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Fear of Missing Out of the Social Network Scale (FoMOSNS) adaptation and validation to undergraduates

Adaptación y validación de la Escala sobre el Miedo a Perderse Algo en las Redes Sociales (EMPARRSS) en estudiantado universitario

Adaptação e validação da Escala sobre o Medo a Perder Algo nas Redes Sociais (EMPARRSS) em estudantes universitários.

适配与验证大学生社交网络“错失恐惧”量表 (EMPARRSS)

بين الطلاب الجامعيين (EMPARRSS) تكيف والتحقق من صحة مقياس الخوف من تفويت شيء ما على وسائل التواصل الاجتماعي

Suárez-Perdomo, Arminda , Arvelo-Rosales, Carmen Nuria , Álvarez-González, Yasmina , Garcés-Delgado, Yaritza 

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Abstract

This article describes the adaptation and validation of The Fear of Missing Out of the Social Network scale to undergraduates. 1818 undergraduates at the 30 Spanish Universities, aged 18-68 years ($M = 21.7$, $DT = 5.6$). 66.3% women, 32.1% men and 1.5% other gender. To obtain the factor structure, we used exploratory structural equation modeling (ESEM) with oblimin rotation, and for confirmatory purpose we used as the estimation method the Weighted Least Squares Mean and Variance Adjusted with moving measurement window (WLSMW). Also, we performed a ROC analysis of rating and continuous diagnostic test results by mean of area under the curve (AUC) and tested it by multivariate analysis of Covariance (MANCOVA). The results showed that a two-factor structure is the optimal model, personal affection, and social affection, with adequate reliability. Furthermore, discriminate capacity of the scale was proved depending on the factors for the Decision-Making scale (stress and dissatisfaction, vigilance, avoidance, and deferral of task). Scale shows adequate psychometric properties, and its content covers the key aspects of inappropriate use of Social Networks, focusing on the Fear of Missing Out. This is useful for assessing possible inappropriate behaviour in the use of Social Networks among undergraduates. Which may lead to a possible maladaptive pattern in decision-making process.

Keywords: Social Networks, Fear of Missing Out, exploratory structural equation modeling, discriminate capacity, decision-making, undergraduates.

Resumen

Este trabajo describe la adaptación y validación de la Escala sobre el Miedo a Perderse Algo en las Redes Sociales en estudiantado universitario. Participaron 1818 estudiantes de 30 universidades españolas, con edades comprendidas entre 18 y 68 años ($M = 21.7$, $DT = 5.6$). El 66.3% eran mujeres, el 32.1% eran hombres y el 1.5% restante de otros géneros. Se empleó el Modelo de Ecuaciones Estructurales Exploratorio (MESE) para hallar la estructura factorial, utilizando el Mínimo Cuadrado Ponderado Ajustado a la Media y Varianza como método de estimación (WLSMW). Asimismo, con la nueva escala se elaboró un análisis de validez discriminante, basado en el área bajo la curva ROC (ABC) y una posterior comprobación por medio de un análisis multivariado de covarianza (MANCOVA). Los resultados muestran una estructura óptima de dos factores del constructo analizado: Afección Personal y Afección Social; con una fiabilidad adecuada. Además, se demostró la capacidad de discriminación de la escala en función de los factores de la Escala de Toma de Decisiones (Estrés e insatisfacción, Vigilancia, Evitación y Postergación de la tarea). La escala muestra unas propiedades psicométricas adecuadas y su contenido recoge los aspectos claves del uso inadecuado de las Redes Sociales, centrado en el miedo a perderse algo, lo que resulta útil para evaluar posibles conductas inapropiadas en el uso de Redes Sociales en el alumnado universitario y que ello pueda provocar un posible patrón desadaptativo en el proceso de toma de decisiones.

Palabras clave: Redes Sociales, miedo a perderse algo, modelo de ecuaciones estructurales exploratorio, capacidad discriminante, toma de decisiones, estudiantado universitario.

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Resumo

Neste trabalho, apresenta-se a adaptação e validação da Escala sobre o Medo a Perder Algo nas Redes Sociais em estudantes universitários. O estudo envolveu 1818 estudantes de 30 universidades espanholas, com idades compreendidas entre os 18 e os 68 anos ($M = 21,7$, $DT = 5,6$). 66,3% eram mulheres, 32,1% eram homens e os restantes 1,5% eram de outros géneros. Foi aplicado o Modelo de Equações Estruturais Exploratório (MESE) para encontrar a estrutura dos fatores, utilizando o Mínimo Quadrado Ponderado Ajustado à Média e Variação como método de estimativa (WLSMW). A nova escala foi igualmente objeto de uma análise da validade discriminante, com base na área sob a curva ROC (ABC) e de uma verificação posterior através de uma análise multivariada de covariância (MANCOVA). Os resultados mostram uma factorização ótima na solução de dois fatores do construto analisado, que são: Impacto Pessoal e Impacto Social; com uma fiabilidade adequada. Além disso, a capacidade de discriminação da escala foi demonstrada em termos dos fatores da Escala de Tomada de Decisões (Stress e Insatisfação, Vigilância, Evasão e Procrastinação da Tarefa). A escala apresenta propriedades psicométricas adequadas e o seu conteúdo abrange os principais aspetos da utilização inadequada das Redes Sociais, centrando-se no medo de perder algo, o que é útil para avaliar possíveis comportamentos inadequados na utilização das Redes Sociais em estudantes universitários, o que pode conduzir a um possível padrão desadaptativo no processo de tomada de decisões.

