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RECEIVED 30 January 2024

ACCEPTED 07 August 2024

PUBLISHED 05 September 2024

CITATION

Carranza Esteban RF, Mamani-Benito O,
Huancahuire-Vega S, Casildo-Bedón N,
Cabrera-Orosco I and
Turpo-Chaparro JE (2024) Design and
validation of a scale of motivation for
scientific publication in Peruvian university
professors (MoSCPU-UP).
Front. Educ. 9:1378626.
doi: 10.3389/feduc.2024.1378626

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Design and validation of a scale of motivation for scientific publication in Peruvian university professors (MoSCPU-UP)

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The study's objective was to design and validate a motivation scale for scientific publication in Peruvian university professors (MoSCPU-UP). Instrumental research where a scale of 13 items distributed in 2 factors (Intentional State and Commitment-will) was designed and validated. The sample comprised 546 university professors (62.1% male) aged 22 to 67 ($M = 45.05$ and $DS = 9.32$). The sample was separated into two subgroups for the exploratory and confirmatory factor analysis. For analyzing the validity of evidence based on the content, the Aiken V coefficient was used; for construct validity, exploratory and confirmatory factor analysis was used. Reliability was studied through Cronbach's alpha coefficient. The results show that the items received a favorable evaluation (Aiken's $V > 0.70$). Goodness of fit indices were adequate (IFC = 0.93, TLI = 0.92, and RMSEA = 0.08). Likewise, the correlation between factors 1 and 2 was significant ($p < 0.05$). Evidence of validity based on the relationship with other variables with measures of professional self-efficacy is significant and acceptable reliability ($\alpha = 0.91$; 95% CI = 0.89–0.92). In conclusion, the MoSCPU-UP scale is an instrument that reports evidence of validity and reliability.

KEYWORDS

motivation, scientific publication, university professors, validity, reliability, Peru

1 Introduction

The basis of every university is scientific research; with its exercise, it is possible to ensure important contributions to a country's human, social and economic development (Melgar et al., 2019). In this sense, to ensure scientific productivity, it is necessary to look at the figure of the university professor, who, within his main functions, has as his main purpose the generation of scientific knowledge (van Dijk et al., 2020), an essential requirement for universities to be more competitive, more effective in their teaching, and more productive in terms of science and technological innovation (Ismayilova and Klassen, 2019).

One of the determining factors of scientific production at the university level is the motivation for scientific research and publication (Treccani and Veschetti, 2024), constructs recently developed

and operationalized in the works of Carranza-Esteban et al. (2022) and Mamani-Benito et al. (2023). In this case, motivation in the academic context is defined as the impulse that guides the effort in persistence, direction, and intensity before goals that one sets (Becerra González and Morales Ballesteros, 2015; Rahmouni and Aleid, 2020). Like the cited authors, those of the present also take as a foundation to explain the motivation for the publication of scientific articles the achievement motivation theory of McClelland and Atkinson (Weiner, 2010; Álvarez, 2012), who developed and strengthened a theoretical model based on action and task orientation (Criado-Del Rey et al., 2024). Thus, in the context of the scientific research conducted by the university professor, motivation has important implications since it has proven to be a determining factor when it comes to getting involved in the exercise of scientific research, in this case, proposing research projects, writing articles, and presenting results in conferences require an intentional state that activates and guides behavior based on commitment and will, despite the difficulties that arise along the way (Carranza-Esteban et al., 2022).

In this scenario, the university professor becomes the leading promoter of the research activities carried out in the universities and scientific publications (Vallejo López, 2020; Jeune et al., 2024). Indeed, the workload of university professors involves two main activities, teaching and research; however, the professional advancement of professors depends mainly on their performance in research (Reymert and Thune, 2023). In addition, the evaluation of the performance of the university professor has been oriented toward the research indicators (D'Isanto et al., 2024), of which the most prominent is the publication of articles in specialized scientific journals (Biondi and Russo, 2022). Under this paradigm, higher education professors are then expected to teach research by example since their function is linked not only to transmitting information but also to teaching how to produce new knowledge and reproduce it (Ramirez-Montoya et al., 2023), with the active participation of the student and being a facilitator of the process (Mamani-Benito, 2019).

