

PSYCHOMETRIC VALIDATION OF TRAIT-STATE FEAR OF MISSING OUT SCALE IN INDIAN YOUTH

Lipika Malik^{1*}, Dr. Gautam Gawali²

¹PhD Scholar, Amity Institute of Behavioural and Allied Sciences (AIBAS), Amity University Mumbai, Mumbai, India.
Email Id: lipika.malik@gmail.com, Orcid Id: 0000-0003-2728-1714

²Professor and Director, Amity Institute of Behavioural and Allied Sciences (AIBAS), Amity University Mumbai, India.
Email Id: ggawali@mum.amity.edu, Orcid Id: 0000-0002-8080-8100

ABSTRACT

Interest in fear of missing out (FoMO) and its linkage with mental health and social media has spiked in recent years. India has the world's second highest number of social media users. There has also been some studies examining problematic social media use, but there are few Indian studies regarding FoMO. This may be probably due to the lack of standardized measurement tools for assessing FoMO in India. Therefore, the objective of present study was to investigate the psychometric properties of Trait-State Fear of Missing Out Scale (T-SFoMOS) in Indian youth. A total of 517 young adults (aged 18 to 24 years) completed a survey consisting of the T-SFoMOS. The collected data was subjected to exploratory and confirmatory factor analyses, in addition to various other statistical tests. The study results indicate that the two factor model of T-SFoMOS shows good psychometric properties. The present study provides empirical evidence that the T-SFoMOS is a valid and reliable instrument for measuring FoMO in Indian youth. The study concludes with several theoretical and practical implications for research in FoMO

KEYWORDS: Trait-state fear of missing out, psychometric validation, Indian youth, confirmatory factor analysis, exploratory factor analysis

INTRODUCTION

Social media has become an essential part of our lives. Young adults particularly use social media to socialise and maintain relationships with friends and family. Social media use has been linked with several positive psychological outcomes, such as building social capital,[1] enhancing self-esteem,[2] and connecting with others.[3] However, social media use and addiction can also activate the individual's FoMO.[4] Interestingly, researchers have also found that apart from being a result of social media use, FoMO can also be an important reason for using social media as well.[5] In either case, it has been cemented that FoMO is associated with social media use and abuse.[6]

FoMO has very popularly been defined as "a pervasive apprehension that others might be having rewarding experiences from which one is absent" and "a desire to stay continually connected with what others are doing".[7] This refers to preoccupation with constantly checking on others as one feels that others are having more rewarding experiences as compared to them. In the context of the digital world, this means constantly being online in order to check what others are posting and doing. FoMO causes incessant psychological changes in which individuals' tendency to make use of social networking sites increases.[7] It has been found that individuals with higher levels of FoMO are more alert to smartphone notifications and have weakened concentration.[8] Other researchers have also found that FoMO mediated the relationship between psychopathology and inappropriate smartphone use and social media addiction.[9,10] Research focusing on the impact of FoMO on general health and well-being has also reported that college students with higher FoMO have more attention deficits and focus less on activities. [4] Investigating the relationship between sleep and FoMO, researchers have found a negative correlation between individuals' sleep hours and FoMO.[11] Lastly, it has been found that FoMO is directly related to depression, anxiety, and boredom.[12]

Apart from being studied in relation to social media, mental health, and general well-being, FoMO has also been studied with respect to online shopping and the e-commerce behaviour of individuals. FoMO is habitually used as an impulsive tool in marketing and communication activities aimed at boosting the online shopping behaviours of consumers. Especially in the context of social networking sites, marketing and communication practices designed with impulsive messages for FoMO play a role in triggering compulsive shopping behaviours.[13]

