## Research Article

# Validation of the Young Schema Questionnaire (YSQ-S3) in Mexican University Students

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The Young Schema Questionnaire (YSQ) assesses Early Maladaptive Schemas (EMS) in Schema Therapy, and it has demonstrated adequate psychometric characteristics. However, there is a lack of consistent factorial structures in the available research on the psychometric properties of YSQ versions. This cross-sectional study aimed to adapt, validate, and evaluate the psychometric properties of the short version of the YSQ in Mexican university students. A non-probabilistic sample of 772 Mexican university students from different states of was used. The mean age of the sample was 21.33 years, most (67%) were female, students of psychology (683.7%), and living in México City (49.6%). A series of exploratory and confirmatory factor analysis were made to compare the proposed instrument with the one proposed by the Schema Therapy. The instrument exhibited a structure of 17 out of the 18 original schemes (except the Unrelenting Standards schema), organized in the same 5 dimensions proposed in the Schema Therapy, with a total internal consistency level of 0.962, and a good Confirmatory Factor Analysis fit indexes (e.g., RMSEA=.08). The YSQ-S3-MX version is proposed as a suitable tool for evaluating EMS in Mexican university students, ensuring proper use in clinical practice and research.

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## Introduction

Early Maladaptive Schemas (EMS) provide valuable information about the characteristics of patients, the way they behave, think, and feel. Identifying EMS is vital to provide Schema Therapy. The Schema Therapy has been proven to be useful when providing psychological treatment from a scientific approach, and it helps achieving therapeutic objectives tailored to each patient. It is important that the diagnosis, the implementation of the different techniques, the research, and the treatment of patients are specific for each scenario, and that clinicians and researchers have access to instruments that actually measure the EMS in the population that they are working with.

Young et al.<sup>[1]</sup> defined the EMS as: a) a strong concept, a persistent pattern; b) that includes memories, emotions, cognitions and physical sensations; c) about one self and relationships with others; d) developed during childhood or adolescence; e) maintained through the whole life and; f) mainly dysfunctional. EMS are developed from the existing interaction between the fulfillment of primary needs, first childhood experiences, and temperament.

According to Young et al.<sup>[1]</sup>, there are 18 EMS, included within five dimensions. Those dimensions and EMS are constituted as follows: 1) the Disconnection and Rejection dimension, including the Emotional Deprivation, Abandonment, Mistrust/Abuse, Social Isolation/Alienation, and the Defectiveness/Unlovability schemas; 2) the Impaired Autonomy and Performance dimension, including the Failure to Achieve, Practical Incompetence/Dependence, Vulnerability to Harm or Illness, and the Enmeshment schemas; 3) the Impaired Limits dimension, including the Entitlement/Superiority, and the Insufficient Self-Control/Self-Discipline schemas; 4) the Other-Directedness dimension, including the Subjugation, Self-Sacrifice, and the Admiration/Recognition-Seeking schemas; and 5) the Over Vigilance and Inhibition dimension, including the Emotional Inhibition, Unrelenting Standards, Pessimism/Worry , and the Self-Punitiveness schemas<sup>[2]</sup>.

The Young Schema Questionnaire (YSQ) is one of the instruments used in the Schema Therapy. It is a self-report tool that assesses the presence of each of the 18 EMS using phrases that represent the main characteristics of the EMS<sup>[1]</sup>. The psychometric properties of the YSQ were first evaluated by Schmidt et al.<sup>[2]</sup>, reporting high test re-test reliability and internal consistency coefficients. The YSQ has shown good convergent and discriminant validity when assessing psychological distress, self-esteem, cognitive vulnerability for depression, as well for personality disorders symptoms. Also, factorial analysis supports the YSQ structure when used with clinical or non-clinical samples<sup>[4]</sup>.