Palavras-chave: Redes sociais, medo de perder algo, modelo de equações estruturais exploratório, capacidade discriminante, tomada de decisões, estudantes universitários..

摘要

本研究旨在适配与验证用于大学生群体的社交网络“错失恐惧”量表 (EMPARRSS)。研究样本包括来自西班牙30所大学的1818名学生，年龄介于18至68岁之间 ($M = 21.7$, $SD = 5.6$)。其中66.3%为女性，32.1%为男性，1.5%为其他身份认知。研究采用探索性结构方程模型 (ESEM) 以确定量表的因子结构，并使用调整均值和方差的加权最小二乘法 (WLSMW) 作为估计方法。

同时，通过接收者操作特征曲线 (ROC) 的曲线下面积 (AUC) 分析进行了区分效度验证，并进一步通过协方差多变量分析 (MANCOVA) 确认其区分能力。研究结果显示，该量表在目标构念的两因子解决方案中具有最佳因子结构，这两个因子分别为个人情感影响和社会情感影响，且表现出良好的信度。此外，研究证明该量表能够根据决策量表的各因素（包括压力与不满、警觉性、回避和任务拖延）有效区分目标特性。

该量表展现出良好的心理计量学属性，其范围涵盖了社交网络中“错失恐惧”行为的关键方面，尤其是聚焦于学生对社交网络的不当使用行为。这些行为可能导致不适应性决策模式，因此该量表对于评估大学生社交网络使用行为的不当性具有重要应用价值。

关键词: 社交网络、错失恐惧、探索性结构方程模型、区分能力、决策、大学生

ملخص

العنف ضد المرأة في العلاقات في هذا العمل، تم تقديم تكييف والتحقق من صحة مقياس الخوف من تفويت شيء ما على وسائل التواصل الاجتماعي بين الطلاب الجامعيين. شارك في الدراسة 1818 طالبًا وطالبة من 30 جامعة إسبانية، تتراوح أعمارهم بين 18 و68 عامًا (المتوسط الحسابي = 21.7، والانحراف المعياري = 5.6). شكّلت النساء نسبة 66.3% من العينة، والرجال 32.1%، بينما كانت النسبة المتبقية 1.5% تنتمي إلى فئات لتحديد البنية العاملية للمقياس، مع تطبيق طريقة التقدير باستخدام أقل (MESE) جندرية أخرى. تم استخدام نموذج المعادلات الهيكلية الاستكشافية علاوة على ذلك، تم إجراء تحليل للصدق التمييزي باستخدام المقياس الجديد، استنادًا إلى (WLSMW) المربعات الموزونة المعدلة للمتوسط والتباين أظهرت النتائج تحقيق عاملية (MANCOVA)، تلاه تحقق إضافي من خلال تحليل متعدد المتغيرات للتغاير (ROC (ABC) مساحة تحت منحنى مثلى في الحل المكون من عاملين للبناء الذي تم تحليله، وهما: التأثير الشخصي والتأثير الاجتماعي، مع مستويات موثوقية مناسبة. بالإضافة إلى ذلك، يُظهر المقياس. أثبت المقياس قدرته على التمييز استنادًا إلى عوامل مقياس اتخاذ القرار، وهي: الإجهاد وعدم الرضا، اليقظة، التجنب، وتأجيل المهمة خصائص سيكومترية مناسبة، ويغطي محتواه الجوانب الأساسية المرتبطة بالاستخدام غير الملائم لوسائل التواصل الاجتماعي، مع التركيز على الخوف من تفويت شيء ما. وهذا يجعله أداة مفيدة لتقييم السلوكيات غير المناسبة المحتملة في استخدام وسائل التواصل الاجتماعي بين الطلاب الجامعيين، والتي قد تؤدي إلى ظهور نمط غير متكيف في عملية اتخاذ القرار.

