

Attitudes towards Research (EACIN-R): Psychometric Evidence of Social Workers in Cartagena de Indias, Colombia

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Abstract

The aim of this article is to report the psychometric properties of the Scale of Attitudes towards Research-Revised version in a Colombian population sample. Two instrumental quantitative studies were conducted using a cross-sectional survey methodology. In the first study, the questionnaire was applied to 141 university students, and in the second to 159 students, all belonging to the Social Work program of a private university institution in Cartagena de Indias.

The data were subjected to internal consistency and factor structure analysis through exploratory factor analysis (AFE) and confirmatory factor analysis (AFC). The results of the AFE allowed reducing the scale maintaining three dimensions, which were tested by the AFC. The final version of the instrument consisted of 27 items and three dimensions. The model was deemed appropriate according to the goodness-of-fit indices and the reliability coefficients obtained for each subscale and the total scale. This instrument is a reliable and valid tool for assessing the predisposition to research in university students of Social Work in the city.

Keywords: Attitudes; Factor analysis; Validation; University students; Research.

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Escala de actitudes hacia la investigación (EACIN-R): evidencias psicométricas en trabajadores sociales en Cartagena de Indias, Colombia

Resumen

Este artículo tiene por propósito reportar las propiedades psicométricas de la Escala de Actitudes hacia la Investigación-Versión revisada en una muestra poblacional colombiana. Se realizaron dos estudios cuantitativos utilizando una metodología de encuesta transversal. En el primer estudio, se aplicó el cuestionario a 141 universitarios, y en el segundo a 159 estudiantes, todos ellos pertenecientes al programa de Trabajo Social de una institución universitaria privada en Cartagena de Indias. Los datos fueron sometidos a un análisis de consistencia interna y estructura factorial a través de análisis factorial exploratorio (AFE) y confirmatorio (AFC). Los resultados del AFE permitieron reducir la escala manteniendo tres dimensiones, que fueron sometidas a prueba mediante el AFC. La versión final del instrumento consistió en 27 ítems y tres dimensiones. El modelo resultó apropiado según los índices de bondad de ajuste y los coeficientes de confiabilidad obtenidos para cada subescala y la escala total. Este instrumento es una herramienta fiable y válida para evaluar la predisposición a la investigación en estudiantes universitarios de Trabajo Social de la ciudad.

Palabras clave: Actitudes; Análisis factorial; Validación; Universitarios; Investigación.

Summary: 1. Introduction, 2. Methodology, 3. Findings. 3.1. Study 1, 3.2 Study 2, 4. Conclusions, 5. Bibliographic references.

1. Introduction

The presence of a diverse range of ideas and frameworks related to research, combined with an overemphasis on rigid procedures and a lack of individual, institutional, and educational support for research, have led to a lack of enthusiasm among students toward this field (Guo *et al.*, 2022; Rojas Betancur and Méndez-Villamizar, 2017). The Ibero-American educational systems face a challenge in transforming this indifference (Albornoz & López-Cerezo, 2010).

To analyze attitudes toward research among social workers, the instrument developed by Aldana de Becerra *et al.* (2020) was validated to provide a reliable tool to measure the presence or absence of this attitude.

Attitudes towards research: A scan

The academic doctrine has proposed numerous concepts and explanatory models about attitudes toward research in Social Work (Cox *et al.*, 2022; Ortega-Ruiz, 1986). The process of acquiring knowledge brings attention to the conflicts and worries encountered regularly. Bernal (2016) asserts that scientific research on global conflicts goes beyond only addressing undesirable phenomena. It also aims to cultivate individuals' awareness of their surroundings and their pivotal role as catalysts for change. Hence, the connection between the student and the theoretical, methodological, and disciplinary knowledge is anticipated to stimulate the student's capacity to extract and reinterpret what they have acquired in their educational setting.

The attitude towards research is shaped by individual capabilities and how personal experiences are portrayed, reinterpreted, and replicated. Popper (1962) describes the attitude toward research as the capacity to construct claims, hypotheses, and theories and verify them through empirical observations and experiments. This traditional approach views research as a systematic procedure and the researcher as someone who can conceptualize reality. Nevertheless, one may wonder: What motivates humans to investigate the sensory encounters of the world? According to Bunge (1969), the primary driver of exploratory conduct is recognizing that existing information is inadequate for solving specific problems (p. 3).

