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The latent structure of the Young Schema Questionnaire-Short Form

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Objective: The current study aimed to examine the latent structure of a web-based, Brazilian Portuguese version of the Young Schema Questionnaire-Short Form (YSQ-SF).
Method: The sample consisted of 15,557 adult participants – 4,702 men and 10,855 women – with age ranging from 18 to 60 years. Confirmatory factor analysis was used to test the *a priori* conceptual 15-factor model presumed to underlie the YSQ-SF item set.
Results: Most items displayed high levels of reliability (factor loadings greater than 0.7) and low liability to random measurement error (residual variances below 0.02), indicating that the *a priori* YSQ-SF factor structure is adequate.
Discussion: These findings offer empirical evidence supporting YSQ-SF construct validity and, consequently, its application in adults.

Keywords: Young Schema Questionnaire; schema therapy; construct validity; web survey; structural equation analysis

Introduction

Information processing theory assumes that the human mind is in some way analogous to a computer system,[1] processing information from the environment and the system itself using various cognitive mechanisms.[1] According to this perspective, the experience of a person is appropriated by the system as a schema: a cognitive structure that organizes stimuli, events, and concepts in meaningful ways.[1,2] Thus, cognitive schemas are essential variables to understand behavior and psychosocial adjustment.[2]

Early maladaptive schemas (EMS) are stable cognitive structures that develop from childhood dysfunctional experiences and are related to the emergence and maintenance of personality and clinical disorders and maladjustment.[2-5] The Young Schema Questionnaire-Short Form (YSQ-SF)[6] is a 75-item self-report psychometric tool designed to evaluate the manifestations of 15 EMS. The assessment of EMS in clinical settings helps clinicians and clients to identify and change EMS. Table 1 briefly describes the 15 YSQ-SF schemas and their main domains.

The YSQ-SF has been translated and adapted for different countries, including Canada, Spain, Norway, France, Australia, South Korea, and Brazil.[7-14] However, these validation studies have methodological limitations related to small and homogeneous samples (i.e., university students

or outpatients) and exploratory statistical procedures (i.e., principal component analysis). In addition, investigations aiming to evaluate the latent structure of the YSQ-SF have failed to produce invariant factor solutions, generating architectures that vary from 13 to 17 factors,[7,9-13] including one case in which a non-interpretable factor was encountered.[10]

Published studies using the YSQ-SF in Brazil are scarce. Cazassa[13] failed to replicate the 15-factor structure purported to underlie the latent structure of the YSQ-SF. Nevertheless, adequate indicators of internal consistency reliability were encountered for all EMS scale scores, except for the dependence/incompetence one. In addition, the YQS-SF showed adequate discriminant power and convergent validity with a measure of neuroticism.[13,14] Silva et al.[15] found all 15 YSQ-SF scale scores to be sufficiently sensitive to differentiate men with vs. without an alcohol addiction problem. Luz et al.[16] showed significant differences between men and women in most EMS scale scores: women had higher scores in failure, vulnerability to harm and illness, self-sacrifice, and in all scales pertaining to the domains of impaired autonomy and performance and other-directedness. Emotional inhibition scale scores were higher for men than women. Although important methodological limitations related to sampling and analytical procedures were present, those results show empirical viability of the YSQ-SF in clinical settings.

Table 1 Details about schema domains, early maladaptive schemas (EMS) and definitions

Schema domain	Schema	Definition
Disconnection and rejection	- Abandonment/instability - Mistrust/abuse - Emotional deprivation - Defectiveness/shame - Social isolation/alienation	Feelings of disappointment and frustration experienced in relation to the expectations of security, stability, affection, empathy, sharing of feelings, acceptance and analysis.
Impaired autonomy and performance	- Dependence/incompetence - Vulnerability to harm or illness - Enmeshment/undeveloped self - Failure	Disabling feelings resulting from a diminished sense of autonomy or confidence.
Impaired limits	- Entitlement/grandiosity - Insufficient self-control/self-discipline	Difficulty in respecting social norms and the rights of others. Failure to meet common goals and targets.
Other-directedness	- Subjugation - Self-sacrifice	Subservience and need for approval.
Overvigilance and inhibition	- Emotional inhibition - Unrelenting standards/hypercriticalness	Blocking spontaneity, self-expression, feelings and relaxation. Strict rules and expectations on performance and ethical behavior.

