

# Internal consistency and factor structure of the Portuguese version of the Liebowitz Social Anxiety Scale among alcoholic patients

## Consistência interna e estrutura fatorial da versão em português da Escala de Ansiedade Social de Liebowitz entre pacientes alcoolistas

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### Abstract

**Objective:** Liebowitz Social Anxiety Scale is an instrument used to evaluate the severity of social phobia. It has been widely used in different contexts and cultures, presenting variable psychometric properties. The objective of this article is to investigate the internal consistency and the factor structure of this scale. **Method:** In a sample of 300 alcoholic patients hospitalized in 3 mental clinics in Southern Brazil, 74 of them were social phobics (24.6%). The Structured Clinical Interview for DSM-IV-Axis I Disorders – Patient Edition, a semi-structured clinical interview based on DSM-IV, was used to check for the diagnosis of social phobia. The internal consistency was measured by Cronbach's alpha. Data were subjected to a factor analysis with the principal component method of parameter estimation. Questionnaire items loading at 0.35 or above were considered in the final factor solution. **Results:** The coefficient of internal consistency was 0.95. All items showed corrected item-total correlation coefficient above 0.15, considered the minimum requested index. The factor analysis resulted in 5 dimensions which corresponded to 52.9% of the total variance. The five factors extracted were: factor I – speaking in a group, factor II – activity in public, factor III – social interaction with unknown person, factor IV – attitude of disagreement or disapproval and factor V – social interaction in leisure activity. **Conclusions:** The scale proved to be reliable and structurally valid instrument for use in a population of alcoholic patients. The possibility of screening for social phobia through the use of the instrument may be helpful in identifying probable cases of the disorder among alcoholics.

**Descriptors:** Phobic disorders; Psychology, social; Factor analysis, statistical; Anxiety; Alcoholism

### Resumo

**Objetivo:** A Escala de Ansiedade Social de Liebowitz é um instrumento utilizado na avaliação da gravidade da fobia social. Tem sido amplamente usada em diferentes contextos e culturas, apresentando propriedades psicométricas variadas. O objetivo do artigo é investigar a consistência interna e a estrutura fatorial da escala. **Método:** A escala foi aplicada em uma amostra com 300 pacientes alcoolistas hospitalizados em três clínicas psiquiátricas na região Sul do Brasil, sendo 74 deles fóbicos sociais (24,6%). O SCID-I/P, entrevista clínica semi-estruturada baseada no DSM-IV, foi usado para avaliação do diagnóstico de fobia social. A consistência interna foi medida pelo Alfa de Cronbach. Os dados foram submetidos à análise fatorial com estimativa de parâmetros por meio da análise do componente principal. Todos os itens do questionário de cargas fatoriais maiores ou iguais a 0,35 foram considerados na solução final da análise fatorial. **Resultados:** O coeficiente de consistência interna foi de 0,95. Todos os itens mostraram coeficientes de correlação entre o item e a totalidade dos itens maiores do que 0,15, o menor índice aceitável. A análise fatorial resultou em cinco dimensões que correspondiam a 52,9% da variância total. Os cinco fatores excluídos foram: fator I – falar em público; fator II – atividade em público; fator III – interação social com pessoa desconhecida; fator IV – atitude de discordância ou enfrentamento; e fator V – interação social em atividade de lazer. **Conclusões:** A escala mostrou-se confiável e estruturalmente válida quando utilizada em populações de pacientes alcoolistas. A possibilidade de rastreamento da fobia social através do uso do instrumento pode ser de grande utilidade na identificação de prováveis casos entre alcoolistas.

