0.249	**0.785**	0.278	0.209	0.201	0.192
EHU_5	0.348	**0.831**	0.300	0.280	0.224	0.253

ESU_1	0.344	0.262	**0.757**	0.192	0.256	0.225
ESU_2	0.312	0.284	**0.900**	0.299	0.339	0.339
ESU_3	0.312	0.286	**0.838**	0.223	0.347	0.250
ESU_4	0.287	0.338	**0.842**	0.290	0.408	0.323
FOMO_1	0.200	0.251	0.254	**0.894**	0.445	0.609
FOMO_2	0.240	0.288	0.336	**0.906**	0.486	0.669
FOMO_3	0.173	0.245	0.272	**0.891**	0.409	0.639
FOMO_4	0.167	0.217	0.214	**0.841**	0.458	0.589
SOL_1	0.174	0.196	0.302	0.449	**0.834**	0.429
SOL_2	0.195	0.223	0.393	0.431	**0.892**	0.473
SOL_3	0.241	0.290	0.379	0.450	**0.898**	0.534
SOL_4	0.178	0.238	0.351	0.452	**0.865**	0.457
TFWP_1	0.171	0.245	0.311	0.586	0.456	**0.868**
TFWP_2	0.183	0.215	0.300	0.564	0.430	**0.842**
TFWP_3	0.216	0.246	0.331	0.676	0.517	**0.866**
TFWP_4	0.178	0.153	0.189	0.502	0.377	**0.715**

Note: Bold values indicate the item loadings on constructs.

Table 4: Descriptive Statistics, Correlation Coefficients

Constructs	Mean	Std. Deviation	ECU	EHU	ESU	FOMO	SOL	TFWP
ECU	0.072	.052	**.805**					
EHU	0.184	.049	.386**	**.640**				
ESU	0.223	.052	.375**	.348**	**.698**			
FOMO	0.275	.070	.220**	.278**	.298**	**.780**		
SOL	0.331	.063	.225**	.270**	.405**	.509**	**.762**	
TFWP	0.019	.033	.228**	.256**	.336**	.704**	**.537****	**.681**

***ESU**: Excessive social use of SNS; **EHU:** Excessive hedonic use of SNS**; ECU:** Excessive cognitive use of SNS**;FOMO**: Fear of Missing out; **SOL**: Sense of Loneliness; **TFWP**:Technology-FWP Friction*

Table 5: Model Fit

SRMR	0.048	0.124
d_ULS	0.691	4.645
d_G	0.351	0.515
Chi-square	804.350	992.327
NFI	0.862	0.830

Table 6: Standardized Regression Estimation Structural Model

Path	Standardized Coefficient	P value
Direct effect		
Excessive social use of SNS→ Fear of Missing out	0.217	0.000
Excessive hedonic use of SNS→ Fear of Missing out	0.181	0.000
Excessive cognitive use of SNS→ Fear of Missing out	0.073	**0.160**
Fear of Missing out → Sense of Loneliness	0.225	0.003

Excessive social use of SNS→ Sense of Loneliness	0.049	0.032
Excessive hedonic use of SNS→ Sense of Loneliness	0.041	0.024
Excessive cognitive use of SNS→ Sense of Loneliness	0.016	0.213
Indirect effect		
Excessive social use of SNS→ Fear of Missing out→ Sense of Loneliness	0.049	0.032
Excessive hedonic use of SNS→ Fear of Missing out→ Sense of Loneliness	0.041	0.024
Excessive cognitive use of SNS→ Fear of Missing out→ Sense of Loneliness	0.016	0.213
Technology FWP Friction x Fear of Missing out > Sense of Loneliness	0.052	0.018

*Note(s): *p <0.05, **p <0.01, ***p <0.001. **ESU**: Excessive social use of SNS; **EHU:** Excessive hedonic use of SNS; **ECU**: Excessive cognitive use of SNS; **FOMO**: Fear of Missing out; **SOL**: Sense of Loneliness; **TFWP**:Technology-FWP Friction*

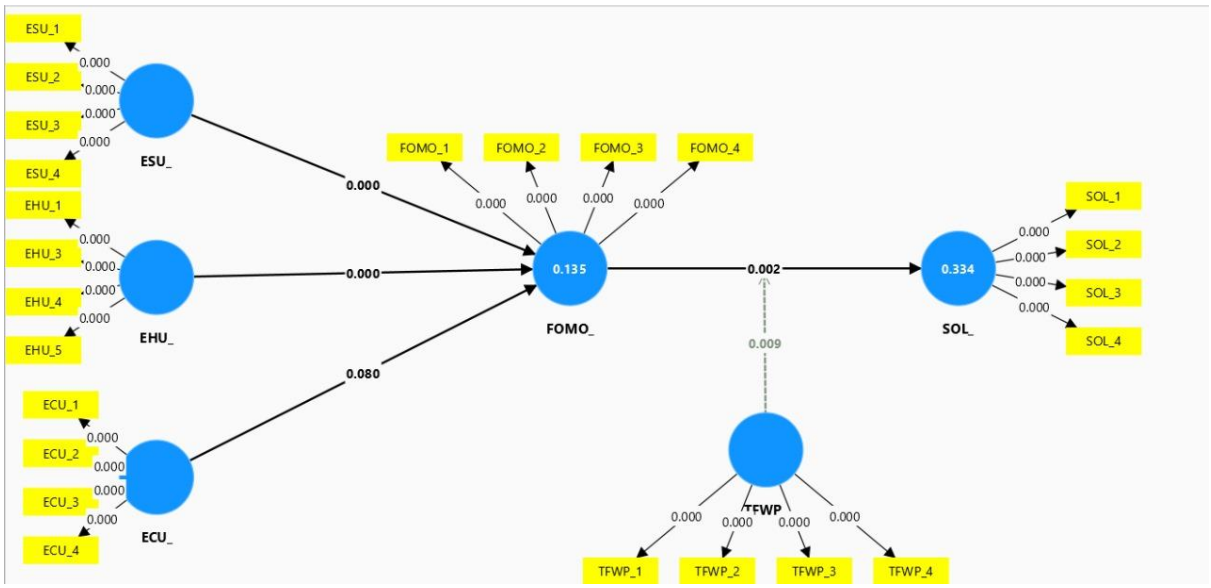

Fig. 2. Results from Structural Equation Modeling (SEM)