In the Peruvian context, in recent years, progress has been made regarding the strengthening of research as a fundamental pillar of universities (Millones-Gómez et al., 2021), mainly thanks to reforms made in the new university law (Ministerio de Educacion, 2014). Since 2014, many Peruvian universities have significantly increased their scientific production (Glass et al., 2018). However, recent independent analyses have continued to report limited scientific production by many university professors. For example, we have some reports of national scope; In medicine, an investigation carried out with 806 thesis advisors from all the medical schools of the Peruvian territory reported that only 4 and 2 universities had half or more of their advisors who published in journals indexed in Scopus or Google Scholar, proving to be few universities that had thesis advisors with current scientific production (Mejia et al., 2022). Another study on 231 directors of Psychology theses from 30 Peruvian universities found that 58.4% had never published a scientific article, 26.8% had done so in the last 3 years, and 18.2% in the previous 5 years. However, 23.8% disseminated their publications in journals indexed in SciELO and only 14.7% in Scopus (Mamani Benito et al., 2020).

Although these studies only represent two areas of knowledge, this is enough to have an idea that many university professors in Peru do not have the habit or the motivation to generate new knowledge (Brito-Nuñez et al., 2024). In this case, the probable causes of the low scientific publication that are mentioned are university professors, mostly with more than 25 years of service, with few advised theses,

little participation in research projects (Delgado Arenas et al., 2021), and lack of motivation in the development of new knowledge and scientific publication (Barrutia Barreto et al., 2019).

In line with the above, the lack of motivation of university professors for research and publication often leads to poor teaching performance. In this regard, it has been verified that professors without research are five times more likely to be among the faculty with the lowest performance (García-Gallego et al., 2015). So why are university professors little motivated by scientific research and publication? It is an important question for university administrators and research managers who want to improve their professors' motivation and thus increase their institution's scientific production (Salomi and Geetha, 2024).

Faced with these facts, it is necessary to investigate the level of motivation with which university professors in Peru work, given that the intentional state, commitment, and will are determining factors in the exercise of scientific research (Roa et al., 2024). Given this, it is urgent to accurately assess the motivation for the publication of scientific articles, an issue that may be possible by having valid and reliable measures. This tool could also help to assess the effectiveness of training and instructional strategies and materials designed to increase professors' motivation for scientific publication.

Consulting the literature reveals the existence of scales to measure motivation toward academic achievement among students (Lagos et al., 2024) and faculty populations (Criado-Del Rey et al., 2024). Additionally, there is evidence of a few scales designed to assess research motivation, such as the MOiN-VU, a measure developed by Carranza-Esteban et al. (2022) comprised 13 items distributed into two factors (will and interest). However, this scale is designed to be applied to students and measures motivation for research in a general way. Likewise, the psychometric evidence of another MOPu-AC scale developed by Mamani-Benito et al. (2023) is made up of 9 items distributed in a single factor, but its application is also restricted to university students. However, it does address the motivation construct for publishing a scientific article.

Taking into account this gap in the literature, the authors of this report consider it convenient to design a scale to measure the construct in question, despite having the possibility of adapting some measures already built. However, it is important to recognize that the characteristics of the construct and the target population are different in previous works. Consequently, this work aimed to design and validate a motivation scale for scientific publication among Peruvian university professors (MoSCPU-UP).

2 Methods

2.1 Design

Instrumental design and cross-sectional study (Ato et al., 2013).

2.2 Participants

Through a non-probabilistic sampling, 546 Peruvian university professors (75.20% women) participated, who taught courses at

private universities, whose ages ranged from 22 to 67 years ($M=45.05$ and $DS=9.32$), 93.4% taught in undergraduate, 57.5% worked part-time, 83% were hired, and 55% lived in the Peruvian mountains (Table 1).

2.3 Instrument design

For the design of the scale, the scientific literature provided by the SciELO and Scopus databases was reviewed to identify the indicators and definitions of the construct. With the help of 5 experts (university professors and researchers), the scale was validated to determine the clarity, relevance, and representativeness of the content of the items (Ventura-León, 2019).

The MoSCPU-UP scale comprises 13 items distributed in two dimensions (Intentional state, and Commitment and will), whose response options in Likert-type format are: totally disagree, disagree, neither agree nor disagree, agree, and totally agree.

