System Complexity, Information & Communication Overload, Work-Family Balance & Social Networking Sites' Tiredness: A Social and Digital Perspective

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Abstract

The use of Internet for constant connectivity with social networking sites has negative consequences in the form of higher mental pressure, low physical and offline activities, and mental tiredness and fatigue. Using these given phenomena, this research explores how system complexity, information overload, and communication overload are decisive factors of tiredness of social networking sites among Chinese individuals. The study also adds the role of work-family balance as a predictor in determining the tiredness levels of the use of social networking sites. A survey questionnaire was conducted over a sample of 507 respondents, drawn through non-probability purposive sampling techniques from employees of major Chinese organizations. The Structural Equation Modelling measurements revealed that, except for system complexity, the impact of information overload, communication overload, and work-family balance is significant in causing tiredness of social networking sites. However, while both overload factors were responsible for greater tiredness, a higher balance between work and family tends to reduce it. The study suggests that policymakers should develop strategies through to reduce such tiredness. It was also felt that a more work-family balance should be a panacea for such tiredness among the Chinese people.

Keywords

Information Overload, Communication Overload, Work-Family Life Balance, Social Networking Sites' Tiredness, China.

1. Introduction

The Digital Global Overview puts on record that there has been a 30% expansion of global users of social networking

sites (**Kemp**, 2021), with an additional more than one billion new users over the past three years. Out of such users, 96% of the individuals belong to the age group of between 16 and 24 years who are using social networking sites. In China alone, 79% of these individuals are aged 18 years (**Kemp**, 2021; **Shankleman *et al.***, 2021). Since the time of 2000, social networking sites have become integral components of the daily routine for different age groups, by creating new channels of communication, connectivity, and self-expression (**Jang *et al.***, 2013). These social networking sites are multifaceted digital platforms, that help information media sharing, exchange of ideas, boosting social and professional relationships, and enhancing professional networking between community members and business groups. In addition, studies have identified several other motives linked with the use of social networking sites, such as social interaction, entertainment and recreation, self-documentation, information search, instrumental usage, and self-enhancement (**Brockman; Belmadi**, 2023). In the context of China, social networking sites like WeChat and Weibo have helped to maintain both social and family relationships and tend to reflect social harmony. Moreover, rapid technological development and innovations have driven the usage of these platforms in the domains of education, business, and information search (**Wang *et al.***, 2024).

Due to the constant usage of social networking sites, there has also been several negative and unintended consequences. One of such unpleasant consequences of excess usage of social networking sites is often referred to as fatigue or tiredness resulting out of social networking sites. This kind of tiredness is subjective in nature and develops as a self-evaluated feeling for each individual from the over utilization of social networking sites. The wide utilization of social networking sites has created expectations among people and to get obliged to respond and stay connected with what others are posting. For this reason, users of these social networking sites need to pay regular attention to what is happening on these sites, despite an overwhelming volume of social and family demands (**Lee *et al.***, 2016).

Although the concept of social networking fatigue and tiredness is a growing concern in literature, the scant body of literature has been found while investigating several antecedents. These factors were entitled as taking break, social dynamics, cutting back or suspending social networking sites activities, immersion, and other platform related factors. However, because of the increasing use of social networking sites and over-dependence on them, researchers are mainly interested in observing mental health-related consequences of such usage. World Health Organization has also expressed a concern about the mental and physical health of individuals, emphasizing on the optimal condition of wellness for all individuals, while remaining capable to utilize their potential effectively (**Yang; Feng**, 2024).

In accordance with these findings, a survey conducted in the last decade also revealed that having got tired with the usage and over-dependence on social networking sites, a large number of individuals preferred to reduce their usage of social networking sites and manage fatigue-related issues through work-family balance (**Žnidaršič; Marič**, 2021). A balance between work and family is a burgeoning topic in the field of organizational research which refers to the efforts of individuals to have enough both time and money to devote to family while performing several tasks at the workplace (**Žnidaršič; Marič**, 2021). Both work and family are known as important and intertwined component domains in an individuals' life. The current literature also supports the relationship between work-family life balance and the psychological well-being of individuals. The idea of psychological well-being is often determined by the ability to deal with mental stress while managing different challenges in life (**Ryff**, 1989).

Observing the factor of fatigue as an outcome of stress, it is also believed that stress is a transactional process between the individual and the environment. The theory of person-environment (P-E) further explains this relationship and claims that stress is a result of an imbalance between the demand placed by the environment and individual's ability to deal with that demand (**Armitage; Amar**, 2021). However, in the modern era, the increasing technological and communication-related advancement also causes adverse mental outcomes for the individuals who are linked with the social networking sites for which this research study has been carried out. Specifically, this study aimed to resolve following questions that have arisen owing to the relationship between the study variables and tiredness of social networking sites:

- What is the impact of system's complexity on the tiredness of social networking sites among Chinese residents?
- What is the impact of information overload on the tiredness of social networking sites among Chinese residents?
- What is the impact of communication overload on the tiredness of social networking sites among Chinese residents?
- What is the impact of work-family life balance on the tiredness of social networking sites among Chinese residents?