Trait and State FoMO

Initially, FoMO had been theorised as a single trait construct phenomenon, demarcated as a generalised anxiety brought on by worry that one is missing out on others' pleasurable experiences.[7] However, FoMO is considered to have both trait-FoMO and state-FoMO forms.[14] General trait-FoMO is similar to the concept given by Przybylski et al.[7] State-FoMO, on the other hand, also known as online-specific FoMO, refers to an unsteady cognitive bias that appears during online activities like social media use.[14] In other words, individuals can have a dispositional trait of FoMO, known as the trait FoMO. At the same time, the frequent use of social media and social networking sites may also trigger or increase

an aspect of FoMO that is linked specifically to other users' online activities, which develops in the context of Internet communication and is less stable. This part is known as state-FoMO. State FoMO is considered vital in the context of using social media and social networking sites. The results of several types of research show that anxiety and depression were significantly positively associated with trait FoMO, but not with state-FoMO[15] and that the levels of mental health negatively predicted trait-FoMO, but did not predict state-FoMO.[16] Furthermore, state-FoMO is shown more linked with social media use behavior than trait FoMO.[17] It is also reported that the satisfaction of psychological needs is associated with lower trait-FoMO.[18] Other studies have found high social support to be associated with lower trait-FoMO.[19]

It has become abundantly clear that the concept FoMO is very important in contemporary research, ranging from general health to consumer behaviour and mental health, FoMO is relevant everywhere and in all countries. Researchers have been cognizant of this and have validated the 10-item FoMO scale (FoMOs) by Przybylski et al.[7] in different countries and languages. Several studies have found favourable psychometric properties of the FoMOs and adapted previously to Turkish,[20] Arabic,[21] and Spanish.[22] However, FoMOs mostly assesses an individual's trait-FoMO. Therefore, the Trait-State Fear of Missing Out Scale (T-SFoMOS) developed by Wegmann et al.,[14] is probably a more rounded and robust assessment tool for assessing FoMO. Additionally, recent research employs the use of trait and state factors of FoMO which are essential in understanding the dynamics of FoMO with other variables. Hence, a study conducted by Li et al.[17] found that the Chinese version of T-SFoMOS has high construct validity and convergent validity among Chinese university students. However, to the best of the authors' knowledge, research on validation of T-SFoMOS in other populations is scanty. More specifically with India having a huge number of social media users, it becomes imperative to investigate the psychometric properties of T-SFoMOS among the Indian youth.

MATERIAL AND METHODS

Participants

In this cross-sectional research, a total of 517 young adults in India were selected as sample. Convenience sampling was used. The age of participants varied between 18-24 years with the mean age of participants being 20 years (SD=2).

Procedure

Ethical approval was received from the Institutional Ethics Committee before the recruitment of the participants, and ethical standards in the 2013 Declaration of Helsinki were followed. Data was collected face-to-face as well as online using Google Forms. Participants were provided with informed consent and participation was voluntary. The T-SFoMOS was available in English, which did not require any translation and was used to assess the Indian population; without disrupting the face validity of the scale.

Measures

Trait-State Fear of Missing Out Scale (T-SFoMOS)

The T-SFoMOS[14] comprises 12 items assessing two domains: trait-FoMO (such as, "I fear others have more rewarding experiences than me") and state-FoMO (such as, "I fear not to be up-to-date in my social networking sites"). Each item is answered from 1 (totally disagree) to 5 (totally agree). Scores are added to create a FoMO score for every participant. Higher scores indicate higher levels of FoMO. The Cronbach's alpha values of the trait-FoMO and state-FoMO in the original study were .82 and .81, respectively. In the present study, the Cronbach's alpha for trait-FoMO was .82, and for state-FoMO was .78.

Data Analysis

The data was screened to check for outliers with the help of SPSS-20. Exploratory factor analysis and confirmatory factor analysis were performed to explore structural validity. Further, reliability assessment was done by using Cronbach's alpha. Calculation of Average Variance Extracted (AVE), Heterotrait-Monotrait (HTMT) ratio and composite Reliability (CR) was done to assess validity by providing evidence of convergent and discriminant validity in the Indian population by using AMOS 20.

RESULTS

As shown in Table 1, most of the participants were females (72%) and belonged to middle socioeconomic status (87%). Most of the participants had between 1-3 social networking sites (SNSs) accounts (68%) and used them between 2-3 hours in a day (41%).