**Descritores:** Transtornos fóbicos; Psicologia social; Análise fatorial; Ansiedade; Alcoolismo

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**Financing:** The study was partially supported by the Brazilian research funding agencies (Fundação de Amparo à Pesquisa do Estado do Rio Grande do Sul - FAPERGS - process nº04/08100-5 and Fundação de Amparo à Pesquisa do Estado de São Paulo - FAPESP - process nº02/0071.1)

**Conflict of interests:** None

**Submitted:** January 19, 2005

**Accepted:** June 6, 2006

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## Introduction

Social phobia is defined as a persistent fear of embarrassment or negative appraisal during social interaction or performance in public. Activities such as meetings or interactions with strangers, formal presentations, and those which require an assertive behavior are frequently feared by individuals suffering from social anxiety disorder.<sup>1</sup>

The National Comorbidity Survey (NCS) reported a lifetime prevalence of 13.3% for social phobia, according to DSM-III-R criteria, and it seems to be increasing.<sup>2-3</sup> In Brazilian general population, a lifetime prevalence of 2.6% was reported.<sup>4</sup> Social phobia has a highly prevalent co-morbid condition associated with other anxiety disorders, depressive disorders, and substance abuse, significantly increasing the risk for these disorders, being associated with significant impairment in the functioning and quality of life, as well as with increased risk of suicide attempts.<sup>5-7</sup> In alcoholic samples, the prevalence of social phobia ranged from 2.4% to 57% (mean 21%). Reciprocally, the diagnosis of alcoholism in samples of social phobic patients ranged from 14.3% to 43.3% (mean 26.5%).<sup>8</sup> Among community epidemiological studies, the NCS found similar results: the prevalence of lifetime social phobia to be 10.8% in males and 24.1% in females with a history of alcohol abuse. Among those with alcohol dependence the percentage was 19.8% and 30.3% in males and in females, respectively.<sup>9</sup> Within this context, psychometric evaluations of social phobia scales must be assessed so that the instruments can be more adequately used.

One of the most frequently used scales for social phobia identification is Liebowitz Social Anxiety Scale (LSAS).<sup>10</sup> It is a questionnaire, composed of 24 items, originally built for measuring fear and avoidance experienced in social and performance situations (bidimensional model). Several studies support the use of the scale to screen patients with social phobia and it is widely used in different clinical contexts.<sup>11</sup> The scale can also be used in the assessment of pharmacological treatments for social phobia by comparison with placebo groups.<sup>12</sup>

The scale has also been considered as a valid and reliable instrument for evaluating social phobia in children.<sup>13</sup> In its self-administered version, it also shows good psychometric properties, as indicated by results of test-retest reliability, internal consistency, and validity measures.<sup>14-15</sup>

The scale was originally developed with distinct subscales to evaluate fear and avoidance, involving social interaction and performance/observation by others. Factor analysis showed that this two-factor model does not provide an adequate fit for the data, suggesting the need for a deeper investigation into the underlying structure of the scale. A separate exploratory factor analysis of fear and avoidance rates yielded 4 factors: 1) social interaction, 2) public speaking, 3) observation by others, and 4) eating and drinking in public, which showed a discriminative and convergent validity with other measures of social anxiety. These findings suggest that there are 4 global categories of social fear evaluated by the scale, and that while the anxiety of social interaction appears to be uni-factorial, the situations of fear of performance/observation can be multi-factorial.<sup>16</sup> A confirmatory factor analyses of the self-report version of the LSAS using data from a sample of 188 outpatients with anxiety disorders showed that the structure and psychometric properties of the self-administered version are highly similar to that the original analysis of the Liebowitz Social Anxiety Scale.<sup>17</sup>

LSAS has, then, been used in several countries and in different contexts, but no Brazilian study has been found on the psychometric properties of the scale. The objective of this study is to perform a factor analysis of LSAS and to observe its internal consistency when used in a population of alcoholic patients. The data were collected as part of a research which aims to investigate the co-morbidity of social phobia and alcoholism.

## Method

### 1. Subjects

The research was performed with a total of 300 alcoholic patients, being 275 (91.7%) males and 25 (8.3%) females, who were hospitalized in two mental hospitals and in a center specialized in the treatment of drug dependence at a general hospital in Porto Alegre, Brazil. Their mean age was  $41.58 \pm 8.62$ . All patients were recruited from December 2001 to July 2003.