الدالة الكلمات :

وسائل التواصل الاجتماعي، الخوف من تفويت شيء ما، نموذج المعادلات الهيكلية الاستكشافية، القدرة التمييزية، اتخاذ القرار، الطلاب الجامعيون

Introduction

Social networks (SNs) have become popular in recent years as platforms for seeking and sharing information, as well as generating debate (Kong *et al.*, 2021). This led to an increase in research analysing young people's uses of social networking sites and Internet (Pertegal-Vega *et al.*, 2019), examining different variables that may explain the effect of inappropriate use of social media and the Internet on young people. Among these variables is the Fear of Missing Out (FoMO, Buglass *et al.*, 2017).

FoMO has been the subject of study in recent years (Milyavskaya *et al.*, 2018; Tandon *et al.*, 2021). To define it properly, two components must be taken into account: on the one hand, apprehension or fear that others are enjoying rewarding experiences while you are away; and, on the other hand, the desire to be visible and active on your SN accounts. (Przybylski *et al.*, 2013). In this sense, FoMO is the result of taking or not taking advantage of opportunities and regret in decision-making, which has negative emotional consequences (Milyavskaya *et al.*, 2018). That is, people who exhibit FoMO are characterised by a desire to be continuously connected to know what others are doing, in turn causing concern about missing out on a social event (Barry & Wong, 2020).

The desire to be always connected is fuelled by the possibility of communicating through technology and the use of SNs. Being constantly online has increased access to the wide range of activities and events on offer (Milyavskaya *et al.*, 2018). Various elements are mixed here, such as the fact that participation in social media prevents negative moods, feelings of loneliness or dissatisfaction with personal relationships (Ellison *et al.*, 2007). In this way, FoMO is related with factors such as the satisfaction of psychological needs, mood or a general satisfaction with participating in social media networks (Przybylski *et al.*, 2013). Thus, FoMO uniquely captures the self-perception of the harmful impact of the use of social media.

In this sense, with the advent of SNs and other forms of communication, the possibility of experiencing this has increased (Barry & Wong, 2020).

A wide range of activities to choose from does not always ensure a positive response, as the choice may lead to regret (Milyavskaya *et al.*, 2018). Thus, it is noted that FoMO has both positive and negative aspects. As stated by Elhai *et al.* (2020), persistent online checking conduct is inherent to FoMO, with two associated behaviours: a) active, when people have time to proactively browse; and b) passive (or reactive), through numerous social media-related notifications received throughout the day, triggering a compulsive response. On the one hand, social notifications are useful for social life and are positively valued because they satisfy and relieve FoMO (Paul *et al.*, 2015). Online social interaction can improve the social capital of many people, and is seen as a positive component of FoMO (Cheng *et al.*, 2019; Elhai *et al.*, 2020). However, receiving continuous notifications is a disruptive factor; it is associated with constant checking behaviour with adverse effects (Elhai *et al.*, 2021; Hussain *et al.*, 2023). Thus, these notifications can lead to distraction and task dispersion, which affects attention and disrupts the activity at hand (Duke & Montag, 2017; Wen *et al.*, 2023); affecting “switching costs” and making it difficult to return to the task at hand to complete it (Montag *et al.*, 2019).

Although there are many studies from various disciplines, they are partial and segmented (Tandon *et al.*, 2021), and further research needs to be done in a more comprehensive manner. However, despite the fact that FoMO has recently received a great deal of scientific attention in the use of SNs (Al-Busaidi *et al.*, 2023; Fioravanti *et al.*, 2021; Talan *et al.*, 2024), according to Milyavskaya *et al.* (2018), there is a key limitation in FoMO research: existing instruments do not make it possible to draw conclusions about causality or long-term effects.

For this reason, a series of objectives are set out to guide the development of this work: a) adapting and factorising the “FoMO scale” (Mazlum & Atalay, 2022) for university students; and b) testing the discriminatory power of the adapted scale among the students, according to the factors of the Decision-Making Scale (Suárez-Perdomo *et al.*, 2022), which analyses stress and dissatisfaction, vigilance, task avoidance and procrastination.

Regarding the first objective, the FoMO construct has gained relevance in science since it was empirically addressed by Przybylski *et al.* (2013), in order to determine the fears and anxieties expressed by not being connected to the social groups to which they belonged and, in addition, missing out on the activities they were engaged in. To this end, they developed a 10-item scale measuring people's level of fear of missing out on rewarding experiences. In turn, Zhang *et al.* (2020) developed a scale to gauge the degree of FoMO, considering that they could analyse the level of threat to the "private self" and the "social self". The cited papers argued that while the social self is about how people want to be perceived by others, the private self is about missing out on experiences that can develop or maintain one's own private self.

In recent years, different scales have emerged that attempt to analyse the level of FoMO (Ma *et al.*, 2021; Riordan *et al.*, 2015; Sette *et al.*, 2020), measuring the anxiety, sadness and regret that a person reflects when a social event or opportunity is missed. However, these scales have important shortcomings that determine the need to develop scales with greater sensitivity in the analysis of FoMO. Such as regret about decisions and feelings of loss and loneliness, as well as the cultural component that is conducive to adaptation to the target population (Mazlum & Atalay, 2022).

