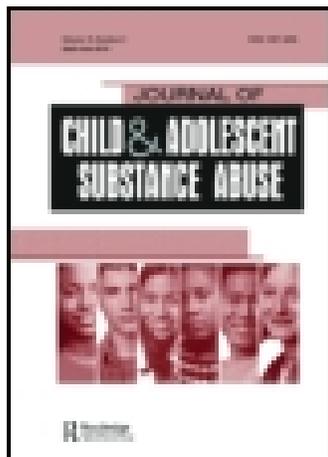


This article was downloaded by: [24.232.162.43]

On: 30 April 2015, At: 19:52

Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Journal of Child & Adolescent Substance Abuse

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/wcas20>

Psychometric Properties of the Alcohol Expectancy Scale in Argentinean Adolescents Applying the Rating Scale Analysis

Angelina Pilatti^a, Juan Carlos Godoy^a, Óscar Lozano^b & Silvina Brussino^a

^a Universidad Nacional de Córdoba, Córdoba, Argentina

^b University of Huelva, Huelva, Spain

Published online: 30 Apr 2015.



CrossMark

[Click for updates](#)

To cite this article: Angelina Pilatti, Juan Carlos Godoy, Óscar Lozano & Silvina Brussino (2015): Psychometric Properties of the Alcohol Expectancy Scale in Argentinean Adolescents Applying the Rating Scale Analysis, Journal of Child & Adolescent Substance Abuse, DOI: [10.1080/1067828X.2013.829009](https://doi.org/10.1080/1067828X.2013.829009)

To link to this article: <http://dx.doi.org/10.1080/1067828X.2013.829009>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms & Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

Psychometric Properties of the Alcohol Expectancy Scale in Argentinean Adolescents Applying the Rating Scale Analysis

Angelina Pilatti and Juan Carlos Godoy

Universidad Nacional de Córdoba, Córdoba, Argentina

Óscar Lozano

University of Huelva, Huelva, Spain

Silvina Brussino

Universidad Nacional de Córdoba, Córdoba, Argentina

The goal of this study was to analyze the psychometric properties of the Alcohol Expectancy Scale (AES-AA) applying item response theory. Data were obtained from 592 adolescents enrolled in private and public schools of the city of Córdoba (Argentina). This psychometric study was carried out with the Rating Scale Model (RSM), a polytomous Rasch model. Out of the 45 items that make up the scale, 42 items had adequate fit indexes, explaining 91.3% of the adolescents' response patterns. The estimation error of the parameters was low, indicating adequate precision of the items. In general, the participants' scores fell within the range of the continuum where the test is most precise. Adolescents' least frequent expectancies about alcohol consumption were related to sexual behavior (positive expectancies), whereas their most frequent expectancies corresponded both with the Sociability Scale (positive expectancies) and to the Cognitive and Behavioral Impairment Scale (negative expectancies). Implications for preventive programs are discussed.

Keywords: adolescent, alcohol expectancy, item response theory

INTRODUCTION

Adolescent alcohol consumption represents one of the main problems in public health. Data from the Monitoring the Future survey indicated that 72% of all 17-year-old adolescents have consumed alcohol at some time (Johnston, O'Malley, Bachman, & Schulenberg, 2010), and approximately 20% drank more than 5 standard drinks during the 2 previous weeks (Johnston, O'Malley, Bachman, & Schulenberg, 2011). Data from epidemiological studies in

Argentina showed that 60% of adolescents drink alcohol and that 25% drink intensively (Secretariat for the Prevention of Drug Abuse and Drug Trafficking [Secretaría de Programación para la Prevención de la Drogadicción y la Lucha contra el Narcotráfico (SEDRONAR)], 2011). This prevalence is similar to that reported in other studies carried out in Argentina (Alderete & Bianchini, 2008; Pilatti, Godoy, & Brussino, 2011), Brazil (Galduróz & Carlini, 2007), and Mexico (Rojas-Guiot, Fleiz-Bautista, Medina-Mora, Morón, & Domenech-Rodríguez, 1999).

Alcohol consumption at these ages has been shown to be a predictor of the onset of problems of abuse and dependence in adulthood (DeWit, Adlaf, Offord, & Ogborne, 2000). Alcohol abuse and dependence are defined by the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association [APA], 1994)* as a maladaptive pattern of alcohol use, leading to clinically

Address correspondence to Óscar Lozano, University of Huelva, Clinical, Experimental and Social Psychology, Campus El Carmen. Facultad de Ciencias de la Educación, Avda. Fuerzas Armadas, s/n., Huelva 21071, Spain. E-mail: oscar.lozano@dpsi.uhu.es