In Colombia, the proposal made by Bunge (1969) is implemented by Martínez *et al.* (1981) and Gartner-Isaza and Cifuentes-Patiño (2001), researchers who agree on the distinction of the inverse relationship between the perception of insufficient knowledge about the object and the investigative behavior of the individual. This relationship is crucial both in terms of predisposition for research and in disciplinary construction.

Papanastasiou (2005) formalized this inadequate perception of knowledge as an "attitude towards research," defining it as an individual's cognitive, behavioral, and affective-emotional inclination to question the sufficiency of their surrounding landscape. A theoretical difference



between the perspectives of Popper (1962) and Bunge (1969) is the bidirectional nature of the attitude; this perspective reveals that the predisposition to research depends not only on the subject's functions but also on the quality fostered by higher education institutions (from now on referred to as HE).

Following the findings presented by Papanastasiou (2005) and supported by ministerial organizations, higher education institutions embarked on restructuring educational policy in relation to the research component. In Colombia, the educational transformation was carried out in collaboration with MERCOSUR-Educativo, the Ministry of Education (MEN), and the National Accreditation Council (CNA). These organizations joined forces to modify educational principles and promote quality in education. The MEN and the CNA were crucial in establishing regulations and criteria for developing research attitudes throughout the Andean territory (Consejo Nacional de Acreditación [CNA], 2022; Decreto 2566/2003). Among the commitments agreed upon regarding research, the following stand out:

- Mandatory research training: Higher education institutions must demonstrate how they foster a culture of research and encourage critical and independent thinking in students by providing concrete means such as research workshops, access to scientific databases, and personalized tutoring.
- Social research: Higher education institutions should foster a research-oriented attitude among students by promoting curricular heterogeneity and flexibility. Including research projects achieve this focused on significant social issues, such as environmental sustainability, gender equity, or community health.
- Comprehensive promotion of research activity: Higher education institutions should foster students' inclination to research by incentivizing them with academic and financial benefits based on the quality of their work produced during academic stays or participation.

The educational innovation implemented in the country directly impacted the field of Social Work, resulting in a mandatory disciplinary obligation to adopt a research-oriented attitude. In Colombian territory, this modification was led by the Consejo Nacional de Trabajo Social, which determined that the professional must "have an impact on the resolution of social problems, transformation processes, and the construction of social fabric through various methodologies based on a systematic body of knowledge that enables, among other things: sensitization, prevention, promotion, organization, mobilization, and research" (Consejo Nacional de Trabajo Social, 2019, p. 26).

The laws enforced by higher education institutions (HEIs) in the Andean area have gradually advanced in the field. This national progress is substantiated by evidence in three distinct scenarios: research to describe, research to comprehend, and research to intervene.

The first scenario pertains to bibliometric investigations in the field of disciplinary research. These indicate an increase in the generation of knowledge in Social Work. The works of Bueno (2013; 2019), Cifuentes-Gil (2015; 2018), Acuña-Pinilla *et al.* (2019), and Linardelli & Pessolano (2019) within this domain exemplify the advancement of the discipline and emphasize the significance of research as a shared obligation in the profession.

The second scenario centers on epistemological investigation. These reports document a rise in production and provide a comprehensive analysis of the correlation between critical reflection processes and the professional practice of Social Work. The works of Vargas de Roa (2005), Cifuentes-Gil (2009), Ortiz-Novoa & Falla-Ramírez (2013), Vargas-López (2018), and Sierra-Polanco (2022) serve as examples of how this situation has become more established. These works highlight the importance for professionals to critically analyze and redefine how the discipline is understood and how it impacts their professional work.

The third scenario pertains to intervention research. This demonstrates a rise and establishes the skills, techniques, and protocols to comprehend and tackle societal issues from a multidimensional viewpoint. The studies conducted by Camelo and Cifuentes (2006), Vargas-López and Muñoz-Franco (2015), Muñoz-Franco and Vargas-López (2013), Falla-Ramírez (2017), Moreno-Camacho and Molina-Valencia (2018), and Escobar-Serrano *et al.* (2020) support the proposed increase, highlighting the importance of thoroughly assessing individuals and creating personalized intervention plans for each specific situation.