There are three different length editions of the YSQ. The third edition, long version of the YSQ (YSQ-L3<sup>[5]</sup>), is composed of 232 items, using a six points Likerttype scale. The short version of the YSQ-L3 (YSQ-S3<sup>[6]</sup>) includes the most representative five items of each EMS, with a total of 90 instrument items. The YSQ-S3 has similar characteristics as the YSQ-L3<sup>[4]</sup>. Stopa et al.<sup>[7]</sup> reported that both YSQ-L3 and YSQ-S3 have similar internal consistency, parallel forms reliability, as well as concurrent validity, and the YSQ-S3 can be used for clinical and research purposes<sup>[<u>4</u>]</sup>. The YSQ-S3 has been most widely used to study obsessive compulsive disorder, substance abuse and personality disorders.

Several recent studies have been conducted to validate and assess the psychometric properties of the YSQ-S3. It has been validated in Portuguese, Croatian, Flemish, Persian, French and Japanese. In Spanish, it has been validated among university students in Peru and Chile for assessing all 18 EMS. In Mexico, we only found one study about the validation of the YSQ-S3 among students in the state of Hidalgo, showing a good structure of 10 EMS<sup>[8]</sup>. To our knowledge, there is only one study about the evaluation of the psychometric properties of the YSQ-S3 in Mexican population. It is of great importance to contribute to the scientific literature and obtain an YSQ-S3 version adapted to the Mexican Spanish language and to the Mexican culture, as well as evaluate its psychometric properties so we can have the certainty that it is actually measuring the EMS in Mexicans. Therefore, the objective of this study was to adapt and validate the YSQ-S3, as well as to evaluate its psychometric properties in Mexican university students.

## Method

#### Design

This study was conducted using an exploratory, cross-sectional, quantitative design<sup>[9]</sup>.

#### Participants

A non-probabilistic accidental sampling was used<sup>[10]</sup>. The criteria proposed by Nunnally<sup>[11]</sup> and Thorndike<sup>[12]</sup> was considered, using the formula N=10k, where *k* represents the number of items of the instrument. The proposal of Martínez-Arias<sup>[13]</sup> was also considered, using a sample consisting of 5 to 10 participants per item. The inclusion criteria included: being older than 18 years and currently being university student. The exclusion criteria included: having answered any version of the YSQ before the start of this study, having one or more psychiatric disorder diagnoses, having any mental deficiency, having a brain lesion, and being under the influence of any legal or illegal drug. We obtained a sample of 843 students from seven states of the country.

The sample consisted in 772 university students: 67% (*n*=517) were female and 33% (*n*=255) male. The mean age was 21.33 (*SD*=4.085) with a minimum of 18 and a maximum of 63 years. The data related to their career, the current semester, and the state of residence is shown in Table 1.

Career	Semester							
	n	%		n	%			
Psychology	530	68.7	1st semester	129	16.7			
Psycho-oncology	1	0.1	2nd semester	55	7.1			
Psychiatry	2	0.3	3rd semester	143	18.5			
Medicine	4	0.5	4th semester	21	2.7			
Biology	1	0.1	5th semester	74	9.6			
Administration	2	0.3	6th semester	70	9.1			
Electronic Engineering	14	1.8	7th semester	77	10			
Law	17	2.2	8th semester	52	6.7			
Physics	12	1.6	9th semester	151	19.6			
Chemistry	26	3.4						
Industrial Engineering	71	9.2	State of residence					
Mechanical Engineering	20	2.6	Aguascalientes	16	2.1			
Environmental Engineering	26	3.4	México City	383	49.6			
Civil Engineering	22	2.8	Jalisco	80	10.4			
Computational Engineering	11	1.4	State of México	115	14.9			
Metallurgical Engineering	9	1.2	Baja California	51	6.6			
Communication	1	0.1	Sonora	16	2.1			
Electrical Engineering	3	0.4	Tamaulipas	111	14.4			

Table 1. Sample characteristics according to career, semester, and place of living (n=772).

#### Ethical considerations

The protocol for this study was approved by the Mexican Institute of Behavioral Cognitive Psychotherapy (IMPCC), regarding its methodology and ethical principles. It was also approved by the educational institutes from where the participants were from. All participants were given an informed consent format. This format included details regarding the study characteristics, possible consequences, and use of data. Once an individual read and signed the informed consent format, they were included as a participant of this study.