Thus, the current study aims to contribute to the psychometric evaluation of the YSQ-SF by investigating its latent structure (construct validity) in a large sample of adults from the general population using structural equation modeling.

Method

Procedures and participants

This study was part of the Brazilian Internet Study on Temperament and Psychopathology[17] (BRAINSTEP): a large web survey that aims to investigate individual differences in various psychological, psychiatric, and biological constructs. Participants completed the digital versions of numerous self-report instruments in a research website (www.temperamento.com.br), including the YSQ-SF. To encourage participation, preliminary results of the BRAINSTEP project appeared on national television and local newspapers, with the information that voluntaries would be given a psychological and psychiatric profile based on their responses at the end of the protocol.

Electronic informed consent (EIC) was obtained from participants before they were able to access the system, in accordance with Brazilian legal requirements (Resolution 196/1996) and the Code of Ethics of the World Medical Association (Declaration of Helsinki). The study protocol was approved by the institutional review board at Hospital São Lucas, Pontificia Universidade Católica do Rio Grande do Sul (PUCRS, 24907813.10000.4336). To warrant data reliability, questions testing for attention and inconsistent responding (validity checks) were present within the questionnaires. A more detailed description of the study protocol is available elsewhere.[17]

Selected participants were those between 18 and 60 years of age who scored adequately in the validity checks. The resulting sample included 15,557 individuals (4,702 men and 10,855 women), with mean age of 28.8 years (standard deviation = 9.0 years). Participants were predominantly Caucasian (68.1%), single (60.0%), Catholic (32.3%), and had incomplete college education

Table 2 Demographic characteristics of the sample

	Males (n=4,702)	Females (n=10,855)
Age (years), mean ± standard deviation	28.6±9.0	28.8±9.0
Race		
Caucasian	67.4	68.4
Mixed	24.2	23.6
African	5.7	5.2
Asian	0.9	1.2
Other	1.8	1.6
Marital status		
Single	65.2	57.7
Married	29.3	33.5
Divorced	4.7	7.3
Widowed	0.1	0.5
Religion		
Catholic	31.2	32.8
Protestant	18.2	21.7
Spiritualist	8.0	13.5
Jewish	0.4	0.2
Other	7.2	7.0
No religion	35.0	24.8
Occupation		
Student	29.1	29.4
Employed/autonomous	57.1	51.4
Retired	0.9	0.8
Unemployed	8.5	9.1
Other	4.4	9.3
Education		
Elementary school	0.7	0.6
High school degree	20.3	19.6
University degree	21.0	24.1

Data presented as %, unless otherwise specified.

(36.8%). Table 2 provides a more detailed description of the sample.

Instruments

The Sociodemographic data questionnaire aimed to collect information such as age, sex, and educational, civil and economic status. It also included a brief history of

Table 3 Factor loadings and standard errors for each item

Early maladaptive schemas/item	Factor loads	Standard errors
Emotional deprivation		
1	0.87	0.004
2	0.87	0.005
3	0.90	0.005
4	0.94	0.004
5	0.78	0.004
Abandonment/instability		
6	0.84	0.006
7	0.84	0.004
8	0.87	0.003
9	0.85	0.004
10	0.94	0.004
Mistrust/abuse		
11	0.73	0.004
12	0.82	0.005
13	0.92	0.004
14	0.86	0.004
15	0.81	0.005
Social isolation/alienation		
16	0.89	0.004
17	0.81	0.004
18	0.92	0.003
19	0.94	0.001
20	0.87	0.004
Defectiveness/shame		
21	0.95	0.001
22	0.95	0.001
23	0.91	0.003
24	0.88	0.003
25	0.85	0.003
Failure		
26	0.90	0.004
27	0.92	0.003
28	0.94	0.002
29	0.93	0.002
30	0.86	0.003
Dependence/incompetence		
31	0.84	0.004
32	0.66	0.010
33	0.73	0.006
34	0.85	0.005
35	0.88	0.003
Vulnerability to harm or illness		
36	0.97	0.004
37	0.85	0.005
38	0.44	0.009
39	0.64	0.009
40	0.60	0.009
Enmeshment/undeveloped self		
41	0.79	0.007
42	0.32	0.015
43	0.39	0.018
44	0.66	0.007
45	0.82	0.005
Subjugation		
46	0.80	0.008
47	0.87	0.005
48	0.62	0.006
49	0.80	0.005
50	0.76	0.004

