

Research Article

The Affect Balance Scale (ABS): Psychometric Properties in Argentina

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Abstract

The Affect Balance Scale (ABS) was developed to assess the affective component of subjective well-being. This study aims to evaluate the psychometric properties of ABS in a non-probabilistic sample composed of 2241 individuals in the general population in Argentina, ages ranging from 18 to 89 years ($M = 37.53$; $SD = 14.80$). The results suggest acceptable psychometric properties within the sample. Excellent adjustment to the data of the two-dimensional model is observed through confirmatory factor analysis. Results of the factorial invariance analysis of gender conducted indicate that both groups are equivalent in terms of the factor structure under investigation. Internal consistency was also found to be adequate. As a result, the study contributed to assessing positive and negative affect in Spanish speaking populations.

Keywords: Affect Balance Scale; positive; negative; affect, subjective; well-being; Argentina

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Psychological Thought, 2021, Vol. 14(2), 427-443, <https://doi.org/10.37708/psyct.v14i2.527>

Received: 2020-08-14. Accepted: 2021-04-02. Published (VoR): 2021-10-31.

Handling Editor: Marius Drugaș, Department of Psychology, University of Oradea, Romania.

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Although studies in the area of positive psychology have grown exponentially in recent years (Castro-Solano, 2014), research on the exploration of affect balance remains scarce in Spanish-speaking populations. For this reason, the study aims to adapt and validate the Affect Balance Scale (Bradburn, 1969) into Spanish. The study's relevance stems from obtaining valid and reliable measurements through this technique, enabling the advancement of research on subjective well-being, and offering researchers and health professionals a psychological measure that allows assessing the affective balance in the Argentine population. As it is a short administration instrument, it makes it possible to carry out an assessment of the construct in a short period.

The study of affect has attracted the interest of numerous researchers in the field of psychology (Diener et al., 1993; Kim & Mueller, 2001). According to Zajonc (1980), affect is defined as a dispositional element in which two significant types of experiences coexist. For example, those with positive emotionality and those with negative emotionality. The former experiences are called positive affect (Gargurevich, 2010; Waller et al., 1990) and represent a set of emotions such as joy, motivation, energy, or self-confidence (Bradburn, 2015; Diener & Emmons, 1984; Headey et al., 1993). Conversely, negative affect reflects an overall dimension of subjective malaise, which includes different aversive emotional states such as sadness, anxiety, anger, or guilt (Bradburn, 2015; Lucas et al., 1996; Watson et al., 1988).

Furthermore, it may be considered that both positive affect and negative affect are extremes of the same dimension, indicating that they should be formulated as independent constructs (Bradburn, 2015; Diener & Emmons, 1984; Robles & Páez, 2003). The reason for this distinction is that both variables are affected by different factors (Bradburn, 1969; Headey et al., 1993). For example, the chance to enjoy the culture and the arts could increase positive affect, while the lack of access to these opportunities does not necessarily lead to experiencing negative affect; similarly, the absence of violence does not directly effect experiencing positive affect (Sirgy, 2012).



The Affect Balance Scale (ABS; Bradburn, 1969) was developed to evaluate affective experiences through ten items, five of which measure positive emotional experiences while the other five assess negative affective experiences. According to Bradburn (2015), the particular content of an experience is not as relevant as a "pleasant or unpleasant" characteristic. Thus, the questions are presented in general terms (e.g., "Did you feel satisfied with having accomplished something?") instead of specifying the "something" that may occur. Likewise, it is worth noting that the questions refer to affect experienced over recent weeks and not to affective experiences in general. This insight is due to researching the states of affect in a comprehensive manner that could, in reality, measure long-term personality tendencies or dispositions. The applied technique is interested in exploring ongoing environmental situations that impact emotional states (Bradburn, 2015).

The scale has been implemented in over 38 countries (Macintosh, 1998) including Canada (Helmes et al., 2010; Maitland et al., 2001; Mcdowell & Praught, 1982), England (Harding, 1982; van Schuur & Kruijtbosch, 1995), Holland (Kempen, 1992), Poland (Żemojtel-Piotrowska et al., 2013), and the United States (Moriwaki, 1974), among others. The scale is designed for different ages, ranging from adolescents (Żemojtel-Piotrowska et al., 2013) to elderly adults (Himmelfarb & Murrell, 1983; Kempen, 1992; Liang, 1985; Moriwaki, 1974). As the original author suggested, the confirmatory analyses support the two-dimensional factorial structure ($CFI > .96$; $RMSEA < .06$) (Helmes et al., 2010; Kim & Mueller, 2001). Although it has been suggested that these findings may be explained as the result of a statistical artifact (Cherlin & Reeder, 1975), there is a consensus that positive and negative affect should be implemented as separate constructs (Bradburn, 2015; Diener et al., 2009).