In this study, to analyze the evidence of validity based on the relationship with other variables, the *Professional self-efficacy* questionnaire was used-AU-10 (Maffei et al., 2010), validated in the Peruvian population by Calderón-De la Cruz et al. (2018). It is made up of 10 items with seven response options from “never or none” to

“always or every day”. The present study’s internal consistency analysis showed adequate values [$\alpha=0.92$ (95% CI: 0.91–0.92)].

2.4 Procedure

The Universidad Peruana Unión ethics committee approved the research (Reference: 2022-CE-EPG-0000105). In order to collect information regarding the motivation for publication in university professors, an online questionnaire was created using the Google Forms platform. The link was disseminated through social networks such as Facebook and WhatsApp. In the first section of the questionnaire, informed consent was presented, and the purpose of the study was explained, emphasizing that participation was voluntary and anonymous.

2.5 Data analysis

In the first instance, the scale items’ mean, standard deviation, skewness, and kurtosis were calculated. In the second instance, an Exploratory Factor Analysis (EFA) was performed using the unweighted least squares method after analyzing the Bartlett test and the Kaiser-Meyer-Olkin (KMO) coefficient. Parallel analysis suggested a two-factor model. These analyzes were obtained using the FACTOR Analysis program version 10.1.

In the third instance, a Confirmatory Factor Analysis (CFA) was carried out using the statistical software AMOS version 24 the model’s goodness of fit was evaluated, and structural equation modeling (SEM) was used. Absolute and incremental goodness-of-fit were determined using the comparative fit index (CFI), the Tucker-Lewis index (TLI), the root mean square error of approximation (RMSEA), and the root mean square error (RMR), all of them following the criteria proposed by Hu and Bentler (1999) who state that the GFI, CFI, TLI, GFI should be values ≥ 0.9 and the RMSEA and RMR values ≤ 0.08 .

Finally, reliability was estimated through the coefficient Cronbach’s alpha and their respective confidence intervals (Dominguez-Lara and Merino-Soto, 2015).

3 Results

The results of the evaluation of five experts regarding the relevance, representativeness, and clarity of the items of the MoSCPU-UP scale reflect that the items received a favorable evaluation ($V>0.70$). Therefore, the MoSCPU-UP scale reports evidence of content-based validity (Table 1).

3.1 Preliminary analysis of the items

Table 2 shows the mean, standard deviation, asymmetry, and kurtosis of the 19 items of the MoSCPU-UP scale. It is observed that item 1 has the highest average score ($M=4.51$), and item 4 shows the greatest dispersion ($DE=0.85$). The items’ skewness and kurtosis scores are within acceptable values. On the other hand, it can be seen that all the items on the scale present communalities and corrected

TABLE 1 Sociodemographic characteristics of the total sample and subsamples.

Variables	Total (N = 546)		AFE (N = 180)		AFC (N = 366)	
	f	%	f	%	f	%
Sex						
Male	339	62.1	114	63.3	225	61.5
Female	207	37.9	66	36.7	141	38.5
Age ranges						
22 to 42	237	43.4	76	42.2	161	44.0
43 to 67	309	56.6	104	57.8	205	56.0
Education						
Undergraduate	510	93.4	170	94.4	340	92.9
Postgraduate	36	6.6	10	5.6	26	7.1
Workday						
Full-time	232	42.5	87	48.3	145	39.6
Part-time	314	57.5	93	51.7	221	60.4
Employment status						
Hired	458	83.9	146	81.1	312	85.2
Employee	56	10.3	22	12.2	34	9.3
Exclusive dedication	32	5.9	12	6.7	20	5.5
Place of residence						
Coast	233	42.7	69	38.3	164	44.8
Mountain	304	55.7	106	58.9	198	54.1
Jungle	9	1.6	5	2.8	4	1.1

f = frequency; % = Percentage.

TABLE 2 Aiken’s V for the evaluation of the relevance, representativeness, and clarity of the items of the research motivation scale.

