ADAPTATION OF THE TRAIT-STATE FEAR OF MISSING OUT SCALE IN VIETNAM SAMPLE OF UNIVERSITY STUDENTS

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Abstract. The study aims to psychometrically validate the Vietnamese version of the Trait-State Fear of Missing Out Scale (T-SFoMOS-V) and test its reliability and validity, measurement invariance also evaluates the status of the level of T-SFoMO among students in Vietnam. This study aims to promote the adaptation to the cultural context of a self-report instrument that can measure the extent of the T-SFoMO of students in the Vietnamese context. A study was performed on a sample group of students from Hue University, including 324 students for the first phase and 321 for the second one, who completed a survey comprising a questionnaire of T-SFoMOS-V and the Nomophobia Questionnaire. Item analysis and exploratory factor analysis were carried out on the T-SFoMOS-V. Confirmatory factor analysis and measurement invariance showed that the T-SFoMOS-V for university students had good construct validity. The internal consistency of the T-SFoMOS-V (0.87) and the test-retest reliability (0.86) were also good. The T-SFoMOS-V was significantly correlated with nomophobia (0.17). The research results show that 88.0% of students experienced T-SFoMO at different levels, with no significant difference in students by grade level and gender. From these results, discussions were held within the results' scope, and the limitations of this study were mentioned.

Keywords: reliability, validity, measurement invariance, trait-state fear of missing out, Vietnamese university students.

1. Introduction

Fear of Missing Out (FoMO) is a psychological construct related to psychopathology, a phenomenon characterized by the desire to stay continually connected with what others are doing and a pervasive apprehension that others might be having rewarding experiences from which one is absent [1]; describe the feeling that something is happening on social networks, and you are not part of it [2]; the uneasy and often all-consuming sense that "friends or others have rewarding experiences from which one is absent" [3]. Thus, it is believed that the emotional response to missing an experience that is related to the private or public self is associated with a feeling of being absent from desired experiences or having a strong desire to stay continually connected with what others are doing, which is a new type of fear concerning people who constantly check if

their friends share something new (a piece of news, status updates, photos, etc.) on the net, especially in the context of the increasing use of social networks.

The research review on FoMO shows an increasing prevalence due to social media use over the past few years [4]. Central to FoMO is the perceived need to persistently stay connected with one's social network, resulting in frequent (and, for some people, excessive) use of social networking sites and messaging services [5], [1]. Scientific literature defines FoMO as two specific primary components: (1) a pervasive apprehension that others might be having rewarding experiences from which one is absent [5], [4], [1] and (2) a preoccupation of social networking site (SNS) users with being deprived of interaction while offline, a pervasive apprehension that others might be having rewarding experiences from which one is absent [6], [5], [4]. FOMO is considered a two-dimensional construct, including trait-FoMO (i.e., "a relatively stable individual characteristic") and state-FoMO (i.e., "fear of missing out on online content and interaction with others using social media") [4], [7].

The first component aligns with the cognitive aspect of anxiety (e.g., worry, rumination, etc.). The latter part involves a behavioral strategy to relieve such pressure – analogous to how compulsions aim (though maladaptively) to alleviate anxiety in obsessive-compulsive disorder. Currently, this behavioral component of FoMO most often involves frequent checking of SNS and messaging services to maintain social connections and avoid missing out on rewarding experiences [5], [1]. Thus, on a theoretical level, the construct of FoMO is usually described and assessed in an online context.

FoMO is not a singular phenomenon but rather a more complex construct that could reflect a personal predisposition and a specific cognition regarding the fear of missing out online. So, the term state-FoMO – in contrast to the dispositional trait-FoMO – is considered necessary in using Internet communication applications [7]. Many studies show that the intensity of discussion of FoMO has significantly increased with the rise of technology-namely social media. There has been growing empirical literature investigating the role of this phenomenon in problematic online behaviors.