With regard to the second objective, it was considered necessary to identify the discriminating power of the scale with decision-making processes, as decision-making can be observed in terms of coping

strategies (Alzate *et al.*, 2004), divided into two: a) adaptive or vigilant strategies, involving the responsible seeking and checking of decisions, in which a person's self-confidence is evident, and b) maladaptive coping strategies, characterised by hypervigilance in the belief that time is available, developing a frantic and disordered search for time; likewise, avoidance strategies, trying to avoid making decisions by means of selective attention, coupled with procrastinatory decision-making behaviour (Fabio, 2006; González-Navarro *et al.*, 2017; Navarro *et al.*, 2012). Thus, two patterns of decision-making, adaptive and maladaptive, are observed, based on the theory formulated by Janis & Mann (1977), in which the adaptive pattern is identified as careful behaviour leading to deliberate behaviour, keeping the person vigilant and self-confident to make the best possible decision; and the maladaptive pattern as panic and avoidance behaviour leading to the inability to make decisions. This lack of decisiveness characterised within the maladaptive pattern can lead to wrong decisions far removed from success.

This inability to make decisions coupled with the inappropriate use of social media creates a discouraging picture. Social media use is not usually mediated by complex thinking that evaluates the pros and cons of the decisions that are made, but action is often more immediate. If FoMO is added to this, the result can be extremely negative, as a feedback addiction can occur between FoMO and inappropriate use of social media. In a study by Baker *et al.* (2016), it was found that almost three quarters of people feel anxious when faced with indecision processes, which involve the risk of missing out on what their social group is doing. Possible regret in the decision-making process emerges more prominently in young people, as they seek to maximise their benefit when faced with a choice between alternatives (Zhang *et al.*, 2020).

Therefore, FoMO and the decision-making process may be related, so it is necessary to test the extent to which the adapted scale is able to discriminate people who suffer from FoMO

regret. In short, the discriminant capacity of the adapted scale is analysed in terms of the decision-making factors (stress and dissatisfaction, vigilance, task avoidance and progress in), once the possible influence of the level of use of SNs by university students has been controlled.

Method

Participants

A total of 1,818 university students participated in this study, which was accessed through a non-probabilistic snowball sample. Sampling began by contacting the departments of the participating universities, with the instructions to pass the questionnaire on to the teaching staff and for them to pass it on to the students. Finally, the sample consisted of 66.3% women, 32.1% men and 1.5% of people who identified with other genders. Participants ranged in age from 18 to 68 years ($M = 21.7$, $SD = 5.6$). As noted above, participants were studying at university, 94.9% were taking a degree (36.4% first, 24.9% second, 18% third, 13.7% fourth and 1.8% fifth) and the remaining 5.1% were studying for a postgraduate qualification. In addition, 41.6% were studying in the Social and Legal Sciences, 17.1% in Arts and Humanities, 15.4% in Engineering and Architecture, 15.2% in Sciences and the remaining 10.8% in Health Sciences, out of 30 Spanish universities.

Instruments

Fear of Missing Out (FoMO) Scale. The instrument chosen for adaptation and validation was the FoMO Scale (Mazlum and Atalay, 2022), which analyses the level of fear of missing out on social media in university students, analysing this fear from a private and social perspective. The original instrument consisted of 17 Likert scale items with five response alternatives. (1- Completely disagree and 5 - Completely agree). A two-factor model was obtained: (a) *private* and (b) *social*; which showed an adequate fit index ($RMSR = .05$; $GFI = .97$; $CFI = .95$), with internal consistency ranging from .84 to .88.

The decision was taken to translate it from English to Spanish for subsequent adaptation to the target study population, taking into account recommendation D.2 of the International Test Commission's Guidelines (2010) for adaptation of the items to the Spanish population. Once the questionnaire was translated, it was sent to a panel of 3 experts in the construction of data gathering instruments and in the FoMO construct. Subsequently, the items were improved, taking into account the recommendations of the experts and considering the logic of their formulation with respect to the construct in Spanish. The experts also advised keeping the number of items in the original questionnaire and increasing the number of response alternatives from 5 to 6 (1 Strongly disagree and 6 Strongly agree).

Use of social networks: In addition, the ad hoc measure for the use of SNs was used, which consists of two items: When do you usually go online? (1) in the morning; (2) at midday; (3) in the afternoon; (4) in the evening; (5) at any time of the day. How much time do you spend on SNs per day? (1) Less than one hour a day, (2) one to two hours, (3) two to three hours, (4) three to four hours, (5) more than four hours.