Items	Relevance (n = 5)				Representativeness (n = 5)				Clarity (n = 5)			
	M	SD	V	CI 95%	M	SD	V	CI 95%	M	SD	V	CI 95%
Item 1	3.00	0.00	1.00	0.80–1.00	3.00	0.00	1.00	0.80–1.00	3.00	0.00	1.00	0.80–1.00
Item 2	3.00	0.00	1.00	0.80–1.00	3.00	0.00	1.00	0.80–1.00	3.00	0.00	1.00	0.80–1.00
Item 3	2.60	0.55	0.87	0.62–0.96	2.60	0.55	0.87	0.62–0.96	3.00	0.00	1.00	0.80–1.00
Item 4	3.00	0.00	1.00	0.80–1.00	3.00	0.00	1.00	0.80–1.00	3.00	0.00	1.00	0.80–1.00
Item 5	3.00	0.00	1.00	0.80–1.00	3.00	0.00	1.00	0.80–1.00	3.00	0.00	1.00	0.80–1.00
Item 6	3.00	0.00	1.00	0.80–1.00	3.00	0.00	1.00	0.80–1.00	3.00	0.00	1.00	0.80–1.00
Item 7	2.80	0.45	0.93	0.70–0.99	3.00	0.00	1.00	0.80–1.00	3.00	0.00	1.00	0.80–1.00
Item 8	2.60	0.55	0.87	0.62–0.96	2.40	0.89	0.80	0.55–0.93	3.00	0.00	1.00	0.80–1.00
Item 9	2.40	0.89	0.80	0.55–0.93	2.40	0.89	0.80	0.55–0.93	3.00	0.00	1.00	0.80–1.00
Item 10	3.00	0.00	1.00	0.80–1.00	3.00	0.00	1.00	0.80–1.00	3.00	0.00	1.00	0.80–1.00
Item 11	2.40	0.89	0.80	0.55–0.93	2.40	0.89	0.80	0.55–0.93	3.00	0.00	1.00	0.80–1.00
Item 12	3.00	0.00	1.00	0.80–1.00	3.00	0.00	1.00	0.80–1.00	3.00	0.00	1.00	0.80–1.00
Item 13	3.00	0.00	1.00	0.80–1.00	3.00	0.00	1.00	0.80–1.00	3.00	0.00	1.00	0.80–1.00
Item 14	2.20	0.45	0.73	0.48–0.89	2.20	0.45	0.73	0.48–0.89	3.00	0.00	1.00	0.80–1.00
Item 15	3.00	0.00	1.00	0.80–1.00	3.00	0.00	1.00	0.80–1.00	3.00	0.00	1.00	0.80–1.00
Item 16	3.00	0.00	1.00	0.80–1.00	3.00	0.00	1.00	0.80–1.00	3.00	0.00	1.00	0.80–1.00
Item 17	3.00	0.00	1.00	0.80–1.00	3.00	0.00	1.00	0.80–1.00	3.00	0.00	1.00	0.80–1.00
Item 18	2.40	0.89	0.80	0.55–0.93	2.40	0.89	0.80	0.55–0.93	3.00	0.00	1.00	0.80–1.00
Item 19	2.40	0.89	0.80	0.55–0.93	2.40	0.89	0.80	0.55–0.93	3.00	0.00	1.00	0.80–1.00

correlation coefficients of the item with the total number of items greater than .30.

3.2 Exploratory factor analysis (EFA)

After analyzing the Kaiser-Meyer-Olkin index (KMO = 0.935) and the Bartlett test (1978.3; $gl = 171$; $p = 0.001$) yielded satisfactory results, an EFA was carried out. The method of unweighted least squares with promim oblique rotation was used, and parallel analysis was used to determine the factors, revealing two factors underlying the 19 items. The rotated solution of the 13 items explains 72.45% of the total variance. Factor 1 (Intentional state) explains 64.98% of the variance, and Factor 2 (Commitment and will) contributes 7.47%. All items present saturations greater than .40 (Table 3).

3.3 Confirmatory factor analysis (CFA)

The CFA was used to examine the internal structure of the scale. Nevertheless, the initial results indicated that the goodness-of-fit indices were not adequate. Therefore, the index modification technique eliminated items 3, 8, and 17; despite this, the model was not satisfactory. In a second respecification, items 11, 12, and 19 were eliminated, obtaining a satisfactory factorial structure model ($\chi^2 = 221,904$, $df = 20$, $p < 0.001$; $RRM = 0.041$; $TLI = 0.924$; $IFC = 0.938$; and $RMSEA = 0.080$).

TABLE 3 Preliminary analysis of the items of the MoSCPU-UP scale.