#### Instruments

We used the Young Schema Questionnaire – Short Form, 3rd Edition (YSQ-S3; Young<sup>[16]</sup>): The YSQ-S3 includes 90 items evaluating all 18 EMS in five dimensions. This questionnaire uses a Likert-type scale ranging from option 1: *Completely untrue of me* to option 6: *Describes me perfectly*. The results of this questionnaire can be interpreted using a level in which the EMS are presented, from low to very high.

#### Procedure

The YSQ-S3 was translated to Mexican Spanish. Two experts in psychology with English certifications evaluated the translation. Modifications from this process were made. Another translation of the questionnaire was made, from Spanish to English, in order to check if the questionnaire was adequately translated and reviewed. Comments from the experts were addressed. The pilot version and the informed consent were applied to 50 people with the same characteristics as the participants of the final sample. According to the results of the pilot phase, corrections to the questionnaire were made, resulting in the final version of the instrument. In order to standardize the application process, reduce the loss of data, and make the general application process easier and faster, an application manual and a web page where the participants were able to respond the final version of the questionnaire were designed. After soliciting authorization from the universities' authorities, the instrument and an informed consent were applied to groups of 30 students.

Each group was gathered in a computer room, at their university, according to their availability. The web page including both the informed consent and questionnaire was uploaded on the computers and one computer was assigned to only one participant. After that, each participant had 45 minutes to read and (after they decided to participate) sign the informed consent and also answer the whole questionnaire. This process was done electronically via the computer. The results from the pilot and the application phase were captured in a ® IBM SPSS Statistics 21 database for later analysis. The database was cleaned of missing data, eliminating 71 of the total 843 cases registered. The remaining 772 cases were included in the final statistical analysis.

As a result of the adaptation process and the assessment of the questionnaire, the YSQ-S3 version for Mexican population, the "Cuestionario de Esquemas Desadaptativos de Jeffrey Young tercera edición version corta para población Mexicana" (YSQ-S3-MX) was integrated (see supplementary material).

#### Statistical Analysis

Descriptive analysis of demographic data and questionnaire results were performed. Kolmorogov-Smirnov tests and graphic data analysis were conducted to evaluate the bias of the variables. Chi-square tests were made to evaluate the statistical differences in sociodemographic variables. The following analyses were made: frequency analysis to evaluate if the response scale was attractive to the participants and to evaluate the bias of each item; Student's *t* tests to assess whether the items discriminated against each other; contingency tables to assess the directionality of the items; reliability analysis using Cronbach's alpha to evaluate the internal consistency of the instrument; bivariate Pearson's correlation analysis to determine the rotation to be used in the following exploratory factor analysis; exploratory factor analysis using the principal components method in order to determine the construct validity of the instrument, and to determine the best factor structure; and a confirmatory factor analysis using Structural Equation Modeling (SEM) with maximum likelihood estimation method in order to compare the factor structure found in the exploratory factor analysis against the original YSQ-S3 structure. The SEM analysis was conducted using **(BIM SPSS and Amos 21 statistics software.** 

## Results

According to the Kolmorogov-Smirnov tests and graphic data analysis, we observed that the sociodemographic variables (age, gender, place of living, field of study, and semester) and the total scores form each EMS did not present a normal distribution (all *p*<.000). It was also observed that there were outliers in age and total scores of the abandonment, mistrust/abuse, social isolation/alienation, defectiveness/unlovability, failure to achieve, practical incompetence/dependence, enmeshment, subjugation, self-sacrifice, entitlement/superiority, and the admiration/recognition-seeking schemas.

There were statistically significant differences in gender ( $X^2$ =517, p=.000), state of residence ( $X^2$ =875.974, p=.000), field of study ( $X^2$ =5,967.368, p=.000), and semester ( $X^2$ =210.720, p=.000).

#### Psychometric properties of the YSQ-S3-MX

The frequency analysis showed that all response options were attractive to the participants. Items 12, 31, 50, 56, 65, 67, and 89 showed a normal distribution (not biased) while the rest of the items showed a biased distribution. The items with a normal distribution were eliminated and the rest of the analyses were conducted with only the biased items.

