

PSYCHOMETRIC STUDY  
OF THE MAIN CLINICAL SCALES  
OF THE LISTADO DE SÍNTOMAS BREVE (LSB-50)  
[SHORT CHECKLIST OF SYMPTOMS]  
IN ARGENTINEAN ADOLESCENTS

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This research aims at studying some psychometric properties of the Listado de Síntomas Breve (LSB-50) [Short Checklist of Symptoms] in Argentinean adolescents. The sample included 1003 adolescents (50.2% females, 49.8% males) aged between 12 and 18 years ( $M = 14.99$ ,  $SD = 1.98$ ). The LSB-50 is a 50-item scale that assesses psychopathology using seven main clinical scales: Hypersensitivity, Obsessive-Compulsive, Anxiety, Hostility, Somatization, Depression, and Sleep disturbance. Analyses included the study of the associations among scales, second order confirmatory factor analysis, internal consistency analyses by Cronbach's alphas, the exploration of sex differences in the clinical scales and their association with age, and within-subjects ANOVA to test differences among them. Correlations among clinical scales were all positive and mostly moderate. A hierarchical model that proposed that all scales loaded in one major factor was confirmed by a second-order confirmatory factor analysis. Internal consistency by Cronbach's alpha was adequate. Females scored significantly higher than males in the Obsessive-Compulsive scale, but the effect size showed that this difference had little relevance. Only Depression was significantly and positively associated with age but this relationship was extremely weak. Obsessive-Compulsive and Hostility were the scales with highest scores, and Anxiety and Somatization presented the lowest scores. These results show that the scale seems to be suitable to the local population. However, more evidence of validity and reliability should be sought.

Key words: Psychological symptoms; Mental health; Psychopathology; Adolescents; LSB-50.

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Studying the prevalence of psychological symptoms in a population constitutes a pivotal issue for public health (Kohn et al., 2005). Estimations based on Latin-American statistics show that nearly 20% of the Argentinean population suffer from some kind of mental disorder (Ministerio de Salud [Ministry of Health], 2010). Psychological discomfort is mostly prevalent in Buenos Aires City and its greater metropolitan area. However, there is a lack of updated data and local estima-

tions on this topic. The only national survey on mental disorders was conducted at the beginning of the 80s (Casullo, 1981; Di Marco, 1981; Pagés Larraya, Casullo, & Paso Viola, 1982). One of the reasons for this absence of information is the scarcity of psychometric screening instruments with proved quality of validity and reliability. Gathering information about psychopathology could address to three main goals: (a) establishing the dimension of the problem, (b) describing psychological features of individuals with psychopathological symptoms, and (c) identifying individuals at risk of developing mental disorders in order to apply early interventions.

Consequently, it is imperative for researchers and health providers to count on instruments specifically designed to measure psychological symptoms in an accurate and brief way. As for researchers, the availability of this type of assessment will allow them to estimate the prevalence of psychological symptoms in the population, as well as to study the relationships among symptomatology and sociodemographic or psychological variables. Regarding health providers, the accessibility to such tests would allow to rapidly assess patients, in a valid and reliable manner, and to refer to specialists for a thorough diagnosis and a customized intervention of those at risk of experiencing psychological discomfort. Based on the aforementioned, the role of screening tests becomes pivotal due to their ability to simply and rapidly perform assessments (Hernández Aguado et al., 2011; Lewis, Sheringham, Kalim, & Crayford, 2008).

#### ASSESSING PSYCHOLOGICAL SYMPTOMS

Since psychological *symptoms* present a subjective manifestation, assessing psychopathology constitutes a challenge for the field of psychological testing. As self-reports reflect what an individual claims to experience, the information gathered entails the advantages and disadvantages of self-description. However, it has been stated that the use of this kind of measurement facilitates individuals to freely and more sincerely communicate their symptoms (Corcoran & Fischer, 2000; de Rivera & Abuín, 2012). According to Holi (2003), the main goal of self-report instruments relies on rapidly gathering clinical information, aiming at controlling for the possible influence of the interviewer. Screening self-reports provide an initial knowledge of the subjects' psychopathology, detecting individuals at risk and prompting diagnostic procedures and interventions.

Currently, when analyzing the prevalence of mental health disorders, depressive and obsessive-compulsive symptoms arise as the most frequent (Caparrós Caparrós, Villar Hoz, Juan Ferrer, & Viñas Poch, 2007; Casullo, 2004; González de Rivera et al., 1999; Sánchez & Ledesma, 2009). Additionally, research has found differences in sex in the frequency of psychological symptoms. Usually, adult females manifest more anxiety, somatization, depression, interpersonal sensitivity, and phobias than males (Abuín & de Rivera, 2014; Caparrós Caparrós et al., 2007; Carrasco Ortiz, Sánchez Moral, Ciccotelli, & del Barrio, 2003; Casullo, 2004; González de Rivera et al., 1999; Houghton et al., 2012; Martínez Azumendi, Fernández Gómez, & Beitía Fernández, 2001; Ruipérez, Ibáñez, Lorente, Moro, & Ortet, 2001; Sánchez & Ledesma, 2009; Urbán et al., 2014). On the other hand, men display higher scores in hostility and psychoticism than women (Gempp Fuentealba & Avendaño Bravo, 2008; Urbán et al., 2014). Nevertheless, some studies have reported no differences in sex in interpersonal hostility, paranoid ideation, and psychoticism (Casullo, 2004; Gempp Fuentealba & Avendaño Bravo, 2008; González de Rivera et al., 1999; Martínez Azumendi et al., 2001; Sánchez & Ledesma, 2009). Regarding adolescents, girls scored

higher than boys in almost all symptoms (Casullo & Castro Solano, 1999; Casullo, Cruz, González, & Maganto, 2003; Casullo & Fernández Liporace, 2001).