Table 1: Socio-demographics and social networking sites (SNSs) usage of the participants (N = 517)

Variable		Frequency (%)
Gender	Male	143(28%)
	Female	374(72%)
Socio economic status	Lower	11(2%)
	Middle	451(87%)

	Upper	55(11%)
No. of SNSs accounts	No account	1(-)
	Between 1-3 accounts	349(68%)
	Between 4-5 accounts	88(17%)
	Between 6-7 accounts	39(7%)
	More than 7 accounts	40(8%)
Number of hours spent daily on SNSs	None	4(1%)
	Less than half hour	14(3%)
	1 hour	46(9%)
	2-3 hour	214(41%)
	4-5 hours	167(32%)
	More than 6 hours	72(14%)

Exploratory factor analysis (EFA)

EFA was performed as there is scanty research on the validation of T-SFoMOS in other populations. Particularly in India no prior validation of T-SFoMOS has been done. The value of the Kaiser-Meyer-Olkin (KMO) test for T-SFoMOS was 0.86. This indicated that the data had meritorious suitability for EFA.[23] Bartlett's test of sphericity was 2237.99 ($p < .001$). This result indicated that the T-SFoMOS had common factors and was appropriate for factor analysis. Next, EFA was performed using principal axis analysis, Promax rotation, in consistence with the original research. The two factors explained 42.5% of the variance. Item loadings, mean and standard deviation (SD) of T-SFoMOS are shown in Table 2.

Table 2: Factor loadings of the two FoMO-factors, means, and standard deviations (SD) of the items (N=517)

State FoMO item	Factor loading	Mean	SD
When I have a good time it is important for me to share the details online (e.g. updating status)	.384	2.03	1.21
When I go on vacations, I continue to keep tabs on what my friends are doing	.487	1.93	1.14
I fear not to be up-to-date in my social networking sites	.576	2.07	1.18
It is important that I have a say about the latest issues in my online social networks (videos, images, posts, etc.)	.462	2.18	1.17
I am continuously online in order not to miss out on anything.	.691	2.07	1.17
I continuously consult my smartphone, in order not to miss out on anything	.777	2.48	1.21

It is important that I understand the internet-slang my friends use	.528	2.56	1.26
Trait FoMO Item			
I fear others have more rewarding experiences than me	.850	2.26	1.33
I fear my friends have more rewarding experiences than me	.921	2.19	1.29
I get worried when I find out my friends are having fun without me	.640	2.24	1.23
I get anxious when I don't know what my friends are up to	.307	1.83	1.10
When I miss out on a planned get-together it bothers me	.337	2.68	1.37

Confirmatory factor analysis (CFA)

CFA was computed using AMOS 20.0. The model-fit measures were used to assess the model's overall goodness of fit (CMIN/df, GFI, CFI, TLI, SRMR, and RMSEA). All values were within their respective common acceptance levels.[24,25] The two-factor model (State FoMO and Trait FoMO) yielded a good fit (Table 3) for the data: CMIN/df =2.523, GFI =0.962 , CFI = 0.967, TLI =0.954 , AGFI =0.938 , and RMSEA=0.054

Table 3: Model fit indices for T-SFoMOS obtained through CFA (N=517)

Fit indices	Obtained values	Cut off for good fit
CMIN/df	2.523	<3
CFI	0.967	≥0.90
GFI	0.962	≥0.95
AGFI	0.938	≥0.90
TLI	0.954	≥0.90
RMSEA	0.054	<0.08

Construct reliability

Construct Reliability was assessed using Cronbach alpha and composite reliability (CR). As shown in Table 4, Cronbach alpha for state FoMO and trait FoMO was found to be 0.78 and 0.82 respectively. Composite reliability for state FoMO was 0.78 and 0.83 for trait FoMO, both above the 0.70 benchmark.[26] Hence, construct reliability was established for each construct in the study.

Convergent validity

Convergent validity of scale items was estimated using AVE.[27] As shown in Table 4, the average variance extracted value of state FoMO (0.35) was below the threshold of 0.50,[27] hence items in this construct can be reworded, modified, or deleted in order to improve its convergent validity, however, average variance extracted value of trait FoMO was 0.50 indicating that this construct is valid.