2. Literature Review

Human beings as social entities depend substantially on member species of their kind to thrive. They need social connections to avoid stress, loneliness, and distress. The rapidly growing and instantly emerging social networking platforms like X (twitter), Facebook, Instagram in the last decade have notably changed people's perspective about communication and connection with each other. It is estimated that approximately 3.48 billion individuals were using social media platforms globally in 2019 (**Khalaf *et al.***, 2023) which has now reached 4.59 billion in 2024 and

it is anticipated to grow significantly over time (**Montag *et al.***, 2024; **Janizar *et al.***, 2023; **Idelbe *et al.***, 2023). The rapidly growing ICT has grabbed the attention of researchers and policy makers to study various impacts of ICT and its significance on socio-economic and political scenario. There is a positive influence of ICT on education, employment, trade, industrialization, economical boost, poverty reduction and politics (**Oumbé *et al.***, 2023). The ICT projects are also affected in various ways and dimensions identified are lifecycle, project nature, complexity level, methodology and project success, which are all very crucial to design and implement properly to make it successful (**Joseph**, 2017).

Moreover, the advancement in information and communication technology (ICT) at organizational level has changed the on-site presence constraints, forcing many employees to work from home, which has revolutionized the work experience for employees to maintain work-family balance, personal well-being and time management. ICT has though provided ease and convenience in media sharing and innovations in business but its over use may cause stress (**Lee *et al.***, 2016). Known as ICT overload, it is the utilization of excessive and multiple technological devices and services at the same time e.g., mobile and telephones, social media platforms, online meetings and conferences, search engines and like, to connect, contact and complete tasks. This multiple tool application and usage is causing exertion on workers' minds to counteract and suffer from fatigue. ICT thus can also affect the stress magnitude and well-being. It can either increase or decrease the stress, particularly it can enhance or retard the employees' personal life and work balance (**Day *et al.***, 2010; **Lachouri *et al.***, 2022).

The concept of ICT-mediated "information overload" is therefore referred to as the psychological state and reasoning capacity of mind when an individual is dealing with multiple information at a time and is unable to configure properly. There is a survey-based study conducted by gathering data of 1,004 mobile phone users which factually supports the cognitive aspects of information overload. The past events, experiences, sentiments and cultural memories linked with the current situation may elevate the information overload which may vary with age and type of task. The findings of this research work object to the myths about the negative impacts of multiple tasking and information overload and supports the conceptualization of polychronicity culture and introducing it in the organizations to reduce the overload (**Saunders *et al.***, 2017; **Li *et al.***, 2024). However, in the era of this multitudinous ICT application, notable negative outcomes have been recorded on workplace environment and expected productivity ratio. Advancement and continuous usage of these tools can normalize this information overload, and ends up building familiarity and adoption by the workers to make progress and productivity (**Yu *et al.***, 2023; **Dabis *et al.***, 2023).

Likewise communication overload is defined as the overload of the multiple interacting and connecting tools at the same time including messaging services, emails, notifications and news feeds (**Cho *et al.***, 2011). Communication overload poses a challenge to individuals' mental capability to counteract with multiple tasking associated with polychronic culture in the workplace (**Kirchberg *et al.***, 2015; **Hasbullah**, 2022). The phenomenon of work-related ICT (W-ICT) usage for maintain a flow of communication after working hours has become usual custom in most of the organizations and is considered to be the demand of the business. In many business sectors, keeping contacts and responding after working hours is crucial to communication (**Gadeyne *et al.***, 2018; **Martín-Morán; Nieto**, 2022). In a study of a sample of 400 employees in hospitality and tourism industry, using data analysis with structure equation modelling (SEM) and Partial least squares (PLS) measures, a positive correlation was found between communication overload after working hours and employees' recognized injustice (**Elshaer *et al.***, 2024; **Alghazali *et al.***, 2022).

System complexity is mainly a result of rapid advancement and introduction of new technology, and upgradation features in information and communication networks, which aim to improve the service quality. Such technological advancements may often lead to system complexity due to of new features and problems related to their adoption and understanding. As a result, complexity causes stress and fatigue to those who are incapable of comprehending these changes. The amount of complexity increases the level of difficulty to understand and use the information for most employees. Due to system complexity, when employees are unable to understand new functions and fail to catch the pace of information and communication, they are no longer efficient and expert in their work environment. This causes techno-stress and increases the burden of learning new features, often resulting in irritation and impacting their productivity (**Ayyagari**, 2012).

The use of ICT is considered to be the energy and time saver, but it is also assumed to be causing fatigue in users. Fatigue or tiredness refers to the employees' feeling based on the experiences going on in his environment which could be measured as per ones' feeling of mild tiredness to a state of overtiredness (**Ravindran *et al.***, 2014). This fatigue is also often the result of individuals failing to respond to ICT advancements, which results in not only fatigue and tiredness but also other serious consequences like family conflicts, negative work performance and reduced life quality which eventually results in health issues. This is quite a challenge for the new workforce to maintain balance between work and family life (**Sardeshmukh; Srinivasan**, 2014). Fatigue or tiredness is also caused due to the negative effect of ICT utilization after business hours, specifically in work place and organizations (**Korunovska;**

Spiekermann, 2019). Work-related ICT usage after working hours can deteriorate the individual well-being, mental health and cause fatigue (**Lee** *et al.*, 2021).