The inclusion criteria were: to be in the 20-60-year age bracket, to live in the city and to be an alcoholic under treatment. The exclusion criteria were to present a diagnosis of schizophrenia, acute psychotic disorder, mental retardation, confusional states, severe antisocial personality disorder, and presence of decompensated cirrhosis or other debilitating physical condition. Patients were excluded based on the information collected in the medical records and through psychiatric evaluation. Approximately 10% of all contacted patients were excluded during the interview due to mental retardation (20%), confusional states (50%) or severe antisocial personality disorder (30%).

### 2. Instruments

During the hospitalization, the LSAS was administered in order to check the severity of social phobia.<sup>10</sup> Scores under 52 (51 or less) suggest mild phobia; scores between 52 and 81 reflect moderate phobia, and scores above 82 indicate severe phobia. The original scale was translated to Portuguese by a bilingual psychiatrist. Another bilingual psychiatrist who was unfamiliar with the original version back-translated this initial Portuguese version into English. Then, a third bilingual psychiatrist checked the comparability of item meanings between the retranslated and the original version to verify content equivalence. All three professionals involved in the procedure worked in the elaboration of the final Brazilian version of the LSAS to ensure cross-cultural equivalence both in terms of semantic content and linguistic structure. To our knowledge this is the first study to evaluate the psychometric properties of the LSAS in Brazil.

The SCID-I/P (Structured Clinical Interview for DSM-IV-Axis I Disorders – Patient Edition), a semi-structured clinical interview based on DSM-IV, was used to check for the diagnosis of social phobia in all patients.<sup>18</sup> It has also evaluated the occurrence of alcohol dependence and other anxiety disorders.

### 3. Statistical analysis

The measure of internal consistency was the Cronbach's alpha.<sup>19</sup> The corrected item-total correlation coefficients were calculated for each item of the scale. Items whose correlation coefficients were under 0.15 were considered to be poorly correlated with total scale scores.<sup>20</sup> Data were subjected to a factor analysis with the principal component method of parameter estimation, since this method does not require normal distribution of data. Questionnaire items loading at 0.35

or above were considered in the final factor solution.<sup>21</sup> All items related to fear and avoidance were considered in the analysis, and the method of data reduction used to explore dimensionality of the LSAS was the factor analysis with the principal component method of parameter estimation. A derived matrix by varimax rotation was obtained to meet Thurstone's requirements. The number of factors to be retained was that of Kaiser's criterion modified by Jolliffe. Analytical procedures were carried out with the Statistical Package for the Social Sciences (SPSS).<sup>22</sup>

All patients signed an informed and free consent form, and the project was approved by the Research Ethics Committee of the Universidade Federal de São Paulo (n. 0589/04) and of the treatment facilities where the work was performed.

## Results

The diagnosis of alcohol dependence was corroborated by SCID-I/P in all patients. The frequency of social phobia in the sample was 24.6% and among phobic patients 28.4% had mild social phobia, 43.2% had moderate social phobia, and 28.4% had the severe form of the disorder.

### 1. Reliability study/Internal consistency

The coefficient of internal consistency for the LSAS was 0.95. No item showed corrected item-total correlation coefficients smaller than 0.15 (Table 1).

### 2. Factor analysis

The factor analysis with the principal component method of parameter estimation applied to all completed questionnaires extracted five factors, accounting for 52.9% of the total variance of the scale items (Table 2).

The item loadings for the five rotated factors are displayed in Table 2. The scale items were distributed so that reasonable interpretation of the factors could be possible. Factor I is composed of items 31, 32, 39, 40, 11, 29, 30, 12, 3, 4, 9, 27 and 33, corresponding to "speaking in a group" dimension. This factor encompasses 34.59% of the explained variance. Items 5, 25, 26, 6, 7, 8, 1, 2, 28 and 10 are related to "activity in public" dimension (factor II), which encompasses 5.44% of the explained variance. Factor III reflects "social interaction with unknown person" and is composed of items 20, 23, 24, 22, 21, 19, 16 and 15, accounting for 4.68% of the explained variance. Items 43, 47, 44, 48, 36, 35, 34, 38, 18, 17, and 37 compose factor IV, which refers to an "attitude of disagreement or disapproval", which encompasses 4.37% of the explained variance. Finally, factor V corresponds to "leisure activity", comprising items 45, 46, 13, 41, 14 and 42, corresponding to 3.84% of the explained variance.

