Visión Sy 2025, 23(1), 53-63 ISSN 1657-4338

Artículo Original

Validation of the Conspiracy Mentality Scale in a colombian sample

Validación de la Escala de Mentalidad Conspirativa en una muestra colombiana

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Abstract

Conspiracy theories cause real harm to people, their health, physical safety and the environment, amplify and legitimize misinterpretations of phenomena such as pandemics, and reinforce stereotypes that can exacerbate violence and extremist ideologies. In this study, psychometrics properties of the Conspiracy Mentality Scale were examined in a sample of adults from the Colombian Caribbean (N = 698) to determine the validity and reliability of use. Likewise, it was sought to establish the levels of conspiratorial thinking of the evaluated population and the demographic groups that are more susceptible to adopting these beliefs. The results showed that the Spanish-speaking version of the scale presents good factorial validity, and the factorial structure coincides with the original version. No demographic differences were found in conspiratorial thinking or skepticism. The study findings represent a bridge to deepen the study of conspiratorial thinking in the region.

Keywords: Conspiratorial thinking; Validation; Colombia; CFA

Resumen

Las teorías conspirativas causan daños reales a las personas, su salud, su seguridad física y el medio ambiente, amplifican y legitiman interpretaciones erróneas de fenómenos como las pandemias y refuerzan estereotipos que pueden exacerbar la violencia y las ideologías extremistas. En este estudio, se examinaron las propiedades psicométricas de la Escala de Mentalidad Conspirativa en una muestra de adultos del Caribe colombiano (N = 698) para determinar la validez y confiabilidad del uso. Asimismo, se buscó establecer los niveles de pensamiento conspirativo de la población evaluada y los grupos demográficos que son más susceptibles a adoptar estas creencias. Los resultados mostraron que la

versión de habla hispana de la escala presenta una buena validez factorial, y la estructura factorial coincide con la versión original. No se encontraron diferencias demográficas en el pensamiento conspirativo o el escepticismo. Los hallazgos del estudio representan un puente para profundizar el estudio del pensamiento conspirativo en la región.

Palabras clave: Pensamiento conspirativo; Validación; Colombia; CFA

Introduction

During COVID-19 there was a worrying rise in misinformation and conspiracy theories. These theories are dangerous because they are often aimed at discriminating against vulnerable groups, ignore scientific evidence, and polarize society with serious consequences. Conspiracy theories cause real harm to people, their health, physical safety and the environment, amplify and legitimize misinterpretations of phenomena such as pandemics and reinforce stereotypes that can exacerbate violence and violent extremist ideologies (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2021). This impact at the social level is due to the fact that they affect the decision-making of individuals, for example, favor the reactance towards vaccines or prevent people from taking care of the environment (Jolley & Douglas, 2014).

Conspiracy theories can be defined as implausible explanations of significant social or political events that postulate powerful agents working together in secret to achieve a malevolent goal, that often contradict the explanations made by the relevant epistemic authority, and that are steeped in a particular tradition of explanation (Brotherton, 2013; Byford, 2011; McCauley & Jaques, 1979; Sunstein and Vermeule, 2009; Uscinski & Parent, 2014).

The literature on the investigation of conspiratorial beliefs could be divided into two approaches: one of studies at the individual level (e.g., psychology) and another at the social level (e.g., sociology). Psychology has addressed conspiracy beliefs as a symptom associated with psychological disorders such as paranoia, paranoid ideation and schizotypy (Bruder et al., 2013; Darwin et al., 2011). Similarly, anxiety has been reported as a positive predictor of conspiratorial beliefs (Grzesiak-Feldman, 2013; Swami et al., 2016). The literature reports associations with personality traits, self-esteem and propensity to cognitive biases, among others (see discussion in Goreis and Voracek. 2019). On the other hand, studies at the social and cultural level highlight the central role of context, politics and communication. These studies point out that the tendency to believe in conspiracy theories is not a phenomenon underlying disorders or personality traits. In contrast, it is argued that it is a consequence of contextual influences (Schlipphak et al., 2021) and is characterized as a cultural phenomenon (Mantequilla and Knight, 2016). Countries with religious differences, for example, Jordan and Germany have been found to have significant differences in levels of belief in conspiracy theories.