In line with the increase in productive matter, other evidence supporting the existence of a favorable attitude towards disciplinary research includes the consolidation of young research capital through organizations such as the Colombian Network of Research Seedbeds (RedColsi) and the opening of existing disciplinary journals to student publications.¹, and the systematization of experiences built in pre-professional practices. However, there needs to be more disciplinary Interest in investigating attitudes towards research in undergraduate students. According to the author, there are no published research or university projects focused on this thematic theme².

This unexplored space regarding attitudes towards research in disciplinary university students implies omitting a vital perspective to understand their disposition and motivation in investigative activities. If, in the words of Pérez-Álvarez (2023), there is an urgency to "reveal in our discipline a praxis that recognizes tensions, debates, struggles, and resistances generated in

¹ Currently, Colombia has three journals on Social Work: Trabajo Social from the Universidad Nacional de Colombia (Bogotá), Trabajo Social from the Universidad de Antioquia (Medellín), and Prospectiva from Universidad del Valle (Cali). These magazines showcase student works derived from undergraduate and graduate theses to obtain a professional and master's degree in social work and social intervention.

² The national magazines need to mention published studies on this thematic focus. Similarly, on the open access page that displays projects from disciplinary research groups, no visible proposals are in progress or completed for evaluating attitudes towards research in professional career students.

that horizon of transformation" (p. 1), the overlooking of this thematic focus is limiting the understanding and development of effective strategies to promote participation in investigative praxis, wasting institutional resources and ecologically slowing down the objective of the discipline.

Anticipating the evidence demonstrating the implications of the predisposition to investigate (Barrios-González *et al.*, 2019; García-Bedoya *et al.*, 2018; Verkade & Lim, 2016) and the wide range of instruments designed for this purpose (Aldana de Becerra *et al.*, 2016, 2020; Arellano-Sacramento *et al.*, 2017; Barrios-González & Delgado-Sánchez, 2020; Castro-Molinares, 2017; Ochoa-Vigo *et al.*, 2016), the need for validated instruments to accurately assess attitudes towards research has been identified. In this situation, the importance of creating a space for validating an instrument that provides a reliable assessment of this attitude in college students arises. This study aims to determine the psychometric properties of the Attitudes Towards Research Scale (EACIN-R) in Social Work students from a private university in Cartagena de Indias.

2. Methodology

The study outlines the procedure for evaluating the psychometric characteristics of the EACIN-R Revised Research Attitude Scale. We conducted two investigations: an initial study including 141 people and a subsequent study with 159 participants to validate the findings. Due to its numerical nature, statistical treatment, and deductive interpretation of the data, this study's methodology aligns with a cross-sectional survey of quantitative type and descriptive-instrumental character (Carretero-Dios & Pérez, 2005). The Colombian disciplinary literature lacks studies on the reliability and validity of measures that assess attitudes toward research among career students. In this study, we examined the psychometric properties of the scale previously indicated to construct a valid and reliable assessment of this attitude in Colombia.

Participants

Three hundred subjects in total – 270 women and 30 men between the first and fourth years of their professional careers – participated, all of them students of the presential undergraduate in social work of the Rafael Núñez University Corporation, a private IES present in Cartagena de Indias. Non-probability sampling selected participants based on the following criteria: (a) acknowledging their majority age, (b) being active in the financial system, (c) actively participating in the academic enrolment system, and (d) belonging to the Social Work program.

The sample of study 1, which corresponded to the exploratory factor analysis, consisted of 141 individuals: 121 women (85.8%) and 20 men (14.1%) who were not repeating subjects in their academic curriculum.



The sample of study 2, corresponding to the confirmatory factor analysis, consisted of 159 students, including 149 women (93.7%) and ten men (6.3%) without repetition.

Instruments

The research uses the *EACIN-R Revised Version*, modified for the Colombian population by Aldana de Becerra *et al.* (2020). This version is the third iteration of the instrument to assess attitudes towards research. We gathered the data using an anonymous internet-based questionnaire. The questionnaire comprises a series of situational statements to assess students' inclination to investigate. Students are required to respond by selecting a political answer option (ranging from 1, indicating "totally disagree," to 5, indicating "totally agree"). This allows them to express their level of agreement or disagreement.

In addition to sociodemographic variables like the participant's sex, academic semester, current academic status, and probative degree option mechanism, the scale consists of 28 items structured in three dimensions (see Table 1). The instrument's theoretical dimensions are as follows (Aldana de Becerra *et al.*, 2020).

