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# PSYCHOMETRIC PROPERTIES OF THE EATING ATTITUDES TEST FOR MEN

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Propiedades Psicométricas del Test de Actitudes Alimentarias para hombres

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#### Abstract

The objective of the present work was evaluated the psychometric properties of the Eating Attitudes Test in Mexican males. Participants: Mexican young men 566, with an average age of 18.11 (*SD* 3.49) years old, were recruited from public and private schools of México City.The participants completed the Eating Attitudes Test (EAT) in groups of 15. Results: Internal consistency was calculated with Cronbrach's alpha coefficient, the total scale had a  $\alpha$  = .79. The factorial analysis (varimax rotation) extracted five factors: 1) Drive for thinness ( $\alpha$  = .70), 2) Perceived social pressure ( $\alpha$  = . 59), 3) Compensatory behaviors ( $\alpha$  = .49), 4) Food control and exercise ( $\alpha$  = .48), and 5) Food Styles ( $\alpha$  = .55), accounting for 30.18% of the total variance. Conclusion: The results show that the EAT-40 is a suitable instrument for males, focusing primarily on drive for thinness, compensatory behaviors such as vomiting, laxative use, or excessive exercise as well as abnormal eating behaviors.

Key words: eating disorders, men and Eating Attitudes Test (EAT).

#### Resumen

El objetivo del presente trabajo fue evaluar las propiedades psicométricas del Test de actitudes alimentarias (EAT-40) en varones mexicanos. Participantes: 566 varones jóvenes, con una edad promedio de 18.11 años (DE = 3.49), los cuales pertenecían a escuelas públicas y privadas del la Ciudad de México y el área metropolitana, los participantes contestaron el EAT-40 en grupos de 15 jóvenes. Resultados: la consistencia interna fue calculada con el coeficiente alpha de Cronbach, la escala total tuvo un  $\alpha$ = 0.79. El análisis factorial (con rotación varimax) extrajo cinco factores: 1) Motivación por la delgadez ( $\alpha$  =.70), 2) Presión social para comer ( $\alpha$  =.59), 3) Conductas compensatorias ( $\alpha$  =.49), Control alimentario y ejercicio ( $\alpha$  =.48) y 5) Estilos alimentarios ( $\alpha$  =.55), todos los factores explicaron el 30.18% del total de la varianza. Conclusión: Los resultados muestran que el EAT-40 es un instrumento adecuado para varones, centrándose principalmente en la unidad de la delgadez, conductas compensatorias como el vómito, el uso de laxantes o ejercicio excesivo, así como comportamientos alimentarios anormales.

Palabras clave: trastornos alimentarios, hombres, actitudes alimentarias y Test de Actitudes Alimentarias (EAT).

A review of the existing literature reveals that there has been an increase in eating disorders research, focused mainly on identifying factors of vulnerability and risk, but only a few have explored gender differences (Ballester, De Gracía, Patiño, Suñol, & Ferrer, 2002; Barriguete-Meléndez et al., 2009; Erol, Toprak & Yazici, 2006; Vázquez et al., 2004). According to Button, Aldridge, Palmer (2008) few studies of male show inconsistent findings, some in both males and females suggested an increased incidence of anorexia nervosa over time, whereas other reports found evidence of an increased prevalence of bulimia nervosa and binge eating presenting in clinical services not necessarily representing rates in the community. Nevertheless eating disorders continue to present predominantly in females and the proportion of males remains broadly stable.

In particular, in men cases the literature has focused on weight loss (Tamim, et al., 2006; Woodside, 2002) and body image (Hausenblas & Fallon, 2002; Pope, Phillips & Olivardia, 2002; Vázquez, et al., 2006; Yang, Gray, & Pope, 2005) for the last two decades and recently in users of anabolicandrogenic steroid (Kanayama, Barry, Hudson, & Pope, 2006; Olivardia, Pope & Hudson, 2000) because they may cause medical morbidity, including atherogenesis, gynecomastia, hepatotoxicity and suppressed neuroendocrine function, addiction to adverse psychiatric effects, including aggression and violence during its use, recognizing other unhealthy behaviors that might be associated specifically with males.

The increasing presence of eating disorders has

caused the development of a wide range of instruments that allow a reliable detection of symptomatology and associated factors within communitarian and high risk populations. Nevertheless, the majority of these focuses on women, and they are scarce for men, only validated instruments that had their origin in the evaluation of eating disorders in feminine population are available, so it is necessary to evaluate its psychometric properties for men cases.