Technostress is the term used for this type of stress caused by information and computer technology. **Tarafdar** *et al.* (2007) tested three hypotheses to check the consequences of technostress on workers' productivity. By using the survey data from 223 organizations, the study found that role stress and technostress are inversely proportional to the individual's work productivity while role stress is directly proportional to technostress. The study proposed that adverse impacts of technostress in organizations can be reduced by planning and introducing effective strategies to avoid the decline in expected productivity (**Zhang**, 2023). Another study introduced a new scale comprised of five points including complexity, overload, privacy, invasion and inclusion to measure the technostress among older individuals aged 60 years or above and found it imperative to reduce technostress in later age (**Nimrod**, 2018). Technostress is considered as the basic reason of anxiety, psychological disorders, depression, fatigue and reduced productivity. Older and experienced workers are prone to the effects of technostress due to less interest and unfamiliarity with the ICT. Additionally, female workers are greatly affected by techno-complexity and techno-uncertainty while males are subjected to higher level of techno-overload and techno-invasion (**Marchiori** *et al.*, 2019).

The correlation between the digital media usage and stress in both males and females of a probability sample in United States was investigated (**Hampton** *et al.*, 2016). The results of this survey revealed that the use of digital media is not much related to the elevated psychological stress level. A few groups showed that females using digital media perceive lower stress as compared to men. Internet and mobile phone technologies, and social media platform for sharing life events may cause much psychological stress in females more than males. The person-environment (P-E) fit model explains the significance of equilibrium between an individual and its surrounding environment to keep positive energy and to reduce stress while failure to maintain this equilibrium leads to stress and then strain respectively. This environment may vary from individual to individual based on personal interest, preferences and choices (**Armitage; Amar**, 2021).

Self-disclosure is another debatable aspect of social media networking sites. These sites require personal information to create user profile, and the member must have to share some personal information with the other users to connect. The information on user's profile may include information of past events, current and future plans. According to some studies, users are most of the time reluctant to reveal themselves as this is the disclosure of their privacy values and this is sometimes considered apparently as paradox and conservative thinking to be attached with social media network yet reluctant to share their personal data (**Chen**, 2013). Cyberbullying, blackmailing, self-harming behavior, suicidal tendency and other privacy breach concerns associated with social media platform usage by the teenagers are evident but the empirical data regarding the positive aspects of social media usage by teens as a source of self-expression and body of wisdom is scarcely reported (**Fernandes** *et al.*, 2022).

In addition, studies from the context of work-family balance have also gained much critical attention. **Pearson** *et al.* (2009) investigated the relationship between work-family conflict, overload, technological innovation, and autonomy. A valid sample of 233 respondents was analyzed using the Smart PLS-SEM methodology. However, contrary to other findings, the study showed that the family-work conflict did not have any significant association with information technology innovation. **Leung and Zhang** (2017) suggested a work-family border theory while utilizing the information and communication technology at home. It has been observed that technological stress is mainly caused by the work-family conflict. Likewise, **Ye** *et al.* (2024) have explored several strategies that can help in achieving work-family balance. Based on theoretical support from the traditional resource theory, the study found that family-supportive supervisor behaviour in hotel industry promotes work-family balance. Moreover, family certainty also creates a good influence on work-family balance.

Decataldo and Fiore (2022) stated that during the time of the COVID-19 crisis, the higher education system in Italy had faced several challenges; but it reflected its ability to adapt the changes in spite the pandemic. In a short period, many Italian universities transitioned from in-person classes to online teaching methodology, while ensuring the fact that education continued despite the disruptions in learning and teaching process. However, such kind of transition from face-to-face to online approach was not easy. The study conducted a survey focusing on the faculty at the University of Milan Bicocca. The faculty who was unprepared for this sudden change, had to rethink their teaching methods and adapt to distance learning education which got increasing attention globally. The faculty not only used new technologies, they also had to find ways to engage students and maintain high standards of learning. Additionally, there has been a lot of focus on how technological stress has their impact on the students, whereas there has been less attention as given towards the faculty, who were experiencing stress related to technology, which ultimately influenced their work-life balance and overall life quality. Considering the overall discussion as provided, this study examined the role of two types of technostress named as feeling overwhelmed by technology (techno-overload) and feeling insecure about using technology (techno-insecurity) with their influence on the work-life balance. The study observed that both factors of work-family life balance and technological overload and stress are related to each other.