Table 4: Showing descriptive statistics (mean, SD), reliability, convergent and discriminant validity (N=517)

	Mean	SD	AVE	Cronbach's Alpha	CR	HTMT ratio
State FoMO	15.32	5.47	0.35	0.78	0.78	0.7
Trait FoMO	5.47	4.85	0.50	0.82	0.83	

Discriminant validity

Discriminant validity in the study was assessed using Heterotrait-Monotrait (HTMT) Ratio. The results show that the HTMT value was 0.7, which is below the required limit of .85[28] indicating adequate differentiation between state FoMO and trait FoMO.

DISCUSSION

Contemporary research is focused on investigating the trait and state components of FoMO with mental health, behavioural, and substance addictions. The purpose of the present study was to investigate the psychometric properties of the T-SFoMOS among the Indian population. The principle findings of the present study show that the reliability analysis of the state and trait FoMO of T-SFoMOS show good internal consistency as indicated by their respective Cronbach's alpha. The Cronbach's alpha in the present study for state FoMO and trait FoMO was .78 and .82 respectively, which is also roughly similar to the Cronbach's alpha in the original study. Further, the composite reliability (CR) for state FoMO and trait FoMO was found to be 0.78 and 0.83 respectively. This indicates that T-SFoMOS has good internal reliability in the Indian population. Li et al.[17] while validating the Chinese version of T-SFoMOS found Cronbach's alpha of state FoMO and trait-FoMO to be .77 and .79, respectively. Further composite reliability of state-FoMO and trait-FoMO were found to be .76 and .80, respectively. The Present study has similarly found high Cronbach's alpha and composite reliability of state FoMO and trait FoMO.

Additionally, the results of EFA established the same factors, i.e. state and trait FoMO, in accordance with the initial scale, and the CFA results also confirmed these factors' accuracy. It is to be noted though that the factor loadings for some items were relatively low, with some falling below commonly recommended thresholds. Despite that these items were retained because of their theoretical relevance to the construct. However, the weak loadings suggest that they may not adequately represent the latent variable. Accordingly, these items may benefit from revision or removal in future studies to improve the scale's psychometric properties.

Continuing with the above, in the original research the two factors only explained 38.32% of the variance,[14] however, the variance explained in the present study (42.5%) is more than that, indicating a good fit of the model. Further, CFA also yielded good model fit indices (CMIN/df=2.523; GFI =0.962; RMSEA =.054; CFI =0.967; TLI =0.954; AGFI=0.938). This indicates that T-SFoMOS has good construct validity in the Indian population.

Further, with respect to convergent and discriminant validity, it was seen that AVE for trait FoMO was close to the satisfactory level of 0.5, hence it is concluded that trait FoMO has good convergent validity in the Indian population however AVE for state FoMO is less than acceptable levels of 0.5, this means that state FoMO does not show satisfactory convergent validity in Indian population. Rewording or deletion of certain items in the state FoMO scale can help achieve satisfactory convergent validity. With respect to discriminant validity, the HTMT ratio of both state FoMO and trait FoMO shows both factors have satisfactory discriminant validity in the Indian population. Therefore, it can be concluded that the T-SFoMOS has high construct validity, high reliability and satisfactory convergent and discriminant validity and can be used with the Indian population.

Implications for counselling practice and research

The present study is important for the Indian population for a number of reasons. Firstly, researchers and practitioners can utilise this newly validated instrument for examining state and trait FoMO in India and refine the knowledge produced in the present study with further validations. Secondly, the present study indicates that the T-SFoMOS is a valid and reliable self-reporting instrument for assessing FoMO among Indian youth. The T-SFoMOS is easy to use, administer, and interpret, so it provides quick insights into the level of state and trait FoMO experienced by any individual. Therefore, it can be utilised by college counsellors, universities, professionals, parents, and even by the youth themselves. Thirdly, the study is of special relevance to the Indian youth that has been otherwise overlooked by the research community. Many in India, especially clinical practitioners and health specialists, have started realizing that high levels of FoMO are linked with adverse mental and physical health outcomes. Therefore, the present study can contribute toward understanding the prevalence of state and trait FoMO among the Indian population and hence create awareness programs and interventions for the same.