The Student's *t* tests showed that all items discriminated against each other correctly when comparing the higher and lower percentiles means. No items were eliminated at this stage. It was observed in the contingency tables that the directionality of the items was correct. There was no need to recode or eliminate items at this stage. The Cronbach's alpha analysis showed an internal consistency overall of 962. There was no need of eliminating items at this stage.

It was determined, through the Pearson's bivariate correlation analysis, that the optimal rotation to use in the exploratory factor analyses was the Varimax (Orthogonal) rotation. This, because the highest correlation found between the overall score of the instrument and each of the items was r=.670, p<.000.

The first exploratory factor analysis showed that items 71, 7, 49, 82, 45, 10, 87 and 13 had a low factorial weight and they were eliminated, considering the factorial weight threshold of 40 proposed by Cliff and Hamburguer<sup>[15]</sup>. As a result of the second exploratory factor analysis, item 25 was eliminated for having a low factorial weight, and items 90, 81, and 85 were eliminated for having a considerable factorial weight in different factors than the ones purposed by the original instrument. Table 2 shows all items eliminated at this point.

Stage	Items
Frequency analysis (not biased items)	12, 31, 50, 56, 65, 67, 89
1st exploratory factor analysis (low factorial weight)	71, 7, 49, 82, 45, 10, 87, 13
2nd exploratory factor analysis (low factorial weight)	25
2nd exploratory factor analysis (factorial weight in different factors)	90, 81, 85

Table 2. Items eliminated on each analysis stage.

The third and final exploratory factor analysis conducted with the remaining 71 items showed a Kaiser-Meyer-Olkin test coefficient of 944, and a Bartlett's test of p<.000. These results suggest that the data is well suited for the exploratory factor analysis, and that there was good correlation between the items. Therefore, the analysis conducted was pertinent, according to the recommendations of Dziub and Shirkey<sup>[16]</sup>.

All 71 items were distributed in 17 factors, with a total of 65.226% of the variance explained. The Cronbach's alpha analysis showed an overall internal consistency of 959. Table 3 shows the detailed results of the final exploratory factor analysis.