Regarding the individual approach to conspiratorial thinking, the researchers of one of the largest comparative studies carried out to date, point out that the difference between nine countries evaluated (n = 11,523) only explained 2% of the variance. Consequently, the authors recommend approaching conspiratorial thinking from individual characteristics. However, it is pointed out that this variance explained by contextual differences (2%) could be due to the fact that the instrument used measures conspiratorial beliefs in an abstract way, in addition the countries evaluated have similar conditions of economic wealth and value system (see Walter and Drochon, 2022).

As Walter and Drochon's (2022) research points out, conspiracy theories are present in different cultural contexts. However, the results are heterogeneous in relation to sociodemographic variables. While studies show that men are more likely to believe in conspiracy theories than women (Freeman and Bentall, 2017; Hogg et al., 2017; Douglas et al., 2019), others have evidence that the

opposite is true (Mancosu et al., 2017), and others found no difference at all (Enders and Smallpage, 2019; Uscinski and Parent, 2014).

Associations have also been found between being young and presenting conspiratorial beliefs (Galliford and Furnham, 2017; Hettich et al., 2022). In contrast, in Latin American countries such as Argentina, Colombia and Paraguay, people over 42 years of age are more sympathetic to conspiratorial beliefs (Caycho-Rodríguez et al., 2022d). On the other hand, a low level of education suggests a greater likelihood of believing in conspiracy theories (Douglas et al., 2016; Freeman and Bentall, 2017; Hollander, 2018; Hettich et al. 2022). However, for educational attainment, the results are still not consistent (Enders and Smallpage, 2019; Galliford and Furnham, 2017). For example, in Latin American countries Chile and Ecuador, people with higher educational levels were more likely to have conspiratorial beliefs about vaccines (Caycho-Rodríguez et al., 2022d).

As can be deduced from the previous paragraph, there are differences between some countries of the global south and north regarding the characterization of conspiratorial thinking. However, in the Latin American case, research regarding conspiracy theories is studied as a social and historical phenomenon, it is pointed out that historically conspiracy theories are used as a political instrument (Senkman and Roniger, 2019); in which a group promotes alternative truths to the formal discourse of events to take center stage, waging a battle with a "hidden" enemy, regaining control over the collective destiny of society without delay (Crenzel, 2021). However, from the COVID-19 juncture, interest in conspiracy theories in Latin America increased, measuring the effects and prevalence of conspiracy theories on vaccination (e.g., Caycho-Rodríguez et al., 2022a; Rabbia, 2021).

Regarding the contrasting results of conspiratorial thinking, it is argued that the psychometric properties are very rarely examined and the factorial and convergent validity are not addressed, so there is a risk of bias in the studies and the amount of noise measured (Swami et al., 2017) hence the importance of validating the instruments according to the region where it will be applied. Many instruments can be classified from two categories: questionnaires to measure specific and generalized beliefs (Goreis and Voracek, 2019). The specific cutting instruments, their items make references to known conspiracy theories that arise in a certain cultural and historical context, within these instruments are e.g., the Conspiracy Theory Belief Scale (Douglas and Sutton, 2011), the Conspiracy Theory Belief Inventory (Swami et al., 2010).

In the instruments that measure generic beliefs in conspiracy theories the items do not refer to specific theories e.g., "Some things that everyone accepts as truth are actually hoaxes created by people in power" (Stojanov and Halberstadt, 2019) examples of these scales are: The Generic Conspiracy Beliefs Scale (Brotherton et al., 2013), the Conspiracy Mindset Questionnaire (Bruder et al., 2013) and the Conspiracy Mindset Scale (Stojanov and Halberstadt, 2019). Generic scales are not linked to a specific sociocultural and historical context, so they are susceptible to validation in different cultural contexts unlike specific scales, which address conspiratorial beliefs of a place or community.

One of these generic scales to measure the conspiracy mentality is the one developed by Stojanov and Halberstadt (2019), which has two dimensions, one that measures rational skepticism and the conspiracy mentality (conspiracy ideation). This scale has presented adequate psychometric characteristics in the United States, New Zealand, North Macedonia (Stojanov and Halberstadt, 2019) and Switzerland (Stojanov and Hannawa, 2022). Despite the cross-cultural use of the Conspiracy Mentality Scale, there are no studies that evaluate the psychometric properties of this instrument in the Spanish-speaking population of Latin America. The objective of this study is to examine the psychometric properties of the Conspiracy Mentality Scale to determine the validity and reliability of use in the adult population of the Colombian Caribbean. Likewise, it seeks to establish the levels of conspiratorial

thinking of the evaluated population and the demographic groups that are more susceptible to adopting these beliefs.