Concerning life cycle, significant associations have been found. As people get older, depression and somatization increase while hypersensitivity and hostility decline (Abuín & de Rivera, 2014; González de Rivera et al., 1999). Moreover, some results indicate no relationship between age and obsessive-compulsive or anxiety (González de Rivera et al., 1999) nor with any kind of psychological symptoms studied (Carrasco Ortiz et al., 2003; Casullo & Castro Solano, 1999). Casullo et al. (2003) compared younger and older adolescents and found that the youngest (14-15 years old) reported more somatization, interpersonal sensitivity, depression, anxiety, phobia, and paranoid ideation than the older group (16-18 years old). Casullo and Fernández Liporace (2001), on the other hand, informed that older adolescents manifested higher scores in depression and obsessive-compulsive than their younger counterparts.

#### The Sample Issue: Clinical, Normal, or General Population?

To use a psychological test in a particular culture, the psychometric properties of that instrument should be studied first with that specific group of individuals. Since the psychological symptoms are considered as highly dependent on the population under study (Casullo et al., 2003; De Las Cuevas et al., 1991), the characteristics of the sample used to conduct validity and reliability studies of psychopathology tests have been the object of debate.

Some authors posit that if the main goal of this type of psychological assessments is to identify individuals with psychological distress, the choice should be to use clinical populations as their responses will present a wider range of variability in comparison with a general population, where positive asymmetry is more likely to be observed (e.g., de Rivera & Abuín, 2012; Hoffmann & Overall, 1978). On the contrary, other researchers argue that clinical populations also present biases as the scores obtained in this type of sample are usually higher and results should not be extrapolated to the general population (Carrasco Ortiz et al., 2003; De Las Cuevas, 1991; Sánchez & Ledesma, 2009). Although studies with mixed samples have been proposed as a useful strategy (Bados, Balaguer, & Coronas, 2005), several studies still use samples of general population due to their accessibility and feasibility of the study (e.g., Daoud & Abojedi, 2010; Ruipérez et al., 2001).

Another important debate postulates that general population samples do not necessarily mean *normal* populations. Since the idea of a screening test is to detect individuals at risk from the general population, the idea of using a sample of that kind presents a judicious strategy (Eaton, Neufeld, Chen, & Cai, 2000).

#### Self-Reports, Reliability, and Validity

Self-reports are usually preferred to clinician interviewers due to their economic characteristics (Holi, 2003). Although these types of measurements are criticized based on their weakness to accurately reflect individuals' discomfort (Corcoran & Fischer, 2000), some studies have shown a significant correspondence between their scores and clinician diagnosis (Morlan & Tan, 1998; Sturm et al., 2010). For instance, the revised version of the Symptom Checklist (SCL-90-

R; Derogatis, 1983) is the most widely employed screening scale to assess psychopathology, and it has been adapted to be used in many populations, such as Argentina (Casullo, 1998; Sanchez & Ledesma, 2009), Spain (De Las Cuevas et al., 1991), China (Zhang & Zhang, 2013), and Chile (Gempp Fuentealba & Avendaño Bravo, 2008), among other countries.

Since the SCL-90-R resulted extremely long for screening purposes, a shorter version, named the Brief Symptom Inventory (BSI) was developed (Derogatis 1975; Derogatis & Spencer, 1982). This version was adapted to be used in countries such as Spain (Ruipérez et al., 2001), Jordan (Daoud & Abojedi, 2010), Turkey (Sahin & Durak, 1994), Israel (Canetti, Shalev, & De-Nour, 1994), Italy (De Leo, Frisoni, Rozzini, & Trabucchi, 1993), the Philippines (Aoian, Patsdaughter, Levin, & Gianan, 1995), Korea (Noh, Avison, & Kaspar, 1992), and Russia (Ritsner, Rabinowitz, & Slyuzberg, 1995).

In both cases, using the original and the shorter version, studies reported adequate reliability results, but researchers have had difficulties in obtaining evidences of validity. In fact, many of the versions only constitute mere translations of the original, lacking the required psychometric studies. An even shorter version of the scale, the BSI-18 (Derogatis, 2001), was developed and adapted in countries such as Mexico (Torres, Miller & Moore, 2013), Ireland (Houghton, et al., 2012), and China (Liu, Chen, Cao, & Jiao, 2013). But again, difficulties were found when validity evidence was studied. A comparison of the SCL-90-R and its shorter versions concluded that the latter ones were psychometrically more adequate and, therefore, recommended to be used as screening measurements (Prinz et al., 2013).