Table 3. (*continued*)

Early maladaptive schemas/item	Factor loads	Standard errors
Self-sacrifice		
51	0.55	0.007
52	0.80	0.005
53	0.89	0.004
54	0.61	0.006
55	0.87	0.004
Emotional inhibition		
56	0.88	0.005
57	0.91	0.004
58	0.90	0.003
59	0.81	0.005
60	0.73	0.005
Unrelenting standards/ hypercriticalness		
61	0.90	0.005
62	0.72	0.006
63	0.42	0.010
64	0.77	0.007
65	0.46	0.010
Entitlement/grandiosity		
66	0.74	0.009
67	0.65	0.008
68	0.63	0.009
69	0.76	0.007
70	0.56	0.010
Insufficient self-control/self- discipline		
71	0.77	0.004
72	0.88	0.004
73	0.61	0.008
74	0.67	0.007
75	0.82	0.005

psychiatric disorders and psychological and psychiatric treatments.

The YSQ-SF[5] is a 75-item self-report questionnaire that aims to evaluate 15 EMS (5 items each). Items are scored on a Likert scale ranging from 1 (Completely false about me) to 6 (Describes me perfectly). High scores on a specific subscale index denote stronger manifestations of the assessed EMS. The version of the YSQ-SF used in this investigation was translated and adapted to Brazilian Portuguese by Silva et al.[15]

Analysis

Results are expressed as descriptive statistics, using frequencies for categorical data and means and standard deviations for continuous variables. Structural equation modeling was used to test the *a priori* conceptual 15-factor model supposed to underlie the 75 YSQ-SF self-report items. Age clusters were used to control model variance.

Comparative fit indexes (CFI), the Tucker-Lewis index (TLI), and root mean square error approximation (RMSEA) were used to assess the goodness of fit of the *a priori* 15-factor model. RMSEA estimate values near or below 0.06, a RMSEA close fit (Cfit) higher than 0.05, and CFI and TLI values near or greater than 0.95 are indicators

of appropriate model fit.[18] Because Internet samples are biased towards younger participants (49.8% were younger than 26 years), age was used as a cluster indicator to correct the estimation of standard error of the factor loadings. Considering such cluster structure (i.e., participants nested in 43 different ages), the standard errors and chi-square test of the model fit took into account such non-independence using the implementation proposed by Asparouhov.[19,20]

Results

The 15-correlated factor solution displayed appropriate model fit coefficients for the proposed indicators: RMSEA = 0.027, Cfit = 1.0, CFI = 0.953, TLI = 0.95. Most items showed strong factor loadings (> 0.7), and all items displayed low residual variances (< 0.02). Some items in the enmeshment/vulnerability of self, vulnerability to harm or illness, and unrelenting standards/hypercriticalness EMS had lower factor loadings, ranging from 0.32 to 0.46. Table 3 shows factor loading and standard errors.

Correlations among factors ranged from low (0.01) to moderate (0.63). The results indicate that EMS within the same schematic domain present higher correlations among themselves than with EMS of different domains. For an example, Abandonment/Instability displayed correlations of 0.281 to 0.588 with other EMS from the same domain; and presented lower correlations, ranging from 0.118 to 0.125, with EMS from the Overvigilance and Inhibition domain. The correlation matrix is shown in Table 4.

Discussion

This investigation sought to evaluate the latent structure (construct validity) of the YSQ-SF via structural equation modeling. For a that, a large community sample of adults completed a web-based version of YSQ-SF.[17]

Consistent with Young's hypothesis, our findings confirm the robustness of the 15-factor structure purported to underlie the item set of an YSQ-SF[6] (in this case, the Brazilian Portuguese version). Also, because factor loadings were mostly high – which can be regarded as a proxy for good levels of reliability – and residual variance was significantly low – indicating low item vulnerability to random measurement error – the Brazilian version of the YSQ-SF shows very good psychometric properties.

Furthermore, the factor-correlation matrix displayed a pattern of associations that fits the interpretation proposed by Young[4] (Table 1). Factors that pertained to the same cognitive domain displayed stronger associations among themselves than with factors pertaining to other domains.