Przybylski et al., (2013) developed a self-report Fear of Missing Out Scale (FoMOS) for assessing FoMO [1], comprising ten items and assesses a unitary factor. However, Przybylski's single-factor FoMOS mainly assesses an individual's trait-FoMO. Addressing this limitation, T-SFoMOS was developed by Wegmann et al. (2017), a 12-item and two-dimensional tool that assesses two FoMO traits (i.e., trait-FoMO and state-FoMO). Trait-FoMO represents the predisposition to develop state-FoMO and other internet-related cognitions. The state-FoMO represents a specific cognition mediating between an individual's core characteristics and internet communication disorder [7]. Therefore, the T-SFoMOS may be a more rounded and robust tool for assessing FoMO. Cronbach's alpha values in the original validation study of the trait-FoMO and state-FoMO were 0.82 and 0.81, respectively.

In Asia, many university students frequently use social networking sites (SNSs) via their smartphones; however, studies on FoMO have shown relatively few validated FoMOS currently available for researchers [4]. There have also been some studies examining problematic social media use in Vietnamese, but no Vietnamese studies concerning FoMO. This may be partly due to the need for standardized tools for assessing

FoMO. The present study validated the T-SFoMOS-V. It tested its reliability, validity, and measurement invariance among Vietnamese university students. So, with the dearth of studies examining T-SFoMO, this study enriches the measurement tools of psychometrically testing in Vietnam.

2. Content

2.1. Objectives

This study aims to enrich the measurement tools of psychometrically testing and promote the adaptation to our cultural context of a self-report instrument. The goal is to measure the extent of the FoMO and the relationship between FoMO and other variables related to demographic characteristics in Vietnamese culture, thus supporting research in our country and promoting the possibility of cross-cultural comparisons.

Specifically, this work aims to measure and validate the validity and reliability, measurement invariance, and level of T-SFoMO in a Vietnam sample of University Students.

2.2. Research design

2.2.1. Participants

In this study, we use the convenience sampling method. The study group of this research was composed of 324 students of the University of Education, Hue University, who completed an online survey. In the first set of experiments, an exploratory factor analysis along with validity and reliability analyses were carried out on the first study group, while a confirmatory factor analysis was carried out on the second study group. The first included 210 females accounted for 64.8% of the sample, and 114 males accounted for 35.2%; their grades, 173 (53.4%) were sophomores, 151 (46.6%) were juniors. The second one was 321, which included 207 females accounting for 64.5% of the sample, and 114 males accounted for 35.2%; as for their grades, 171 (53.3%) were sophomores, and 150 (46.7%) were juniors. Participants' ages ranged from 19 to 25 (Mean = 19.0, SD = 0.80).

The distribution of the study sample group is summarized in Table 1.

Table 1. Sample characteristics of the participants

Gender	Participants (n=324)	Participants (n=321)
Female, *n* (%)	210 (64.8)	207 (64.5)
Male, *n* (%)	114 (35.2)	114 (35.5)
Age (*M ± SD*)	19.0 ± 0.80	19.0 ± 0.80
Grade		
2nd class, *n* (%)	173 (53.4)	171 (53.3)
3rd class, *n* (%)	151 (46.6)	150 (46.7)

2.2.2. Instruments

Trait-State fear of missing out on the scale (T-SFoMOS): Developed by Wegmann et al. (2017) [7], it comprises 12 items assessing two domains-Trait-FoMO has five items, and State-FoMO has seven. Each item is responded to from 1 (totally disagree) to 5

(totally agree). Scores are summed to create a FoMO score for every participant. Higher scores represent higher levels of FOMO.

Nomophobia Questionnaire (NMP-Q): The NMP-Q was used to test the convergent validity of the Vietnamese version of the T-SFoMO Scale. The NMP-Q was developed by Caglar Yildirim (2015) [8]. It has four sub-dimensions, 20 items, and a 7-point Likert Scale. Cronbach Alpha values of the Vietnamese version of the NMP-Q were $\alpha = 0.90$, with the component sentences all satisfying the condition with a weight greater than 0.30 [9]. The Cronbach's alpha of NMP in the present study was 0.94.