In particular, the problem related to the validity is based on the difficulties to determine the factorial structure of the instrument. Factorial structures usually result in a different amount of dimensions and the items show complex loadings (Cyr, McKenna-Foley, & Peacock, 1985; Martínez Azumendi et al., 2001). Psychometric theory postulates that, in order to produce valid measurements, a scale must be reasonably reliable. However, a reliable scale is not necessarily valid (Kerlinger & Lee, 2000). That is, although necessary, reliable results do not guarantee valid measures.

Generally, psychopathology screening tests such as the ones previously mentioned, show good internal consistency estimated by Cronbach's alpha (e.g., Abuín & de Rivera, 2014; Caparrós Caparrós et al. 2007; Carrasco Ortíz et al., 2003; Casullo & Castro Solano, 1999; Ruipérez et al., 2001). On the other hand, results of factor studies display a great variety, ranging from single-factor structures to two, five, six, and even eight factors (e.g., Abuín & de Rivera, 2014; Daoud & Abojedi, 2010; De Las Cuevas et al., 1991; Hoffmann & Overall, 1978; Urbán et al., 2014). In the case of the SCL-90-R, for example, it has been difficult to establish the adequate fit of the nine-dimensional structure by confirmatory factor analyses (Hardt, Gerbershagen, & Franke, 2000; Rauter, Leonard, & Swett, 1996; Schmitz et al., 2000; Vassend & Skrondal, 1999). It has been highlighted that this factorial inconsistency might be due to clinical comorbidity (de Rivera & Abuín, 2012).

It is recurrent for researchers to find a higher-order unique factor that measures general psychiatric distress (Benishek, Hayes, Bieschke, & Stoffelmayr, 1998; Bonyng, 1993; Boulet & Boss, 1991; Cyr et al., 1985; Daoud & Abojedi, 2010; Grande, 2014; Loutsiou-Ladd, Panayiotou, & Kokkinos, 2008; Martínez Azumendi et al., 2001; Piersma, Boes, & Reaume, 1994; Prunas, Sarno, Preti, Madeddu, & Perugini, 2012; Torres et al., 2013; Zach, Toneatto, & Streiner, 1998). Those reports reflect great convergence between scales, also expressed by their strong positive correlations (Abuín & de Rivera, 2014; Caparrós Caparrós et al., 2007; Casullo & Castro Solano, 1999; Chapman, Petrie, & Vines, 2012).

### Listado de Síntomas Breve (LSB-50) [Short Checklist of Symptoms]

In an attempt to generate a short, reliable and, most importantly, valid measure of psychopathology, the SCL-90-R was examined by de Rivera and Abuín (2012) to develop the Listado de Síntomas Breve (LSB-50) [Short Checklist of Symptoms]. One of the main changes introduced was the exclusion of both Psychoticism and Paranoid Ideation scales. In this regard, Eaton et al. (2000) pointed out that self-report measures are unsuitable for psychotic disorders. Additionally, de Rivera and Abuín argued that these two dimensions should not be included in self-reports as they not only comprise items with unclear content for respondents but they also describe symptoms that are easily detectable by clinical interviews. Actually, a study conducted in Italian population concluded that Psychoticism and Paranoid Ideation showed an erratic psychometric behavior and did not emerge as differentiated dimensions when factor analyses were performed (Prunas et al., 2012). Other modifications of the scale involved linguistic equivalences in items. Each item was revised to reflect people's expressions more accurately. "Trouble falling asleep," for instance, was replaced by "I find it difficult to fall asleep." Besides, the authors added a new dimension that assesses sleep disturbance, an essential aspect of psychological discomfort.

The LSB-50 is composed by 50 items measuring different psychological symptoms that serve as a basis to obtain several scales. It contemplates seven main clinical scales: Hypersensitivity, Obsessive-Compulsive, Anxiety, Hostility, Somatization, Depression, and Sleep disturbance. In addition, two more clinical scales may be calculated: Psychoreactivity, which comprises obsessive-compulsive and hypersensitivity symptoms, and Sleep disturbance extended, that integrates the measurement of anxiety and depression symptoms. Also, four indexes of severity can be addressed: (a) Global Severity index, (b) Number of Symptoms Present index, (c) Intensity of Symptoms Present index, and (d) Risk of Psychopathology index. Distortions in answers, either by showing more or less psychological discomfort, can also be analyzed by examining two supplementary scales: Magnification and Minimization.

The psychometric studies of the original studies of the LSB-50 (Abuín & de Rivera, 2014; de Rivera & Abuín, 2012) included the analysis of internal consistency by Cronbach's alphas, correlation with other psychometric measures of self-perception and interpersonal relations, an exploratory factor analysis that indicated a structure of six components (the Hypersensitivity and Obsessive-Compulsive items loaded in the same factor) and discriminant analysis. A study in the Colombian population (Rojas Gualdrón, 2012) studied a second-order model that showed a good fit. However, the first-order dimensions did not replicate those proposed by de Rivera and Abuín (2012). The LSB-50 was designed to overcome the difficulties which measures like the SCL-90-R have. However, up to this day, evidence of rigorous validity studies is scarce, and further research should test if it is in fact an improvement on the aforementioned psychopathology screening measures.