КМО:944																				
						E	Bartlett	: p<.00	0										Factor	Factor
				Over	all per	entag	e of exp	lained	varian	ce: 65.2	226%								explained	Cronbach's
					c	verall	Cronba	ch's alj	pha:.95	9									variance	alpha
Schema	Item	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15	F16	F17		
	42	.799	.086	.136	.110	.119	.076	.060	.094	.035	.093	.126	.001	.156	.068	.073	.043	.138		
	78	.797	.125	.071	.110	.121	.095	.184	.028	.107	.026	.129	.064	003	.065	.113	.076	.090		
Failure to achieve	60	.786	.135	.082	.120	.154	.095	.186	.010	.089	.051	.119	.094	.017	.053	.109	.075	.066	5.936%	.906
	24	.707	.124	.138	.210	.094	.044	.010	.129	.017	.106	.071	028	.170	.126	.045	.072	.207		
	6	.676	.110	.122	.267	.091	.074	.085	.184	.054	.132	.086	027	.232	.050	.076	.058	.111		
	55	.158	.766	.042	.166	.183	.140	.039	.083	.078	.134	.053	.058	.137	.069	.063	.053	.072		
	19	.102	.754	.081	.142	.222	.094	.087	.049	.084	.117	.028	.017	032	.043	.035	.074	.074		
Emotional deprivation	1	.067	.743	.053	.100	.156	.129	.020	.034	.023	022	.048	.032	.025	.120	.167	.039	.062	4.871%	.834
	37	.215	.593	.076	.176	.208	.127	.226	.167	.014	.180	.085	.042	.145	.065	027	.012	.091		
	73	.074	.584	.063	.030	.030	.052	.091	.242	.133	.078	.032	.044	.068	027	.041	014	.148		
	70	.032	.018	.754	.039	.033	.034	.049	.172	.090	.100	.084	.165	.031	.100	.031	014	.091		
	88	.044	.040	.704	050	021	.032	.143	.127	.086	.111	.087	.085	.111	047	.140	.054	.084		
Admiration/Recognition-	34	.116	.127	.677	.139	.149	.087	.056	.019	.098	.138	.116	.051	.176	.038	.046	.039	020	4.687%	.799
8	16	.205	.074	.638	.065	.039	.072	.008	.015	.116	050	.094	.129	.136	.122	.056	.047	.059		
	52	.187	.064	.507	.079	.037	.136	.182	089	.071	.032	.021	.210	.009	.369	.148	.164	.142		
	41	.130	.088	027	.670	.090	.078	.019	.110	.043	.085	039	.071	.021	.060	.259	.066	.185		
	23	.223	.258	.146	.635	.188	.119	.114	.190	.108	025	.101	.109	.105	.096	022	.061	.042		
Defectiveness/Unlovability	59	.126	.081	.012	.634	.206	.117	.136	037	.106	.072	.104	086	.085	023	.058	.020	.169	4.552%	.826
	5	.256	.232	.140	.607	.133	.143	.120	.158	.082	.013	.165	.098	.115	.084	.002	.082	.028		
	77	.201	.101	.050	.592	.262	.090	.102	.179	.102	.071	.136	.072	.047	.141	.021	.068	.128		
	58	.133	.184	.017	.228	.717	.211	.025	.171	.109	.066	.047	.053	.017	.096	.155	.084	.091		
	40	.156	.214	010	.228	.709	.243	.061	.158	.119	.071	.050	.077	.035	.029	.117	012	.011		
Social Isolation/Alienation	76	.234	.226	.152	.236	.649	.198	.149	.117	.072	.041	.025	003	.040	.119	.078	.118	.052	4.516%	.855
	4	.286	.221	.108	.158	.646	.172	.146	.091	019	008	.032	.052	.024	.166	.043	.152	.022		
	22	014	.144	.033	.050	.597	.010	.025	.135	.187	.099	.171	.203	.159	051	012	.043	.086		
	66	.038	.083	.060	.082	.109	.795	.082	.070	.147	011	.065	.084	.020	.067	.049	001	.084		
Emotional Inhibition	48	.122	.084	.110	.120	.107	.751	016	.067	.071	.017	.032	.098	.123	.083	.126	.064	.019	4.128%	.825
	84	.033	.155	031	.041	.244	.723	.041	.085	.065	.023	.083	.086	.104	025	.018	025	.151		
	30	.161	.171	.174	.181	.103	.670	.014	.110	.073	.124	.009	.022	.102	.129	.072	.130	.022		
	38	.164	.100	.098	.093	.064	.053	.826	.116	.018	.128	.115	.042	.119	.067	.009	.082	.017		
Abandonment	2	.151	.063	.079	.066	.085	.038	.821	.089	.000	.168	.103	.070	.078	.093	.029	.015	.045	3.958%	.816
	20	.130	.110	.172	.117	.073	032	.656	.157	.091	.137	.089	.008	.013	.135	.125	.098	.165		
	74	.017	.191	.053	.214	.117	.120	.448	.155	001	.072	.006	013	.279	004	.210	.149	.101		
Mistrust/abuse	57	.024	.101	.132	.035	.219	.067	.065	.701	.122	.051	.157	.096	.092	011	.091	.023	.086	3.868%	.797