The Affect Balance Scale has been widely related to many psychological variables, as strong positive associations were found between positive and negative affect and different psychological constructs such as satisfaction with life (Górnik-Durose, & Pyszkowska, 2020; Prapas & Mavreas, 2019; Sirois & Hirsch, 2015), or personality traits (Burnham et al., 2018; González-Gutiérrez et al., 2005; You et al., 2018), among diverse cultural contexts in China (You et al., 2018), Germany (Sirois & Hirsch, 2015), Greece (Prapas & Mavreas, 2019), Polonia (Górnik-Durose, & Pyszkowska, 2020), United States (Burnham et al., 2018) or Spain (González-Gutiérrez et al., 2005).

Even though similar scales have been profiled in the literature (Diener et al., 1995; Watson et al., 1988), the Affect Balance Scale is the oldest and one of the most common instruments used to measure affect (Antony & Barlow, 2020; Bradburn, 2015). One of the main differences of the technique lies in the fact that while adjective-based measures such as

Positive and Negative Affect Schedule (Watson et al., 1988) refer to affect using adjectives, the items of the Affect Balance Scale questionnaire, of greater length, allow a wider range of aspects linked to positive and negative emotional experiences to be reflected.

Method

Participants

Participants were 2,241 individuals (Men = 23.7%; Women = 76.3%) within the Autonomous City of Buenos Aires (CABA), Argentina, with ages ranging from 18 to 89 years ($M = 37.53$; $SD = 14.80$). A convenience sampling was applied. Subjects between 18 and 90 years old living in Buenos Aires were used as inclusion criteria. Subjects who were undergoing psychological or psychiatric treatment at the time of administration were excluded.

Measures

Affect Balance Scale. The Affect Balance Scale (ABS; Bradburn, 1969) is a 10-item self-administered questionnaire that measures both positive ("Have you felt very happy?") and negative (e.g., "Have you felt like crying?") affective experiences. The items have a Likert response format with four response anchors being 0 = never and 4 = very frequently. For the Spanish adaptation, the international methodological standards suggested by the International Test Commission (ITC) were implemented (Muñiz et al., 2013; Muñiz & Hambleton, 2000).

Mini International Personality Item Pool. The Mini-International Personality Item Pool (Mini-IPIP; Donnellan et al., 2006) is a 20 item self-administered questionnaire that measures five personality factors: Openness to Experience (e.g., "Do not have a good imagination."), Conscientiousness (e.g., "Often forget to put things back in their proper place"), Extraversion (e.g., "Talk to a lot of different people at parties."), Agreeableness (e.g., "Sympathize with others' feelings") and Neuroticism (e.g., "Get upset easily."). The items use a Likert response format with five response anchors being 1 = Completely disagree, and 5 = Completely agree. An Argentinian adaptation of the Mini-IPIP (Simkin et al., 2020) was applied, which reported adequate internal consistency ($.77 \leq \omega \leq .88$) and fit statistics [CFI = 0.927, RMSEA = 0.061, and CI (0.58, 0.55)]. In the current sample, MINI IPIP has shown adequate internal consistency for Openness ($\omega = 0.85$; $\alpha = .85$), Conscientiousness ($\omega = 0.75$; $\alpha = .74$), Extraversion ($\omega = 0.67$; $\alpha = .65$), agreeableness ($\omega = 0.69$; $\alpha = .68$), Neuroticism ($\omega = 0.64$; $\alpha = .66$), and fit statistics [CFI = 0.91, RMSEA = 0.059 and CI (0.55, 0.62), SRMR = 0.059].



Satisfaction with Life Scale. Satisfaction with Life Scale (SWLS; Diener et al., 1985) is a 5-item self-administered questionnaire that measures satisfaction with life (e.g., "In most ways my life is close to my ideal"). The items use a Likert response format with seven response anchors being 1 = Completely disagree, and 7 = Completely agree. An Argentinian adaptation of the SWLS (Moyano et al., 2013) was implemented, which reported adequate internal consistency ($\alpha = .75$). In the current sample, SWLS has shown adequate internal consistency ($\omega = 0.87$; $\alpha = .87$) and fit statistics [CFI = 0.99, RMSEA= 0.048 and CI (0.02, 0.06), SRMR= 0,02].