2.2.3. Working procedure

The T-SFoMOS-V was translated from the original English version following standardized international guidelines [10]. Accordingly, the process of translating the scale is improved according to the following steps: (i) The original T-SFoMOS was translated from English into Vietnamese by two lecturers from the University of Foreign Languages. They are fluent English speakers who have studied abroad in an English program. After completing this step, the two trainers agreed to develop a translation for the T-SFoMOS-V. (ii) The above translation (translated by two lecturers at the University of Foreign Languages) was back-translated from Vietnamese into English by a translator whose native language is English and fluent in Vietnamese. (iii) A Vietnamese Doctor of Psychology majoring in Applied Psychology (who graduated abroad, studying English program) has compared this version with the original scale to check the validity of this scale's accurate Vietnamese translation. From there, we have the T-SFoMO-V. We then test the reliability and validity of the T-SFoMOS-V on a sample of students and use the T-SFoMOS-V to measure and evaluate the frequency of FoMO in a Vietnam Sample of University Students. Data was collected through an online survey. The sampling process includes the following steps:

1. Obtained survey approval and wait for support from school leaders.

2. Asked for help from the student's academic advisor to organize a survey.

3. The academic advisor informed the purpose and method of participating in the study.

Students who agreed to participate in the study would receive an online survey link from the researcher through an academic advisor.

To achieve this goal, we proceeded in the following steps:

1. Adapting the original T-SFOMO version to the Vietnamese school context. After translating the T-SFoMOS, we prepared a questionnaire that consisted of two components: background information and the T-SFoMOS. Participants completed the T-SFoMOS-V and sociodemographic characteristics.

2. Statistical analysis consisted of several steps involving a descriptive analysis of sociodemographic characteristics and analyzing the validity of the T-SFoMOT-V for university students. We used the students' answers to exploratory factor analysis (EFA), Confirmatory factor analysis (CFA), and other validity on the data collected with the first implementation to verify that the T-SFOMO two-factor model has an adequate fit, consistent with the factor structure of the original version of the T-SFOMO.

3. Assess criterion validity: The Nomophobia Questionnaire (NMP-Q) was selected as the concurrent validity criterion. Convergent validity was assessed using correlation analysis to compare the T-SFoMOS with the NMP-Q.

4. Stability tests were conducted with internal consistency coefficients to analyze the reliability of the T-SFoMOS-V for university students; reliability analyses on the data collected with the second implementation of the T-SFoMOS-V. After two weeks, these students were invited to continue completing the scale and evaluated using an intraclass correlation coefficient.

2.2.4. Data analysis

This study used SPSS 24.0 and Amos 20 to analyze the data. The following analytical methods are used:

Firstly, statistical item analysis and exploratory factors. The two-factor model of T-SFoMOS was assessed using exploratory factor analysis (EFA). Items with factor loads lower than 0.30 and items that do not have at least a 0.10 difference between their loads on two factors were excluded. The factor loads of the items in the scale are over 0.30, and at least 50% of the general variance is explained and found to be sufficient for the behavioral sciences [11], [12]. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (KMO>0.80) and Bartlett's test of sphericity (p<0.05) were used to assess the data suitability. A KMO value over 0.90 indicated appropriateness for factor analysis [13].

Secondly, confirmatory factor analysis (CFA) using Amos was used to verify the factor structure of a set of observed variables. For the CFA, the data-model fit was assessed by the comparative fit index (CFI> 0.90), Tucker-Lewis Index (TLI>0.90), and root mean square error of approximation (RMSEA< 0.06) (90% C.I.) [14]. In addition, in this study, the relationship between the T-SFoMOS-V and the NMP-Q was calculated with the Pearson correlation coefficient to determine the criterion validity of the T-SFoMOS-V.