Variable	M	SD	As	K	h	ritc
Item 1	4,511	0.756	-2,400	2,800	0.482	0.435
Item 2	4,056	0.794	-1,172	2,952	0.512	0.431
Item 3	4,078	0.820	-0.815	0.994	0.671	0.626
Item 4	4,028	0.853	-0.756	0.379	0.565	0.606
Item 5	4,294	0.680	-0.554	-0.317	0.739	0.749
Item 6	4,233	0.676	-0.540	0.120	0.759	0.770
Item 7	4,233	0.739	-0.735	0.245	0.660	0.658
Item 8	4,089	0.838	-0.454	-0.481	0.827	0.788
Item 9	4,272	0.721	-0.553	-0.590	0.808	0.809
Item 10	4,156	0.794	-0.687	-0.032	0.605	0.684
Item 11	4,189	0.744	-0.402	-0.830	0.827	0.816
Item 12	4,272	0.690	-0.521	-0.404	0.901	0.851
Item 13	4,178	0.701	-0.750	1,499	0.583	0.642
Item 14	3,961	0.832	-0.508	0.301	0.618	0.592
Item 15	4,122	0.772	-0.506	-0.348	0.744	0.699
Item 16	4,006	0.799	-0.470	0.065	0.654	0.581
Item 17	4,328	0.666	-0.487	-0.740	0.774	0.777
Item 18	4,122	0.765	-0.511	-0.282	0.644	0.714
Item 19	4,322	0.688	-0.727	0.175	0.728	0.761

M, medium; SD, standard deviation; As, asymmetry coefficient; K, kurtosis coefficient; h, communality; ritc, corrected item-test correlation.

TABLE 4 Exploratory factor analysis of the MoSCPU-UP scale.

Items	F1	F2
1. Estoy decidido a aprender sobre redacción científica (I am determined to learn about scientific writing).	0.708	
2. Reviso frecuentemente nuevas publicaciones en mi área de investigación (I frequently review new publications in my research area).	0.997	
4. Cada vez que hay oportunidad asisto a capacitaciones sobre publicaciones científicas (Whenever there is an opportunity, I attend scientific publications training).	0.950	
5. Cada vez que hay oportunidad asisto a capacitaciones sobre publicaciones científicas (I am motivated to publish scientific articles).	0.590	
6. Como parte de mi rol académico estoy comprometido con la publicación científica (As part of my academic role, I am committed to scientific publication).	0.659	
8. Me he propuesto publicar artículos científicos para ser calificado como RENACYT por Concytec (I have proposed to publish scientific articles to be qualified as RENACYT by Concytec).	0.721	
9. Aportar al desarrollo de mi país a través de publicaciones científicas me da satisfacción (Contributing to my country's development through scientific publications satisfies me).	0.437	
10. Sé que hay obstáculos antes de publicar pero eso no me hará desistir de mis motivaciones (I know there are obstacles before publishing, but that will not make me give up my motivation).	0.574	
11. Espero con mis publicaciones pronto ser clasificado como investigador RENACYT (With my publications, I hope to soon be classified as a RENACYT researcher).	0.578	
12. Espero contribuir a la ciencia a través de mis publicaciones científicas (I hope to contribute to science through my scientific publications).	0.651	
13. Cuando me informo, prefiero hacerlo a través de artículos científicos (I prefer to do it through scientific articles when I get information).	0.700	
17. Espero que mis publicaciones científicas sean citadas por otros investigadores (I hope that other researchers will cite my scientific publications).	0.550	
3. En cada actividad de investigación tengo en mente la publicación de artículos (In each research activity, I consider the publication of articles).		0.438
7. Quiero publicar artículos científicos para recibir el reconocimiento de mi universidad (I want to publish scientific articles to receive recognition from my university).		0.928
14. Quiero publicar artículos científicos para obtener incentivos económicos (I want to publish scientific articles to obtain financial incentives).		0.998
15. Si tengo artículos publicados será más fácil tener mejores condiciones laborales (If I have published articles, it will be easier to have better working conditions).		0.995
16. Quiero publicar artículos científicos para alcanzar becas de estudios en el extranjero (I want to publish scientific articles to obtain study scholarships abroad).		0.998
18. Quiero publicar artículos científicos para ingresar al círculo de investigadores (I want to publish scientific articles to enter the circle of researchers).		0.612
19. Publicar artículos científicos es una de mis metas como docente universitario. (Publishing scientific articles is one of my goals as a university professor).		0.0460
% Variance	64.98	7.47
Inter-factor correlation		
F1	1	
F2	0.871*	1

Likewise, the correlations between the factors were significant ($p < 0.05$). In summary, the model of 13 items distributed in two factors is satisfactory.

