

RESEARCH ARTICLE

Why Do Adolescents Use Social Media? Validation of the Croatian Version of Motives to Use Social Networking Sites Scale

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Introduction: Motivation for social media use is a multidimensional construct; however, most existing questionnaires focus solely on motives and do not distinguish between active and passive use. To address this, the Motives to Use Social Networking Sites Scale (MOTUS; Reimann et al., 2023) was developed, integrating motivational aspects and usage modes.

Aim: This study examined the construct and convergent validity of the MOTUS scale in Croatian high school students. The original eight-factor model was tested with confirmatory factor analysis (CFA), and measurement invariance across gender was assessed with multigroup CFA. Associations with social media, loneliness, and fear of missing out were analysed for convergent validity. The Average Variance Extracted (AVE) and the Heterotrait–Monotrait (HTMT) ratio were also calculated to further evaluate the MOTUS scale. Reliability was assessed with Cronbach's α and Macdonald's ω .

Methods: Participants were 853 adolescents aged 14–19 ($M = 16.21$, $SD = 1.07$; 69.6% women). In addition to MOTUS, they completed the Fear of Missing Out Scale (FoMO), De Jong Gierveld Loneliness Scale and estimated daily time on social media.

Results: The eight-factor model showed acceptable fit after removing one item with cross-loadings (CFI = .916, TLI = .900, RMSEA = .061, SRMR = .074). Measurement invariance supported configural, metric, and scalar equivalence across gender. Convergent validity was confirmed through significant correlations between MOTUS subscales, time on social media, and FoMO.

Conclusions: The MOTUS scale shows acceptable psychometric properties for assessing motives and usage modes of social media in Croatian adolescents.

Keywords: social media, motivation, adolescents, MOTUS scale, fear of missing out

Introduction

Social Network Sites (SNSs) have become an integral part of daily life, especially among adolescents and young adults in developed countries. For example, the 2024 data from the U.S. context show that up to 95 % of adolescents aged 13–17 use at least one social media platform, with YouTube, TikTok, Instagram, and Snapchat standing out as the most popular (Faverio & Sidoti, 2024). The average time spent on these platforms continues to rise. Research shows that adolescents spend an average of 4.8 hours per day on social media, highlighting their significant role in this population's daily life (Rothwell, 2023). Social media provides opportunities for commu-

nication, content sharing, identity expression, information access, and entertainment (Anderson & Jiang, 2018), but it also carries several potential risks. Intensive social media use raises questions about its impact on users' psychosocial development and well-being (Uhls et al., 2017).

Research highlights both positive and negative consequences of SNSs use among young people. Positive outcomes include increased social connectedness, a sense of support and belonging, access to information, networking with peers and professionals, and opportunities for self-expression (Best et al., 2014; Ellison et al., 2014; Uhls et al., 2017). On the other hand, excessive social media use can lead to undesirable outcomes such as increased symptoms of anxiety and depression, reduced sleep quality, negative feelings of comparison with others, lower self-esteem, and a distorted body image (Keles et al., 2020; Twenge & Campbell, 2019; Uhls et al., 2017). Negative consequences are often linked to phenomena such as cyberbullying, uncontrolled overuse, or comparisons with idealized portrayals of others (Anderson & Jiang, 2018; Midgley et al., 2021; Vogel et al., 2014).

The effects of social media use are often influenced by the underlying motivation. Jarman et al.'s (2021) research demonstrated that diverse motivations for SNSs use (e.g., information sharing, passing time, social interaction, and appearance feedback) revealed mixed associations with social media engagement (e.g., intensity, active use, and passive use) and well-being. Using social media for social support can enhance a sense of connection with others and life satisfaction (Choi, 2024; Winstone et al., 2021), whereas using it for comparison with others may lead to negative emotional outcomes (Keles et al., 2020). Receiving 'likes' is one of the main motivations for social media use among young people, and research results show that feedback from other SNS users directly influences adolescents' emotional state, impacts their self-esteem, and plays an important role in identity construction (Jong & Drummond, 2016).

These findings highlight the complex relationship between motivation and the outcomes of social media use, necessitating precise measurement methods. Since social media use motivation is a multidimensional construct, numerous questionnaires have been developed to measure it. These instruments differ based on the theoretical framework they rely on, the aspects of motivation they assess, the target population, and the characteristics of specific platforms.