Thirdly, stability tests were conducted with internal consistency coefficients to analyze the reliability of the T-SFoMOS-V among university students. Cronbach alpha reliability coefficient, correlation value between two congruent halves, Spearman-Brown formula, and Guttmann split-half reliability formula were used to determine the internal consistency level. A reliability coefficient higher than 0.70 is accepted as an indication of the scale's reliability [11]. The stability level of the scale was calculated by determining the correlation between the results of the two implementations, following the two-week test-retest reliability often performed in research studies (Li et al, 2020).

2.3. Results

2.3.1. Item analysis

Item analysis is an analytical method assessing the relationship between each item and total item scores [8]. This approach removes ambiguous or misleading items in a single test, as well as improving items reused in later tests [15]. To ensure the reliability and validity of the scale, MacCallum et al., (1991) suggested deleting items with a correlation coefficient less than 0.30 with the total score of the questionnaire [16], [17]. The correlations between the item-dimension scores and between the dimension-total scores according to this criterion, all 12 items had good psychometric performance (≥0.30). The correlation coefficient between the items and dimensions varied between 0.49 and 0.72 for Dimension 1 and 0.05 and 0.69 for Dimension 2. The correlation coefficient between the dimensions and the total score was 0.88 and 0.87. Therefore, all 12 items were retained to conduct exploratory factor analysis.

2.3.2. Validity findings of the Vietnamese version of the Trait-State fear of missing out scale for students

2.3.2.1. Exploratory factor analysis

The results of the KMO, Bartlett's test of sphericity, chi-square value of the T-SFoMOS-V for students show that the KMO coefficient is 0.81, sig Bartlett's test of sphericity was 0.00<0.05. This result indicated that the T-SFoMOS-V had common factors and was appropriate for factor analysis.

Exploratory factor analysis (EFA) was performed with the 12 items. We performed factor analysis according to the principal components with varimax rotation. The value of the total variance extracted (53.66% > 50.00%) meets the requirement. The results showed that 12 items and two factors were selected for inclusion in the T-SFoMOS-V. The factor loading of the T-SFoMOS-V for students is presented in Table 2.

Table 2. Factor loading of the T-SFoMOS-V in two factors by EFA.

State-FoMO item	Factor loading	Trait-FoMO item	Factor loading
10. When I have a good time it is important for me to share the details online (e.g., updating status)	0.78	2. I fear my friends have more rewarding experiences than me	0.81
7. It is important that I have a say about the latest issues in my online social networks (videos, images, posts, etc.)	0.75	1. I fear others have more rewarding experiences than me	0.80
12. When I go on vacation, I continue to keep tabs on what my friends are doing	0.73	3. I get worried when I find out my friends are having fun without me	0.76
11. It is important that I understand the Internet-slang my friends use	0.65	4. I get anxious when I don't know what my friends are up to	0.72
8. I fear not to be up-to-date in my social networking sites	0.65	5. When I miss out on a planned get-together it bothers me	0.57
6. I continuously consult my smartphone, in order not to miss out on anything	0.57		
9. I am continuously online in order not to miss out on anything	0.48		

Table 2 shows that the factor loading of the T-SFoMOS-V for students ranges from 0.48 to 0.81. Thus, the T-SFoMOS-V for students comprises two factors and 12 items. Factor 1, "State-FoMO," has seven items and a load value between 0.48 and 0.78. Factor 2, "Trait-FoMO," has five items and a load value between 0.57 and 0.81.

2.3.2.2. Confirmatory factor analysis

This study used Amos 20.0 to analyze the confirmatory factor analysis (CFA). AMOS provides an index called the Modification Indices (MI). This high index indicates problems with the structure of the factor scale, reducing the model's fit. The Covariances

table in MI represents the covariance problem of factors together. We focused on the error pair covariance e on the same scale.

The above MI Covariances results show that the error pair e1 and e2 have a very high MI of 100,38, and these two errors correspond to observed variables F2 F1 of the same sub-scale T-FoMo. High MI indicates that if two-way arrows are connected to this error pair, the MI coefficient will be reduced, and the model will be better. Often leading to high MI between two errors of two observed variables of the same scale is due to overlapping data (two questions with similar content). To reduce MI and increase model fit, perform declaration on AMOS for high covariance e1-e2 pair by connecting two-way arrows between them. After connecting the two-way arrow connecting the covariance between the two errors, we performed the analysis again. Table 3 presents the fitting index of the confirmatory factor analysis for the T-SFoMOS-V. The 12 items and two-dimensional model fit well.