The measure of internal consistency assessed by Cronbach's alpha was 0.91 for the first subscale, 0.87 for the second, 0.87 for the third, 0.86 for the fourth, and 0.83 for the fifth. The eigenvalues for each factor are displayed in Table 2. All the eigenvalues were above 1.0

## Discussion

Social phobia was diagnosed in almost one fourth of the sample, confirming the high frequency of comorbidity between social phobia and alcoholism already highlighted by other studies.<sup>8-9</sup> Patients with social phobia had twice as many alcohol-related problems as non-phobic patients, and individuals with disorders related to alcohol use were nine times as likely to suffer from social phobia than the general population.<sup>23</sup>

**Table 1 - Corrected item-total correlations for items of the Liebowitz Social Anxiety Scale**

Item - total statistics	Corrected item total correlation
1-Fear or anxiety of telephoning in public	0.63
2-Avoidance of telephoning in public	0.60
3-Fear or anxiety of participating in small groups	0.64
4-Avoidance of participating in small groups	0.52
5-Fear or anxiety of eating in public place	0.56
6-Avoidance of eating in public place	0.57
7-Fear or anxiety of drinking with others in public places	0.48
8-Avoidance of drinking with others in public places	0.42
9-Fear or anxiety of talking to people in authority	0.60
10-Avoidance of talking to people in authority	0.62
11-Fear or anxiety of acting, performing or giving a talk in front of an audience	0.63
12-Avoidance of acting, performing or giving a talk in front of an audience	0.61
13-Fear or anxiety of going to a party	0.61
14-Avoidance of going to a party	0.49
15- Fear or anxiety of working while being observed	0.59
16-Avoidance of working while being observed	0.49
17- Fear or anxiety of writing while being observed	0.59
18- Avoidance of writing while being observed	0.57
19-Fear or anxiety of calling someone you don't know very well	0.58
20-Avoidance of calling someone you don't know very well	0.50
21- Fear or anxiety of talking with people you don't know very well	0.68
22- Avoidance of talking with people you don't know very well	0.62
23-Fear or anxiety of meeting strangers	0.56
24-Avoidance of meeting strangers	0.55
25- Fear or anxiety of urinating in a public bathroom	0.46
26-Avoidance of urinating in a public bathroom	0.44
27-Fear or anxiety of entering a room where others are already seated	0.64
28- Avoidance of entering a room where others are already seated	0.58
29-Fear or anxiety of being the center of attention	0.59
30-Avoidance of being the center of attention	0.57
31-Fear or anxiety of speaking up at a meeting	0.64
32-Avoidance of speaking up at a meeting	0.65
33-Fear or anxiety of taking a test	0.50
34-Avoidance of taking a test	0.53
35-Fear or anxiety of expressing a disagreement or disapproval to people you don't know very well	0.65
36-Avoidance of expressing a disagreement or disapproval to people you don't know very well	0.59
37-Fear or anxiety of looking at people you don't know very well in the eyes	0.51
38-Avoidance of looking at people you don't know very well in the eyes	0.46
39-Fear or anxiety of giving a report to a group	0.64
40- Avoidance of giving a report to a group	0.63
41-Fear or anxiety of trying to pick up someone	0.49
42-Avoidance of trying to pick up someone	0.54
43-Fear or anxiety of returning goods to a shop	0.45
44-Avoidance of returning goods to a shop	0.41
45-Fear or anxiety of giving a party	0.53
46-Avoidance of giving a party	0.47
47-Fear or anxiety of resisting a high pressure salesperson	0.46
48-Avoidance of resisting a high pressure salesperson	0.48

*N* of cases = 300

*N* of items = 48

Cronbach's Alpha = 0.95

This study was the first one to evaluate the psychometric properties of LSAS in Brazil. Procedures were used to evaluate the internal consistency and the factor structure of the instrument.