3.4 Validity based on the relation with other variables

A convergent validity analysis was carried out using the Pearson correlation between MoSCPU-UP and the Professional Self-efficacy Scale (PSES). Table 4 shows a statistically significant correlation between both variables and their dimensions ($p < 0.01$), with a small and moderate effect size.

3.5 Reliability

The reliability of the scale was estimated with Cronbach's α coefficient. On the scale in general, an acceptable value was obtained ($\alpha = 0.910$; 95% CI = 0.89–0.92). Likewise, for factor 1 ($\alpha = 0.879$; 95% CI = 0.84–0.89), in factor 2 ($\alpha = 0.859$; 95% CI = 0.81–0.87); evidencing that the scale scores are reliable.

4 Discussion

Research plays an essential role in universities and is found as an aspect of qualification for professors (González-Díaz et al., 2022). In

TABLE 5 Goodness of fit indices of the factorial model of the MoSCPU-UP scale.

Model	χ^2	gl	p	TLI	CFI	RMSEA	CMIN/DF	RMR
19 items	1,035,843	151	< 0.001	0.798	0.821	0.127	6,860	0.053
16 items	516,531	103	< 0.001	0.868	0.887	0.105	5,015	0.043
13 items	221,904	64	< 0.001	0.924	0.938	0.080	3,467	0.041

TABLE 6 Means, standard deviations, and correlations between the MoSCPU-UP and Professional self-efficacy scales.

Variable	<i>M</i>	<i>DS</i>	1	2	3
1. MoSCPU-UP	53.90	7.50			
2. Intentional state	33.74	4.79	0.929**		
3. Commitment and will	20.15	3.52	0.865**	0.618**	
4. PSES	58.86	10.19	0.419**	0.348**	0.419**

M, mean; *SD*, standard deviation, ** indicates $p < 0.01$.

Latin America, universities strive to improve the investigative skills of professors who show weaknesses when conducting research (Castro, 2021). This is because what differentiates regular basic education professors from university professors is that university professors combine research and teaching (van Dijk et al., 2020), which positively improves the quality of teaching (García-Gallego et al., 2015; Cadez et al., 2017). Likewise, one of the best indicators of research activities is a scientific publication (Lambovska and Yordanov, 2020; Lambovska and Todorova, 2021). Therefore, it is important to have effective instruments to measure teaching research. This research aimed to design and validate a motivation scale for scientific publication among Peruvian university professors (MoPUCI-PU).

Regarding the validity of content through expert judgment evidenced by Aiken's *V* coefficient, it is observed that the items developed are relevant and representative of the construct motivation for scientific publication, obtaining adequate values in the lower limit of the CI (Aiken, 1980) 95%. Likewise, according to the judges' criteria, the items are sufficiently clear to be understood and answered by the population under study (Ventura-León, 2019). Therefore, the MoPUCI-PU scale reports content-based validity evidence. Likewise, regarding the validity based on the internal structure before the EFA, it is found that the communalities and correlation coefficients are within the ranges greater than 0.30.

The findings reported in this research show through the AFE the existence of two factors underlying the MoSCPU-UP scale that together explain 72.45% of the common variance, with items with factor loadings greater than 0.40 representing adequate values (Streiner, 2003). The content analysis of the items of the first factor allowed designation as "Intentional State," referring to the conscious decision to implement activities related to publication and scientific writing. In contrast, the second factor's content analysis allowed designation as "Commitment and will," considering cognitive orientation, effective will, and incentives related to scientific publication. In this way, the MoPUCI-PU scale presents evidence of validity based on the internal structure (Table 5).

Next, the AFC allowed evaluation of the modification indices of the items, a process through which the decision was made to eliminate items 3, 8 17; for the second respecification, items 11, 12, and 19 were eliminated. This resulted in a 13-item two-dimensional model with optimal fit indices ($\chi^2 = 221,904$, $df = 20$, $p < 0.001$; RRM = 0.041;

TLI = 0.924; IFC = 0.938; and RMSEA = 0.080). These results are comparable to the study by Carranza-Esteban et al. (2022), which found a two-dimensional model for the construct of motivation to research in Peruvian students, in which one of the factors is related to the commitment-will in which indicators related to the incentive and enthusiasm for activities related to writing and publishing scientific articles are shown. Thus, the MoPUCI-PU scale presents evidence of validity based on the internal structure (Table 6).