Limitations and future recommendations

In spite of the uniqueness of the present study, several limitations must also be considered when interpreting the results. Firstly, all data were self-report among a self-selected sample from a small number of universities and colleges and are therefore subject to well-known biases (e.g., memory recall, social desirability), as well as suffering from a lack of generalizability to the total Indian youth population and the Indian general population. Further studies should be carried out on more representative samples and use more objective methods to provide a more robust insight into levels of FoMO. Secondly, further research is required to delve deeper into the characteristics of trait-FoMO and state-FoMO. Therefore, more studies are needed to investigate the psychometric properties of this instrument in the general Indian population and in other countries. Finally, measurement invariance testing across gender was not performed in the present study. As this was the first validation of the instrument in an Indian population, the present findings should be interpreted as preliminary evidence of validity, and future studies with more balanced group sizes should inspect cross-group equivalence.

CONCLUSION

Present study was conducted with the objective of investigating the psychometric properties of T-SFoMOS in Indian youth. Results reveal robust psychometric properties of T-SFoMOS in Indian youth. Based on the findings, the T-SFoMOS is an appropriate psychometric instrument for assessing trait and state fear of missing out among Indian youth. This validation can serve as an instrument in determining youth's online behaviour, primarily social media use. Further, the increase of social media use among young adults necessitates further research to better understand the mechanism underlying social media use (such as fear of missing out) and its consequences on young adults' mental health. Educating

young adults about healthy social media use and interacting with other people without feeling missing out on something is of vital importance to the mental health of these young adults.