### Psychopathology and Adolescence

Though the risk of psychopathology is present during the complete lifecycle, adolescence presents a period when the possibility of developing psychological symptoms increases (Jessor, 1991). One of the reasons for this is the inclination of adolescents to engage in *risk-taking behaviors*. Although some risk behaviors are considered needed, expected, or even beneficial (Ellis et al., 2012), their relation to psychological symptoms should not be overlooked (e.g., Vrouva, Fonagy,

Fearon, & Roussow, 2010). Jessor's (1987) Problem Behavior Theory (PBT), proposes that engagement in risk-taking behaviors may be explained by adolescents' need to oppose society norms. It is thought, that this conduct is temporary and will decline in adulthood (Briggs, 2009; Graham, 2004). But, in the meantime, they favor adolescents' susceptibility to psychopathology.

The presence of psychological symptoms does not only entail a personal discomfort but it is associated with other unwanted consequences. Research has shown that psychopathology in adolescence is related, for example, to bad social functioning, low performances at school, family stress (e.g., Angold et al., 1998; Kofler et al., 2011; Quiroga, Janosz, Bisset, & Morin, 2013) or even psychological problems in adulthood (e.g., Helgeland, Kjelsberg, & Torgersen, 2005; Stepp, Olino, Klein, Seely, & Lewinsohn, 2013). It is because of this that identifying adolescents at risk of psychopathology constitutes an important goal. Firstly, identifying the dimension of the problem and its related risk factors emerge as two relevant goals. Moreover, rapidly and accurately assessing adolescents who consult a clinician constitutes a necessary step toward the design of proper interventions to safeguard mental health and recover psychological wellbeing. To accomplish that, the purpose of this study is to explore the characteristics of a new screening measure, the LSB-50, in order to establish some foundations that will serve later to provide researchers and mental health professionals with an adequate instrument. Hence, this work specifically aims at analyzing some psychometric properties of the LSB-50 in Argentinean adolescents.

## METHOD

### Participants

Participants were 1003 Argentinean adolescents between 12 and 18 years old ( $M = 14.99$ ,  $SD = 1.98$ ) and proportionally distributed by sex (50.2% females, 49.8% males). Most of them attended private high schools (60.4%), and, from that group, 66.8% received religious education. Regarding their family, most of them (64.1%) were being raised by both parents; 29.4% lived with one of their divorced parents, and only a small proportion had lost a parent (2.8% the father, 0.7% the mother). A 3% said to have other living arrangements. In terms of siblings, most of these adolescents (65.7%) had one or two siblings, 22.9% had three or more, and 11.4% were an only child.

### Materials and Procedure

*Listado de Síntomas Breve* (LSB-50) [Short Checklist of Symptoms] (de Rivera & Abuín, 2012). This 50-item scale assesses different psychological symptoms. Seven main clinical scales may be calculated from the items: (a) Hypersensitivity, which assesses inter- and intra-personal sensitivity (seven items); (b) Obsessive-Compulsive, that refers to the presence of rituals, compulsions, and doubts (seven items); (c) Anxiety, which attempts to cover symptoms of general anxiety disorder, panic, and phobic disorders (nine items); (d) Hostility, that enquires about behaviors of anger, rage, and resentment (six items); (e) Somatization, which asks about somatic symptoms due to psychological or medical problems (eight items); (f) Depression, that assesses sadness, hopelessness, lack of energy, and guilt (10 items); and (g) Sleep disturbance,

which examines possible sleeping difficulties from a wellbeing perspective (three items). Items are rated on a 5-point Likert scale, ranging from 0 = *nothing* to 4 = *a lot*.

Data collection took place in 2013 in Buenos Aires City, and was coordinated by two trained psychologists who work as professors in the University of Buenos Aires. The assessed adolescents needed to meet the following inclusion criteria: being Argentinean, between 12 and 18 years old and attending high school. Adolescents that did not meet the criteria and/or were under psychiatric treatment were not assessed. This way, a nonrandomized sample with volunteer participants was obtained. No incentives were given either to participants or to data collectors. Informed consents from their parents were obtained before the study began. In this document, parents were informed about the objective of the research and were told that they could refuse or interrupt their participation at any time. Approximately, 20 individuals refused to participate.

## RESULTS

Firstly, Pearson's correlations among all scales were obtained (Table 1). All the associations were positive and statistically significant ( $p < .01$ ). The strongest relationships found were between Hypersensitivity and Depression ( $r = .76$ ), and between Hypersensitivity and Anxiety ( $r = .62$ ). The weakest correlations observed were between Sleep disturbance and Hostility ( $r = .26$ ) and between Sleep disturbance and Anxiety ( $r = .31$ ).

TABLE 1  
Item analysis and response frequency

	Hypersensitivity	Obsessive-Compulsive	Anxiety	Hostility	Somatization	Depression	Sleep disturbance
Hypersensitivity	1						
Obsessive-Compulsive	.59**	1					
Anxiety	.62**	.56**	1				
Hostility	.51**	.47**	.47**	1			
Somatization	.45**	.45**	.50**	.42**	1		
Depression	.76**	.58**	.60**	.52**	.52**	1	
Sleep disturbance	.35**	.34**	.31**	.26**	.38**	.37**	1

\*\*  $p < .01$ .