Several multidimensional questionnaires combine various dimensions of motivation. For example, the Motivation Scale for Using Social Network Sites (Masciantonio & Bourguignon, 2023) includes six motives: entertainment, social interaction, seeking information, instrumental use, self-documentation, and self-enhancement. The Social Network Sites Use Motivation questionnaire (Kim et al., 2011) measures motives such as seeking friends, social support, entertainment, information, and convenience. The Motives in Content Generation Using Social Media questionnaire (Leung, 2013) assesses five socio-psychological needs fulfilled by content generation: showing affection, venting negative feelings, gaining recognition, getting entertainment, and fulfilling cognitive needs. The Social Media Motivations Scale (Orchard et al., 2014) evaluates motives such as freedom of expression, information-seeking, social interaction, and others. These tools help researchers better understand the diversity of motives underlying social media use and their implications for user behavior. A literature review suggests that most of these questionnaires are based on the Uses and Gratifications Theory (UGT, Katz et al., 1973), which posits that users choose SNSs and content that best satisfy their needs.

While these motivation scales offer valuable insights into the multifaceted drivers of social media engagement, a significant limitation is that all were developed and validated primarily for adult or young adult populations. None of these instruments were specifically designed for, or psychometrically tested in, adolescent samples. This presents a critical gap in the field, as adolescents use social networking platforms in developmentally distinct ways, shaped by their ongoing identity formation, peer dynamics, and emotional regulation processes (Uhls et al., 2017; Valkenburg & Piotrowski, 2017). Constructs such as self-presentation, belonging, and social comparison may have different meanings and implications for adolescents compared to adults. Consequently, applying adult-validated measures to adolescent populations may result in reduced validity and reliability, as well as inaccurate interpretations of the psychological and behavioral mechanisms behind their social media use.

Besides these universal questionnaires, there are also context-specific instruments developed for particular platforms, such as TikTok (Omar & Dequan, 2020) or Instagram (Lee et al., 2015). These instruments focus on motivations related to the specific content of the platforms they are designed for, which limits their generalizability but provides deeper insights into user engagement.

Additionally, various measures focus on specific needs or motives underlying social media use, such as the need for social comparison (Yang et al., 2018) or the fear of missing out, which is characterized by the desire to stay connected to what others are doing and the fear of being absent from rewarding experiences (Przybylski et al., 2013).

This diversity of measures allows for a comprehensive analysis of motivation but also requires careful instrument selection to ensure validity and reliability in the context of an ever-changing digital environment. Understanding different instruments for measuring motivation for using SNSs is crucial for further research on its impact on mental health and user behavior.

Recent trends emphasize the importance of distinguishing between “active” and “passive” social media use (Verduyn et al., 2017), which traditional questionnaires often overlook. Active use refers to posting content or interacting with other users, whereas passive use involves consuming content posted by others (Reimann et al., 2023). Research suggests that passive use (e.g., lurking) is more likely to lead to negative outcomes than active participation (Verduyn et al., 2017).

However, most measures assessing motivation for using SNSs focus solely on motives, without differentiating between active and passive use. To address this limitation, Reimann et al. (2023) developed a new measurement instrument – the Motives to Use Social Networking Sites Scale (MOTUS) – in which items integrate both motivational aspects and active/passive usage.

In developing the MOTUS scale, Reimann et al., (2023) identified four key motives for social media use commonly reported in prior research: the need for self-presentation, need to belong, need for social comparison, and need for entertainment. These were assessed across both active and passive usage modes, resulting in an eight-factor structure. The final 28-item instrument demonstrated satisfactory psychometric properties in two studies conducted with German-speaking adult samples (mean age $\approx$ 29 years), confirming its factor structure and showing good reliability and validity. However, as both studies were conducted exclusively with adults in a specific cultural-linguistic context, the generalizability of the MOTUS scale to adolescents and other language groups remains untested. There is a pressing need for age-appropriate, developmentally sensitive instruments that reflect the unique cognitive and social contexts of adolescent users. Validated adolescent-focused measures—such as an adapted version of MOTUS—represent a crucial step in enhancing the precision and relevance of research in this area.

Accordingly, the present study aims to address this gap by evaluating the construct and convergent validity of the Croatian version of the MOTUS scale in a large sample of high school students. Specifically, the study tests the original eight-factor model (Reimann et al, 2023), assesses measurement invariance across gender, and explores associations with self-reported time on social media, loneliness, and fear of missing out. This work contributes to the broader goal of developing valid instruments for adolescent populations, thereby informing future research, interventions, and policies on youth digital media engagement.

Method

Participants and Data Collection

This study was part of a large-scale project and employed a convenience sample. Participants were students from schools in both coastal and continental regions of Croatia whose principals had consented to the research. Adolescents were recruited from several high schools in towns across Primorje-Gorski Kotar County and Bjelovar-Bilogora County. The study included students who were present in class during questionnaire administration, had obtained parental consent, provided their own consent, and reported using social media.