Decision-making process Finally, use was made of the instrument developed by Suárez-Perdomo *et al.* (2022), which consists of 17 items divided into four factors: (1) stress and dissatisfaction (5 items) examines the discomfort involved in decision making (e.g. I tend to waste a lot of time on trivial things before reaching the final decision; When I have to make a decision, I wait a long time before I start thinking about it.); (2) vigilance (7 items), analyses the person's constant attention to alternatives and caution when making decisions (e.g. I like to consider all alternatives; I take a lot of precaution before making a decision); (3) avoidance (3 items), analyses the person's possible self-sabotage when making decisions (e.g. I avoid making decisions, I prefer to leave it to others.; I don't like to take responsibility for decision making unless I really have to); and, (4) task

postponement (3 items), refers to the person's procrastinatory decision-making behaviour (e.g. I put off making decisions; I can't think if I have to make a decision in a hurry).

Procedure

Prior to dissemination of the questionnaire, approval was obtained from the Research Ethics and Animal Welfare Committee of the authors' University (CEIBA2023-3269). This dissemination was carried out in two stages: (1) A pilot data gathering was carried out, with the participation of students of the Education Faculty of the authors' University. Ten students per item were selected, the questionnaire was presented, the study objectives were explained and the student response was monitored in order to resolve doubts and contribute to improvement of the items of the adapted questionnaire. (2) The questionnaire was widely disseminated. To this end, dean's offices, departments and teaching staff from 30 Spanish universities were contacted. The aim was for teachers to invite their students to take part in the study, including the questionnaire in their virtual classrooms. To ensure ethical procedures, informed consent was requested and the anonymity of the participants was ensured, in accordance with Organic Law 3/2018, of December 5, on the Protection of Personal Data and guarantee of digital rights.

Data analysis

To determine the factorial structure of the adapted instrument, the Exploratory Structural Equation Model (ESEM, Asparouhov and Muthén, 2009) was used. This model has the advantage of combining Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA), which considers the variance-covariance matrices; it is better adapted to the type of scale presented by the questionnaire. Another advantage is that the factorial weight of the items belonging to a factor does not need to be zero in the other items present in the scale, so the calculation between the adjustment indices and the correlations of the latent variables is more precise. Oblique Geomin rotation was used as a method, as it

involves oblique rotations that show relationships between factors based on the constructs closest to reality, taking into account that it is ascribed to the Social Sciences (Brown, 2006; Schmitt, 2011). The Weighted Least Squares, Mean and Variance Adjusted Method of Estimation (WLSMV) was used.

The χ^2 test, the χ^2/df ratio, the root mean square error of approximation (RMSEA), the Tucker-Lewis index (TLI), the comparative fit index (CFI) and the weighted root mean square residual (WRMR) were used as indicators for the analysis of model fit. A good model fit is considered when the TLI/CFI indexes reach values above .90 and the RMSEA index is in the .08-.05 range. (Byrne, 2013). In addition, we used Bartlett's test of sphericity and the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO, Pérez and Medrano, 2010).

To decide on the number of factors, several criteria were considered: (1) Their theoretical meaning, analysing the thematic coherence of item content. (2) The presence of a number of factors with at least three items in each factor and which were significant (NC = 95%) only in one or two factors. (3) The fit indices were observed, as taking this criterion into account can only lead to accepting more factors than necessary (Hayashi *et al.*, 2007). Once the number of factors had been determined, factor weights of less than .30 and those with factor weights of less than .15 between two factors were discarded. Next, an internal consistency analysis was performed for both the instrument and the different factors that comprise it, finding the Omega coefficient (McDonald, 2013). SPSS 25 was used for descriptive statistics, Mplus 7.4 (Muthén and Muthén, 1998- 2010) was used for MESE, and Microsoft Excel was used to estimate the Omega coefficient.

For the second objective, the ROC curve was carried out to determine the discriminative capacity of the scale, observing the sensitivity and specificity demonstrated as a function of the factors of the Decision-Making Scale (Suárez-Perdomo *et al.*, 2022). Thus, the

discriminant ability of the factors resulting from the adapted scale to discern between a low or high level in the decision-making factors was observed. Finally, a multivariate analysis of covariance (MANCOVA) was carried out, considering Internet connection and the time spent by participants on social media as covariates, taking as an indicator of effect size (ES) the statistic η^2 (Cohen and Swerdlik, 2006). SPSS 25 was used for both analyses.

Results

Psychometric analysis of the FoMO Scale adaptation

To address the first objective, the model fit analysis was performed to decide on the number of factors that make up the adapted instrument. As shown in Table 1, the factorial

structure in which at least three items are significant on one factor and only significant on one or two factors is in the two-factor solution. In other words, in solutions with three or four factors, there is less discrimination in this sense, with items being significant in more than two factors, with no minimum of three items in each of the existing factors. With respect to the model fit, it can be observed that the higher the number of factors, the better the fit index. Nevertheless, the best solution in which all items are clearly represented is the two-factor solution. In addition, the KMO test was obtained in the two-factor solution, with a value of .947, and Bartlett's sphericity test was significant (18445.36, *gl* 136, $p < .000$). Also, the internal reliability of the two-factor model was analysed by means of the Omega coefficient with a value of .93, being .86 for the first factor and .91 for the second factor.