KM0:.944																				
						E	Bartlett	: p<.00	0										Factor	Factor
				Over	all per	centage	e of exp	lained	varian	ce: 65.2	226%								explained	Cronbach's
					0	overall	Cronba	ich's alj	pha:.95	9									variance	alpha
Schema	Item	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15	F16	F17		
	75	.056	.060	.153	.061	.241	.057	.079	.630	.157	.061	.140	.112	.067	024	007	026	.130		
	3	.151	.171	.024	.175	.013	.116	.170	.575	.044	.117	.060	.090	.034	.218	.104	.169	058		
	39	.157	.210	.064	.338	.108	.080	.114	.563	.040	.083	.112	.148	.021	.093	.234	.083	.063		
	21	.184	.243	.060	.149	.048	.232	.268	.529	.091	013	.103	.139	.000	.023	.137	.144	091		
	54	.057	.046	.092	.022	.135	.075	038	.045	.819	.066	.091	.051	.114	.010	.002	.011	.063		
Self-Punitiveness	72	.071	.057	.028	.038	.082	.053	.047	.107	.789	.115	.108	.184	.047	.069	.091	.052	.055	3.810%	.807
	36	.080	.124	.198	.119	.127	.124	.025	.112	.669	.084	.054	.005	.086	.054	.127	.083	.083		
	18	.057	.115	.169	.266	030	.166	.118	.106	.579	.157	.122	.060	014	.122	.170	.036	085		
	83	.057	.129	.066	.057	.042	008	.158	.012	.061	.718	.054	.059	.072	.126	.155	.055	029		
Self-Sacrifice	11	.005	.083	.064	018	.086	.025	.117	.146	.156	.682	.074	.075	.050	051	.122	.174	051	3.550%	.733
	29	.148	.046	.085	.100	014	.041	.103	.046	.096	.673	.121	.123	026	.045	011	.021	.146		
	47	.092	.107	.104	.048	.109	.079	.056	.020	.064	.623	.046	.027	.023	.342	.018	.140	.149		
	44	.147	.034	.187	.069	.056	.021	.195	.185	.124	.117	.647	.075	.079	.116	.036	.101	.042	-	
Vale and iliter to Marrie an	80	.128	.108	.184	.036	.065	.027	.103	.091	.086	.133	.643	.106	.111	.064	.139	.138	.099		
Illness	62	.121	.042	.140	.254	.022	.122	054	.042	.152	.046	.598	084	.191	029	046	.009	.013	3.448%	.766
	26	.132	.008	105	010	.143	.077	.136	.171	.070	.033	.562	.233	.024	.019	.332	.057	.131		
	8	.186	.113	.101	.143	.162	.026	.137	.290	.036	.141	.448	.018	.083	.166	.386	.013	.107		
	32	.042	.075	.191	.011	.049	.070	.080	.067	.095	.046	.189	.755	.067	.034	041	.039	012		.746
Entitlement/Superiority	68	.003	.043	.003	.064	.165	.100	032	.117	.085	.068	058	.720	.145	.036	.241	.034	.063	3.330%	
,	86	.000	.037	.289	.096	.075	.098	024	.144	.102	.193	.054	.675	.130	.053	010	045	009		
	14	.090	.015	.378	002	003	.070	.183	.132	.025	.039	.023	.476	.194	075	.032	.110	.083		
	51	.076	.031	.185	.038	.044	.123	.095	.079	.146	.061	.188	.208	.655	.158	010	.115	016		
Insufficient Self-	15	.228	.062	.146	.036	.146	.052	.050	.069	.065	029	.043	.135	.638	.128	.133	.013	.096	3.264%	.749
Control/Self-Discipline	69	.073	.088	.102	.158	036	.161	.133	020	.055	.045	.116	.158	.562	122	.240	.166	.059		
	33	.226	.183	.291	.140	.072	.108	.151	.077	.071	.070	.191	.079	.525	.187	.100	.062	.002		
	64	.152	.096	.160	.076	.015	.129	.131	.048	.070	.199	.077	015	.101	.651	.011	.122	.214		
Subjugation	46	.094	.061	.057	.033	.106	.070	.114	.105	.069	.145	073	002	.321	.623	014	034	.210	2.952%	.674
	28	.083	.089	.085	.171	.132	.071	.060	.068	.096	.063	.261	.090	054	.607	.165	.270	021		
	35	.206	.155	.209	.193	.064	.109	.161	.152	.146	.115	.179	.097	.116	.085	.634	.039	.020		
Pessimism/Worry	17	.154	.177	.207	.112	.177	.168	.080	.132	.174	.176	.124	.100	.214	.067	.584	.026	.071	2.856%	.816
	53	.149	.090	.173	.093	.123	.145	.049	.164	.263	.177	.160	.050	.228	.031	.547	.068	.074		
	27	.046	.038	.086	.043	.000	.083	.097	.057	.049	.072	.040	.067	.084	.030	.023	.801	.131		
Enmeshment	9	.144	016	.028	.080	.140	.040	.090	.162	.025	.139	.135	015	.204	.077	002	.689	.093	2.794%	.683
	63	.102	.164	.069	.104	.167	013	.041	033	.113	.221	.091	.028	052	.311	.099	.579	061		