When talking about the instruments for Eating Disorders symptoms detection, perhaps the most used is the Eating Attitudes Test (EAT – 40, Garner & Garfinkel, 1979). Which has been translated into different languages: Spanish (Castro, Toro, Salamero, & Guimerá, 1991), Italian (Cuzzolaro & Petrilli, 1988), French (Leichner, Steiger, Puentes-Neuman, Perreault, & Gottheil, 1994), Portuguese (Pereira, et al., 2008), Turkish (Savasir & Erol, 1989), assessing its psychometric properties in more than 100 countries (Garner, 1997), including México (Alvarez, Mancilla, Vázquez, Unikel, Caballero, & Mercado, 2004).

Specifically in men the EAT (Garner & Garfinkel, 1979) has been used in eating disorder patients (Fernández-Aranda et al., 2009; López, 2008), athletes (Filaire, Rouveix, Pannafieux & Ferrand, 2007; Riebl, Subudhi, Broker, Schenck & Berning, 2007), multiple sclerosis patients (Terzi, Kocamanoglu, Güz & Onar, 2009), obese people (Larrañaga & García-Mayor, 2009, López et al., 2004), been more frequently applied to community samples (Babio, Canals, Pietrobelli, Pérez & Arija, 2009; Franco, 2007; Gadalla, 2009; Johnson & Bedford, 2004; Mancilla et al., 2009; Vázquez, López, Álvarez, Franco, & Mancilla, 2004; Vázquez, López, Álvarez, Mancilla & Ruíz, 2006). However their psychometric properties data are not so frequent, so the objective of the present work was to evaluated the psychometric properties of the Eating Attitudes Test (EAT- 40) in Mexican males.

## Method

## Participants

EAT-40 was administered to a community sample not probabilistic of 566 Mexican young men with an average age of 18.11 (*SD* 3.49) years old, from public and private schools located in the north of México City; 156 (27.56%) from elementary school, 127 (22.44%) from high school, and 283 (50%) from university.

## Procedure

The research protocol was presented to each educational institution, following the approval, the participants completed the Eating Attitudes Test (EAT -40) voluntarily in groups of 15 persons and their doubts were solved by researchers.

#### Instrument

Eating Attitudes Test (EAT-40, Garner & Garfinkel, 1979) is a 40-item Test to assess behaviors and attitudes associated with eating disorders. The EAT-40 consists of three factors (Garner, Olmsted, Bohr, & Garfinkel, 1982): Dieting, Bulimia, food preoccupation and Oral control. The cut-off point suggested by the authors is equal or major to 30. All items were reviewed and adapted for men before its application and the item 23 concerning to menstruation was eliminated.

## Results

First, it was analyzed the frequency distribution of all participants (N = 566) on the EAT total score (Figure 1). The average score was 13.19 (SD = 7.23), the frequency peak between 7.5 and 12.5.

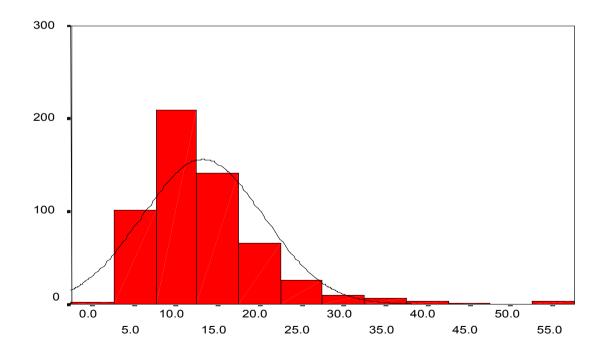


Figure 1. Total frequency of scores obtained in the EAT for all participants.

Twenty-two subjects scored the cutoff point of 28 estimated by Alvarez, et al. (2004), which represents the 3.6% of the total sample, this cut-off point is set for Mexican women; however, it seems to us that this data are important for comparison.

## Reliability Analysis

It was performed by calculating the Cronbach's Alpha Coefficient, the total scale had an  $\alpha$  = .79. If the items 18, 20 27 y 31 were removed the Alpha Coefficient would increase. However, none of the increments observed by the elimination of any of the items is substantial, so, it was thought convenient to retain all, except item 23 before mentioned.

Regarding to the correlation existing between each of the EAT40 items with the total value, it was observed through the Pearson's Correlation Coefficient that all the EAT reactives were positively and significant correlated (table 1). In the case of 15 reactives, their correlations were moderated ( $r \ge .30$ ,  $p \le .0001$ ); 15 items showed a weak correlation ( $r \ge .20$ ) and finally 9 reactives were poorly related with the total punctuation ( $r \le .20$ ).

Construct validity analysis

Factors were formed taken into account the following criteria (Yela, 1997):

- The item must have a saturation smaller than 40.

- An item is included in a single factor, one in which

a higher level of saturation is present.

- Conceptual congruence must exist between all items that are included in a factor.

- A factor to be considered such as it, must include at least three reactives.