Procedure

Following the literature, a questionnaire was administered through an online social media platform (Iannelli et al., 2018; Kosinski et al., 2015) within Argentinians between the ages of 18 and 90 years old, of both genders. The subjects participated voluntarily. Written consent was obtained from participants who completed the survey. Participants were informed that the data derived from this research would be used exclusively for scientific purposes under the national personal and data privacy law (25.326).

Data analysis

The model was tested through confirmatory factor analysis. To estimate the independence of the results and the robustness of the model, it was decided to rely on different estimation methods, such as diagonally weighted least squares (DWLS), unweighted least squares (ULS), and robust maximum likelihood (RML), considering that each of them is robust to different conditions (e.g. sample size, number of items, number of latent variables) (Yang-Wallentin et al., 2010). The model was tested based on the goodness of fit indexes GFI (Goodness of Fit Index), NNFI (Non-Normed Fit Index), NFI (Normed Fit Index), CFI (Comparative Fit Index), RMSEA (Root Mean Square Error of Approximation), and SRMR as recommended by the literature (Holgado-Tello et al., 2009; Kline, 2005, 2010; Schumacker & Lomax, 2004). Cross-validation using gender as a segmentation variable was performed to confirm the initial analysis relying on the diagonally weighted least squares (DWLS) as an estimation method.

Lastly, the sample was segmented according to gender to perform a factor invariance analysis, applying different levels of restriction. A configurable model (without restrictions) was tested first, then a metric model (restricting the factor loadings of the items), and, finally, a structural model (restricting covariances). Internal consistency was then estimated from different coefficients such as ordinal alpha, omega, H (Hammer, 2016; McDonald, 1999; Zumbo et al., 2007). Finally, following previous studies (Burnham et al., 2018; Górnik-Durose,

& Pyszkowska, 2020; You et al., 2018), the ABS was correlated to Personality Traits and Satisfaction with Life in order to assess its external validity. SPSS 20 and LISREL 8.8 programs were used to perform the statistical analysis of the data.

Results

The two-dimensional model was tested using a confirmatory factor analysis (see Figure 1).

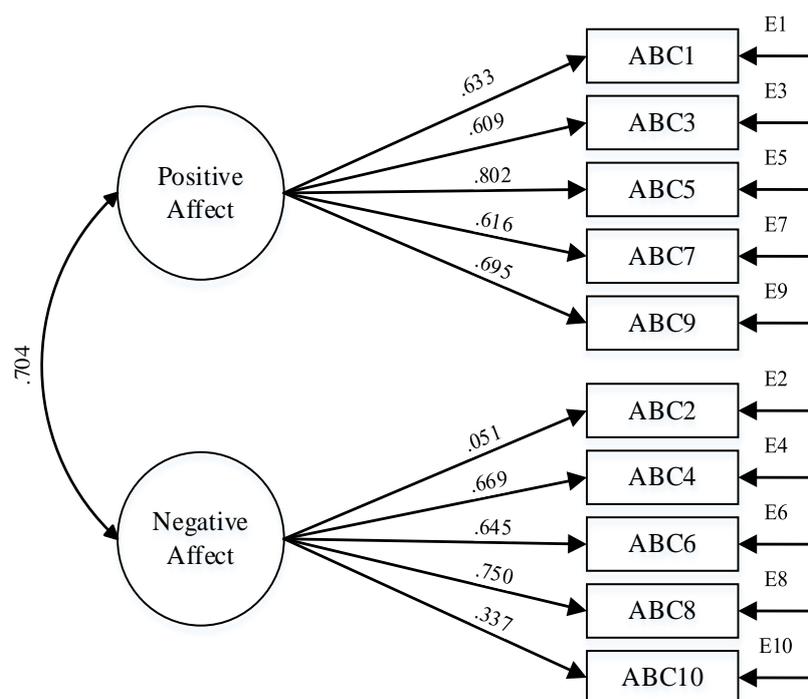


Figure 1. Structural model of the Affect Balance Scale (ABS)

An adequate adjustment of the empirical data was verified (see Table 1).