KM0:.944																				
Bartlett: p<.000																Factor	Factor			
Overall percentage of explained variance: 65.226%															explained	Cronbach's				
Overall Cronbach's alpha: 959															variance	alpha				
Schoma	Sahama Itam E1 E2 E2 E4 E5 E4 E7 E9 E0 E10 E11 E12 E12 E14 E15 E14 E17															<b>F17</b>				
Schenia	nem	r1	FZ.	r)	14	17	ro		10	1.2	F10	FII	FIZ	гIJ	F 14	FIJ	F10	F17		
	61 .172 .166 .117 .276 .041 .104 .027 .064 .084 .094 .108 .074 .030 .087 .084 .029 .705																			
Practical	43	.178	.139	.106	.086	.112	.115	.110	.044	.020	.089	.034	001	.072	.181	.054	.130	.625	2.708%	.756
incompetence/Dependence	79	.345	.166	.114	.205	.073	.102	.157	.070	.087	006	.164	.038	.063	.129	.012	.097	.625		

Table 3. Detailed results of the final exploratory factor analysis of the YSQ-S3-MX.

Table 4 shows the resulting values of the confirmatory factor analysis via SEM using the structure of 71 items in 17 factors from the final exploratory factor analysis shown in table 3.

Index		Value
	X <sup>2</sup> test (CMIN) ( <i>df</i> )	5406.698 (2278)
	Significance (p)	<.000
Absolute fit indices	Minimum Discrepancy (CMIN/DF)	2.37
Absolute in mulces	Goodness of Fit Index (GFI)	.826
	Root Mean Square Error of Approximation (RMSEA)	.042
	Root Mean Residual (RMR)	.080
	Normed Fit Index (NFI)	.813
Incremental fit indices	Non-Normed Fit index (NNFI)	.870
	Comparative Fit Index (CFI)	.881

Table 4. Model fit indices of the confirmatory analysis via SEM of the YSQ-S3-MX.

## Discussion

This objective of this study was to adapt, validate and to evaluate the psychometric properties of the YSQ-S3 with Mexican university students. This study was conducted using a sample of 772 Mexican university students (67% female and 33% male) from different majors in 7 states of Mexico. We showed that the YSQ-S3 translated to Mexican Spanish was valid to assess 17 out of 18 EMS in the Mexican population.

There are several studies validating the different versions of the YSQ, in different languages and countries. Some studies examined the YSQ-L3<sup>[12]</sup>, and a considerable amount examined the YSQ-S3<sup>[18][19][20][21][22][23][24][25][26][27][28]</sup>. Different studies have been conducted in order to assess the psychometric properties of the YSQ-S3, resulting in different structures. Some studies show the same characteristics as the original instrument<sup>[20][23][24][26][27]</sup>, while others show similar but not the same structure as the original version<sup>[18][19][21][22][23][28]</sup>. We found only one study of the validation of the YSQ-S3 in Mexican students<sup>[8]</sup>, showing good psychometric properties when using this instrument in students of the state of Hidalgo, and an interesting structure of 10 factors of the questionnaire. Those results are somehow similar to what we found. This study shows that the YSQ-S3-MX have a similar but not the same factorial structure and characteristics as the YSQ-S3 and have adequate psychometric properties for its correct use for the assessment of the EMS in Mexican university students. This places this study in line with the scientific literature mentioned before. In that sense, this study presents a new valid and reliable instrument for the evaluation of the EMS with Mexican student population, which represents an important addition to the scientific research of the cognitive-behavioral field.