Based on the above discussion, a research framework was designed for this study, as shown in Figure 1.
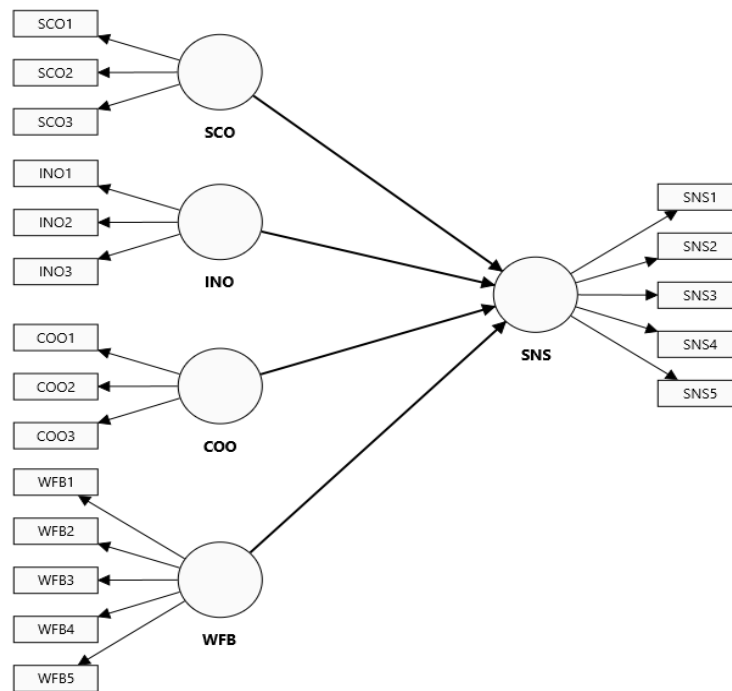
Figure 1: Research Framework with Items.

Note: SCO- system complexity, INO- information overload, COO- communication overload, WFB- work-family balance, SNS; social networking sites

3. Research Methodology

The study adopted a quantitative research design to measure the interrelationship between the variables of the study. A questionnaire was designed to collected data across a final sample of 507 respondents. The demographic characteristics of the sample gathered included their age, gender, time spent on social networking sites and educational and income levels. This sample was contacted through both online (305 respondents) and offline, face-to-face (202 respondents) sources. The descriptive statistics comprised measuring mean values, SD of Items, factor loadings, model's reliability, composite reliability, convergent validity, and VIF. In addition, other measures like Cronbach alpha and HTMT ratio were used to measure discriminant validity using the pair of variables. The structural equation modelling technique was used for quantitative data analysis, which ideally suits testing hypothetical relationships between variables. Table 1 summarizes the nature of variables (IV or DV) and a list of items of the questionnaire with their sources.

Table 1: Variables, Nature, Items and Scale's Source.

Variable	Nature	Items	Source
ICT Overload			
System Complexity	Independent	1. The functions of SNSs are not easy to use. 2. It is not easy to get the results that I desire when using SNSs. 3. Learning to use SNSs is not easy for me.	(Ayyagari *et al.*, 2011)
Information Overload	Independent	1. I am often distracted by the excessive amount of information in SNSs. 1. I find that I am overwhelmed by the amount of information that I process on a daily basis from SNSs. 2. I feel some problems with too much information in SNSs to synthesize instead of not having enough information.	(Karr-Wisniewski; Lu, 2010)
Communication Overload	Independent	1. I receive too many messages from friends (or acquaintances) through SNSs. 2. I feel like I have to send many more messages to friends through an SNS than I would want to send. 3. I feel that I generally get too many notifications of new postings, push messages, news feeds, etc. from SNSs while performing other tasks.	(Cho *et al.*, 2011)
Work-Family Balance	Independent	1. I devote equal attention to my work and family responsibilities. 2. My workload provides great opportunity for me to perform my family roles. 3. I always find time after work to take care of my family. 4. I often use my annual leave to meet my family needs. 5. The flexible work arrangement in my place of work gives me great chance to perform my family roles.	(Popoola; Fagbola, 2023)
Tiredness Of Social Networking Service (SNS)	Dependent	1. I find it difficult to relax after continually using SNSs. 2. After a session of using SNSs, I feel really fatigued. 3. Due to using SNSs, I feel rather exhausted. 4. After using SNSs, it takes effort to concentrate in my spare time. 5. During SNS use, I often feel too fatigued to perform other tasks well.	(Karasek Jr, 1979; Van Yperen; Hagedoorn, 2003)

4. Analysis and Discussion

Right at the outset, the demographic characteristics of the sample were collected and analyzed. The analysis revealed that the sample comprised 351 male and 156 female respondents. In terms of age, there were 202 respondents in the age

range of 29 years or below; 173 respondents in the age range of 30 to 39 years; and 132 respondents above 40 years. The sample was identified through online and offline sources with 305 and 202 respondents respectively from each source. Regarding average daily time spent on SNS usage, it was found that 82 respondents spent less than 30 minutes; 115 respondents spent 30 minutes to 1 hour; 124 respondents spent 1 hour to 2 hours; 93 respondents each spent 2 hours to 3 hours and more than 3 hours. Regarding education levels, 117 respondents belonged to high school and below category; 129 belonged to vocational college category; 192 respondents had a bachelor's degree; and 69 respondents had master degree and above. The income level of the respondents showed 211 respondents in the category of less than 5000 CN¥; 174 respondents in 5000–10,000 CN¥ category; and 122 respondents in more than 10,000 CN¥ category.

Overall, there was a dominance of male respondents (351 respondents, 69.23%); while the highest participation came from age group of 29 years or below (202 respondents, 39.84%) . Moreover, 82 respondents (16.17%) showed least participation with less than 30 minutes as average time spent on the SNS usage; while 124 respondents (24.46%) spent maximum average time 1-2 hours on SNS. In the educational level category, the highest number of respondents belonged to bachelors' category (192 respondents; 37.87%) and the least number was of Master's degree (69 respondents; 13.6%). In terms of income level, it was found that 211 respondents (41.6%) earned less than 5000 CN¥ representing the highest number of participants in this category, and 122 (24.06%) earning more than 10,000 CN¥. Table 2 summarizes these characteristics.