Table 1.
Confirmatory Factor Analysis of the ABS

	Fit Index						
	NFI	NNFI	CFI	GFI	AGFI	RMSEA [IC]	SRMR
MLR	.968	.962	.971	.949	.918	.064 [.057-.070]	.048
DWLS	.967	.960	.970	.985	.975	.065 [.059-.071]	.059
ULS	.967	.960	.970	.980	.968	.065 [.059-.071]	.059

Note. Bidimensional model

A cross-validation using gender as a segmentation variable was performed with both samples of women and men (see Table 2).

Table 2.
Cross-Validation Analysis of the ABS

	Fit Index						
	NFI	NNFI	CFI	GFI	AGFI	RMSEA [IC]	SRMR
Women	.972	.968	.976	.987	.979	.060 [.053-.068]	.056
Men	.935	.935	.951	.972	.955	.074 [.061-.088]	.075

Note. Bidimensional model

Subsequently, the factor invariance of the model was tested. The sample was segmented according to gender. Three models (configural, metric, and structural) were tested with different levels of restriction. The results verified the factor equivalence of the model between the two analyzed samples (see Table 3).

Table 3.
Factorial invariance of ABS

Model	S-B	gl	Δ S-B	p	RMSEA [IC 90%]	ΔRMSEA	CFI	Δ CFI
Configural	380.039	68	-	-	.064 [.057-.070]	-	.972	-
Metric	400.135	76	8.115	.422	.061 [.055-.067]	.003	.970	.002
Structural	415.062	79	17.587	.091	.061 [.055-.067]	.003	.969	.003

Internal consistency of the dimensions were further estimated. For this, different indices were applied (ordinal alpha, omega, H) (see Table 4).

Table 4.
Ordinal Alpha, Omega, H of ABS

	Ordinal Alpha	Omega	H
Positive Affect	.802	.805	.820
Negative Affect	.590	.635	.750

Finally, the ABS was correlated to Personality Traits and Satisfaction with Life to explore its external validity (see Table 5).

Table 5.
Correlations between Personality, Satisfaction with Life and Affect Balance

	O	E	C	A	N	SWL	PA	NA
Openness	1							
Extraversion	.135**	1						
Conscientiousness	-.007	-.046*	1					
Agreeableness	.230**	.190**	.065**	1				
Neuroticism	-.132**	-.100**	-.126**	-.054*	1			
Satisfaction with Life	.132**	.187**	.141**	.180**	-.359**	1		
Positive Affect	.155**	.248**	.137**	.163**	-.345**	.555**	1	
Negative Affect	-.148**	-.115**	-.163**	-.161**	.531**	-.430**	-.375**	1

Note. **O**= Openness; **E**= Extraversion; **C**= Conscientiousness; **A**= Agreeableness; **N**= Neuroticism; **SWL**= Satisfaction with Life; **PA**= Positive Affect; **NA**= Negative Affect

Discussion

The current study analyzes the internal structure of the Affect Balance Scale (ABS; Bradburn, 1969). The Argentinian version of the ABS replicated a two-factor structure with adequate psychometric properties. The scale presents ten items similar to the original items presented by its creator. Furthermore, the correlation of all of the items with their factors was adequate in the majority of the cases. Although items with a correlation below .3 were observed, which may indicate their elimination (e.g., "Were you so restless that you could not remain seated?"), it was decided to maintain them to discern their theoretical relevance. By applying Confirmatory Factor Analysis (CFA), it was possible to prove that ABS has presented an adequate adjustment to the data obtained in the population studied, in a similar manner to what has been reported in other contexts (Godoy-Izquierdo et al., 2008).

The bifactorial model was implemented using a confirmatory factor analysis based on the estimation of matrices of polychoric correlations and the RML, DWLS, and ULS methods, following the suggestions for the treatment of ordinal variables (Kořar & Yilmaz-Kořar, 2015). It should be noted that the use of each estimation method responds to sample characteristics and specific data (distribution and sample size, number of observable and latent variables, number of parameters to be estimated, among others). It is for this reason that it was decided to determine the model with each of these methods to prove its independence from such conditions. The results of this analysis register an adequate adjustment of the model for the three types of methods used. This finding verifies the robustness of the internal structure of the instrument. Cross-validation using gender as a segmentation variable also confirmed these initial analyses.

Furthermore, the factor invariance of the model was studied by comparing the sample between men and women. A model was tested to which different levels of restriction were applied progressively. The results confirm the invariance of the structure tested since no significant differences between the Satorra-Bentles indices ($p > .01$) are verified. There are also no differences in the RMSEA ($< .015$) and CFI ($< .01$) indices (Davidov et al., 2018).

Cross validation analysis.