The exploratory factor analyses showed that the YSQ-S3-MX has adequate characteristics regarding item distribution on each factor, and their factorial weight. It also showed good values related to the association between items from the KMO test, good variance homogeneity from the Bartlett's test, good percentage of variance explained, as well as a high internal consistency from Cronbach's alpha coefficient.

The confirmatory factor analysis using SEM showed contradictory results regarding the model fit, according to the recommendations from different authors<sup>[29][30][31]</sup>. First, the absolute fit indices'  $X^2$  test indicated a non-adequate model fit considering the criteria proposed by Barrett<sup>[32]</sup> where a non-significant  $X^2$  test result is needed for a good model fit. However, there are a few considerations when using the  $X^2$  test as a determinant of the model fit, because it has been proven that when using this test, a large deviation from normality is assumed, leading to a rejection of the model even when the model is correctly specified<sup>[33]</sup>. Also, because the  $X^2$  test significance is sensitive to the size of the sample, it has been observed that on most occasions when a large sample is used, the results ended being significant, leading to a rejection of the model <sup>[24][35]</sup>. This is a possible explanation of the  $X^2$  test result from this study, which suggests a poor model fit. Because of the limitations when using the  $X^2$  test alone, it is recommended to consider the CMIN/DF index for the model fit<sup>[36]</sup>, with values for a good model fit, according to the recommendations of good model fit values higher than.90 or.95<sup>[38]</sup>. Despite of that, because of the sensitivity of this index, it has become less used and popular, and it is recommended to not use this specific index<sup>[39]</sup>. The RMSEA index showed a good fit model as well, considering the values of less than.08 proposed by Hu & Bentler<sup>[40]</sup>. However, there is not a good model fit considering stricter values of less than.05 proposed by Byrne<sup>[42]</sup>, and by Diamantopoulos and Siguaw<sup>[43]</sup>.

Secondary, the incremental fit indices, and specifically the NFI and NNFI indices showed that there is not a good fit model, considering the recommendations of values higher than.095 by<sup>[40]</sup>. However, it has been considered that these indexes should not be determinant for the model fit by themselves<sup>[44]</sup>. The CFI index showed a non-good model fit, considering the proposed value of higher than.095 by Hu and Bentler<sup>[40]</sup>. It is considered that, despite the contradictory results from the confirmatory factor analysis, the YSQ-S3-MX is a newly proposed instrument that has the proper characteristics and psychometric properties to be used in the professional practice.

It is important to note that just one of all EMS did not show in the resulting factorial structure. The possible reasons considered for this are: the way the items were phrased; the number of items included in that specific EMS; the characteristics of the studied population, related to the Mexican culture and/or the age of the participants; or what that specific EMS stablishes. It is possible that the characteristics of the Unrelenting Standards schema are perceived by the studied population within other EMS in the same dimension, or that this schema is perceived differently by the studied population compared to the population in which the YSQ was developed.

There are some limitations to consider in this study. The sample had some initial differences in gender, age, major, location, and semester. That is, the majority of participants were female, were studying psychology, and were living in Mexico City; there was not an adequate control of outliers in age and in some EMS, which could have affected the results somehow. Also, the reasons why the missing EMS was not presented were not clarified.

For future research, it is suggested to conduct studies with a stricter methodological rigor regarding the initial equivalence of the participants for variables such as age, gender, major, and location. It is important to eliminate outliers in order to have a better interpretation and to get a better generalization of the data. It is also necessary to conduct more studies to explore the reasons why the Unrelenting Standards was not presented in the factor structure. Finally, it is suggested to keep making adaptation studies and to keep studying the psychometric properties of the YSQ-S3 in different clinical and non-clinical populations.

It is considered that the major contribution of this study was the development of the YSQ-S3-MX (see supplementary material). The YSQ-S3-MX is an instrument with good factorial structure, construct validity, internal consistency, and moderate model fit, which has the proper characteristics to evaluate 17 out of the 18 EMS and useful for the diagnosis and patient treatment.

# **Statements and Declarations**

## **Conflicts of Interest**

The authors declare not having any competing financial or non-financial interests to disclose. The authors did not receive support from any organization for the submitted work.

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