The method of Cronbach's alpha was applied to evaluate the scale item homogeneity. The issue of lack of reliability has been a special concern for researchers dealing with diagnoses of disorders who depend on information given by patients. In



order to improve the reliability of the assessment of these disorders, researchers have reproduced measures in the form of items-symptoms, which evaluate different aspects of a given disorder.<sup>24</sup> Therefore, the scores of symptom scales tend to present better reliability than individual items, the improvement in reliability being a direct function of the number of items in the scale, as long as the items are positively correlated.<sup>25</sup> It is important to evaluate the reliability of measures since, according to the psychometric principles, if a measure is not reliable, it cannot be considered as valid. If the items of a scale measure the same construct, then the internal consistency of the scale may be considered as being a reliability index.<sup>26</sup>

The internal consistency of LSAS was high – 0.95 –, in agreement with what has been reported in other studies.<sup>11-12</sup> The Turkish version of LSAS indicated good reliability. It was observed that the scale discriminated between patients with generalized social phobia and patients without this diagnosis, including those with other diagnoses of the anxiety spectrum.<sup>27</sup> The French version showed good validity and sensitivity in terms of detecting changes after behavioral therapy in social phobic patients.<sup>28</sup> In its Spanish version, the scale showed good internal consistency and adequate validity, as well as reproducibility for use in clinical research and for the clinical evaluation of patients with social phobia.<sup>29</sup>

The factor analysis defined 5 factors which encompassed 52.9% of the total variability of the data. This analysis differs from the study by Safren et al., which resulted in 4 factors.<sup>16</sup> Safren's items of factor 1 (social interaction) were distributed in factor III (social interaction with unknown person) as well as in factors IV (attitude of disagreement or disapproval) and V (social interaction in leisure activity) of our study, while the items of their factor 2 (public speaking) were within factor I in our study (speaking in a group). Safren's items of factor 3 (observation fear) are distributed among factors II (activity in public) and IV (attitude of disagreement or disapproval) of this study, and the items of factor 4 (eating and drinking in public) are included in factor II (activity in public). Perugi et al. also examined symptomatological subtypes of social phobia by means of principal component factor analysis of the LSAS and found five factors; interpersonal anxiety, formal speaking anxiety, stranger-authority anxiety, eating and drinking while being observed, and anxiety of doing something while being observed.<sup>30</sup> Further studies are necessary to find out if the factors here identified can eventually be used as subscales of LSAS.

In a latent class analysis, Kessler et al. showed that the brief set of social fears assessed in their survey can be disaggregated into a class characterized largely by speaking fears and a second class characterized by a broader range of social fears. One-third of the people with lifetime social phobia exclusively reported speaking fears, while the other two-thirds also had at least one of the other social fears assessed.<sup>31</sup> In a cluster analysis, Furmark et al. found three clusters, consisting of phobics scoring either high (generalized subtype), intermediate (non-generalized subtype) or low (discrete subtype). Generalized or severe social phobia tended to be over-represented among individuals with low levels of educational attainment and social support. Overall, public-speaking was the most common fear.<sup>32</sup>

In our study, Factor I (speaking anxiety) explained almost 35% of data variability. Since only a few social phobic patients seek for treatment, it is possible that they may use alcohol as self-medication and, as a consequence, are more prone to become alcoholics. Several studies show that social phobia typically pre-