A total of 853 adolescents aged 14 to 19 ($M = 16.21$, $SD = 1.07$; 69.6 % women) took part in the study. Only age and gender were collected as demographic variables, both because no additional information was necessary to address the research questions and to maintain participant anonymity. Since the project was designed to examine the relationships among different constructs, with the administration of a large number of paper-based measures, in order to minimize participant burden, all students completed several common questionnaires, while additional instruments were administered depending on the subsample. Namely, in this study, the MOTUS scale was administered to 853 adolescents and the Fear of Missing Out Scale and the De Jong Gierveld Loneliness Scale were administered to a subsample of 256 high school students aged 15 to 18 ($M = 16.10$, $SD = 0.88$; 71 % women). A scheduled time was allocated during school hours for students to complete the questionnaire, which typically required 15 minutes.

The research was approved by the Research Ethics Committee of the Faculty of Humanities and Social Sciences at the University of Rijeka (approval number: 640-01/24-01/04). Prior to the commencement of data collection, formal approval was obtained from the principals of participating schools. Informed consent was secured from the parents or legal guardians of all student participants. Parents received comprehensive information detailing the study's purpose, procedures, and any potential risks. Additionally, all participants were fully informed about the

voluntary nature of their involvement and provided their assent prior to participation. To ensure ethical integrity and participant protection, the data collection process was conducted in coordination with school psychologists. Confidentiality and privacy were strictly upheld, no personally identifiable information was collected, and all responses were fully anonymized. Data were securely stored and accessible only to the research team. Participants were assured that their responses would be used exclusively for research purposes and that they retained the right to withdraw from the study at any time without any adverse consequences.

Measures

The Motives to Use Social Networking Sites Scales

The Motives to Use Social Networking Sites Scales (MOTUS, Reimann et al., 2023) is a 28-item instrument grounded in a two-dimensional framework. It assesses four primary motives for social media use: self-presentation, belonging, social comparison, and entertainment, alongside the mode of engagement, distinguishing between active and passive use.

Therefore, MOTUS has an eight-factor structure (Reimann et al., 2023): (1) need for self-presentation – active (4 items, e.g., *I post pictures or videos of myself for self-presentation*), (2) need for self-presentation – passive (4 items, e.g., *I look at content from others to know what's trending*), (3) need to belong – active, close friends (4 items, e.g., *I interact with my friends to show that I am thinking about them*), (4) need to belong – active, groups (3 items, e.g., *I send out group invitations or respond to them to feel connected to that group*), (5) need to belong – passive (3 items, e.g., *I look at content from others to know what's going on in the lives of family and friends*), (6) need for social comparison – passive (4 items, e.g., *I look at content from others to find out whether they are more popular than me*), (7) need for entertainment – active (3 items, e.g., *I generate informative or funny content myself because I enjoy it*), (8) need for entertainment – passive (3 items, e.g., *I scroll through social networking sites because the content matches my interests*).

The scale was originally designed to be platform-independent, making it applicable across various social networking sites (SNSs). Participants respond using a five-point Likert scale ranging from 1 (*never*) to 5 (*often*), indicating the frequency with which specific SNS activities are performed to satisfy the stated motives. For the present study, the MOTUS was translated into Croatian using a back-translation procedure to ensure both linguistic accuracy and cultural appropriateness. First, two researchers independently translated the original English version into Croatian. Their translations were then compared, and any discrepancies were discussed to produce a preliminary consensus version. Next, this Croatian version was translated back into English by a bilingual expert. The back-translated version was carefully compared with the original English text to identify inconsistencies or potential differences in meaning. Any disagreements were thoroughly discussed, with particular attention paid to conceptual accuracy and cultural relevance. This process was undertaken to maintain the psychometric integrity of the scale while adapting it for use with a Croatian adolescent population. Data on validity and reliability are presented in the Results section.

The Fear of Missing Out Scale

The Fear of Missing Out Scale (FoMO, Przybylski et al., 2013; Croatian translation Kovač, 2024) is a 10-item scale that measures fear of missing out on social events, especially involving friends, often through social media. It reflects the desire to stay constantly connected with what others are doing (e.g., *I get worried when I find out my friends are having fun without me*). Answers are given on a 5-point Likert scale ranging from 1 (*not at all true of me*) to 5 (*extremely true for me*). The total score is obtained by summing all responses, with scores categorized as follows: 10–19 indicating a low level of fear of missing out, 20–39 a moderate level, and 40–50 a high level (Przybylski et al., 2013). In the current sample, the scale has demonstrated satisfactory reliability, as reported in the Results section.