Then, univariate statistics were calculated for each element (Table 2). Most means have values around 1.5. Skewness and kurtosis values indicate a lack in univariate normal distribution for most items. Also, a normalized estimate of Mardia's coefficient of 210.03 indicated a non-normally multivariate distribution.

TABLE 2  
Univariate statistics for the items

	<i>M (SD)</i>	Skewness	Kurtosis		<i>M (SD)</i>	Skewness	Kurtosis
Item 1	1.96 (1.00)	0.70	-0.27	Item 26	1.98 (1.12)	1.07	0.34
Item 2	1.91 (0.97)	0.99	0.44	Item 27	2.05 (1.22)	1.02	0.04
Item 3	1.93 (1.15)	1.13	0.32	Item 28	1.78 (0.98)	1.24	0.95
Item 4	1.93 (1.05)	1.00	0.29	Item 29	1.57 (1.00)	1.91	3.02
Item 5	1.37 (0.80)	2.39	5.37	Item 30	1.89 (1.07)	1.15	0.56
Item 6	2.36 (1.25)	0.58	-0.69	Item 31	1.84 (1.05)	1.25	0.89
Item 7	2.32 (1.13)	0.60	-0.40	Item 32	1.51 (0.88)	1.84	3.03
Item 8	2.81 (1.23)	0.15	-0.98	Item 33	1.96 (1.18)	1.09	0.19
Item 9	2.47 (1.20)	0.54	-0.61	Item 34	1.69 (1.06)	1.60	1.76
Item 10	1.79 (1.05)	1.38	1.28	Item 35	1.44 (0.74)	1.91	3.93
Item 11	2.01 (1.15)	1.04	0.21	Item 36	2.16 (1.14)	0.85	-0.05
Item 12	1.74 (0.97)	1.31	1.13	Item 37	1.63 (1.04)	1.76	2.38
Item 13	1.96 (1.21)	1.19	0.38	Item 38	1.64 (0.97)	1.62	2.11
Item 14	1.75 (1.07)	1.42	1.15	Item 39	2.11 (1.32)	0.94	-0.37
Item 15	2.25 (1.23)	0.75	-0.47	Item 40	1.57 (1.01)	1.85	2.60
Item 16	2.10 (1.17)	0.88	-0.12	Item 41	1.79 (1.14)	1.45	1.17
Item 17	1.21 (0.63)	3.51	12.98	Item 42	1.62 (0.98)	1.72	2.43
Item 18	1.39 (0.76)	2.29	5.51	Item 43	1.82 (1.10)	1.27	0.76
Item 19	1.41 (0.75)	2.06	4.27	Item 44	2.40 (1.24)	0.59	-0.62
Item 20	1.73 (0.99)	1.34	1.19	Item 45	1.34 (0.74)	2.65	7.53
Item 21	1.32 (0.73)	2.72	7.87	Item 46	1.30 (0.72)	2.79	8.02
Item 22	1.87 (1.17)	1.27	0.62	Item 47	1.41 (0.76)	2.05	4.10
Item 23	1.62 (1.02)	1.73	2.25	Item 48	1.57 (0.98)	1.90	3.07
Item 24	2.09 (1.15)	0.92	-0.01	Item 49	2.61 (1.27)	0.43	-0.83
Item 25	1.43 (0.81)	2.24	5.14	Item 50	1.76 (1.08)	1.37	0.99

A second-order confirmatory factor analysis was conducted to study if a hierarchical model that proposed that seven factors loaded in one major dimension was adequate for the LSB-50. Estimation method was robust maximum likelihood (ML) using the polychoric matrix due to the categorical nature of the items (Likert scaled). This type of matrix is more appropriate when variables are ordinal and when there is evidence of high values of skewness and kurtosis (Freiberg Hoffmann, Stover, de la Iglesia, & Fernández Liporace, 2013; Múthen & Kaplan, 1985). EQS 6.2 was the statistical package used.

To value model fit, different indexes obtained by the robust method were examined: Satorra-Bentler scaled chi-square (S-B  $\chi^2$ ), normed-of-fit index (NFI), incremental fit index (IFI), comparative fit index (CFI), and root mean square error of approximation (RMSEA). They all showed an excellent fit of a hierarchical model of seven first-order factors and one second-order factor, S-B  $\chi^2 = 3397.85$  ( $p < .001$ ); NFI = .943; IFI = .966; CFI = .962; RMSEA = .044; 90% CI [.042, .045].

Moreover, all regression paths (factorial weights) were statistically significant, and none of them showed a negative sign nor exceeded the value of 1. Figure 1 shows that most factorial weights were higher than the minimum accepted (Kline, 2011). Only Item 6 had a slightly lower weight than expected (Item 6 = .36). Additionally, all regression paths from the clinical scales to the second-order factor of general psychiatric distress were appropriate.