Table 1. Number of factors with three significant items (95%) on one factor

Factors	Fact/ Items	χ^2	gl	RMSEA	90%	CFI	TLI	WRMR
1	1	18532.81	136	.131	.127-.135	.798	.0769	.07
2	2	18532.81	136	.079	.085-.093	.929	.919	.03
3	2	18532.81	136	.083	.079-.088	.940	.927	.02
4	2	18532.81	136	.077	.073-.082	.956	.0930	.02

Note: Fact/Items = number of factors with three or more significant items (95%) on one factor and not significant on more than one or two factors.

The factorial solution obtained consisted of two factors, in which the factor weights ranged from .445 to .838, as shown in Table 2, selecting the STDYX standardisation estimate of the resulting CFA model that

obtained a significance $p \leq .001$. The first factor, personal affect, consists of 9 items and the second factor, social affect, consists of 8 items.

Table 2. Factor weights for the final version of the scale according to the Standardised 2-factor model

Item	Factors	
	Personal Affect	Social Affect
I get anxious when I think I'm missing out on a social event promoted on social media.	.731	-.13
Missing out on a social event makes me feel sad.	.797	-.50
I feel indecisive when I have to choose between several social events.	.715	-.016
I feel nervous if I think I have missed a social event due to ignorance.	.736	.061
I regret when I choose to go to one social event and rule out other options.	.558	.109
I am obsessed with having missed out on a social event.	.650	.087
I feel excluded when I am unable to go to all social events.	.450	.305
I feel regret when I miss social events.	.668	.151
I feel guilty when I miss out on a social event I was thinking of attending.	.445	.300
I feel lonely when my friends attend a social event without me.	.018	.790
I feel ignored by my friends when I miss a social event.	.015	.779
I feel anxious about being unable to keep up with the social life of my friends.	.027	.733
I feel uneasy about not being able to attend the plans proposed by my friends.	.102	.649
I obsess over the thought that my friends are having a good time without me.	.107	.836
I get nervous when friends share experiences of events I missed.	.030	.838
I feel ignored by my social circles when I refuse their invitations.	.095	.777
I feel anxious about turning down invitations for unavoidable reasons.	.087	.628

Discriminant capacity of the new scale

Regarding the second objective, the ROC curve was performed, for which the factors of the Decision-Making Scale were divided based on the .33 and .66 percentiles, to establish two levels of classification of the factors. Scores located below .33 were considered “low” and those scores above .66. “high” on each factor

for further analysis. In addition, the factors of the adapted and factored scale of the Fear of Missing Out on SNs were used as a diagnostic measure. The analysis of the ROC curve (Figure 1 and 2) by obtaining the area under the curve (ABC) showed regular tests for stress and dissatisfaction, task avoidance and procrastination according to the social affect.

Figure 1. ROC analysis of the area under the curve (ABC) of the factors of the Fear of Missing Out on SNs Scale according to stress, dissatisfaction and vigilance.

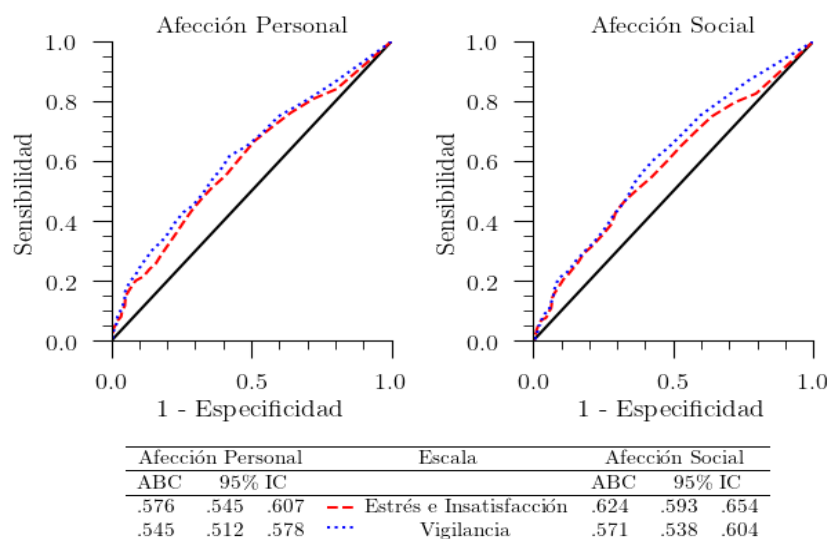
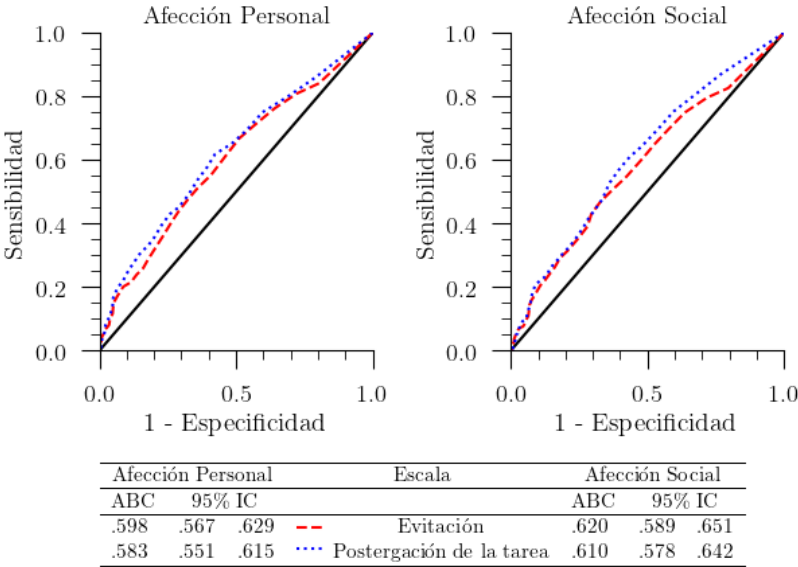