Table 3. Fitting index of confirmatory factor analysis for the T-SFoMOS-V

Model	χ^2	df	p	X^2/df	TLI	GFI	CFI	AIC	BIC	SRMR	RMSEA
Two factors CFA (n =324)	95.04	42	<0.001	2.26	0.93	0.93	0.95	143.03	224.92	0.09	0.08

In Table 3, the two-factor model of the T-SFoMOS-V fits well with the observed data. The X2/*df* = 2.26 (1< X2/*df* <3) (Hari et al., 1998), GFI = 0.93, CFI =0.95, TLI =0.93 (> 0.90), and the RMSEA = 0.075 (≤ 0.08) showed a perfect fit. According to these values, it can be said that CFI, GFI, and TLI observable fit values indicate an acceptable fit, and the other observable fit values indicate a perfect fit.
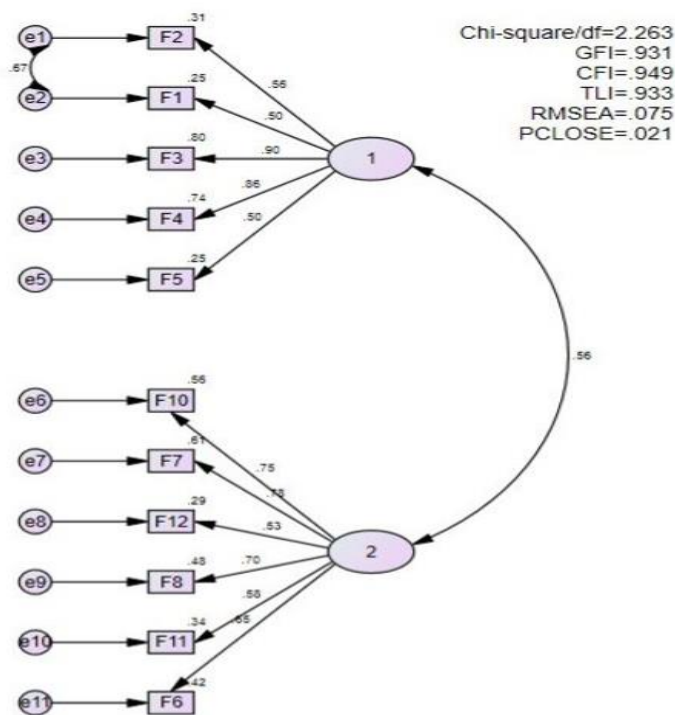

Fig. 1. Confirmatory factor analysis diagram of the scale

In other words, this obtained model indicates that the data confirm the factors. The 2-dimensional model of the T-SFoMOS-V for students has a good fit. The factorial model and values regarding the–item relation of the scale are presented in Fig 1.

2.3.2.3. Criterion validity analysis

Criterion validity tests the correlation between the test score and the criterion. In this study, the NMP-Q was selected as the concurrent validity criterion. Convergent validity was assessed using correlation analysis to compare the T-SFoMOS with the NMP-Q.

The relationship between the T-SFoMOS-V and the NMP-Q was calculated with the Pearson correlation coefficient to determine the criterion validity of the T-SFoMOS-V. Criterion validity analysis results show that the correlation coefficients of the T-SFoMOS with the Nomophobia were 0.17 (Correlation is significant at the 0.05 level (2-tailed)). Thus, the T-SFoMOS-V was significantly correlated with other established indicators of NMP-Q, providing high support for the convergent validity of the T-SFoMOS-V.