Method

Participants: This study included the participation of 698 Colombians (54.73% women), of different age ranges, but mainly young adults (65.18%) and people in middle adulthood (20.77%). Participants were mainly college-educated individuals (58.00%). The minimum sample size for this study was 460, as this number provides sufficient statistical power to model any factor structure in a structural equation analysis (see details in Wolf et al., 2013).

Table 1. Demographic characteristics

Demographic	n
Age group	
Early adulthood	524
Middle adulthood	145
Late adulthood	29
Gender	
Female	382
Male	309
No binary	7
Education	
High School	94
College	108
Undergraduate degree	402
Post-graduate degree	89

Instruments

The Conspiracy Mentality Scale (CMS):

This 11-item scale was developed by Stojanov and Halberstadt, (2019) and measures the tendency to believe in conspiracy theories *(e.g., "Some things that everyone accepts as truth are actually hoaxes created by people in power*") and skeptical beliefs (e.g., "*Some things are not what they* seem"). The CMS is a five-level likert scale (1 = *"Strongly disagree",* 5 = "*Strongly agree*"). Each of the dimensions of this instrument have adequate goodness of fit indices (RMSEA = .04). For this study, a process of linguistic adaptation was carried out since the original version was not designed in the Spanish language. The translation and adaptation of the instrument were conducted by three psychologists fluent in both English and Spanish, followed by a pilot test with five participants (See the Spanish version of CMS at supplementary materials).

Procedure:

This cross-sectional study had a non-probability sampling, in which the participation of individuals depended mainly on their willingness and availability, but not on a random selection process (Salkind, 2010). Participants were mainly acquaintances or relatives of undergraduate psychology students who were invited to share the survey using electronic means, such as email and social media posts. The responses were collected through the use of virtual forms of Google Forms, since this platform allows the automatic digitization of the answers so that transcription errors are avoided. The people recruited for this study had to have Colombian nationality, legal age and access to electronic devices that would allow them to access the survey. Before answering the instruments, participants were informed about the different ethical aspects related to their role in the study and then asked to sign an informed consent. Among the instruments, a verification item was included to discriminate against those participants who did not answer the questionnaires attentively, but instead filled out the questionnaires in a random and careless manner. This research was reviewed and approved by the Ethics Committee of [*blinded for review*].

Data analysis:

First, the descriptive statistical measures were calculated, as well as the inter-item polychoric correlations for the CMS. Next, the Kaiser-Meyer-Olkin (KMO) sample adequacy measure was calculated and the correlation matrix was evaluated to determine if it was possible to perform an Exploratory Factor Analysis (EFA). Secondly, the EFA was carried out to determine different factorial models of the CMS that could

emerge from statistical criteria such as Kaiser's Rule, Parallel Analysis and Minimum Partial Averages (MAP). The extraction of the factors was performed using Unweighted Minimum Squares (ULS) since it is a recommended estimator for categorical data (Forero et al., 2019). In this study, the loads were adjusted with the Promax rotation, since a certain degree of obliquity between the factors was expected.

A Confirmatory Factor Analysis (CFA) was performed to evaluate the goodness of fit of the CMS factor model obtained with the EFA and compare it with possible factorial structures found in previous studies. In this analysis, ULS was also implemented as a factor estimator. The reliability of the instrument was then determined from the calculation of McDonald's Omega coefficient (see Kalkbrenner, 2021). Once the psychometric properties of the CMS were established, the factorial scores were calculated from a weighted average where the regression betas were used as weights.

Finally, the sensitivity of the instrument was evaluated according to gender, age group, having received the COVID-19 vaccine (eg, "Yes", "No"), educational level and income. To determine sensitivity, mean comparisons (*t test*) and Analysis of Variance (ANOVA) were performed for each of the questionnaire domains. Effect sizes were determined using Cohen's *d* and η^2, respectively. The psychometric analyses of the study were performed by implementing the functions of the "psych" (Revelle, 2021) and "lavaan" (Yves, 2012) packages in R (R Core Team, 2021).