Figure 2. ROC analysis of the area under the curve (ABC) of the factors of the Fear of Missing Out on SNs Scale according to task avoidance and procrastination.



Finally, taking as dependent variables the factors of the adapted and factorised Fear of Missing Out on SNs Scale and as fixed variables the factors of the Decision-Making Scale, a multivariate analysis was carried out, using Internet connection and time spent on social media as covariates. The multivariate analysis was significant for all elements of analysis: stress and dissatisfaction. ($F(2, 1275) = 28.97, p < .01, \eta p^2 = .10$), vigilance ($F(2, 1178) = 9.56, p < .01, \eta p^2 = .10$); task avoidance ($F(2, 1277) = 29.06, p < .01, \eta p^2 =$

.10) and procrastination ($F(2, 1210) = 16.18, p < .01, \eta p^2 = .10$). Finally, as shown in Table 3, significant differences were found in all the factors that make up the Decision-Making Scale, with small effect sizes. This indicates the discriminant capacity of the new scale to distinguish between participants on the basis of their decision-making pattern, once the effect of Internet connection and the time spent by participants on social media is kept under control

Tabla 3. Comparison between the factors of the new scale and the factors of the Decision-Making Scale

	Low (n =641)		High (n = 639)		MANCOVA (1, 1276)			
Stress and Dissatisfaction	M	SD	M	SD	Flev	F	p	ηp^2
Personal Affect	1.78	.84	2.14	1.0	30.09	21.91	.00	.04
Social Affect	1.83	.98	2.38	1.2	44.98	35.54	.00	.06
	Low (n =665)		High (n = 518)		MANCOVA (1, 1179)			
Vigilance	M	SD	M	SD	Flev	F	p	ηp^2
Personal Affect	1.86	.88	2.03	1.0	5.99	9.18	.01	.01
Social Affect	1.97	1.05	2.27	1.18	12.12	18.40	.00	.02
	Low (n =541)		High (n = 741)		MANCOVA (1, 1278)			
Avoidance	M	SD	M	SD	Flev	F	p	ηp^2
Personal Affect	1.79	.82	2.13	1.0	36.81	34.57	.00	.03
Social Affect	1.90	.97	2.38	1.2	55.78	48.82	.00	.04
	Low (n =500)		High (n = 715)		MANCOVA (1, 1211)			
Task procrastination	M	SD	M	SD	Flev	F	p	ηp^2
Personal Affect	1.82	.87	2.12	1.0	22.66	21.26	.00	.02
Social Affect	1.93	1.0	2.36	1.2	21.52	20.74	.00	.03

Discussion

The FoMO Scale for social networking aims to fill an important gap in the assessment of inappropriate use of the Internet and SNs by university students, given the scarcity of sensitive instruments to assess the construct in Spanish. The first objective was to analyse the psychometric properties of the adapted instrument and its reliability. The results showed that the most appropriate model was the two-factor version, in line with the original scale (Mazlum & Atalay, 2022) and with the research by Zhang *et al.*, (2020), in which the impact of FoMO on the private self and the social self is observed. The content of the first factor analyses the person's level of reflection on his or her self-perception, including feelings of dissatisfaction, fear, anxiety, sadness or abandonment, which arise from the most personal aspect, independently of the existence of social groups or the perception of how the person looks to others when he or she misses an opportunity or a social event (Mazlum & Atalay, 2022). It can be seen that in the scale obtained, the private component is based on the fear produced by the person's perception of their social environment. This is a transcendental element for evaluation of the construct from the personal standpoint, since the appearance of FoMO has been identified with the feeling of loneliness of the affected person, as this state of loneliness is what drives the person to browse compulsively to satisfy his or her needs for relationships with other people (Yin *et al.*, 2023).