2.3.3. Reliability findings of the Vietnamese version of the Trait-State Fear of Missing Out Scale for students

2.3.3.1. Internal Consistency level

The scale's factor and fundamental reliability analyses were conducted using Cronbach's alpha reliability coefficient, the correlation value between congruent halves, the Spearman-Brown formula, and the Guttmann split-half reliability formula. According to Ho & Gu (2022), the Spearman-Brown coefficient and Cronbach's alpha coefficient depend on the number of items in the dimensions [15].

321 university students were randomly sampled from participants to assess test-retest reliability. T-SFoMOS-V question sequences were rearranged to reduce memory error among Vietnamese university students. The two tests were conducted two weeks apart and evaluated using an intraclass correlation coefficient (ICC) since research studies often perform Two-week test-retest reliability [4].

The internal consistency reliability coefficient of the T-SFoMOS-V for students. The reliability analysis values for each factor, the general scale, and the two-week test-retest reliability of the T-SFoMOS-V are summarized in Table 4.

Table 4. The reliability findings of the Vietnamese version of the T-SFoMo for students

Subscales		Two congruent halves correlation	Sperman–Brown	Guttmann split-half	Cronbach's alpha
Trait-FoMO	1st	0.63	0.78	0.70	0.88
	2nd	0.62	0.77	0.70	0.74
State-FoMO	1st	0.64	0.79	0.76	0.87
	2nd	0.63	0.78	0.77	0.85
Total scale	1st	0.56	0.72	0.72	0.87
	2nd	0.54	0.70	0.70	0.86

Note: 1st (n=324); 2nd (n= 321)

In Table 4, the scale's, consisting of two factors and 12 items, two congruent half correlations were found to be 0.56; the Spearman-Brown reliability coefficient was found to be 0.72; the Guttmann split-half value was found to be 0.72, and the Cronbach's alpha coefficient of the Trait-FoMO, State-FoMO were 0.884 and 0.87, respectively. The alpha coefficient for the total scale (12 items) is 0.87 (n=324). On the other hand, it is seen that factors' congruent half correlations were 0.63 and 0.64; Spearman-Brown values were 0.78 and 0.79; Guttmann split-half values were 0.70 and 0.78, and Cronbach's Alpha values were 0.88 and 0.87, respectively. These findings affirm the data are reliable, suggesting that the items have good internal consistency and reliability.

The two-week test-retest reliability (n=321) of the T-SFoMOS-V was also 0.86, and state-FoMO and trait-FoMO were 0.88 and 0.87, respectively; factors' congruent half correlations were 0.54; Spearman-Brown and Guttmann split-half values were 0.700. Factors and the broad scale can make consistent measurements in this regard.

2.3.3.2. Intercorrelations of the subscales

After factor analysis, item discrimination of the items left in the scale was tested with the sample t-test. Their item-total correlations were tested with Pearson's r test, and the scale's validity was specified. The correlations between scores for each item and their respective factor scores were used as a criterion for understanding each item on the scale's level of serving the general purpose of the factor [18]. The broad scale and each subscale's ability to make stable measurements were tested, and the finding summary shows that the subscale scores strongly correlate with the total scale score. The correlation coefficient was 0.80 and 0.93, and each correlation is significant and positive ($p < 0.001$). In this regard, the scale can make stable measurements.

2.3.4. The status of students' level of Trait-State Fear of Missing Out among students in Vietnam

The status of students' level of T-SFoMO among students in Vietnam shows that students' score of T-SFoMO is 33.41 (SD = 16.75). The mean scores of trait-FoMO and state-FoMO were 12.49 (SD = 6.27) and 21.01 (SD = 10.48), respectively. 88.00% of students have feelings of missing out at different levels. Of which 42.50% had mild feelings of missing out, 22.60 % moderate, and 9.60% severe.

By gender, there was no statistical difference in the level of T-SFoMO between male and female students (t(321) = 0.31, p > 0.05), in which the average total scale score for males is 34.28 (standard deviation is 16.85) and for the female is 32.79 (standard deviation is 16.21). The mean scores of trait-FoMO and state-FoMO are 12.29 (SD = 6.22) and 21.99 (SD = 10.50) for males, and for females is 12.49 (SD = 6.62) and 20.30 (SD = 10.46), respectively. 38.5% of male students have a mild fear of missing out, 30.9% moderate, and 11% severe; 45.3% of female students have a mild fear of missing out, 28.4% moderate, and 8.50% severe.