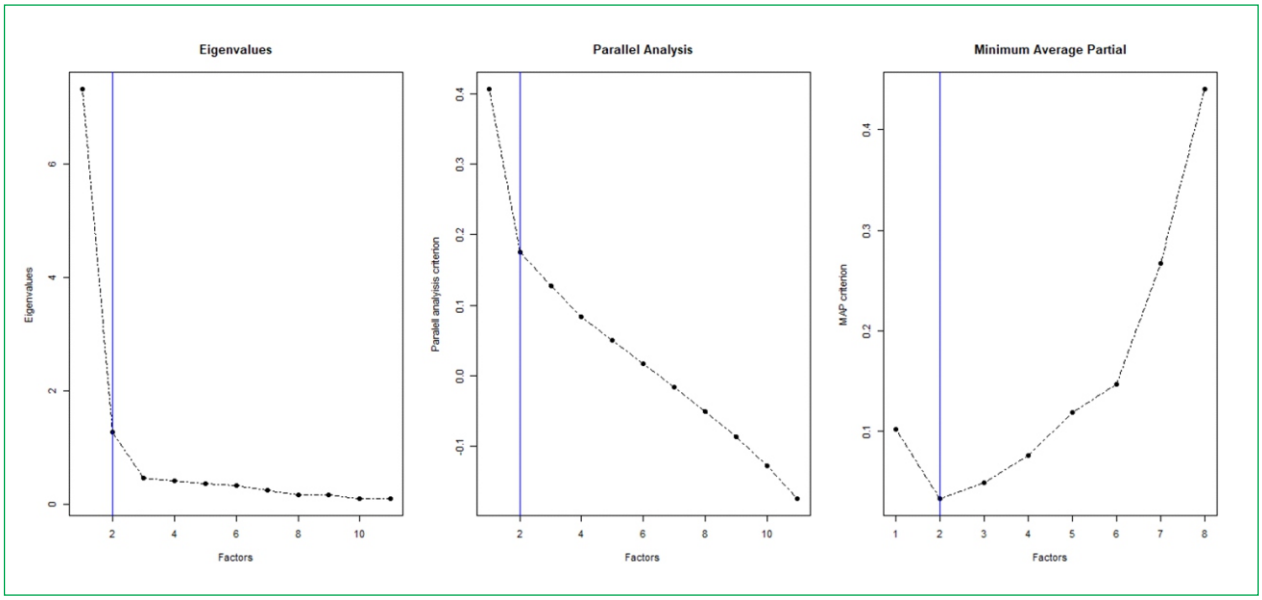
Results

When calculating the polychoric inter-item correlations, it was observed that these range between .42 and .89 (see table 2). The analysis of sample adequacy showed adequate values (KMO = .94) as well as Bartlet's sphericity test $\chi2(55) = 7523$, $p < .001$, so that the Exploratory Factor Analysis (EFA) could be carried out. In the EFA the three statistical criteria used identified 2 possible factors for CMS (see figure 1).