Table 2: Demographic characteristics of respondents (n=507).

Category	Sub-Category	Frequency	Percentage
Gender	Male	351	69.23
	Female	156	30.77
Age	29 or below	202	39.84
	30-39	173	34.12
	Above 40	132	26.04
Survey Sample	Online	305	60.16
	Offline	202	39.84
Average Daily Time Spent on SNS Usage	Less than 30 minutes	82	16.17
	30 minutes to 1 hour	115	22.68
	1 hour to 2 hours	124	24.46
	2 hours to 3 hours	93	18.34
	More than 3 hours	93	18.34
Education Level	High school and below	117	23.09
	Vocational college	129	25.44
	Bachelor	192	37.87
	Master and above	69	13.6
Income Level	Less than 5000 CN¥	211	41.62
	5000–10,000 CN¥	174	34.32
	More than 10,000 CN¥	122	24.06

Next, the Mean and SD of all items were calculated. Table 3 presents the average scores for each variable of the study. The low mean values ranging between 1.0 to 2.5 for which respondents strongly disagreed or only disagreed, whereas the mean values in the range of 2.6 to 3.4 showed moderate level, covering mixed responses. Those values which are in the range of 3.5 to 5.0 reflect that respondent, on average, tend to agree or strongly agree with the given statement which on general grounds, show the support for that particular item or items.

Table 3: Mean and SD of the Items.

Variable	Items	Items	Mean	SD
System complexity	SCO1	The functions of SNSs are not easy to use.	3.60	1.1
	SCO2	It is not easy to get the results that I desire when using SNSs.	3.8	1.14
	SCO3	Learning to use SNSs is not easy for me.	3.5	0.358
Information Overload	INO1	I am often distracted by the excessive amount of information in SNSs.	4	0.952
	INO2	I find that I am overwhelmed by the amount of information that I process daily from SNSs.	4.2	1.17
	INO3	I feel some problems with too much information in SNSs to synthesize instead of not enough.	3.9	0.368
Communication Overload	COO1	I receive too many messages from friends (or acquaintances) through SNSs.	4.1	0.537
	COO2	I feel like I have to send many more messages to friends through SNSs than I would want.	3.7	1.07
	COO3	I generally get too many notifications from SNSs while performing other tasks.	4.3	0.938
Tiredness of Social Networking Sites	SNS1	I find it difficult to relax after continually using SNSs.	3.8	1.915
	SNS2	After a session of using SNSs, I feel really fatigued.	4	0.387
	SNS3	Due to using SNSs, I feel rather exhausted.	3.9	1.212
	SNS4	After using SNSs, it takes effort to concentrate in my spare time.	3.7	1.317
	SNS5	During SNS use, I often feel too fatigued to perform other tasks well.	4.1	0.421
Work-Family Balance	WFB1	I devote equal attention to my work and family responsibilities.	3.9	0.618
	WFB2	My workload provides a great opportunity for me to perform my family roles.	3.6	1.1
	WFB3	I always find time after work to take care of my family.	4.14	0.825
	WFB4	I often use my annual leave to meet my family needs.	3.8	1.168
	WFB5	The flexible work arrangement at my workplace gives me a chance to perform family roles.	3.7	0.311

Table 4 presents factor loadings with diversified range, with the lowest score of 0.66 represented by WFB3, and the highest score of 0.944 shown by COO3. The overall median value of the factor loadings was found to be 0.799 which is the 10th value in the order list. The factor loadings are the true indicator of the fact that items are truly contributing for the measurement of these variables. The factor loadings should be above 0.50 to claim for their relative presence into the model (**Hair Jr** *et al.*, 2011; **McNeish** *et al.*, 2018).

Table 4: Factor Loadings.

Variable	Items/ statements	Factor Loading
SCO1	The functions of SNSs are not easy to use.	0.884
SCO2	It is not easy to get the results that I desire when using SNSs.	0.877
SCO3	Learning to use SNSs is not easy for me.	0.759
INO1	I am often distracted by the excessive amount of information in SNSs.	0.791
INO2	I find that I am overwhelmed by the amount of information that I process daily from SNSs.	0.88
INO3	I feel some problems with too much information in SNSs to synthesize instead of not enough.	0.788
COO1	I receive too many messages from friends (or acquaintances) through SNSs.	0.799
COO2	I feel like I have to send many more messages to friends through SNSs than I would want.	0.712
COO3	I generally get too many notifications from SNSs while performing other tasks.	0.944
SNS1	I find it difficult to relax after continually using SNSs.	0.845
SNS2	After a session of using SNSs, I feel really fatigued.	0.871
SNS3	Due to using SNSs, I feel rather exhausted.	0.844
SNS4	After using SNSs, it takes effort to concentrate in my spare time.	0.861
SNS5	During SNS use, I often feel too fatigued to perform other tasks well.	0.850
WFB1	I devote equal attention to my work and family responsibilities.	0.797
WFB2	My workload provides a great opportunity for me to perform my family roles.	0.788
WFB3	I always find time after work to take care of my family.	0.660
WFB4	I often use my annual leave to meet my family needs.	0.707
WFB5	The flexible work arrangement at my workplace gives me a chance to perform family roles.	0.709