By grade level, there is no statistical difference in the level of T-SFoMO between 2nd class and 3rd class students (t (321) = 0.73, p > 0.05), in which the T-SFoMO total scale score of 2nd class students is 33.17 (standard deviation is 17.28), and that of 3rd class students is 30.55 (standard deviation is 15.49). The mean scores of trait-FoMO and state-FoMO are 12.16 (SD = 6.26) and 21.01 (SD = 10.48) for the 2nd class students and the 3rd class students 12.71 (SD = 6.25) and 20.99 (SD = 10.50), respectively. 51.3% of the 2nd class students have a mild fear of missing out, 34.7% moderate, and 6.70% severe;

44.0% of the 3rd class students have a mild fear of missing out, 25.0% moderate, and 13.0% severe.

The status of students' level of T-SFoMO is presented in Table 5.

Table 5. Students' level of Fear of Missing Out

Total M ± SD		Gender M ± SD		t (321) p>0.05	Grade M ± SD		t (321) p>0.05
		Male	*Female*		*2nd class*	*3rd class*	
33.41 ± 16.75		34.28 ± 16.85	32.7 ±16.21	0.313	33.17 ±17.28	30.55 ±15.49	0.727
Trait-FoMO	12.49 ± 6.27	12.29 ± 6.22	12.49 ±6.62		12.16 ±6.26	12.71 ±6.25	
State-FoMO	21.01 ± 10.48	21.99 ± 10.50	20.30±10.46		21.01±10.48	20.99 ±10.50	

Note: M: Mean score, SD: Standard deviation, ns: negligible

2.4. Discussion and suggestions for future studies

Validity of the Vietnamese version of the Trait-State Fear of Missing Out Scale: The 12-item T-SFoMOS, a two-factor model of T-SFoMOS-V, was tested in the EFA. The results showed that the original factor structure was also found in the Vietnamese version. The one-order model of the 12-item T-SFoMOS-V obtained a series of good fit values. The two-factor model of the T-SFoMO fits well with the observed data as it had in Wegmann et al. (2017) research, and this finding is consistent with the study about the T-SFoMO scale in a Chinese university student sample [7], [4]. In addition, within the scope of the criterion validity, a moderate, positive relationship was found between the T-SFoMO and the NMP, showing that the T-SFoMOS-V was significantly correlated with other established indicators of NMP-Q, providing high support for the convergent validity of the T-SFoMOS-V. The relevancy indicators of the one-factor model of the Vietnamese version of the T-SFoMO for students in this study satisfy the inclusion conditions. Therefore, the two-factor model of the Vietnamese version of the T-SFoMO for students is acceptable.

Reliability of the Vietnamese version of the Trait-State Fear of Missing Out Scale: In this study, Cronbach's Alpha and Mcdonald's ω values were above 0.70 on both EFA and CFA data. The internal consistency of the T-SFoMOS-V (0.87), test-retest reliability (0.86), state-FoMO, and trait-FoMO were 0.88 and 0.87, respectively. This finding is consistent with Cronbach's alpha values of the trait-FoMO and state-FoMO in the original validation study, which were 0.82 and 0.81, respectively [7] and the study used the Chinese T-SFoMOS (for the total scale was 0.84, for trait-FoMO was 0.78, and for state-FoMO was 0.81) [4]. Research results show that the second Cronbach's Alpha value is not reduced considerably compared to the first time (α first = 8.67 compared to α second = 8.64). This could be related to the arrangement of reasonable time between tests and retests. In our study, the time between the first and second survey on the same sample group was two weeks; this has supported the test results well, which may not be affected by memory and experience, external circumstances on the test subject, or the effect of time on the measured characteristic. The result shows the appropriateness of the scale on the sample of Vietnamese culture.