The principal component analysis, after making the VARIMAX rotation, initially extracted fourteen factors with eigenvalues greater than the unity. After taking into account the Yela's criterion that includes at least three items by factor, the number of these was reduced to six, which explained the 33.94% of the total variability. However, some of these factors show some theoretical shortcomings, so several organizations were tested (from four to nine factors), choosing the five factors as the most desirable, which explained the 30.18% of the total variability (Table 2).

Factor structure was organized by five factors Table 3 presents the items composing each factor. The percentage of variance explained by each factor was 7.47 to 5.26, three factors had alpha coefficients greater than .54 and the remaining two were .48 and .49.

The first factor was composed by four items alluding to the obsession for having a figure free of excess fat, therefore was called *drive for thinness*.

The second factor has four items which deals

ÍTEMS	CORRELATION COEF- FICIENTS	INTERPRETATION	SIGNIFICANCE	
4, 6, 8, 9, 12, 14, 15, 16, 22, 25, 31, 33, 36, 38, 40t	0.31-0.49	MODERADA	.0001	
2, 3, 5, 10, 11, 19, 20, 24, 26, 27, 29, 30, 32, 37, 39	0.21-0.30	DÉBIL	.0001	
1, 7, 13, 17, 18, 21, 28, 34, 35	0.04-0.19	POBRE	.05	

Table 1 Correlations obtained between the EAT total score and each of the items

Table 2

Variance	explained	by f	factors
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FACTOR	EIGENVALUES	% OF VARIANCE	% CUMULATIVE
1	2.91	7.47	7.47
2	2.33	5.98	13.45
3	2.24	5.74	19.19
4	2.24	5.73	24.92
5	2.05	5.26	30.18

with the pressure on food consumption by the social environment, therefore was called *social pressure to eat*.

The third factor was composed of five items that consider stressful situations around mealtimes and compensatory behaviors, therefore was called *compensatory behaviors*.

The fourth factor was named food control and exercise, because it included 6 factors related to the fattening food restriction and exercise performance in order to obtain a more aesthetic figure.

Finally, the fifth factor had five items that are related to food preferences and contexts where these are carried out, it was named *food styles*.

Discussion

Table 3 Factorial structure of EAT-40 The present research was developed in order to asses the reliability and factorial validity of the EAT – 40, applied to a sample of Mexican men. This study becomes relevant knowing that is a widely use questionnaire in men (Fernández-Aranda et al., 2009; Filaire, Rouveix, Pannafieux, & Ferrand, 2007; López, 2008; Riebl, Subudhi, Broker, Schenck, & Berning, 2007; Terzi, Kocamanoglu, Güz & Onar, 2009).

Regarding the reliability of the EAT – 40 in male, it was analyzed using the Cronbach's alpha coefficient, by which was found that such instrument has a coefficient of 79 and although is not the male population in which the instrument was leaded, the

Number	Questions	Loadings				
item						
Drive fo	r thinness					
25	I worry about the idea of having body fat.	0.75				
15	I worry about the desire to be thinner.	0.63				
37	I commit to dieting	0.56				
4	I worry about the idea of having body fat. I worry about the desire to be thinner. I commit to dieting I'm really scared to weight too much	0.54				
Social pre	ssure to eat.					
12	I notice that others would prefer that I ate more.		0.71			
33	L notice that others pressure me to eat. Others think that I'm too thin		0.69			
24	Others think that I'm too thin		0.57			
26	Takes me longer to eat than other people		0.50			
Compensa	tory behaviors in the second sec					
4Ō	I want to vomit after meals.			0.61		
13	I vomit after eating.			0.61		
3	I get nervous when mealtime is approaching.			0.58		
28	I take laxatives (purging).			0.49		
5	I vomit after eating. I get nervous when mealtime is approaching. I take laxatives (purging). I try not to eat even I'm hungry. ntrol and exercise			0.42		
Food co	ntrol and exercise					
9	I consider the tood calories that I eat.				0.54	
32	I control myself at meals.				0.48	
22	I think about burning calories when I exercise.				0.45	
	I control myself at meals. I think about burning calories when I exercise. I Especially avoid eating foods with many carbo-					
10	hydrates.				0.45	
20	I get up early in the morning. I exercise a lot to burn calories.				0.44	
16	Lexercise a lot to burn calories.				0.41	
Eood Styl	00					
19	l eniov eating meat.					0.59
27	l enjoy eating at restaurants.					0.50
39	Leniov eating new and delicious meals.					0.49
36	I feel uncomfortable after eating sweets.					0.47
1	I like to eat with other people.					0.41
Cronbach	Lenjoy eating meat. Lenjoy eating at restaurants. Lenjoy eating new and delicious meals. Lenjoy eating new and delicious meals. Leel uncomfortable after eating sweets. Llike to eat with other people. <b>´s alphas total</b> <b>ce explained</b>	α = <b>.70</b>	<b>α =.59</b>	<b>α =.49</b>	<b>α = .48</b>	<b>α =.55</b>
% Variano	ce explained	7.47	5.98	5.74	5.73	5.26

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alpha coefficient indicates that there is an appropriate consistency between items. This index is similar to those reported by Garner et al. (1979) that were .79 also. Furthermore, the correlations obtained for each of the items in relation to the total test punctuations are positive and statistically significant.