Table 2. Inter-item correlations and descriptive statistics

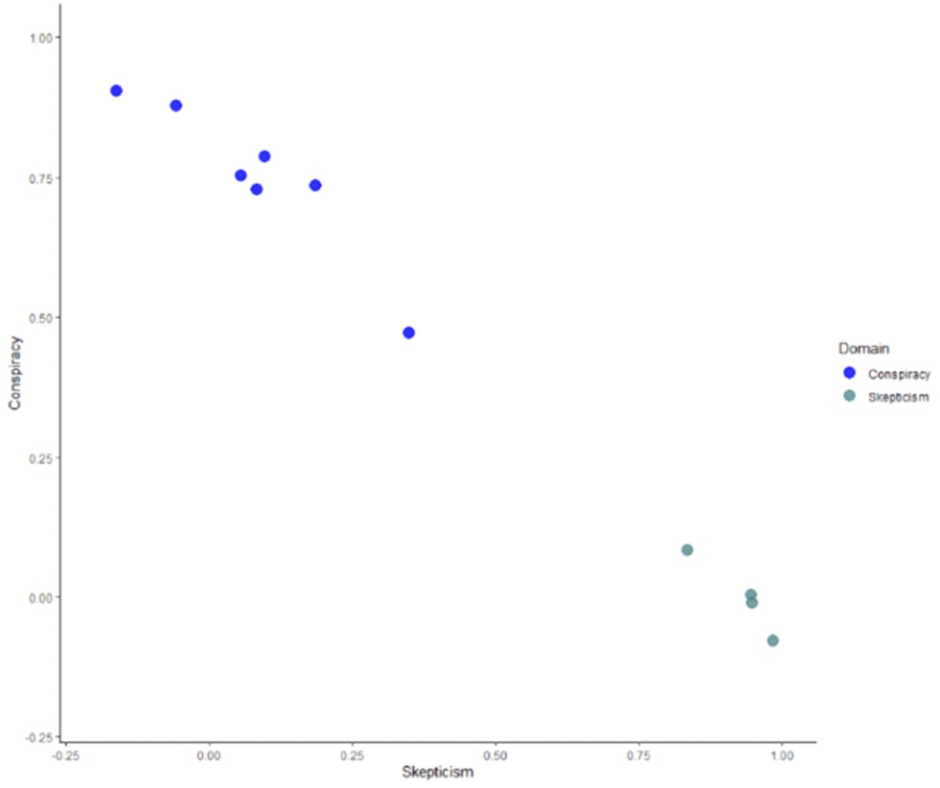
	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11
Item 1	-										
Item 2	.73	-									
Item 3	.65	.74	-								
Item 4	.64	.69	.80	-							
Item 5	.60	.66	.64	.72	-						
Item 6	.62	.61	.69	.70	.65	-					
Item 7	.54	.57	.62	.64	.57	.62	-				
Item 8	.45	.54	.61	.66	.56	.55	.69	-			
Item 9	.45	.54	.63	.67	.56	.56	.64	.84	-		
Item 10	.45	.53	.61	.64	.56	.56	.61	.83	.89	-	
Item 11	.42	.51	.57	.63	.53	.48	.60	.82	.88	.89	-
M	2.87	3.06	3.12	3.30	3.06	2.97	3.18	3.74	3.77	3.73	3.91
SD	1.21	1.15	1.18	1.15	1.13	1.18	1.18	1.10	1.15	1.12	1.12

Figure 1. Factors number according to statistical criteria



From the EFA, a single factor structure was obtained that explains 70.4% of the accumulated variance, which has the same distribution of items as that reported by Stojanov & Halberstadt (2019). In this study the *Conspiracy mentality* factor (items 1, 2, 3, 4, 5, 6 and 7) presents items factorial loads between .47 and .90, while in the *Skepticism* factor (items 8, 9, 10 and 11) the items have loads between .83 and .98 (see figure 2). In this case item 7 ("*Events on the news may not have actually happened.*") presented loads on both factors (F1 = .47, F2 = .35).

Figure 2. Rotated loads of Item in a two-dimensional plane.



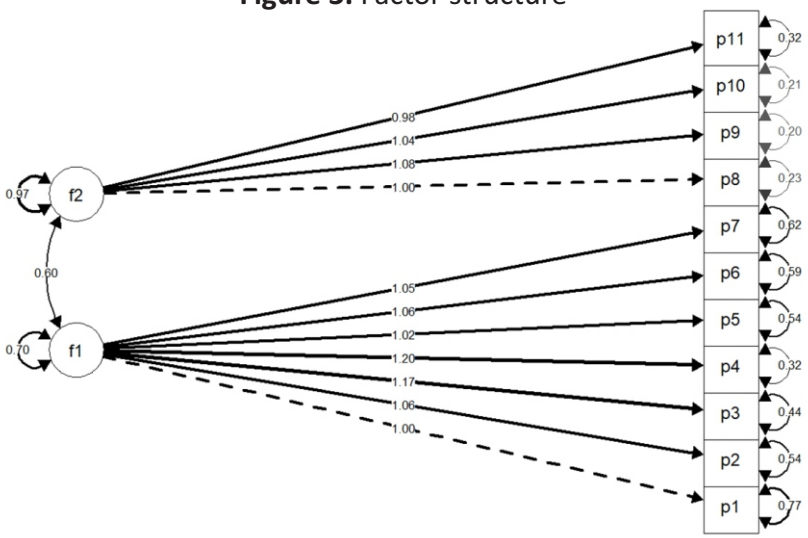
In the CFA, the goodness of fit of the CMS factorial model was evaluated and it was determined that the instrument has an adequate goodness of fit, $\chi2(43) = 128.17$, CFI = .996, TLI = .995, RMSEA = .053. When examining the betas of the items on the factors, it was observed that item 4 *(Many situations or events can be explained by illegal or harmful acts by the government or other powerful* people), β = 1.20, SE = .03, $p < .001$, and item 9 (*There are people who don't want the truth to come out*), β = 1.08, SE = .025, $p < .001$, are the ones that offer the greatest contribution to their respective factors (see table 3). Likewise, the CFA showed that the two factors are related to each other, Cov = .60, SE = .015, $p < .001$ (see figure 3).