De Jong Gierveld Loneliness Scale

The De Jong Gierveld Loneliness Scale (DJGLS, De Jong Gierveld & Kamphuis, 1985; De Jong Gierveld & Van Tilburg, 1999) has 11 items. Although the scale was developed with the distinction between social (e.g., *There are plenty of people I can lean on when I have problems*) and emotional (e.g., *I miss having a really close friend*) loneliness in mind, it can be used as a unidimensional loneliness scale. The scale used a five-point Likert scale ranging from 1 (*not at all*) to 5 (*completely*). After recoding the negatively worded items, a higher total score indicates a more intense global sense of loneliness. For the present study, the DJGLS was translated into Croatian using the same

procedure as the MOTUS scale. The scale has demonstrated satisfactory reliability in our sample, as reported in the Results section.

Social Media Use

Social media use was estimated using two simple open-ended questions. Participants had to estimate the number of hours they spend daily on social media (*“Estimate how many hours per day you are active on social media: _ hours.”*). They also estimated which social network they used the most. No response scale was provided; instead, the participants had to enter the number of hours they spent using social media themselves and indicate which social media platform they used the most. TikTok was the most popular social media (40.2 %), followed by Snapchat (26 %) and Instagram (18.4 %). The average self-reported daily social media use was 4.94 hours ($SD = 2.63$).

Data Analyses

To examine the factor structure of the Croatian version of the MOTUS measure, we conducted confirmatory factor analysis (CFA) with maximum likelihood estimation and robust standard errors, with JASP software (version 0.19.3). Maximum likelihood estimation with robust standard errors (MLR) was employed because this approach is particularly suitable when data deviate from strict multivariate normality (Satorra & Bentler, 1994). The results of the Mardia's test of multivariate normality suggest that our data do not meet the assumption of multivariate normality ($p < .001$). We tested the eight-factor model originally proposed by Reimann et al. (2023). To evaluate the goodness of fit for the proposed models, we employed the χ^2 statistic, where a non-significant result indicates an acceptable fit. Given the chi-square test's sensitivity to sample size (Brown, 2015), we also calculated the relative (normed) chi-square (χ^2/df). Reported guidelines for acceptable values vary, ranging from as high as 5.0 (Wheaton et al., 1977) to as low as 2.0 (Tabachnick & Fidell, 2007), with values below 5.0 generally considered indicative of reasonable model fit (Hooper et al., 2008). We computed several approximate fit indices with conventional cut-offs: Root Mean Square Error of Approximation (RMSEA) with a 95 % confidence interval, Tucker-Lewis Index (TLI), Comparative Fit Index (CFI), and Standardized Root Mean Square Residual (SRMR).

Acceptable fit standards were defined as TLI and CFI $> .90$, RMSEA $< .08$, and SRMR $< .08$ (Hooper et al., 2008; Little, 2013). To test measurement invariance across gender, multigroup confirmatory factor analysis (MGCFA) was performed. We focused on changes in CFI (ΔCFI) and RMSEA ($\Delta RMSEA$), considering $\Delta CFI < .010$ and $\Delta RMSEA < .015$ as indicative of invariance (Chen, 2007; Cheung & Rensvold, 2002).

Internal consistency was evaluated using Cronbach's alpha and McDonald's ω , with a criterion value of $> .70$ considered acceptable (DeVellis, 2003).

For the MOTUS scale, we also calculated the Average Variance Extracted (AVE), which reflects the amount of variance captured by a construct relative to measurement error. According to Hair et al. (2012), a value of at least .50 demonstrates adequate validity, showing that the construct's items consistently capture the same underlying concept. Discriminant validity of the MOTUS scale was assessed using the Heterotrait-Monotrait (HTMT) ratio of correlations, with values below .85 suggesting that the factors in the scale are sufficiently distinct from one another (Henseler et al., 2015).

Convergent validity was assessed through Pearson's product-moment correlations between the MOTUS subscale scores, FoMO, De Jong Gierveld Loneliness Scale, and self-reported time on social media. Also, the correlations with demographics were analyzed.

Descriptive statistics, including mean, standard deviation, skewness, kurtosis, and Shapiro-Wilks test of normality distribution were calculated for all eight factors of MOTUS, FoMO, and De Jong Gierveld Loneliness scale.

Results

The Factor Structure of the MOTUS

The eight-factor model with correlated factors showed an almost acceptable model fit (Table 1). CFI and TLI were both just below the desired threshold of .90, while the RMSEA and SRMS had values below the .08 and .10, respectively. The modification indices indicated that item 19 may have cross-loadings onto factors 2, 3, 4, and 5, suggesting that it may not adequately represent a single underlying construct and could compromise the

construct validity of factor 6. When we excluded this item from the analysis, all fit indices were within acceptable values (Table 1).