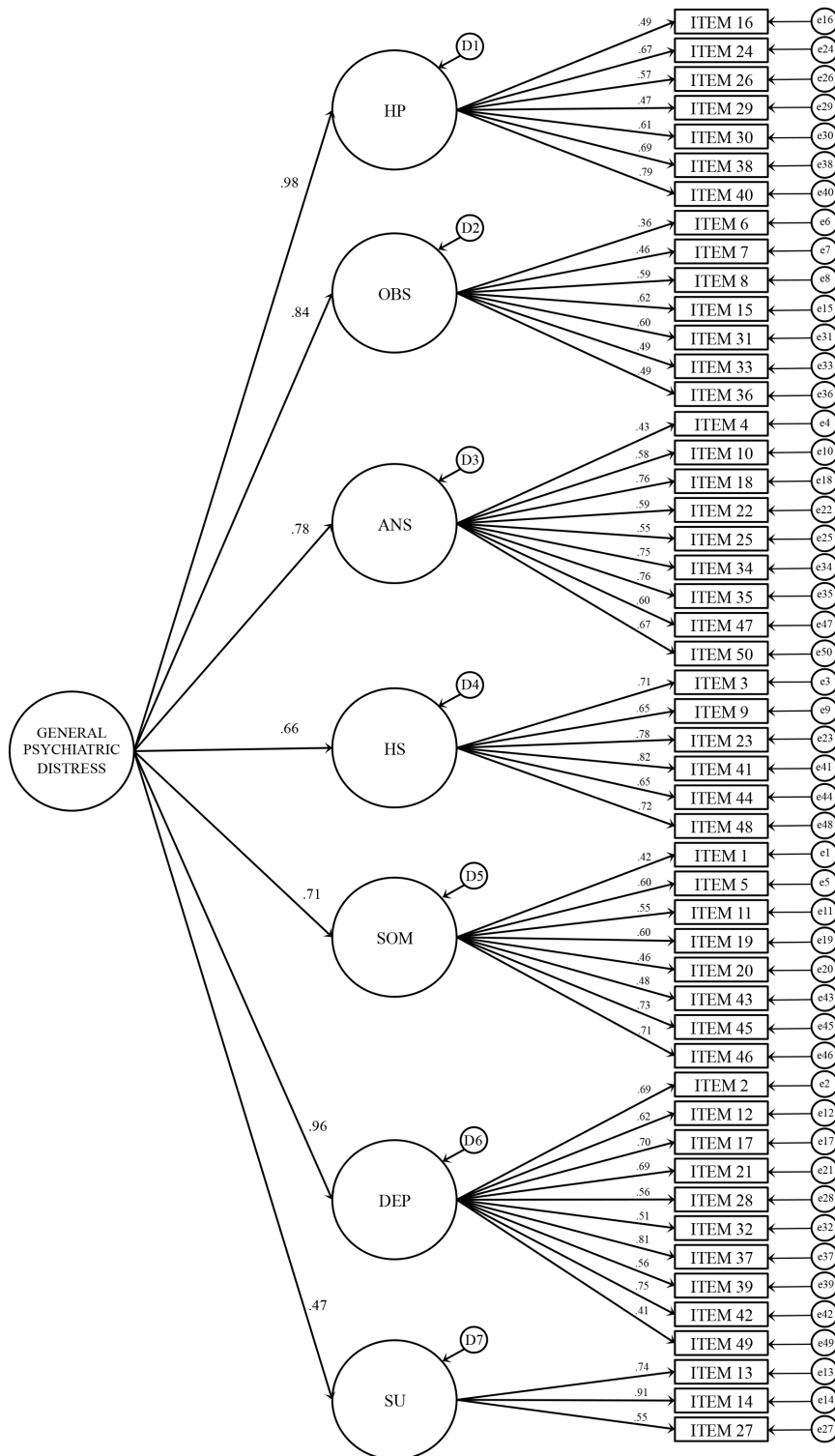


FIGURE 1  
Second-order confirmatory factor analysis.  
HP: Hypersensitivity; OBS: Obsessive-Compulsive; ANS: Anxiety; HS: Hostility;  
SOM: Somatization; DEP: Depression; SU: Sleep disturbance.

To study the internal consistency of scales, Cronbach's alpha coefficients were calculated. In all cases values were acceptable, ranging from .68 to .82 (Table 3). In particular, Hostility was the scale displaying the highest level of internal consistency.

TABLE 3  
Cronbach's alpha for the main clinical scales

	Cronbach's alpha
Hypersensitivity	.75
Obsessive-Compulsive	.68
Anxiety	.78
Hostility	.82
Somatization	.68
Depression	.78
Sleep disturbance	.68

Additionally, descriptive statistics were calculated for each scale. As shown in Table 4, the minimum and the maximum values for all clinical scales varied between 0 and 4. The study of the intervals obtained by adding and subtracting the corresponding standard deviation of each mean ( $M \pm SD$ ) showed that most scale scores ranged from 0 to 1.5/2. Moreover, independent sample *t*-tests were used to estimate differences by sex in the main clinical scales and effect sizes were calculated by Cohen's *d*. Differences were found exclusively in the Obsessive-Compulsive scale,  $t(1001) = -2.51$ ,  $p < .012$ ,  $d = -0.15$ , where females scored significantly higher than males ( $M_F = 1.29$  vs.  $M_M = 1.18$ ). However, the effect size was small.