Table 3. Rotated loadings and CFA betas by items

Domain	Item's description	λ	β
Conspiracy mentality	1. The government or covert organizations are responsible for events that are unusual or unexplained.	.90	1
	2. Many so called "coincidences" are in fact clues as to how things really happened.	.88	1.06
	3. Some things that everyone accepts as true are in fact hoaxes created by people in power.	.79	1.17
	4. Many situations or events can be explained by illegal or harmful acts by the government or other powerful people.	.73	1.20
	5. The alternative explanations for important societal events are closer to the truth than the official story.	.73	1.02
	6. Events throughout history are carefully planned and orchestrated by individuals for their own betterment.	.75	1.06
	7. Events on the news may not have actually happened.	.47	1.05
Skepticism	8. Some things are not as they seem.	.83	1
	9. There are people who don't want the truth to come out.	.95	1.08
	10. People will do crazy things to cover up the truth.	.95	1.04
	11. Many things happen without the public's knowledge.	.98	.98

Note: λ = factor loading, β = CFA regression beta

Figure 3. Factor structure



Once the validity of the CMS was established, the internal consistency of the dimensions was examined by estimating the hierarchical omega coefficient. The results show that both the conspiracy subscale, ω = .91, 95% CI [.89 < ω< .93], and the skepticism subscale, ω = .94, 95% CI [.92 < ω < .96], exhibit high levels of reliability. When comparing the scores between both scales it can be seen that the participants have a greater degree of skepticism, M = 3.78, SD = 1.04, than conspiratorial mentality, M = 3.09, SD = .95, *t* (1394) = -13.10, *p* <.001 (see figure 4). We examined whether there are differences in CMS domains according to gender, age group, having received the COVID-19 vaccine (eg, "Yes", "No"), education level and income. The ANOVA analysis detected significant differences in conspiracy mentality according to age groups, F(3.694) = 3.735, *p* = .011, η2p =.016, however in an analysis of multiple comparisons with Tukey's test, no such differences were detected, *ps* > .05. Likewise, there were no differences in conspiracy mentality according to gender, educational level and income level, *ps* > .05. Similarly, the results showed that there are no differences in the degree of skepticism in relation to the sociodemographic characteristics that were considered for the *ps* > .05 comparisons.