The Model's Reliability, Convergent Validity, Discriminant Validity, and VIF were also calculated as shown in Table 5. The factor loadings were found to be valid enough to determine the relative construct in the given model. The Cronbach alpha for each construct was measured as COO = 0.824, INO = 0.759, SCO = 0.815, SNS = 0.907, and WFB = 0.805. All these values are above 0.70 which is the absolute threshold level for claiming the reliability of every single variable into the model (**McNeish**, 2018; **Hanafiah**, 2020). The composite reliability (rho_a) values for the constructs COO, INO, SCO, SNS and WFB were 0.781, 0.78, 0.872, 0.91 and 0.837 respectively; while the composite reliability (rho_c) values for the same constructs were 0.862, 0.861, 0.879, 0.931, and 0.853 respectively. All of the given values indicated good internal consistency of the given variable into the model. The investigation linked with the amount of the variance as expressed by the construct in relation to measurement error was covered using the AVE. The average variance extracted values were 0.679, 0.674, 0.708, 0.73, and 0.539. The given cut-off point for this variance is above 0.50 to infer that a substantial variance is being expressed by the construct (**Naveed** *et al.*, 2020; **Quoquab; Mohammad**, 2020).

The second part of the Table 5 represents the discriminant validity via HTMT ratio using the pair of variables. The HTMT ratio between constructs is shown as: INO <-> COO = 0.061, SCO <-> COO = 0.672, SCO <-> INO = 0.04, and SNS <-> COO = 0.059. Moreover, the HTMT ratios of the rest of the variables are: SNS <-> SCO = 0.048, WFB <-> COO = 0.121, WFB <-> INO = 0.476, and WFB <-> SCO = 0.083. The pair wise variance inflation factor (VIF) values are shown as follows: COO -> SNS = 1.446, SCO -> SNS = 1.437, INO -> SNS = 1.149, and WFB -> SNS = 1.174. All the values are less than 5, therefore, it confirms that variables are showing no issue of the multicollinearity between each other. The overall presentation of these results is shown in Table 5 and Figure 2.

Table 5. Model's Reliability, Convergent Validity, Discriminant Validity, and VIF.

|	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	(AVE)
COO	0.824	0.781	0.862	0.679
INO	0.759	0.78	0.861	0.674
SCO	0.815	0.872	0.879	0.708
SNS	0.907	0.91	0.931	0.730
WFB	0.805	0.837	0.853	0.539
HTMT	INO <-> COO	0.061	SNS <-> SCO	0.048
	SCO <-> COO	0.672	WFB <-> COO	0.121
	SCO <-> INO	0.04	WFB <-> INO	0.476
	SNS <-> COO	0.059	WFB <-> SCO	0.083
	SNS <-> INO	0.456	WFB <-> SNS	0.761
VIF	COO -> SNS	1.446	SCO -> SNS	1.437
	INO -> SNS	1.149	WFB -> SNS	1.174
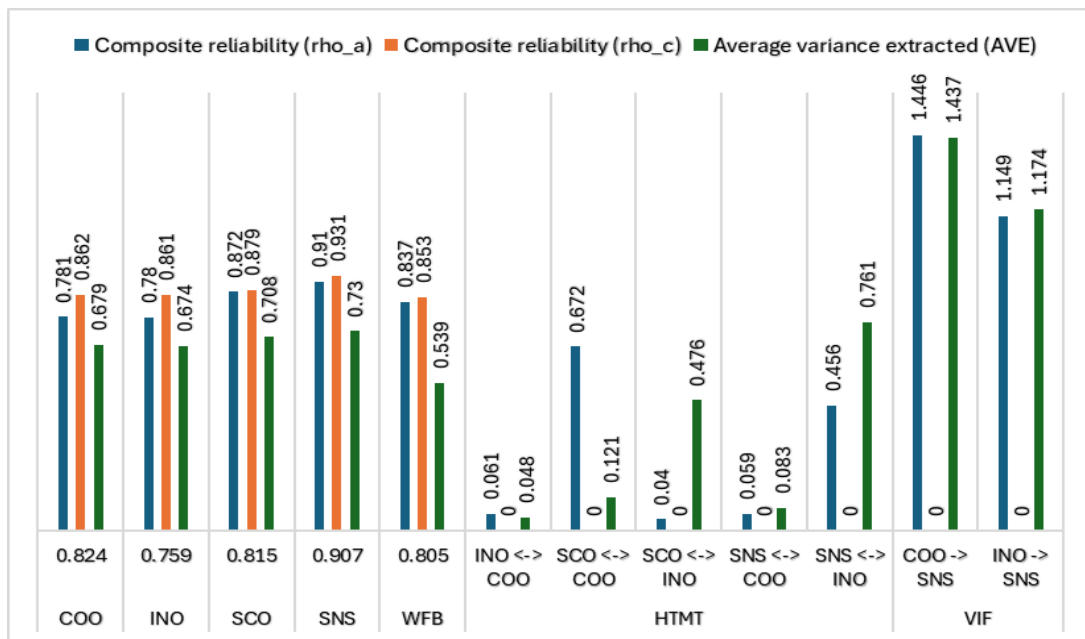
Figure 2: Graphical Presentation of Reliability, Convergent Validity, Discriminant Validity, and VIF