Table 1. Results of the CFA for the Eight-Factor Model of the Motives to Use Social Networking Sites Scales (MOTUS)

	$\chi^2(df)$	χ^2/df	CFI	TLI	RMSEA [95% CI]	SRMR
Eight-factor model	1692.40 (322) $p < .01$	5.25	.884	.864	.071 [.068, .074]	.090
Eight-factor model (without item 19)	1241.98 (296) $p < .01$	4.19	.916	.900	.061 [.058, .065]	.074

An examination of the Croatian translation of item 19 suggests that the issue with this item may stem from subtle shifts in meaning introduced during translation. In the English version, item 19 states, “*I look at content from others to find out where they are professionally.*” Given that our participants were high school students, we intentionally avoided the term “professionally,” which might not be age-appropriate or meaningful in this context. Instead, the item was translated more broadly as “what they are up to” (e.g., “*I look at content from others to see what they are up to / to find out what they are doing*”). While this adaptation aimed to enhance relevance for adolescents, it likely altered the conceptual focus of the item, making it more general and ambiguous. As a result, participants may have interpreted the item in divergent ways, leading to inconsistent responses and substantial cross-loadings across multiple factors.

The invariance tests between genders confirmed the configural, metric, and scalar invariance (Table 2). The original eight-factor model with the same factor structures fits the data satisfactorily in both subgroups, and a further fixation of the factor loadings as well as an additional fixation of the intercepts did not lead to a significant deterioration of the model fit. For scalar invariance, it can be observed that the model fits the data slightly worse ($\Delta CFI = .013$, while $\Delta RMSEA$ is below the expected values of .015; Chen, 2007). Interestingly, as shown in Table 6, girls had a more pronounced need for self-presentation (active and passive) and need to belong (passive and active-close friends).

Table 2. Comparing Configural, Metric and Scalar Invariance of Eight-Factor model of MOTUS across Gender

Invariance	df	AIC	BIC	RMSEA	CFI	$\Delta RMSEA$	ΔCFI
Configural	592	63194	63972	.053	.924		
Metric	611	63230	63917	.054	.919	.001	.005
Scalar	630	63437	64291	.057	.906	.003	.013

All items had loadings of $> .40$ on their respective factors, except item 26, and were significant at $p < .001$. Item 26 had a value of .221, suggesting that this item should also be investigated to find out the reason for this low loading (Table 3).

To further test the validity of the MOTUS scale, we calculated the Average Variance Extracted (AVE), indicating a construct explains more variance in its own indicators than is shared with other constructs. For seven of the factors, the AVE values exceeded the recommended threshold of 0.50 (Hair et al., 2012), indicating that the constructs are adequately represented by their indicators. Only Factor 2 (Need for Self-Presentation Active) yielded a slightly lower AVE of 0.47, which is marginally below the criterion but still close to acceptable levels. Overall, these results suggest that the constructs are adequately represented by their indicators. The MOTUS scale was further examined using the Heterotrait-Monotrait (HTMT) ratio of correlations, as proposed by Henseler et al. (2015). All HTMT values were below the recommended threshold of 0.85, providing evidence of satisfactory validity (Table 4).

As expected, the correlations between the factors were positive and significant, varying between .14 and .51 (Table 4).

Reliability and Descriptive Statistics

Internal consistency for all MOTUS subscales as well as for De Jong Gierveld Loneliness Scale and Fear of Missing Out Scale is shown in Table 5.

Table 3. Average Variance Explained and Standardized Factor Loadings for the MOTUS Items

Factor	AVE	Items	λ
F1 Need for Self-Presentation active	.57	MOTUS1	.76
		MOTUS2	.81
		MOTUS3	.83
		MOTUS4	.46
F2 Need for Self-Presentation active	.47	MOTUS5	.67
		MOTUS6	.70
		MOTUS7	.65
		MOTUS8	.74
F3 Need to Belong active (close friends)	.59	MOTUS9	.81
		MOTUS10	.76
		MOTUS11	.81
		MOTUS12	.69
F4 Need to Belong active (groups)	.68	MOTUS13	.81
		MOTUS14	.83
		MOTUS15	.84
F5 Need to Belong passive	.51	MOTUS16	.78
		MOTUS17	.79
		MOTUS18	.55
F6 Need for Social Comparison passive	.61	MOTUS20	.59
		MOTUS21	.90
		MOTUS22	.77
F7 Need for Entertainment active	.75	MOTUS23	.87
		MOTUS24	.80
		MOTUS25	.92
F8 Need for Entertainment passive	.61	MOTUS26	.22
		MOTUS27	.89
		MOTUS28	.92

Note. All loadings are significant at $p < .001$ level.
AVE = Average Variance Explained.