Figure 4. Sample distributions of CMS domains

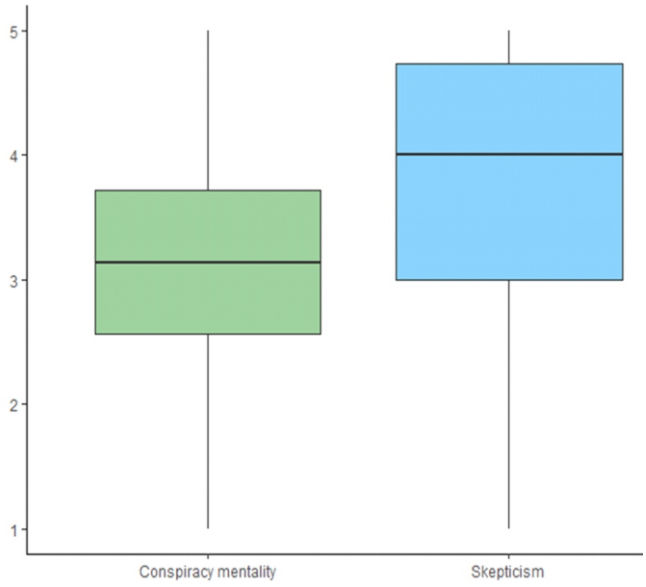


Table 4. Means and standar deviation for each sociodemographic group

	Conspiracy	Skepticism
	M (SD)	M (SD)
Gender		
Male	3.09 (.99)	3.78 (1.05)
Female	3.09 (.91)	3.8 (1.02)
Vacunation		
Yes	3.07 (.94)	3.79 (1.03)
No	3.29 (1.02)	3.65 (1.2)
Education		
High School	3.12 (.98)	3.7 (1.17)
Colleage	3.13 (.93)	3.84 (.97)
Under-graduate	3.06 (.91)	3.8 (1.03)
Graduate	3.08 (1.06)	3.74 (1)
Age		
18-20	3.21 (.83)	4 (1)
20-39	3.01 (.95)	3.72 (1.06)
40-59	3.18 (.99)	3.83 (1.02)
60+	3.51 (.83)	4.09 (.85)
Income level		
Low	3.14 (.93)	3.79 (1.04)
Medium	3.07 (.98)	3.81 (1.03)
High	3 (.89)	3.66 (1.09)

Discussions

This study aimed to examine the factorial validity and reliability of the CMS scale in a Colombian Caribbean sample. The results showed that the CMS is a scale with good fit and reliability, and a bifactorial structure that aligns with previous studies (Stojanov and Halberstadt, 2019; Stojanov and Hannawa, 2022;2023). These findings represent a step forward towards a full validation of the scale, and support the factorial validity of the scale in the studied population, making it a valuable tool for further exploration of conspiratorial beliefs in samples from the Colombian Caribbean.

When comparing scores between both dimensions of the CMS, higher levels of skepticism

than conspiratorial thinking were found, representing a point of external validity as skepticism is expected to be a form of rational suspicion, while conspiratorial mentality is an underlying tendency to irrational suspicion (Stojanov and Halberstadt, 2019; Stojanov and Hannawa, 2022).

Moreover, no significant differences were found in the sample regarding gender, which is consistent with previous research (Enders and Smallpage, 2019; Uscinski and Parent, 2014). Similarly, no differences were found regarding educational level. Studies on this variable disagree with each other (Enders and Smallpage, 2019; Galliford and Furnham, 2017). The results in this aspect are inconclusive; the relationship between non-psychological variables (gender, age, education, etc.) and conspiratorial thinking falls within the sociological approach (Hofstadter, 1964), where the context moderates or affects the tendency toward conspiratorial thinking. On the other hand, psychological research suggests that this variable could be a function of individual variables, as the context has been found to explain little of the variability in conspiratorial thinking (Walter and Drochon, 2022). This could also explain the lack of significant differences regarding income levels among the sample participants. However, the distribution of these variables within the sample should not be dismissed.

The CMS exhibited good psychometric properties in the various studies that examined it (e.g., Stojanov & Hannawa, 2023; 2023), suggesting that this scale could facilitate a cross-cultural approach to conspiratorial thinking. However, to ensure comparability of results across countries, future studies should examine the factorial invariance of the instrument among different populations to ensure that the scale operates similarly for different groups of people, regardless of non-psychological characteristics (Byrne, 2008).

A key strength of this study was that we used methods and estimators appropriate to the nature of the data, to reduce biases in factorial models. Additionally, adults from the Colombian Caribbean participated, a population in which conspiratorial thinking has not been previously addressed. Therefore, the results of this study are a bridge for future studies to deepen our understanding of conspiratorial thinking by identifying the reasons individuals adopt such ideas. They also benefit therapists working with patients experiencing paranoid ideation or disorders characterized by a break from reality, as it provides an objective measure of conspiratorial thinking and aids in developing strategies to reduce this phenomenon.

It's worth mentioning that this study had some limitations. Firstly, the sampling was non-probabilistic, so the results should be generalized with caution. Additionally, a large proportion of participants had university education, and considering that this demographic is smaller in Colombia, future studies should aim for greater participation from individuals with lower educational levels and income. Lastly, this study did not account for the presence of clinical disorders, so it's recommended that future research controls for the effect of this variable on the results. Despite these limitations the study demonstrates the factorial validity of the CMS in a Colomnian sample.

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