**Table 2 - Five factor structure of Liebowitz Social Anxiety Scale**

Item number and content	Loading
<b>FACTOR I (Speaking in a group), Eigenvalue = 16.60, Explained variance = 34.59%, alpha = 0.91</b>	
31- Fear or anxiety of speaking up at a meeting	0.81
32- Avoidance of speaking up at a meeting	0.77
39- Fear or anxiety of giving a report to a group	0.76
40- Avoidance of giving a report to a group	0.71
11- Fear or anxiety of acting, performing or giving a talk in front of an audience	0.66
29- Fear or anxiety of being the center of attention	0.63
30- Avoidance of being the center of attention	0.62
12- Avoidance of acting, performing or giving a talk in front of an audience	0.61
3- Fear or anxiety of participating in small groups	0.58
4- Avoidance of participating in small groups	0.51
9- Fear or anxiety of talking to people in authority	0.43
27- Fear or anxiety of entering a room where other people are already seated	0.43
33- Fear or anxiety of taking a test	0.41
<b>FACTOR II (Activity in public), Eigenvalue = 2.61, Explained variance = 5.44%, alpha = 0.87</b>	
5- Fear or anxiety of eating in public place	0.67
25- Fear or anxiety of urinating in a public bathroom	0.67
26- Avoidance of urinating in public bathroom	0.66
6- Avoidance of eating in public place	0.64
7- Fear or anxiety of drinking with others in public places	0.63
8- Avoidance of drinking with others in public places	0.56
1- Fear or anxiety of telephoning in public	0.52
2- Avoidance of telephoning in public	0.49
28- Avoidance of entering a room where other people are already seated	0.48
10- Avoidance of talking to people in authority	0.40
<b>FACTOR III (Social interaction with unknown person), Eigenvalue = 2.24, Explained variance = 4.68%, alpha = 0.87</b>	
20- Avoidance of calling someone you don't know very well	0.75
23- Fear or anxiety of meeting with strangers	0.74
24- Avoidance of meeting with strangers	0.73
22- Avoidance of talking with people you don't know very well	0.72
21- Fear or anxiety of talking with people you don't know very well	0.69
19- Fear or anxiety of calling someone you don't know very well	0.67
16- Avoidance of working while being observed	0.38
15- Fear or anxiety of working while being observed	0.35
<b>FACTOR IV (Attitude of disagreement or disapproval), Eigenvalue = 2.10, Explained variance = 4.37%, alpha = 0.86</b>	
43- Fear or anxiety of returning goods to a shop	0.66
47- Fear or anxiety of resisting a high pressure salesperson	0.66
44- Avoidance of returning goods to a shop	0.65
48- Avoidance of resisting a high pressure salesperson	0.65
36- Avoidance of expressing a disagreement or disapproval to people you don't know very well	0.56
35- Fear or anxiety of expressing a disagreement or disapproval to people you don't know very well	0.51
34- Avoidance of taking a test	0.49
38- Avoidance of looking at people you don't know very well	0.42
18- Avoidance of writing while being observed	0.42
17- Fear or anxiety of writing while being observed	0.41
37- Fear or anxiety of looking at people you don't know very well	0.40
<b>FACTOR V (Social interaction in leisure activity), Eigenvalue = 1.84, Explained variance = 3.84%, alpha = 0.83</b>	
45- Fear or anxiety of giving a party	0.73
46- Avoidance of giving a party	0.63
13- Fear or anxiety of going to a party	0.60
41- Fear or anxiety of trying to pick up someone	0.58
14- Avoidance of going to a party	0.56
42- Avoidance of trying to pick up someone	0.53

cedes problems with alcohol.<sup>33-35</sup> Social phobia appears to begin in the early adolescence, with serious potential consequences, predisposing the affected individuals to a higher vulnerability to major depression and addictive disorders.<sup>36</sup> There are evidences that alcohol abuse is an attempt at self-medication in a considerable number of social phobic individuals, and alcohol abuse is an important complication of social phobia.<sup>37</sup>

The study presents some limitations. The sample consisted of social phobic and non-phobic alcoholic patients hospitalized at 3 hospitals of the city of Porto Alegre, Brazil, thus not being representative of the general population of alcoholics. Further research is needed to evaluate the psychometric properties of the scale in the community and in other clinical populations. Furthermore, one could also argue if alcohol dependence might eventually influence psychopathological aspects of social phobia, resulting in different symptom clusters in the case of this specific comorbid condition. Nevertheless, factor analysis is a multivariate technique of data reduction and the fact that the sample included both social phobic and non-phobic alcohol dependents does not affect the reported findings.

The scale proved to be reliable and a structurally valid instrument for use in a population of alcoholic patients. The possibility of screening for social phobia through the use of the instrument may be helpful in identifying probable cases of the disorder among alcoholics.

# Acknowledgements

The study was partially supported by the Brazilian research funding agencies (Fundação de Amparo à Pesquisa do Estado do Rio Grande do Sul - FAPERGS - and Fundação de Amparo à Pesquisa do Estado de São Paulo - FAPESP). HMT Barros receives a 1C Research Productivity grant from Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq).

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