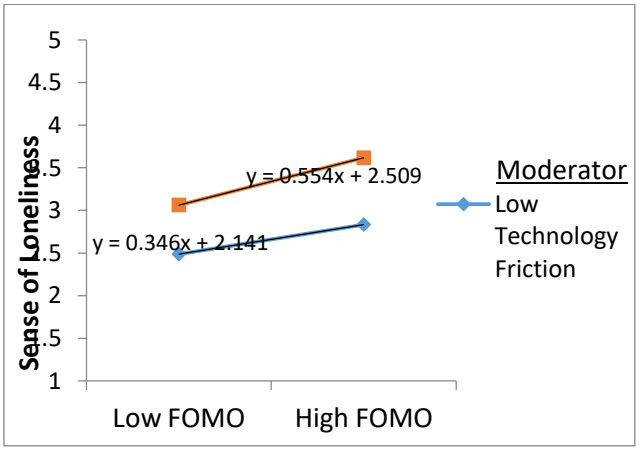

Fig. 3. Technology-FWP Friction strengthens the positive relationship between FOMO and sense of loneliness.

7. Discussion and Conclusion

Excessive social use is found to be strong predictor for sense of loneliness. Being a contributory factor in outcome as social networking sites excessive use reflects phenomena of social overload, known for having negative psychological and behavioral consequences (Adeel, Xiongfei, Ahmed, Ayesha, & Lingling, 2017). The results of study are in line with previous studies which propose that greater the number of friends in social network, the higher will be social overload. User embedded in virtual network receives multiple messages and communication requests according to their size from others (Manago, Taylor, & Greenfield, 2002). This intensive engagement with SNS starts continuous desire to respond to the multiple messages on time (Hong, Chiu, & Huang, 2012). This type of social bonding on SNS tends to endanger user's social, work and personal lives (Ali-Hassan, 2015).

Second, survey results exhibited SNS excessive use for hedonic purpose is also predictor for individual to feel loneliness. It affects relationships with family and also have personal consequences such as exhaustion through using SNS (Adeel, Xiongfei, Ahmed, Ayesha, & Lingling, 2017; Zheng & Lee, 2016). Contrary to our expectation, we have unveiled significant relationship between hedonic use of social networking sites and sense of loneliness. In this aspect, our study is in line with previous studies which states that use of SNS for hedonic purposes at workplace likely to impact individual's performance.

The excessive cognitive use was found to have insignificant relationship with fear of missing out. This is backed by the fact that increased use of social networking sites brings into play the massive amount of information being shared on social sites (Kardefelt-Winther, 2014). But it does not directly affect one's fear of missing out or sense of loneliness. Human mind has limited capacity to process multiple types of information; therefore, such discrepancies may result into some other outcomes such as information anxiety; mental, physical fatigue and stress (Ali-Hassan, 2015).

Further our findings are in line with previous results concerning FOMO as mediator between social networking sites excessive, hedonic and cognitive use. Fear of being excluded from what's happening outside might have been transferred to what's happening at home. Result of this study confirms role of FOMO in trigging SOL among individuals. Heavy use of social networking sites can cut off person from outside world. Individuals who excessively use SNS will have higher rate of FOMO, will likely to develop sense of loneliness in order to maintain social relationships. The users may keep utilizing the inescapable innovation during the normal relaxation time or anticipated time with their families and companions. According to previous studies on internet addiction, young people are more interested in the trending activity on social media sites for which they need to use it, rather than the internet itself.

Additionally, T-FWP frictions act as strong moderator creating a state where individual feels condition of loneliness even around people. This sort of loneliness is caused when individual may feel frustrated due to complaints from family and friends or quarrels with parents because of real world-neglect when engaged in virtual social connections that induces strain, leaving an individual to have feeling of being alone even though surrounded by people (Zhang, Zhao, Lu, & Yang, 2016).

8. Limitations and Future Research

This paper aims at extending the research on the negative aspects of excessive use of SNS with the addition of the new variable (FOMO) fear of missing out; a new concept which had not been discussed previously in the past literature until now. Second limitation is the past several studies were conducted only in the field of academia and in a kind of collectivist culture. It is recommended that future studies should be conducted in the countries where the culture is individualistic as significant cultural factor.

Also, instead of FOMO as mediator, we like to suggest that future studies should be conducted upon the construct of 'Superiority Complex' and add 'Regret' as dependent variable to see the results. The study further recommends longitudinal studies to be conducted to gather the data because these technologies are changing and evolving with each passing day. Furthermore, previous studies were on the active users of SNS and in that list non SNS users were not included so we will suggest the researchers in future they should also consider the non SNS users' opinion also and not only smartphone-based use of SNS there are other devices as well from which users can access SNS and can use it.

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