- Interest in research (affective): This dimension identifies the emotions of satisfaction or dissatisfaction conveyed through empathy or aversion to scientific research. It consists of nine items with a reverse rating.
- Vocation for Research (Behavioral): This dimension identifies the response predisposition that leads to scientific research actions. It consists of 12 items with direct ratings.
- Research evaluation (cognitive): This dimension identifies the conscious and indeed limited knowledge of what is actual, false, desirable, and undesirable in scientific research. It consists of seven items with direct ratings.

Table 1. Dimensions and items of the Research Attitudes Scale-Revised Version.

| Dimension | Number of Items | Items |
|----------------------|-----------------|---|
| Interest in research | 9 | <ol style="list-style-type: none"> 1. Consulting scientific information is a waste of time. 2. Taking updated courses is not for me. 3. Universities should not teach research. 4. Scientific conversations seem dull to me. 5. Thinking about starting research discourages me. 6. I am always the last to find out about current topics. 7. Day-to-day activities do not inspire anything new in me. 8. My research activities could be more organized. 9. I almost always postpone anything involving research. |

| | | | |
|------------------------|-----|----|--|
| Vocation Research | for | 12 | <p>10. Scientific conversations are among the things I enjoy the most.</p> <p>11. I often find myself consulting scientific information.</p> <p>12. Research is something that interests me.</p> <p>13. I have the necessary patience to conduct research.</p> <p>14. I enjoy training to acquire research skills.</p> <p>15. I keep myself informed about current topics.</p> <p>16. I maintain organization in my research activities.</p> <p>17. Most things arouse my curiosity.</p> <p>18. I usually write to delve deeper into topics of Interest.</p> <p>19. I engage with people at research events (conferences and meetings).</p> <p>20. I take any opportunity to showcase my work.</p> <p>21. I enjoy expediting research-related tasks.</p> |
| Research Evaluation | | 7 | <p>22. Persistence contributes to achieving goals.</p> <p>23. Research helps solve social problems.</p> <p>24. All professionals should learn how to conduct research.</p> <p>25. Research helps to detect scientific errors.</p> <p>26. In my research, it is essential to strengthen the ability to listen.</p> <p>27. Working with others in research helps us achieve better results.</p> <p>28. I come up with innovative ideas about everyday problems.</p> |

Source: self-made based on Camacho-Torres (2023).

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According to the original study by Aldana de Becerra *et al.* (2020), satisfactory internal consistency was observed on the full scale ($\alpha = .87$) and its subscales (Research interest: $\alpha = .87$; Vocation for research: $\alpha = .87$; Research evaluation $\alpha = .77$). Regarding construction validity, the authors carried out an exploratory factor analysis that revealed a three-factor solution that explained 53.47% of the variance. Additionally, the Bartlett sphericity test yielded a satisfactory value ($X^2 = 4371.445$, $p = .000$) and an acceptable sampling KMO adequacy index (.88). It is important to note that, so far, the scale has no studies of reliability and validity in social work universities located in Cartagena de Indias.

Procedure

The Ethics and Research Committee of the Corporación Universitaria Rafael Núñez approved the current investigation. All participants willingly volunteered and provided their informed consent. We gathered the data in a manner that kept the identities of the individuals providing it anonymous. We circulated the scale via institutional email.

The EACIN-R Revised Research Attitude Scale was used (Aldana-De Becerra *et al.*, 2020). Authorization was requested from the authors of the instrument for its use. The wording of the scale was checked to determine terms that would hinder the response to the reagents. No terms were identified, and no items were added or erased.

We conducted a preliminary evaluation of the instrument by administering it to 20 students to collect feedback on its clarity and effectiveness. The pilot results indicated that the questionnaire was straightforward, leading to its distribution to the participants' institutional mailboxes. For two months, the instrument was available on the internet.

Analysis of data

Study 1. Due to the political nature of the study variables, we performed an exploratory factor analysis (AFE) using a polychoric correlation matrix (Freiberg-Hoffmann *et al.*, 2013). To determine the number of factors, we used the Horn parallel analysis (Timmerman & Lorenzo-Seva, 2011) and the Minimums non-weighted squares method with standardized Oblimin rotation to extract common factors (Bollen, 1989). We calculated the internal consistency using the polychoric ordinal Alpha using the statistical program Rstudio v. 2023.03.0386. We conducted the descriptive analysis of sociodemographic variables using the JASP statistical package version 0.15.