Table 4. Correlations between Factors of MOTUS Questionnaire (above the diagonal) and Heterotrait-Monotrait ratio (below the diagonal, in italics)

	F1	F2	F3	F4	F5	F6	F7	F8
F1 Need for self-presentation active	–	.43**	.20**	.21**	.31**	.48**	.43**	.16**
F2 Need for self-presentation passive	.55	–	.36**	.38**	.51**	.49**	.38**	.37**
F3 Need to belong active (close friends)	.24	.44	–	.42**	.47**	.23**	.14**	.30**
F4 Need to belong active (groups)	.26	.47	.47	–	.51**	.37**	.18**	.26**
F5 Need to belong passive	.35	.65	.59	.64	–	.49**	.24**	.39**
F6 Need for social comparison passive	.58	.51	.10	.33	.35	–	.31**	.26**
F7 Need for entertainment active	.51	.43	.15	.21	.29	.30	–	.28**
F8 Need for entertainment passive	.24	.57	.39	.38	.63	.24	.36	–

** $p < .01$

Table 5. Means, Standard Deviations and Coefficients of Reliability for eight MOTUS subscales, De Jong Gierveld Loneliness Scale and Fear of Missing Out Scale

	k	Min-Max	M	SD	Skew	Kurt	Shapiro-Wilks W	Coefficient ω	Coefficient α
F1 - Need for Self-Presentation active	4	1.00 – 5.00	1.66	0.84	1.26	1.03	.82**	.834	.803
F2 - Need for Self-Presentation passive	4	1.00 – 4.75	2.71	0.91	0.27	-0.64	.97**	.783	.781
F3 - Need to Belong active (close friends)	4	1.00 – 5.00	4.10	0.84	-1.06	0.59	.87**	.853	.848
F4 - Need to Belong active (groups)	3	1.00 – 5.00	2.95	1.15	0.25	-0.94	.94**	.864	.863
F5 - Need to Belong passive	3	1.00 – 5.00	3.26	0.92	-0.20	-0.70	.96**	.750	.743
F6 - Need for Social Comparison passive	3	1.00 – 5.00	1.98	0.75	0.96	0.63	.91**	.827	.781
F7 - Need for Entertainment active	3	1.00 – 5.00	1.62	0.88	0.94	-0.22	.82**	.901	.897
F8 - Need for Entertainment passive	3	1.00 – 5.00	2.80	0.73	0.13	-0.45	.97**	.791	.683
Loneliness	11	1.00 – 4.64	2.37	0.89	0.59	-0.39	.96**	.898	.900
FoMO	10	1.00 – 4.70	2.69	0.75	0.11	-0.35	.99**	.766	.803

Note. F1 to F8 – MOTUS subscales, Loneliness – De Jong Gierveld Loneliness Scale. FoMO – Fear of Missing Out Scale. k = number of items.

** $p < .01$

All factors and scales had satisfactory coefficients of reliability. Cronbach's alpha values ranged from .68 for need for entertainment–passive to .90 for need for entertainment–active, while McDonald's ω values ranged from .75 for need to belong–passive to .90 for need for entertainment–active. Although the Shapiro-Wilk test indicated significant deviations from normal distribution, the skewness and kurtosis values for all variables fell within the range of ± 2 , suggesting that the distributions can be treated as normal (Kline, 2005).

Convergent Validity

To examine convergent validity, we calculated correlations between MOTUS subscales with FoMO, De Jong Gierveld Loneliness Scale, and self-reported average time on social media. As stated before, data regarding fear of missing out and loneliness was collected on a subsample of participants ($n = 256$; Table 6).

Table 6. Intercorrelations between the MOTUS Subscales with Gender, Age, De Jong Gierveld Loneliness Scale, Fear of Missing Out Scale and Self-Reported Average Time on Social Media ($n = 256$)

	Gender	Age	Loneliness	FoMO	Time on social media
F1 - Need for Self-Presentation active	-.21**	-.13*	.04	.31**	.24**
F2 - Need for Self-Presentation passive	-.28**	-.03	.10	.46**	.18**
F3 - Need to Belong active (close friends)	-.24**	-.09	-.08	.25**	.16**
F4 - Need to Belong active (groups)	-.09	-.01	.07	.26**	.10**
F5 - Need to Belong passive	-.24**	-.07	-.06	.37**	.14**
F6 - Need for Social Comparison passive	-.04	-.12	.12**	.53**	.20**
F7 - Need for Entertainment active	-.03	-.02	.11	.15*	.13**
F8 - Need for Entertainment passive	.00	.07	.02	.16*	.08*

Note. Gender – 0 = woman, 1 = man. FoMO – Fear of Missing Out Scale. Loneliness – De Jong Gierveld Loneliness Scale. Time on social media – self-reported average daily time on social media.