Status of students' Trait-State Fear of Missing Out: This research results show different levels of students' fear of missing out: 42.50% had mild feelings of missing out, 22.60% moderate, and 9.60% severe (students' scores of T-SFoMO is 33.41, mean scores

of trait-FoMO and state-FoMO were 12.49 and 21.01 (SD = 10.484), respectively). These research results are similar to surveys from the United States (US) and the United Kingdom (UK), where three-quarters of adults (aged 18 to 34) experienced FoMO [19]. In China, 15.20% of respondents experienced severe FOMO [4]. The study by JWT Intelligence Communications found that 70% of adults admit to experiencing feelings of missing out (quoted by Abel et al., (2016)) [20]. This result may be related to the university students participating in the study having smartphones and using SNSs (e.g., Facebook, Zalo, YouTube, Instagram, Twitter, and TikTok). Previous studies have shown that students who are inclined to FoMO tend to carry a charger at all times, check their smartphones as soon as they wake up, go to bed with smartphones, stay connected to social media continuously, check smartphones at least 50 times a day, have a social media account history for minimum seven years, have at least four different social media accounts, and spend at least seven hours on social networks every day [21]. On the other hand, FOMO was also used as a predictor for smartphone addiction [7]. In this study, criterion validity analysis results show that the correlation coefficients of the T-SFoMOS with the NMP were 0.171 (Correlation is significant at the 0.05 level (2-tailed)). Therefore, future research must examine the relationship between students' T-SFOMO and Nomophobia and their social media usage behavior.

Surprisingly, no significant differences in students' S-TFoMO levels were found by grade level and gender (p > 0.05). These results are different from some previous studies that suggest FOMO is more related to the female gender [5] and younger age [22], [23], [24]. Simultaneously, a gender difference was found in Chinese female university students had higher FoMO scores related to females than males [5], [25]. This is consistent with previous findings (e.g., [26], [25]) but inconsistent with a few studies reporting that young men have higher levels of FoMO (e.g., [1], [19]). Chinese female university students had higher FoMO scores, reflecting that they prefer to maintain their in-interpersonal relationships via social media more than their male counterparts [27]. There was no significant difference in the level of S-TFoMO of students by grade level and gender in this study; we believe this result may be due to the disproportionate number of genders and class levels in this study. Therefore, future studies should consider the extension sample size and ensure gender and grade level balance in the study sample.

3. Conclusion

The statistical analysis results show evidence that the T-SFoMO-V is reliable and valid. It supports its utility and can be used to assess the fear of missing out among Vietnamese university students. Therefore, future studies by researchers in Vietnam may use the 12-item T-SFoMOS-V to assess FoMO and the relationship between FoMO and other variables related to demographic characteristics in Vietnamese culture. It is possible to consider differences or similarities in aspects associated with FoMO in some studies worldwide such as younger age [28], [23], [24], [5]; females [14], [25]; adverse outcomes, including increasing negative affect, fatigue, stress, physical symptoms, and decreased sleep [29], [30]; and anxious symptom severity, including social anxiety [4].

Overall, the results demonstrate the psychometric properties of the Vietnamese version of T-SFoMOS (i.e., T-SFoMOS-V). The T-SFoMOS-V has high construct validity, reliability, and demonstrable measurement invariance. Based on the findings, the

T-SFoMOS-V is an appropriate psychometric instrument for assessing Vietnamese university students' fear of missing out. This study enriches the measurement tools for studying FoMO in Vietnam and is applicable for subsequent research.

Regardless, there are significant limitations to this study. The first limitation concerns the cross-sectional data collected for the research and the convenient sampling method. This suggests using the results with caution. Second, the data was collected using a self-report questionnaire. Therefore, the self-reported results depend on the participants' responses, memory, and recall, which may need to be revised. Third, all data were self-reported among a self-selected sample from a university so that it can suffer from a lack of generalizability to the total Vietnamese student population. Therefore, future studies should consider expanding the sample size and pay attention to the demographic characteristics of the study sample. They also need to overcome the limitations of the present study.

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