The current investigation also overcame some methodological limitations of previous psychometric studies of the YSQ-SF. Published studies were mostly based on small convenience samples composed of university students and outpatients.[7-14,21,22] Also, most of these studies used exploratory factor analysis, which is inadvisable for instruments in which a theoretical rationale is provided. The only other study carried out in Brazil was based on a convenience sample and used principal component analysis to explore the YSQ structure.[13]

Table 4 Correlations among factors

Early maladaptive schemas	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Abandonment/instability (1)	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Emotional deprivation (2)	0.281	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Mistrust/abuse (3)	0.310	0.315	1	-	-	-	-	-	-	-	-	-	-	-	-
Social isolation/alienation (4)	0.353	0.478	0.408	1	-	-	-	-	-	-	-	-	-	-	-
Defectiveness/shame (5)	0.427	0.424	0.396	0.588	1	-	-	-	-	-	-	-	-	-	-
Failure (6)	0.318	0.307	0.276	0.465	0.547	1	-	-	-	-	-	-	-	-	-
Dependence/incompetence (7)	0.379	0.304	0.300	0.453	0.551	0.561	1	-	-	-	-	-	-	-	-
Vulnerability to harm or illness (8)	0.410	0.296	0.414	0.435	0.486	0.406	0.456	1	-	-	-	-	-	-	-
Enmeshment/undeveloped self (9)	0.299	0.139	0.254	0.331	0.374	0.364	0.419	0.394	1	-	-	-	-	-	-
Subjugation (10)	0.363	0.296	0.287	0.430	0.477	0.451	0.473	0.405	0.441	1	-	-	-	-	-
Self-sacrifice (11)	0.143	0.101	0.108	0.082	0.083	0.069	0.042	0.157	0.132	0.165	1	-	-	-	-
Emotional inhibition (12)	0.125	0.278	0.263	0.409	0.364	0.270	0.016	0.263	0.202	0.276	0.017	1	-	-	-
Unrelenting standards/hypercriticalness (13)	0.118	0.131	0.206	0.200	0.135	-0.027	0.275	0.242	0.131	0.092	0.132	0.189	1	-	-
Entitlement/grandiosity (14)	0.258	0.214	0.273	0.271	0.272	0.153	0.252	0.305	0.215	0.195	0.062	0.175	0.313	1	-
Insufficient self-control/self-discipline (15)	0.292	0.271	0.252	0.381	0.413	0.442	0.459	0.350	0.302	0.357	0.048	0.227	0.054	0.334	1

Furthermore, previous studies have produced evidence that violates the principle of factor invariance, offering solutions for the YSQ-SF that ranged from 13 to 17 factors. Among the few studies that used CFA, three confirmed the 15-dimension structure proposed to underlie the YSQ-SF item set,[6-8] while one advocated in favor of an alternative structure with 13 factors.[10] Studies that examined the YSQ-SF structure via exploratory factor analysis or data reduction techniques yielded from 14 to 17 interpretable factors.[7-13,21]

Considering the methodological and analytical strengths of our investigation – large and heterogeneous sample – and the robustness of the structural modeling results – excellent goodness of fit indexes, high factor loadings, and low standardized errors – we consider that the present results provide strong evidence to resolve the debate on YSQ-SF factor invariance. We hypothesize that the factor variances encountered in other investigations result from methodological and analytical limitations.

The results show the feasibility of using the YSQ-SF to evaluate the 15 EMS described by Young (1998) in the general adult population of Brazil. Future investigations may focus on understanding the relationships between EMS and normal range individual differences, as previously done with regard to the bases of the Five-Factor Model of Personality[21] and in the context of mental disorders.[3,22]

Some limitations of the present work should be noted. Internet samples are usually biased to samples with higher educational and socioeconomic profiles than expected for the general population. In turn, the remote environment provided by the Internet confers a sense of anonymity, which may contribute to the reliability of responses along with a lower likelihood of data transcription errors and missing data. In addition, one characteristic of the BRAINSTEP project[17] is that the response pattern is used to produce a psychological profile given to participants at the end of the assessment protocol, which might encourage their wish to provide accurate information.

In conclusion, the present findings offer empirical evidence supporting YSQ-SF construct validity and, consequently, the application of the Brazilian Portuguese version in adults from Brazil.

Disclosure

The authors report no conflicts of interest.

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