* $p < .05$; ** $p < .01$.

All correlation coefficients between MOTUS subscales and FoMO scale were positive and significant, suggesting good convergent validity of MOTUS scale. The highest correlation was found between FoMO and the subscales Need for Self-Presentation passive (.46) and Need for Social Comparison passive (.53), while the FoMO had lowest correlations with both Need for Entertainment subscales – active (.15) and passive (.16). Results on the De Jong Gierveld Loneliness Scale were not significantly related to the MOTUS subscales, except for the passive Need for Social Comparison.

The correlation coefficients between MOTUS subscales and average daily self-reported time on social media were significant but low and should be interpreted with caution. The highest correlation was between self-reported time on social media and active Need for Self-Presentation. Participants who post material on social media motivated by need to actively present themselves (e.g., *I post pictures or videos of myself to be admired by others; I post pictures or videos of myself because I like to show how I look to other people*) report spending more time on social media.

Discussion

The primary objective of this study was to evaluate the Motives to Use Social Networking Sites Scale (MOTUS) by examining its psychometric characteristics within a Croatian adolescent population. Specifically, the study aimed to determine whether the original eight-factor model of the MOTUS could be replicated among high school students in Croatia and to assess the scale's criterion validity through correlations with theoretically relevant constructs – namely, self-reported average time spent on social media, loneliness, and fear of missing out. By doing so, this study not only contributes to the psychometric validation of the MOTUS in a new cultural and developmental context but also provides insights into the motivational underpinnings of social media use among adolescents. These findings are important for advancing our understanding of how social media motivations relate to psychological well-being and digital engagement across different sociocultural settings.

Psychometric Evaluation of the MOTUS Scale

We tested the original eight-factor model of the MOTUS scale as proposed by Reimann et al. (2023). The model with correlated factors demonstrated a nearly acceptable fit to the data. Closer inspection revealed that item 19 contributed to the suboptimal model fit, likely due to cross-loadings across multiple factors (specifically factors 2, 3, 4, and 5). This issue may stem from the translation process, particularly the adaptation of the original wording to better reflect adolescent experiences in the Croatian context. In an effort to make the item more relatable, the term “professionally” was omitted, potentially rendering the item overly broad and conceptually misaligned with its intended construct. The original item (“*I look at content from others to find out where they are professionally*”) captures not only current activities but also progress, status, and achievements. Our translation (“*I look at content from others to find out what they are doing*”) emphasizes only present activities and misses this dimension. Upon removing item 19 from the model, all fit indices reached acceptable levels, and the remaining items exhibited satisfactory loadings on their respective factors. One exception was item 26, which displayed a positive but relatively weak loading. Notably, in the original validation, this item loaded comparably to the other items within its factor. The reason for its diminished performance in the present sample remains unclear, particularly given that the translation (“*I scroll through social networking sites because content matches my interests*”) was straightforward and semantically consistent with the original. Future studies should consider employing cognitive interviews or small-scale qualitative pilots to explore how adolescents interpret such items, thereby identifying whether the observed psychometric issues stem from linguistic nuances or conceptual ambiguity. This approach could provide more definitive evidence regarding translation fidelity and semantic equivalence. It remains unclear whether this finding reflects cultural incongruence in how the item’s content is perceived or inherent vagueness in the item wording.

We confirmed the original eight-factor structure: need for self-presentation (active, passive), need to belong (active – close friends, active – groups, passive), need for social comparison (passive) and need for entertainment (active, passive). Significant correlations between the subscales occurred and all factors had satisfactory coefficients of reliability. A similar range of correlations between subscales (from $r = .14$ to $.51$) was found in the original study (Reimann et al., 2023). The original eight-factor model with the same factor structures fits the data satisfactorily in both gender subgroups. In the original, the scale was used with subjects over the age of 18 (Reimann et al., 2023), and our results show that the use of this scale is also justified for male and female adolescents in the age range from 14 to 19.

Descriptive and Convergent Validity Findings

Descriptive analyses of MOTUS showed that active Need to belong (close friends) and passive Need to belong had the highest average score. In contrast, active Need for Self-Presentation and active Need for Entertainment achieved lowest average score. In the sample of adult participants, the passive Need for entertainment had the highest average score, followed by the active Need to belong for close friends and the passive Need to belong (Reimann et al., 2023). According to Reimann et al. (2023), the need for affiliation may surpass other motives in importance, given its fundamental role in human life. Correlations of the MOTUS subscales and the self-reported average time on social media were significant, ranging from $r = .08$ to $r = .24$ with the highest association for active Need for Self-Presentation. In the German adult sample, the corresponding correlations varied from $.09$ to $.34$, with the highest association for active Need to belong and active Need for Self-Presentation (Reimann et al., 2023).