These results suggested both groups are equivalent in terms of the factor structure under analysis. This procedure yields evidence in favor of the generalization of the model (Dimitrov, 2010).

Regarding the analysis of internal consistency, adequate values are observed in all indices in both dimensions, considering the number of items that make up each of factors. The values obtained in both dimensions are appropriate since this indicates that the content of the items is diverse and is not repeated (Kline, 1979). This result constitutes a positive feature of the instrument since its items seem to cover different aspects of the construct that it operationalizes.

Lastly, through bivariate correlations, ABS's validity was evident, as each of the subscales was correlated to Personality and Satisfaction with Life measures with similar results as reported in the literature (Burnham et al., 2018; Górnik-Durose, & Pyszkowska, 2020; You et al., 2018). The study contributed to having valid and reliable tools for the evaluation of positive and negative affect in the local context. This study may be utilized to favor the identification of the factors which affect the perception of subjective well-being in Spanish speaking populations, thus expanding upon the singularity of its expression in the local context (Castro-Solano, 2014; Suh et al., 1998).

Limitations and further implications

The current study presents several limitations that are noted below.

Firstly, we have worked with a sample made up of subjects residing in the Autonomous City of Buenos Aires - implying difficulty in generalizing the entire country's population into this one study. Continued analysis of the instrument's psychometric properties will be required within more heterogeneous samples that include individuals from other provinces within Argentina.

Secondly, the factorial invariance between different age groups and provinces of Argentina was not analyzed. Further analysis will be carried out in future studies to increase evidence favorable to the construct's generalization.

Thirdly, the scores' temporal stability has not been analyzed, which could monitor those evaluated on the state of their affective balance.

Fourthly, the response bias related to social desirability has not been controlled and will be considered in future studies, including an instrument in the battery that enables its measurement. Fifth and lastly, this study has not designed statistical norms. This will be addressed in the short term to facilitate the interpretation of the results for clinicians who wish to apply the instrument.

Undoubtedly addressing all these limitations will contribute to improving the quality of the instrument analyzed here.

Conclusions

This study analyzes ABS's psychometric properties, verifying from the results obtained that the theoretical model proposed by Bradburn has been replicated within an Argentinian context. The evidence presented in this work contributes to the model's generalization while it makes a tool available to clinicians at the local level and allows evaluating the affective balance in the Argentine population. This measure is expected to contribute to exploring both affective balance and subjective well-being in the local context.

Ethical Approval

This study has been approved by the University of Buenos Aires Ethics Committee and following the Declaration of Helsinki, the Code of Ethics established by the National Council for Scientific and Technical Research (CONICET) (Res. D No. 2857/06), and Argentina's National Law 25,326.

Funding

This study was conducted within UBACyT 20020170200395BA and PICT-2016-4147, funded by the University of Buenos Aires and the National Agency for Scientific and Technological Promotion (ANPCyT).

Other Support/Acknowledgement

We would like to acknowledge Norman Bradburn (University of Chicago) for his advice, support, and guidance in the adaptation and validation of this study and thank the participants involved in the study.

Competing Interests

The authors have declared that no competing interests exist.

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Appendix

Affect Balance Scale Items adapted into Argentine context

Spanish	English	Nunca	Poco frecuentemente	Frecuentemente	Muy frecuentemente
1. ¿Particularmente interesado/a o estimulado/a por algo?*	1. Particularly excited or interested in something?*	0	1	2	3
2. ¿Tan inquieto/a que no podía quedarse sentado/a?*	2. So restless that you couldn't sit still?*	0	1	2	3
3. ¿Orgulloso/a porque alguien le felicitó por algo que hizo?*	3. Proud because someone complimented you on something you had done?*	0	1	2	3
4. ¿Muy solo/a o distante de otras personas?*	4. Very lonely or remote from other people?*	0	1	2	3
5. ¿Satisfecho/a de haber logrado algo?*	5. Pleased about having accomplished something?*	0	1	2	3
6. ¿Aburrido/a?*	6. Bored?*	0	1	2	3
7. ¿En la cima del mundo?*	7. On top of the world?*	0	1	2	3
8. ¿Deprimido/a o muy infeliz?*	8. Depressed or very unhappy?*	0	1	2	3
9. ¿Que las cosas iban como usted quería?*	9. That things were going your way?*	0	1	2	3
10. ¿Molesto/a porque alguien le criticó?*	10. Upset because someone criticized you?*	0	1	2	3

* Positive affect ** Negative affect



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