Study 2. After completing the initial study, we used the Lisrel program v.8.8 to conduct a confirmatory factor analysis (CFA). The purpose of this analysis was to compare the exploratory component structure. To assess the quality of the model's fit, many statistical measures were considered: the χ^2 /freedom degrees (Bentler, 1990), the Goodness of Fit Index (GFI), the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), and the adjusted Goodness of Fit Index (AGFI) (Byrne, 1998). The text mentions the concepts of Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR) (Hu & Bentler, 1999).

3. Findings

3.1 Study 1

Table 2 shows the factor loads computed using the polychoric correlation matrix. We conducted an internal consistency test using the calculation of ordinal Alpha and an analysis of unweighted square minima with normalized Oblimin rotation. We removed the reagents without factor loads greater than 0.35 (item 2).

The final solution revealed eigenvalues greater than 1, indicating the presence of three components that account for 50% of the variance. The items exhibit factor loads that exceed 0.35 within their respective factors, and the communities have values larger than 0.30. Due to reagent 2's unsatisfactory performance, the final apparatus consisted of 27 chemicals, as shown in Table 2.

The AFE exhibited a rearrangement of the reagents in opposition to the device's theoretical parameters. We initially classified Item 14, which relates to my desire to develop research abilities, and Item 17, which relates to my natural curiosity, under the Research Vocation category. We have since reclassified them under the research appreciation factor.

The Bartlett's sphericity test yielded a significant result (1884.195 gl = 378, Sig = 0.0000). The matrix determinant was less than 0.000001, indicating a minimal value. We also found the Kaiser-Meyer-Olkin sample size appropriateness indicator adequate, with a value of 0.88.

Table 2. Descriptive statistics and factor loadings for the rotated factors in the CFA of the Scale of Attitudes towards Scientific Research.

| Ítem | Media | DE | Skewness | | Kurtosis | | Kolmogorov Smirnov | | U ² | | |
|------|-------|------|----------|--------|----------|------|--------------------|-----|----------------|-----|--|
| | | | A | C | D | Sig. | U ² | F1 | F2 | F3 | |
| A1 | 1.8 | 1.01 | 1.2776 | 1.4009 | 0.26 | <.00 | 0.4 | 0.5 | | | |
| | 6 | 8 | | | 1 | 1 | 0 | 7 | | | |
| A2 | 2.4 | 1.10 | 0.3707 | - | 0.19 | <.00 | 0.0 | 0.1 | | | |
| | 1 | 9 | | | 8 | 1 | 9 | 8 | | | |
| A3 | 2.1 | 1.35 | 0.9331 | - | 0.28 | <.00 | 0.3 | 0.4 | | | |
| | 1 | 1 | | | 3 | 1 | 6 | 7 | | | |
| A4 | 2.3 | 0.98 | 0.1916 | - | 0.22 | <.00 | 0.4 | 0.6 | | | |
| | 7 | 9 | | | 7 | 1 | 6 | 9 | | | |
| A5 | 2.2 | 1.05 | 0.5315 | - | 0.19 | <.00 | 0.6 | 0.6 | | | |
| | 8 | 1 | | | 6 | 1 | 2 | 8 | | | |
| A6 | 2.2 | 0.94 | 0.4385 | - | 0.22 | <.00 | 0.4 | 0.6 | | | |
| | 3 | 6 | | | 1 | 1 | 3 | 6 | | | |
| A7 | 2.4 | 1.09 | 0.3279 | - | 0.19 | <.00 | 0.4 | 0.6 | | | |
| | 7 | 9 | | | 6 | 1 | 1 | 5 | | | |
| A8 | 2.1 | 0.96 | 0.5760 | - | 0.23 | <.00 | 0.4 | 0.5 | | | |
| | 6 | 8 | | | 3 | 1 | 5 | 7 | | | |
| A9 | 2.5 | 1.07 | 0.2947 | - | 0.19 | <.00 | 0.4 | 0.6 | | | |
| | 5 | 9 | | | 0 | 1 | 4 | 4 | | | |
| A10 | 3.1 | 0.99 | - | 0.1465 | 0.26 | <.00 | 0.3 | | 0.4 | | |
| | 3 | 9 | | | 4 | 1 | 9 | 6 | | | |
| A11 | 2.9 | 0.92 | - | - | 0.25 | <.00 | 0.5 | | 0.7 | | |
| | 0 | 8 | | | 1 | 1 | 8 | 5 | | | |
| A12 | 3.3 | 1.03 | - | 0.2576 | 0.23 | <.00 | 0.6 | 0.6 | | | |
| | 2 | 7 | | | 0 | 1 | 3 | 6 | | | |
| A13 | 3.6 | 1.01 | - | 0.5180 | 0.25 | <.00 | 0.5 | 0.5 | | | |
| | 6 | 3 | | | 7 | 1 | 4 | 8 | | | |
| A14 | 3.8 | 0.88 | - | 0.9454 | 0.27 | <.00 | 0.5 | | | 0.4 | |
| | 3 | 6 | | | 8 | 1 | 3 | 5 | | | |
| A15 | 3.6 | 0.84 | - | 0.2815 | 0.24 | <.00 | 0.5 | 0.4 | | | |
| | 0 | 4 | | | 8 | 1 | 2 | 9 | | | |
| A16 | 3.3 | 1.02 | - | 0.1448 | 0.24 | <.00 | 0.5 | 0.6 | | | |
| | 9 | 7 | | | 8 | 1 | 5 | 5 | | | |
| A17 | 4.0 | 0.82 | - | 1.3061 | 0.25 | <.00 | 0.3 | | | 0.4 | |
| | 4 | 7 | | | 9 | 1 | 8 | 0 | | | |
| A18 | 3.7 | 0.96 | - | 0.6976 | 0.27 | <.00 | 0.4 | 0.5 | | | |
| | 4 | 7 | | | 0 | 1 | 2 | 5 | | | |
| A19 | 3.5 | 0.90 | - | 0.5154 | 0.25 | <.00 | 0.3 | 0.4 | | | |
| | 8 | 4 | | | 9 | 1 | 1 | 0 | | | |