Acknowledgments: None

REFERENCES

- Green-Hamann S, Campbell Eichhorn K, Sherblom JC. An Exploration of Why People Participate in Second Life Social Support Groups. *J Comput-Mediat Commun.* 2011;16(4):465-491. doi:10.1111/j.1083-6101.2011.01543.x
- Best P, Manktelow R, Taylor B. Online communication, social media and adolescent wellbeing: A systematic narrative review. *Child Youth Serv Rev.* 2014;41:27-36. doi:10.1016/j.childyouth.2014.03.001
- Sheldon KM, Abad N, Hinsch C. A two-process view of Facebook use and relatedness need-satisfaction: Disconnection drives use, and connection rewards it. *J Pers Soc Psychol.* 2011;100(4):766-775. doi:10.1037/a0022407
- Milyavskaya M, Saffran M, Hope N, Koestner R. Fear of missing out: prevalence, dynamics, and consequences of experiencing FOMO. *Motiv Emot.* 2018;42(5):725-737. doi:10.1007/s11031-018-9683-5
- Alt D. College students' academic motivation, media engagement and fear of missing out. *Comput Hum Behav.* 2015;49:111-119. doi:10.1016/j.chb.2015.02.057
- Fioravanti G, Casale S, Benucci SB, et al. Fear of missing out and social networking sites use and abuse: A meta-analysis. *Comput Hum Behav.* 2021;122:106839. doi:10.1016/j.chb.2021.106839
- Przybylski AK, Murayama K, DeHaan CR, Gladwell V. Motivational, emotional, and behavioral correlates of fear of missing out. *Comput Hum Behav.* 2013;29(4):1841-1848. doi:10.1016/j.chb.2013.02.014
- Duke É, Montag C. Smartphone addiction, daily interruptions and self-reported productivity. *Addict Behav Rep.* 2017;6:90-95. doi:10.1016/j.abrep.2017.07.002
- Elhai JD, Levine JC, Dvorak RD, Hall BJ. Non-social features of smartphone use are most related to depression, anxiety and problematic smartphone use. *Comput Hum Behav.* 2017;69:75-82. doi:10.1016/j.chb.2016.12.023
- Malik L, Shah Nawaz MG, Rehman U, Pragyendu, Uniyal R, Griffiths MD. Mediating Roles of Fear of Missing Out and Boredom Proneness on Psychological Distress and Social Media Addiction Among Indian Adolescents. *J Technol Behav Sci.* 2023;9(2):224-234. doi:10.1007/s41347-023-00323-4
- Qutishat M, Sharour LA. Relationship Between Fear of Missing Out and Academic Performance Among Omani University Students: A Descriptive Correlation Study. *Oman Med J.* 2019;34(5):404-411. doi:10.5001/omj.2019.75
- Holte AJ, Ferraro FR. Anxious, bored, and (maybe) missing out: Evaluation of anxiety attachment, boredom proneness, and fear of missing out (FoMO). *Comput Hum Behav.* 2020;112:106465. doi:10.1016/j.chb.2020.106465
- Demir A, Çetin A. Digital Media in Sports Organizations: The Mediator Role of Social Media Addiction in FoMO and Compulsive Online Shopping. *J Educ Issues.* 2021;7(2):252. doi:10.5296/jei.v7i2.19081
- Wegmann E, Oberst U, Stodt B, Brand M. Online-specific fear of missing out and Internet-use expectancies contribute to symptoms of Internet-communication disorder. *Addict Behav Rep.* 2017;5:33-42. doi:10.1016/j.abrep.2017.04.001
- Balta S, Emirtekin E, Kircaburun K, Griffiths MD. Neuroticism, Trait Fear of Missing Out, and Phubbing: The Mediating Role of State Fear of Missing Out and Problematic Instagram Use. *Int J Ment Health Addict.* 2020;18(3):628-639. doi:10.1007/s11469-018-9959-8
- Röttinger D, Bischof G, Brandt D, et al. Dispositional and online-specific Fear of Missing Out are associated with the development of IUD symptoms in different internet applications. *J Behav Addict.* 2021;10(3):747-758. doi:10.1556/2006.2021.00042
- Li L, Griffiths MD, Mei S, Niu Z. Fear of Missing Out and Smartphone Addiction Mediates the Relationship Between Positive and Negative Affect and Sleep Quality Among Chinese University Students. *Front Psychiatry.* 2020;11:877. doi:10.3389/fpsy.2020.00877
- Xie X, Wang Y, Wang P, Zhao F, Lei L. Basic psychological needs satisfaction and fear of missing out: Friend support moderated the mediating effect of individual relative deprivation. *Psychiatry Res.* 2018;268:223-228. doi:10.1016/j.psychres.2018.07.025
- Song HY, Kim JH. Smartphone Use Type, Fear of Missing Out, Social Support, and Smartphone Screen Time Among Adolescents in Korea: Interactive Effects. *Front Public Health.* 2022;10:822741. doi:10.3389/fpubh.2022.822741
- Can G, Satici SA. Adaptation of fear of missing out scale (FoMOs): Turkish version validity and reliability study. *Psicol Reflex E Crítica.* 2019;32(1):3. doi:10.1186/s41155-019-0117-4
- Al-Menayes J. Keywords Social Media, Addiction, Fear of Missing Out, Psychometrics. 6(2).
- Gil F, Oberst U, Del Valle G, Chamarro A. Nuevas tecnologías - ¿Nuevas patologías? El Smartphone y el fear of missing out. *Aloma Rev Psicol Ciènc Educ Esport.* 2015;33(2):77-83. doi:10.51698/aloma.2015.33.2.77-83
- Kaiser HF. A Second Generation Little Jiffy. *Psychometrika.* 1970;35(4):401-415. doi:10.1007/BF02291817
- Hu L tze, Bentler PM. Fit indices in covariance structure modeling: Sensitivity to underparameterized model misspecification. *Psychol Methods.* 1998;3(4):424-453. doi:10.1037/1082-989X.3.4.424
- Kline RB. Principles and Practice of Structural Equation Modeling. 5th ed. Guilford publications; 2023.
- Hair JF, Ringle CM, Sarstedt M. Partial Least Squares Structural Equation Modeling: Rigorous Applications, Better Results and Higher Acceptance. *Long Range Plann.* 2013;46(1-2):1-12. doi:10.1016/j.lrp.2013.01.001
- Fornell C, Larcker DF. Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *J Mark Res.* 1981;18(1):39-50. doi:10.1177/002224378101800104
- Henseler J, Ringle CM, Sarstedt M. A new criterion for assessing discriminant validity in variance-based structural equation modeling. *J Acad Mark Sci.* 2015;43(1):115-135. doi:10.1007/s11747-014-0403-8