The structural equation modelling technique is one of the most advanced and modern techniques under quantitative data analysis. It helps to examine the hypothetical relationships between the variables of interest. By using the SEM model, the following results were yielded with the help of coefficients, t and p-values, taking the directional path of the model: COO -> SNS (Coefficient = 0.112, T statistic = 5.078, P value = 0.000); INO -> SNS (Coefficient = 0.142, T statistic = 2.703, P value = 0.007); SCO -> SNS (Coefficient = 0.003, T statistic = 0.047, P value = 0.962); WFB -> SNS (Coefficient = -0.672, T statistic = 16.449, P value = 0.000), as presented in Figure 3. These findings reveal that both the INO and COO measure the ICT overload. These results cover four independent variables named SCO, INO, COO and WFB having their impact on SNS. Figure 3 clearly shows p-values of coefficients, whereas the outer model aims to express the factor loadings and p-values against each of the selected items. The first path from SCO to SNS has p-value of 0.962 which is insignificant at 5%. This p-value is an indication that SCO's coefficient of 0.003, which is not enough to determine a significant change in the SNS, leading to a final inference of no impact of SCO on SNS.
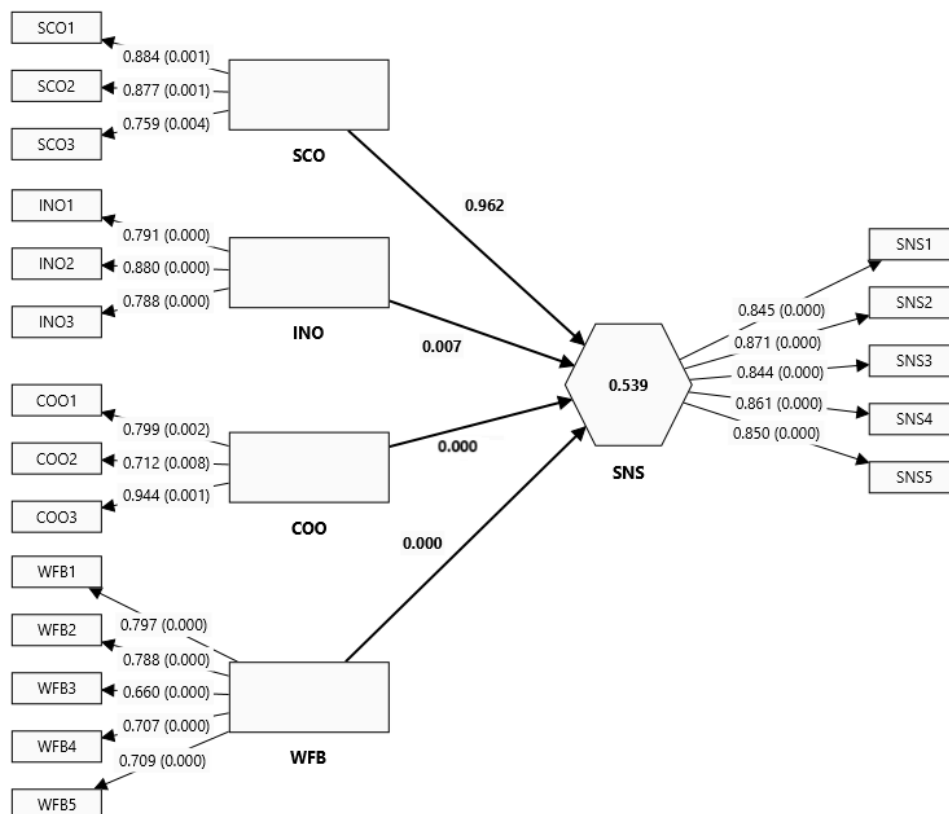

Figure 3: Structural Model Results (Path P-values in the Inner Model).

Figure 3 also depicts the impact of the Information overload on the SNS, as evident from p-value of 0.007 which is < 1% significance point. The coefficient is 0.142, and t-statistics is 2.703. The idea of the INO happens at the time when people are overloaded with too much information, especially through social media. With so many updates, notifications, and content to keep up with, it can become challenging to process everything. This can lead to social media fatigue, where users feel mentally exhausted and stressed from trying to keep up with it all. Because of this overload, people often struggle to manage the content, which reduces their satisfaction and increases their stress. Eventually, they may feel overwhelmed enough to limit their social media use to regain control and reduce their stress levels.

These findings are consistent with the results of previous studies. **Lee *et al.*** (2016), for instance, investigated the impact of several stressors including the information overload on the social network sites fatigue. The study applied hypothetical relationships to confirm that information overload is leading to a higher trend in the SNS fatigue. The given relationship between stressors and SNS fatigue was examined by using the transactional theory of stress and coping as overreaching theory. The given impact of information overload was also found among the key stressors having their relationship with the social network service tiredness and the same has been observed in the present study. The detailed investigation of the current studies thus provided a good source of justification for this relationship.