| | | | | | | | | |
|-----|-----|------|--------|--------|------|------|-----|-----|
| A20 | 3.2 | 0.88 | - | 0.1184 | 0.27 | <.00 | 0.5 | 0.8 |
| | 1 | 5 | 0.2439 | | 7 | 1 | 8 | 1 |
| A21 | 3.2 | 0.88 | 0.0251 | 0.3476 | 0.28 | <.00 | 0.6 | 0.7 |
| | 9 | 3 | | | 1 | 1 | 4 | 1 |
| A22 | 4.4 | 0.80 | - | 6.1685 | 0.35 | <.00 | 0.6 | 0.7 |
| | 9 | 7 | 2.1963 | | 3 | 1 | 3 | 3 |
| A23 | 4.1 | 0.91 | - | 1.4312 | 0.25 | <.00 | 0.5 | 0.7 |
| | 7 | 0 | 1.2107 | | 5 | 1 | 8 | 7 |
| A24 | 4.3 | 0.86 | - | 3.2992 | 0.30 | <.00 | 0.8 | 0.8 |
| | 5 | 2 | 1.6225 | | 7 | 1 | 1 | 3 |
| A25 | 3.8 | 0.89 | - | 0.7709 | 0.24 | <.00 | 0.5 | 0.7 |
| | 8 | 0 | 0.6842 | | 1 | 1 | 2 | 3 |
| A26 | 4.1 | 0.85 | - | 3.6981 | 0.30 | <.00 | 0.5 | 0.7 |
| | 6 | 6 | 1.5546 | | 0 | 1 | 9 | 8 |
| A27 | 4.2 | 0.82 | - | 2.3606 | 0.25 | <.00 | 0.5 | 0.7 |
| | 1 | 6 | 1.2630 | | 6 | 1 | 5 | 0 |
| A28 | 3.6 | 0.91 | - | 0.7506 | 0.26 | <.00 | 0.4 | 0.6 |
| | 0 | 7 | 0.7031 | | 3 | 1 | 1 | 0 |

U²U² = Communalities. Item 2 was removed due to its factor loading value (0.18) and communality (0.09).