Regarding the validity based on the relationship with other variables, a statistically significant positive relationship was found between the scores of the MoPUCI-PU scale and the EAP scale that assesses professional self-efficacy. This result is consistent with previous studies where self-efficacy predicts motivational effects in the academic context (Malkoç and Kesen Mutlu, 2018; Zhang et al., 2019), and it is consistent with the achievement motivation theory of McClelland and Atkinson (Weiner, 2010).

Concerning reliability, the instrument has acceptable indices ($\alpha = 0.910$; 95% CI = 0.89–0.92) with Cronbach's alpha values greater than 0.70 (Henson, 2001; Dominguez-Lara and Merino-Soto, 2015), so it can be said that the MoPUCI-PU scale is a precise measurement instrument.

Among the implications of this research is that the MoPUCI-PU scale provides a framework for conceptualizing and interpreting the motivation for scientific publication among Peruvian university professors. Additionally, it offers a self-report measure that will enable the assessment of publication motivation in university faculty, opening the possibility for future studies related to improving publication motivation among Peruvian university professors. The MoPUCI-PU would help identify professors with low levels of publication motivation, as well as design and evaluate the impact of appropriate intervention programs and/or information campaigns aimed at enhancing motivation levels in this group. This is necessary because it would facilitate the generation of evidence for university authorities to allocate greater financial, material, and human resources to implement scientifically validated interventions.

On the other hand, in practical terms, this questionnaire allows for the identification of areas requiring further training. It will help pinpoint workshops related to scientific writing, submission to indexed journals, guidelines for responding to reviewers, aspects related to post-publication dissemination and citation of the manuscript, among other topics.

Finally, university administrations can utilize this instrument to identify the levels of scientific publication motivation among their faculty or to evaluate the efficacy of interventions aimed at enhancing publication motivation. Additionally, the scale's results could be used to design mentoring programs where highly motivated faculty members can support those with lower motivation, fostering the exchange of experiences and strategies.

This study is not exempt from limitations; firstly, the items were generated deductively based on existing knowledge. Therefore, it is likely that some specific aspects of motivation for scientific publication and that some existing elements do not correctly capture this construct. Secondly, since it is a self-report, there are probably some measurement

errors or biases in the participants. Likewise, the study is limited to Peruvian university professors, so developing similar studies in other locations would be important. Thirdly, other theoretically related measures of scientific publication motivation and network analyses were not included, preventing the assessment of validity evidence based on the relationship with other variables through a network model. Additionally, test–retest reliability was not evaluated, limiting the evidence of the temporal stability of the MoPUCI-PU. Fifthly, invariance analyses were not conducted, making it necessary to perform such evaluation to test the invariance of the MoPUCI-PU to replicate and expand upon the findings of this study. Sixthly, The participants were part of a convince sample and, therefore, not representative of the population. This result in a biased sample, where the majority of participants were part-time female faculty members. This limits the generalizability of the sample's findings to the broader population. Finally, sampling through social media could lead to a self-selection bias among respondents, such as an over representation of women, as women are more inclined to participate than men (Warriner et al., 2002).

Despite these limitations, the results of this study show that the MoSCPU-UP scale is a tool that presents evidence of validity and reliability for a sample of Peruvian university professors. Furthermore, the model was consistent with the presence of two factors. The principal contribution of this study is that it provides a reliable and useful measure for assessing scientific publication motivation among university professors. This, in turn, allows for the establishment of strategies and intervention programs aimed at enhancing professor' motivation for scientific publication.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by the Comité de ética de Universidad Peruana Unión. The studies were conducted in

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accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

RC: Conceptualization, Data curation, Investigation, Methodology, Supervision, Writing – original draft, Writing – review & editing. OM-B: Conceptualization, Investigation, Validation, Writing – original draft, Writing – review & editing. SH-V: Investigation, Supervision, Validation, Writing – original draft. NC-B: Investigation, Validation, Writing – original draft. IC-O: Formal analysis, Investigation, Supervision, Writing – original draft. JT-C: Conceptualization, Investigation, Supervision, Validation, Writing – review & editing.

Funding

The author(s) declare that no financial support was received for the research, authorship, and/or publication of this article.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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