TABLE 4  
Descriptive statistics and sex differences in the main clinical scales

	Main sample			Females	Males	<i>t</i> -tests		
	Minimum	Maximum	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>t</i>	<i>p</i>	<i>d</i>
Hypersensitivity	0	3.86	0.83 (0.68)	0.85 (0.65)	0.81 (.071)	-0.969	.333	-0.08
<b>Obsessive-Compulsive</b>	0	3.57	<b>1.24 (0.69)</b>	<b>1.29 (0.70)</b>	<b>1.18 (0.68)</b>	<b>-2.516</b>	<b>.012</b>	<b>-0.15</b>
Anxiety	0	3.78	0.63 (0.58)	0.64 (0.56)	0.62 (0.59)	-0.449	.654	-0.03
Hostility	0	4.00	0.96 (0.82)	0.98 (0.93)	0.93 (0.81)	-0.943	.346	-0.05
Somatization	0	3.50	0.61 (0.52)	0.62 (0.50)	0.60 (0.53)	-0.495	.621	-0.03
Depression	0	3.30	0.74 (0.58)	0.75 (0.57)	0.73 (0.60)	-0.294	.769	-0.03
Sleep disturbance	0	4.00	0.92 (0.92)	0.95 (0.93)	0.89 (0.91)	-1.052	.293	-0.06

Pearson's correlations were calculated to examine associations between age and each main clinical scale (Table 5). Only a significant weak and positive correlation was found between age and Depression ( $r = .07$ ,  $p < .05$ ), showing that the older the adolescents are, the more depressive symptoms they present.

TABLE 5  
Pearson's *r* correlations between age and the main clinical scales

	Pearson's correlations	
	<i>r</i>	<i>p</i>
Hypersensitivity	.05	.159
Obsessive-Compulsive	.06	.056
Anxiety	.04	.260
Hostility	.03	.304
Somatization	.05	.086
Depression	.07	.040
Sleep disturbance	.03	.298

Finally, a within-subjects ANOVA was conducted to contrast the scores of the main clinical scales. The model was statistically significant, Wilks's  $\lambda = .44$ ,  $F(6, 997) = 213.35$ ,  $p < .001$ ,  $\eta^2 = .56$ . Bonferroni's pairwise comparison indicated that differences were statistically significant in almost every pair ( $p < .05$ ). However, no differences were found between Hypersensitivity and Sleep disturbance ( $p = .065$ ), between Anxiety and Somatization ( $p = 1$ ), nor between Hostility and Sleep disturbance ( $p = 1$ ). The analysis of the means for each scale revealed that in descending order, scores were as follows: Obsessive-Compulsive, Hostility, Sleep disturbance, Hypersensitivity, Depression, Anxiety, and Somatization (see Table 4 for means and standard deviations).

## DISCUSSION

The main goal of this research was to study some psychometric properties of the LSB-50 (de Rivera & Abuín, 2012) in Argentinean adolescents. In this way, analyses focused on the seven main clinical scales and involved the study of their correlations, the test of a second-order one-dimensional model, internal consistency, sex, and age differences, as well as differences in the levels of symptomatology found in each scale.

When examining associations between clinical scales, significant, positive, and mostly strong correlations were found between all scales. This was expected and it replicates previous findings (Abuín & de Rivera, 2014; Caparrós Caparrós et al., 2007; Casullo & Castro Solano, 1999; Chapman et al., 2012). These results highlight the need to revise the use of a general measurement of mental discomfort due to the high comorbidity of the assessed symptoms. Indeed, the second-order confirmatory factor analysis revealed that a hierarchical model where the seven main clinical scales load in one single dimension of psychological discomfort was adequate. Fit indexes obtained by the second-order confirmatory factor analyses indicated an excellent overall fit of the model. All items and first-order factors showed the expected loadings and regression paths were statistically significant in all cases. The inference of a unique dimension to assess general psychiatric distress reproduces results reported by previous research (e.g., Benishek et al., 1998; Bonyng, 1993; Boulet & Boss, 1991; Cyr et al., 1985; Daoud & Abojedi, 2010; Grande, 2014; Loutsiou-Ladd et al., 2008; Martínez Azumendi et al., 2001; Piersma et al., 1994; Prunas et al., 2012; Torres et al., 2013; Zach et al., 1998).

Additionally, as described in former studies regarding the LSB-50 and the SCL-90-R in its different versions (Abuín & de Rivera, 2014; Caparrós Caparrós et al. 2007; Carrasco Ortíz et al., 2003; Casullo & Castro Solano, 1999; Ruipérez et al., 2001), clinical scales showed an adequate internal consistency by Cronbach's alphas. These results yield the good reliability of the instrument and complement previous findings of construct validity evidence.