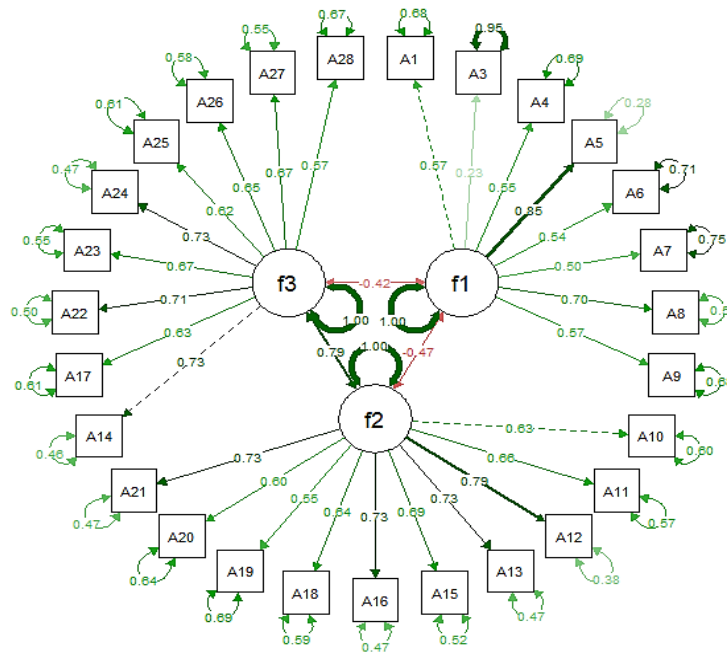
Source: self-made (2023)

3.1 Study 2

We reapplied the scale after removing item 2 to perform the confirmatory factor analysis (CFA), which would allow us to compare the model we obtained from the exploratory factor analysis (EFA). We used Lisrel, v.3.3, and Rstudio to perform the AFC on both tools, using robust unweighted least squares as the estimation method. To get the correct values for the three-dimensional model, the adjustment indices had a χ^2 probability of 0.001, an RMSEA not above 0.05, a GFI greater than 0.95, and CFI, TLI, and AGFI values between 0.90 and 0.95. Figure 1 displays the confirmatory factorial solution, and we found the fit indices using Lisrel software, v.3.3, and Rstudio v. 2023.03.0386 in table 3.

Finally, the instrument had a satisfactory ordinal alpha (α ordinal = 0.91), and each subscale had a satisfactory ordinal alpha for each subscale (Interest in research α ordinal = 0.80, Vocation for research α ordinal = 0.89, and Research evaluation α ordinal = 0.86).

Figure 1. Confirmatory Factorial Solution.



Source: self-made (2023).

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Table 3. Model Fit Indices.

| Fit Index | Expected | Lisrel Obtained | Rstudio Obtained |
|---|---------------|--------------------|---------------------|
| Chi-Square X2 | p> .05 | 533.61 | 404.874 |
| Discrepancy between χ^2 and degrees of freedom | < 5 | 1.80 | 1.26 |
| Goodness of Fit Index (GFI) | 0.90 - 1 | 0.95 | 0.96 |
| Adjusted Goodness of Fit Index (AGFI) | 0.90 - 1 | 0.94 | 0.95 |
| Root Mean Square Error of Approximation (RMSEA) | < 0.05 / 0.08 | 0.07 | 0.04 |
| Comparative Fit Index (CFI) | 0.90 - 1 | 0.99 | 0.96 |
| Normalized Fit Index (NFI) | 0.90 - 1 | 0.94 | 0.92 |
| Non-Normalized Fit Index (NNFI or TLI) | 0.90 - 1 | 0.98 | 0.96 |

Source: self-made (2023).

4. Conclusions

The AFE and AFC results show that the Revised Attitudes Towards Research Scale is a valid way to determine if social work students in Cartagena de Indias will likely want to do research. This is because all its dimensions and the scale are very consistent with each other. The confirmed model consists of three dimensions: a) interest in research, b) voting for research, and c) research valuation.



The Interest in research dimension consists of eight items. It explores feelings of sympathy or antipathy towards scientific research, beliefs related to information seeking, motivation towards the research process, and possible resistance to integrating research into the academic curriculum. It also analyses the pedagogical challenges of teaching attitudes.

The Vocation for Research dimension consists of 10 items and assesses the inclination and commitment toward research activity. This element explores passion, genuine Interest, enthusiasm for scientific research, motivation to acquire new knowledge, and self-learning ability.