In another study, **Fu *et al.*** (2020) investigated different types of overloads including the information overload and their linkage with the social media fatigue. The study collected a sample of 412 respondents for which the results showed that three types of overloads including the information overload tend to discontinue usage of social media and create exhaustion among the users of the social media. Likewise, **Niu *et al.*** (2022) explored the connection between the information overload and intention to reduce the utilization of the social media services. The study further examines the mediating effect of the adverse social comparison and fatigue. The study results show that positive association exists between the information overload and social network service fatigue.

Figure 3 also examined the connection between the communication overload and SNS. The results reveal the p-value as 0.000 which is significant for claiming that more communication overload means more the SNS tiredness and vice versa. The path coefficient is 0.112, showing that an overall direct and positive impact on the SNS tiredness due to higher communication overload. The concept of the COO has been referred to as a situation when the communication demands from the information and communication technologies channels like instant messaging, news feed, and email exceeds the level of the communication capacities of the users (**Cho *et al.***, 2011). The direct impact of the communication overload on the SNS tiredness has also been confirmed by the research study of **Lee *et al.*** (2016) who attained a positive and significant coefficient between both. Additionally, the results of this study are also consistent with **Pang** (2021) who examined how the information overload on compulsive WeChat affected the social media fatigue during the time of COVID-19. A trigging effect from the communication overload of the WeChat was also termed as social media fatigue. The additional theoretical and empirical evidence for the relationship between COO and SNS fatigue is also found in (**Pang; Ruan**, 2023). This study examined the data for 442 smart phone application users for which the results confirmed that both information and communication overload boosted the privacy invasion and users' exhaustion. This evidence is showing enough claim for the support of the higher SNS fatigue because of the communication overload specifically among the Chinese people.

The last path of Figure 3 demonstrates the p-value of 0.000 and the path coefficient is -0.672. This coefficient is the highest as compared to what the study has observed in terms of causal relationship between the information and communication overload and SNS tiredness. This coefficient implies that more work-family balance as created by the sample respondents means lesser the level of the SNS tiredness for the Chinese residents. Although the relationship between work-family balance and SNS tiredness and stress has been investigated on a very little level, yet a few studies are available covering more or less the similar relationships. **Sharma and Sudhesh** (2018) asserted that social media has provided a great level of connectivity among different friends and family members. However, the study finds that positive connection is prevailing between the work-family life balance and social media connectivity.

5. Conclusion and Recommendations

This research study carried out an investigation by examining the role of system complexity, information overload, communication overload, and work-family life balance as key predictors to cause social media service tiredness. The study determined several research questions which including (1) predicting effect of system complexity on social network service tiredness; (2) predicting effect of information overload on social network service tiredness; (3) predicting effect of communication overload on social network service tiredness; and (4) predicting effect of work-family life balance on social network service tiredness is? (**Cigna 360 Well-Being Surveys**)

The study uses structural questionnaires for collecting data from respondents in China, with demographics factors like age, gender, education, average daily time spent on SNS, and income levels. The results were tabulated using all possible modern data analysis methods and procedures. The initial results confirmed that respondents have a good diversification in their demographics, followed by the mean trend against each of the statement in the questionnaire. The mean trends found respondents showing their relative feedback by giving all the possible responses covering the

five-point Likert scale. In the next step of the analysis, factor loadings were presented which highlighted the relative importance of items in the latent constructs' measurements. The model's reliability, convergent validity, discriminant validity, and VIF were also found to be in acceptable data points, revealing that model is fit when account for the reliability analysis, internal consistency reliability, and for the convergent validity (AVE). The VIF scores accounted for true checking of the collinearity for which no issue was found. The final part of the data analysis used the SEM technique and observed some mixed results. It was observed that the effect of the system complexity is insignificant for the SNS tiredness, whereas the same is significantly positive as determined by the information overload, and communication overload. The final remarks of the results claim that more balance in the work and family means lesser level of the tiredness from the social network services.

The study would like to make a few recommendations. Regarding the adverse effect from the information overload on the SNS tiredness, it is suggested that respondents need to simplify the feed by prioritizing the posts over social network sites while reducing the exposure to those contents which are less relevant. Moreover, the implication of the content filtering tools can also be limited for them to see based on keywords, people and contents. The other possible suggestions include the notification management by which users of the social network sites can set silent periods to limit disruptions. However, it is important to note that one should also bear in mind the significance of the offline activities on regular basis. This would help to improve the users' connectivity along with a reduction in the time spending on the online activities which cause mental fatigue and stress.

As the measurement of the communication overload covered too many messages and too many notifications, as received and sent by using the social network sites, this study would like to recommend that respondents should follow practices like batch communication features, selective notifications, time-restricted access, focus mode, and auto-response option. The study also proved that significant relationship of work-family balance is a key to improve the issues like social network sites tiredness. To continue similar practices, the users of social networking sites are suggested to set boundaries for social media usage; be consistent in prioritizing the family-time over social media usage; promote flexible working hours; introduce and follow digital wellness challenges, where everyone needs to participate in reducing the screen time and replace social media with family.

The study also faced a few limitations. The first limitation of this research was that it was conducted within the geographical boundaries of China. The second limitation was implied in limited variables related to information and communication technologies. The third limitation of this research was that it considered only information overload and communication overload to examine the social network sites tiredness. It did not give any consideration to system feature overload, system pace of change, and information relevance for exploring the social network sites tiredness. Future studies can provide better insights by focusing on these limitations.

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