The content of the second factor refers to the social domain, i.e., what the person experiences when they perceive that their friends are having a good time without them. A social affect is observed, as stated by Milyavskaya *et al.* (2018), when a person, regardless of how they learn about alternative activities, sees an event in SNs that leads to an increase in FoMO. In other words, as noted in the cited study, the way they find out about alternative activities may not be important, but SNs can make these reminders more frequent, leading to a greater feeling of FoMO. FoMO is thus an inherently social phenomenon, as the

way in which alternative activities are known is not important, whereas when the alternative activity is of a social nature, its impact is increased (Milyavskaya *et al.*, 2018).

Regarding the second objective, the validity of the scale to discriminate among students according to the level of FoMO they are experiencing is confirmed. Especially with regard to social affect, as can be seen in the analysis of the area under the curve; a regular test was observed for the variables stress and dissatisfaction, task avoidance and procrastination. However, it is worth highlighting the results for personal affect, insofar as it does not present a discrimination test, but there is a tendency close to regularity that determines the possible capacity for discrimination, which is supported by the data obtained in the following analysis carried out. Therefore, the new scale has the capacity to discriminate between students who: (1) present a high degree of FoMO from a social perspective and (2) manifest a maladaptive pattern in their decision-making process. In this case, as deduced from Janis and Mann's (1977) theory, they are students who display frenetic and disordered coping strategies. This can result in personal profiles with a high level of regret about the decision they have made, leading to an increased fear of feeling left out of the social activities of their peers (Zhang *et al.*, 2020). The ability to discriminate adaptive and maladaptive patterns in university students through the level of FoMO will help to understand how students may be affected by making mistakes in the decision-making process that lead to the loss of social opportunities (Baker *et al.*, 2016); even though this may be affecting other areas of personal, academic and professional development. Meanwhile, it has been observed that high levels of FoMO can lead to dysfunctional coping strategies that may be negatively affecting decision-making processes (Brailovskaia *et al.*, 2024).

It is important to highlight that these results are not due to the time university students spend on Internet or SNs, as in the subsequent analysis the possible effect of the variables that

analysed this fact was controlled and it was observed that, without their influence, there were significant differences in the factors that make up the adapted scale. Therefore, the scale presented here has a high sensitivity to analyse the FoMO process in university students, even to discern among students who may present maladaptive patterns in the decision-making process, i.e., who have the ability to clearly identify regret in the decisions taken, feelings of social loss and loneliness when they see that they have missed an opportunity and have not taken advantage of it (Mazlum & Atalay, 2022).

The study has a number of limitations that need to be identified: 1) In the pilot phase of the instrument's implementation, the questionnaire was disseminated in one university, although it was subsequently forwarded to 29 other universities. B) The data gathering instrument used was a self-reporting questionnaire which, although it should not be considered any less valid than other instruments, does present some constraints, such as social desirability in the response.

Bearing in mind the results obtained and the limitations presented, there is a need to continue exploring the Fear of Missing Something in SNs in university students and how this may be affecting decision-making processes, as well as the academic goals of students who are being trained at university. This type of studies could even be transferred to an adolescent population, studying in secondary school and high school, taking into account the situation of vulnerability that they experience at this age.

In conclusion, the Fear of Missing Out on SNs Scale for university students is a reliable instrument that allows us to explore a set of dimensions of FoMO. This scale uniquely captures the harmful impact of the use of SNs on personal and social aspects, identifying, in turn, the form of maladaptation to technology use that generates personal discomfort, fatigue, stress, etc. (Barry & Wong, 2020; Milyavskaya *et al.*, 2018). Considering the scientific community's growing interest in studying the

inappropriate use of SNs and FoMO, it is particularly relevant to have instruments able to identify the core elements of these constructs: regret in decision making, personal and social distress, addiction or social isolation (Mazlum & Atalay, 2022). In addition to an instrument to help identify possible maladaptive patterns in decision making that analyses the assessment of the reasons why the person regrets and what motivates this pattern in their decisions. Therefore, having instruments that are sensitive to both FoMO and discrimination in the decision-making process could encourage the creation of training processes that help the students concerned become aware of the inappropriate use of social media that can lead to the experience of FoMO and maladaptive decision-making processes, leading to an improvement in these aspects of their personal and social life.

Ethics Committee

The Fear of Missing Out questionnaire has been approved by the Research Ethics and Animal Welfare Committee of the University of La Laguna, with registration number CEIBA2023-3269, held on March 17, 2023.

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