Finally, the Research evaluation dimension includes nine items that assess the appreciation and recognition of scientific research. This dimension explores the significance of research in solving social problems, the importance of acquiring research skills, teamwork and collaboration, and the generation of innovative ideas derived from the research process.

In comparison to the reduced version recently analyzed by Hidalgo-Euribe *et al.* (2023), higher indicators were observed in both the total scale (original: $\alpha=.89$, current α ordinal =.92) and the interest sub-scales (originally: $\alpha = 0.75$; current α ordinal = 0.80), specifically in the Vocation (original: $\alpha=0.86$; current α ordinal = 0.89) and Research Value (original $\alpha= 0.69$; current α ordinal = 0.88) categories. Comparatively, the revised model put forth by Aldana de Becerra *et al.* (2020) demonstrated improved measures of internal consistency when compared to the original model. This improvement was observed in both the overall scale (original: $\alpha= 0.87$, revised α ordinal = 0.92) and the sub-scales of Research Vocation (original: $\alpha = 0.88$, revised α ordinal = 0.89) and Research evaluation (original: $\alpha = 0.77$, revised α ordinal = 0.88).

In addition, while comparing this model to the original model imitated by Vargas-Delgado *et al.* (2022) in a neighboring site (Barranquilla), it was found that the internal consistency of the overall scale was mainly good (original: $\alpha=0.85$, current α ordinal = 0.92).

The comparison of this model with the original, assessed in distant places, also shows a significant enhancement in internal consistency measures. When comparing the results obtained in Mexico by Rojas-Solís *et al.* (2021), it was found that higher scores were observed in the sub-scales of Interest (original: $\alpha= 0.74$; current α ordinal = 0.80), Vocation (originally: $\alpha = 0.85$; current α ordinal = 0.89), and Research evaluation (original: $\alpha= 0.61$; current α ordinal = 0.88). The results demonstrate the strong and dependable nature of the suggested model, affirming its applicability across various geographical settings.

This study is notable for being the first at the national level to validate an alternative model to the one proposed by Aldana de Becerra *et al.* (2020). In contrast to prior research that utilized the scale, this study has examined and verified an alternative framework. In addition, when

compared to those reported in a recent study by Hidalgo-Euribe *et al.* (2023) that explored the revised scale in a similar population, the obtained adjustment goodness indices provide further support for satisfactory results. The chi-square value and original degrees of freedom were 4.33, while the current value was 1.26. The original goodness index (GFI) was 0.94, and the current value was 0.96. The original weighted suit index (AGFI) was 0.93, and the current value was 0.95. The original comparative suit index (CFI) was 0.94, and the current value was 0.99. Finally, the original standardized suit index (NFI) was 0.91, and the current value was 0.94.

Furthermore, the study by Quezada-Berumen *et al.* (2019) reveals that the indicators show positive performance. Specifically, there is a slight discrepancy between χ^2 and degrees of freedom (initially 1.23, currently 1.26), a slight increase in the average square approximation error RMSEA (initially 0.02, currently 0.04), no change in the GFI goodness index of adjustment (initially 0.96, currently 0.96), a slight decrease in the AGFI weighted adjustments index (initially 0.96, currently 0.95), no change in the CFI comparative adjusting index (initially 0.99, currently 0.99), and a slight decrease in the NFI standardized adjustability index (initially 0.95, currently 0.94).

In conclusion, the Revised Version Research Attitudes Scale is a reliable and valid tool for evaluating students' inclination to investigate and explore their feelings and ideals about this field. Having a tool like this is the first step in intervening in the beliefs associated with the construction in early academic scenarios. It is essential that the entire student community be able to transform their attitudes and judgments regarding the research work to actively intervene in the social reality and contribute to its improvement.

This study involved a large sample of trained social workers from all over the city. However, future research could consider a larger sample size, including disciplinary students from other institutions, to explore this model and diagnose attitudes toward research at the inter-university level.

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Authors' Contribution statement

Nicolás Álvarez-Merlano: Nicolás Álvarez-Merlano: conceptualization, data curation, formal analysis, resource acquisition, research, methodology, Project administration, Resources,



Software, Supervision, Validation, Visualization, writing (original draft), writing (review of the draft and revision/correction).

Conflicts of interest

The author unequivocally states that there is no conflict of interest in the writing or publishing of this article, reinforcing the integrity and impartiality of the research.

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