Construct validity was conducted, choosing as the best option the five factors structure; drive for thinness, social pressure to eat, compensatory behaviors, food control and exercise, food styles, which explain the 33.94% of the total variance and their Cronbach's alpha coefficients were .70, .59, .49, .48 and .55, respectively.

As can be observed, two of the factors obtained (3 y 4) have an alpha coefficient less than .50, so is suggested to test them in future studies, in order to determine their relevance.

If the factorial organization obtained is compared with that presented by Garner et al., (1982), the following can be observed:

- The factor Diet, Garner et al., (1982) of that grouping contains the items included in the factor 1 (*drive for thinness*) of the present research, as well as the items 9, 10 y 22 of factor 4, *food control and exercise*, and items 39 and 36 of factor 5 food styles, additionally, Garner and Garfinkel include items 14, 29, 30, and 38.

- The factor *Bulimia and food preoccupation*, Garner et al., (1982) contains items 40 and 13 of factor 3, compensatory behaviors, of the validation for Mexican men besides, that 4 items did not achieve our factorial structure (items 6, 7, 31, and 34).

- Finally the factor oral control, Garner et al., (1982), include all the items of factor 2, social pressure to eat, defined for this research, in addition of item 32, located in factor 4, *food control and exercise*, and item 8.

As can be seen, the factorial organization of this study is very different from the presented by Garner et al., (1982), because the items are differently distributed, besides seven items considered in this research are not covered in the factors presented by the study made with women, while nine items of that research are not covered by our factorial distribution.

These differences may be due to gender and participants characteristics, in the validation case of the EAT- 40, the sample was clinically diagnosed women, unlike the present investigation, which was held with a regular male sample. However, the factor structure resulting from this research provides interesting analyses units that should have to be tested in future research:

In the Diet Factor Garner et al., (1982), conjoined both the motivation to lose weight and policies to implement this behavior. In male structure it can be distinguished from *Drive for thinness*, Factor 1, meaning the desire to lose weight and the behaviors aimed for that purpose and the factors found in *food styles*, Factor 5, and *food control and exercise Factor 4*.

Of the aspects related to *Bulimia and food preoccupation factor* Garner et al., (1982), only compensatory behaviors such as vomiting and laxative use in Factor 3 were retaken, and have demonstrated to be good indicators of eating disorders (Keel, Haedt, & Edler, 2005; Keel, Mitchell, Miller, Davis, & Crow, 2000). Finally, Factor 2 which we call *social pressure to eat*, provides interesting information on how the social context is perceiving changes in the participant's feeding, especially in relation to food restriction.

When comparing our results obtained with male participants with the EAT – 40 validation for Mexican women (Álvarez et al., 2004) we see more similarities than those presented by Garner et al. (1982); the number of factors is equal and there is great similarity in three of them: *drive for thinness, social pressure to eat* and *compensatory behaviors,* but differs in their importance; in the men case these three factors were the most important and in that order, whereas in women, in the Álvarez et al., (2004) study, were the third, fifth, and second factors, respectively.

However, is important to emphasize that despite of the similarities found between these studies, the internal consistency coefficients for the factors as for the test are lower in general within the male study than Mexican women. Is important to note the instrument nature, having been creating for feminine population, besides that it must be considered the structural differences in terms of the eating disorders conformation for each gender; for example, the fact that in woman the eating disorders appear to be more associated by the aesthetic body and to extreme behaviors of food restriction, aspect that we did not find with the same intensity in men, and is observed that they look for other ways like exercise to achieve the weight reduction (McElhone, Kearney, Giachetti, Franz Zunf, & Martínez, 1999; Unikel, Bojórquez, Villatoro, Fleiz, & Medina, 2006).

The results show that the EAT – 40 is an appropriate instrument to identify the characteristic symptoms of eating disorders in men, mainly focused with aspects related to drive for thinness, compensatory behaviors like vomit, laxative use and excessive exercise, as well as to abnormal eating behaviors. However, we consider that the EAT – 40 can be improved for it use in males and ought to be strengthened regarding to the contributions and progress made on eating disorder research in this population.

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