The convergent validity data of the questionnaire were observed in relation to the association with loneliness and fear of missing out. During adolescence, building and maintaining close relationships are important goals (Barry et al., 2009), and adolescents who do not achieve these goals may experience loneliness (Buecker et al., 2021; Teppers et al., 2014). Loneliness is a relevant factor in the context of social media use, with its relationship to social media being interpreted through several theoretical frameworks, including the social displacement model, the rich-get-richer model, and the social compensation model (Smith et al., 2021). In our sample, loneliness was significantly related only to the passive Need for social comparison. Given that the effects of social media on feelings of loneliness and social isolation depend largely on various user characteristics, including the need to belong (Smith et al., 2021), it was expected that loneliness would be most strongly associated with the need to belong, but this was not the case. In terms of FoMO, the highest correlation was found with the passive Need for Social Comparison and the active Need for Self-Presentation. This is in line with previous research that found a strong association between fear of missing out and the MOTUS social comparison subscale (Reimann et al., 2023).

Strenghts and Limitations

This study contributes to social media research by validating the MOTUS scale as a comprehensive measure of social media use in different cultural contexts and age groups, offering valuable insights into the motivations and active–passive usage patterns among adolescents. Nonetheless, several limitations should be acknowledged. First, the sample was heavily skewed toward female participants (approximately 70 %), which may constrain the generalizability of findings, particularly in light of known gender differences in social media behaviors and motivational drivers. Second, since students completed the questionnaires in groups during class, where privacy may have been limited, their responses could have been influenced by social desirability. Third, the assessment of convergent validity was conducted in a smaller subsample, which reduces statistical power and may limit the representativeness of these results. The lack of additional validated motivation measures precludes an evaluation of convergent validity and limits the ability to triangulate findings. Incorporating such instruments in future work would bolster the construct validity of the MOTUS scale. Additionally, although many observed correlations reached statistical significance, their effect sizes were generally modest. It is therefore important to critically assess the practical relevance of these findings, especially in applied settings such as education or clinical practice. These limitations highlight the need for continued validation, the use of complementary methodologies, and diversified sampling strategies to enhance the robustness and applicability of the MOTUS scale across contexts.

Conclusion, Implications, and Future Directions

The validation data presented in this study on the Croatian version of MOTUS appear to offer support for the overall psychometric quality of this instrument in line with the original conceptualization. The present study has shown that MOTUS is generally a psychometrically acceptable instrument for assessing the motives for use (need for self-presentation, need to belong, need for social comparison, and need for entertainment) as well as the mode of use (active/passive) of social networks in a Croatian sample of male and female high school students. The theoretical and scientific contribution of this paper provides a better insight and understanding of the different motivations underlying the use of social networks as well as the possibility of a more complete operationalization of social network use by adolescents.

Future applications of this questionnaire to adolescents should examine additional criterion variables. Attention should also be paid to a better translation of question 19 and an additional review of question 26. Addressing these uncertainties through targeted qualitative methods would enhance the scale's validity and overall interpretive clarity. Future research should aim for more balanced sampling or conduct stratified analyses and sensitivity checks to examine potential gender-specific patterns. Furthermore, it would be desirable to apply the questionnaire to older participants as well. The question of measuring the frequency of social media use based on self-assessments remains open, as self-reports may not accurately reflect objective social media use (Mahalingham et al., 2023).

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Author contribution

Tamara MARTINAC DORČIĆ: conceptualization, design, funding acquisition, investigation, project administration, data management, interpretation, supervision, writing original draft, review and editing.

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Declaration of interest statement

The authors have no conflicts of interest to declare.

Ethical statement

This manuscript is the authors' original work.

All participants engaged in the research voluntarily and anonymously.

Their data are stored in coded materials and databases without personal data.

The studies involving human participants were reviewed and approved by the Research Ethics Committee of the Faculty of Humanities and Social Sciences at the University of Rijeka, Croatia. Approval number: 640-01/24-01/04.

Data availability statement

Datasets presented in this article are available from the corresponding author upon reasonable request.

Declaration on using artificial intelligence in research and manuscript preparation

The authors declare that they have used AI technologies (Instatext editor, Chat GPT, Google translate) to translate text from Croatian into English and for spelling, grammar and language editing. Each suggestion was reviewed by the authors.

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