Descriptive statistics of the clinical scales indicated that most answers ranged from 0 to 1.5/2, when the possible maximum value is 4. This was expected and may respond to the fact that data came from general population where skewness is expected (e.g., de Rivera & Abuín, 2012; Hoffmann & Overall, 1978). However, the intervals obtained by subtracting and adding the corresponding value of one standard deviation for each of the clinical scales, indicated a variation of clinical scores between 0 and 1.5/2 which should not be overlooked, since it indicates presence of low/moderate psychopathology.

When analyzing differences in sex in the seven main clinical scales, the only difference found was for the Obsessive-Compulsive scale. Girls display more obsessive-compulsive symptoms than boys. However, previous research has informed significant differences in all scales, as reported for SCL-R (Casullo & Castro Solano, 1999; Casullo et al., 2003; Casullo & Fernández Liporace, 2001). Moreover, the effect size obtained indicated little relevance of the difference found in this study. In this sense, Hartung and Widiger (1998) discussed sex-related differences in psychopathology, stating that researchers often incur in methodological mistakes that are overlooked due to their regular use in psychological research. These authors specifically posit that nonprobabilistic convenience samplings and diagnostic criteria might explain major discrepancies in findings regarding sex differences in psychopathology. Besides, this assessment was conducted by self-report measurements and, therefore, the scores possibly assess distortions in the subjects' answers that are not statistically controlled (Minimization and Magnification). Furthermore, Eagly (1995) criticizes results indicating differences by sex, highlighting that they are usually very small and not precisely replicated across studies, thus, describing them as *artifactual*.

Regarding age, the only statistically significant association found was with Depression and no significant relationships were found for almost all scores. This finding partially replicates results reported on the LSB-50 and the SCL-90-R (Carrasco Ortíz et al., 2003; Casullo & Castro Solano, 1999; González de Rivera et al., 1999). Again, though significant, this result should not be interpreted as replicating previous findings (Casullo et al., 2003; Casullo & Fernández Liporace, 2001) since the association was particularly weak. The conclusion that depression increases with age seems an inappropriate interpretation. This difference with previous research may be due to the level of measurement of the variable age used across studies. While in this study age was utilized as a continuous variable, former research used age-groups (e.g., 14-15 vs. 16-18 years old). Nevertheless, it must be reminded that the sample of the study was composed by adolescents between 12 and 18 years old. That is, the age range was narrow to study developmental changes and differences in clinical symptoms that may be found if the sample was widened by including children or young adults.

These results indicated that the sample of adolescents here studied did not differ significantly in their symptoms regarding sex or age. It is possible, that today's Argentinean adolescents are a more homogenous group than thought. When studying the sample as a whole, descriptive statistics indicated that all scales' scores were mostly low/moderate (between 0 and 1.5/2). That is, psychological symptoms are present with a low to moderate frequency. This should not be overlooked, since as mentioned, adolescents' psychopathology is related to important negative outcomes (e.g., Angold et al., 1998; Kofler et al., 2011; Quiroga et al., 2013); and, because of that, fur-

ther examination of the prevalence of symptoms (previous determination of adequate cut-off values) is needed. A clear picture of the problem would permit to design tailored interventions in the population.

Finally, the within-subjects ANOVA showed that obsessive-compulsive and hostility were the most frequent symptoms and anxiety and somatization the least in this population. This finding partially reproduces previous results where obsessive-compulsive and depression showed to be the most frequent symptoms among adolescents (Caparrós et al., 2007; Casullo, 2004; González de Rivera et al., 1999; Sánchez & Ledesma, 2009). In this study, Depression was the scale with the lowest score. It seems that, from all psychological symptoms assessed, depression is infrequent in this group. However, it is not unusual that Obsessive-Compulsive prevailed as one of the scales with higher scores, as this measurement includes the assessment of *doubtfulness*, an aspect that reflects the hesitation, confusion, and self-doubt that constitute some of the principal characteristics of adolescence (e.g., Erikson, 1950). Finally, it should be mentioned that high scores in Hostility may be related to the recent increment of violence in Argentina's society (Lado, 2014), a phenomenon that impacts the daily life of adolescents.

To sum up, the LSB-50 showed appropriate psychometric properties among the adolescent population in Argentina. The results obtained justify the use of both the scores of each independent scale as well as a higher-order total scores of general psychiatric distress. Reliability aspects were acceptable. When studying its performance regarding sociodemographic features, differences from previous research were found. As mentioned before, they are probably due to non-probabilistic sampling or diagnostic criteria operationalized in this case in a particular measure (LSB-50) which differs from those previously used in terms of language use, length, and symptoms coverage. However, scale scores differed from zero, and therefore, it is possible to conclude that, despite the low to moderate frequency, psychopathology is present in the sample studied.

Future research should focus on producing more validity evidence for the hierarchical model of the LSB-50 by using cross-validation procedures and tests of factorial invariance. Also, it is necessary to study the possible convergence with independent measures. Additionally, reliability could be more appropriately analyzed using ordinal alphas (Elosúa & Zumbo, 2008) and most importantly, gathering information about specificity, sensitivity, positive and negative predictive values as well as Receiving Operating Characteristic curves to determine adequate cut-off values. In this way, it would be possible to provide a reliable, valid, and brief screening instrument for assessing psychopathology in Argentinean adolescents.

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