Color versions of one or more of the figures in the article can be found online at www.tandfonline.com/wcas

significant impairment or distress, manifested by recurrent use of alcohol despite a persistent or recurrent social, occupational, psychological, or physical problem that is caused or exacerbated by alcohol use. To be classified with alcohol abuse, respondents had to report the occurrence of at least one symptom of any of the four *DSM-IV* abuse criteria. To be classified with alcohol dependence, respondents had to report symptoms of at least three of the seven *DSM-IV* dependence criteria (APA, 1994). Moreover, the World Health Organization (WHO) has reported that 9% of the deaths of youths between 15 and 29 years of age are caused by intensive alcohol consumption (WHO, 2009, 2010). Risk factors for alcohol use and abuse include personality traits (McCarthy, Kroll, & Smith, 2001; Urbán, Kökönyei, & Demetrovics, 2008), rearing style (Windle et al., 2008), having peers or parents who drink alcohol (Martino, Collins, Ellickson, Schell, & McCaffrey, 2006), and a combination of high positive alcohol expectancies and low negative alcohol expectancies (Cameron, Stritzke, & Durkin, 2003; Randolph, Gerend, & Miller, 2006).

Alcohol expectancies fall within the framework of the socio-cognitive theory (Bandura, 1986) and they refer to the beliefs about the effects that alcohol has on behavior, mood, and emotions (Goldman, Brown, Christiansen, & Smith, 1991; Leigh, 1999). According to this theory, alcohol expectancies are considered proximal factors with a direct influence on alcohol consumption. Moreover, alcohol expectancies are regarded as the link between social and biological-genetic variables (Goldman et al., 1991; Smith & Goldman, 1994). Thus, early learning experiences (Martino et al., 2006) combined with biological-genetic factors (Smith & Anderson, 2001) constitute early influences on subsequent behaviors.

Adolescents have been reported to hold both positive and negative alcohol expectancies (Randolph et al., 2006; Stein et al., 2006). Positive alcohol expectancies are related to the initiation, maintenance, and escalation of drinking (Mackintosh, Earleywine, & Dunn, 2006; Randolph et al., 2006). More specifically, it has been suggested that positive expectancies have greater weight at early stages of alcohol consumption (Aas, Leigh, Andersen, & Jakobsen, 1998; Tush & Wiers, 2007), which generally occurs during adolescence. Negative alcohol expectancies are important for stopping or delaying drinking (Oei & Jardim, 2007; Urbán et al., 2008). From this viewpoint, adolescents will consume alcohol because they expect to obtain certain positive effects (e.g., social enhancement or tension reduction), and they will not consume, or reduce their alcohol intake, because of the expectations obtain certain negative effects (e.g., cognitive or motor impairment, aggression, or depression). Therefore, both positive and negative expectancies about alcohol should be dealt with in preventive campaigns.

Research indicates that alcohol expectancies can be modified with specific interventions (Cruz & Dunn, 2003; Lau-Barraco & Dunn, 2008). The expectancy challenge, a

procedure that focuses on confronting the pharmacological effects of alcohol with the observed behavioral effects, has been successfully applied to reduce alcohol use (Darkes & Goldman, 1998; Lau-Barraco & Dunn, 2008).

The Alcohol Expectancy Questionnaire-Adolescent Form (AEQ-A; Brown, Christiansen, & Goldman, 1987) and the Comprehensive Effects of Alcohol (CEOA; Fromme, Stroot, & Kaplan, 1993) are the two most widely used instruments to measure alcohol expectancies. Short versions of the AEQ (Randolph et al., 2006; Rönnback, Ahllund, & Lindman, 1999; Stein et al., 2006; Vik, Carello, & Nathan, 1999) and the CEOA (Ham, Stewart, Norton, & Hope, 2005; Valdivia & Stewart, 2005) emerged, mainly for use by clinicians during brief interventions. It is recommended, however, to employ the original long versions for academic research (Stein et al., 2006). There are Spanish versions of both questionnaires, AEQ and CEOA, adapted to the adult and adolescent populations of Mexico (Mora-Ríos, Natera, Villatoro, & Villavalzo, 2000), Colombia (Herrán & Ardila, 2007), Peru (Perez-Aranibar, Van den Broucke, & Fontaine, 2005), and Argentina (Pilatti & Cassola, 2005; Pilatti, Cassola, Godoy, & Brussino, 2005).

Results regarding dimensions of alcohol expectancies have not been conclusive. Some studies were not able to find the dimensions proposed in the original versions of the AEQ (Herrán & Ardila, 2007; Perez-Aranibar et al., 2005; Pilatti & Cassola, 2005; Randolph et al., 2006; Rönnback et al., 1999; Stein et al., 2006; Vik, Carello, & Nathan, 1999) and the CEOA (Ham et al., 2005; Pilatti et al., 2005). This may be due to methodological, social, and cultural differences (Herrán & Ardila, 2007; Pérez-Aranibar, Van den Broucke, & Fontaine, 2005; Vélez-Blasini, 1997). Specifically, some studies employed the complete set of items (Rönnback et al., 1999) while others analyzed the factor structure underlying a shorter number of items (Randolph et al., 2006; Stein et al., 2006). Moreover, samples differed in sociodemographic characteristics and alcohol use across the studies. Specificity and complexity of alcohol expectancies significantly increases when patterns of alcohol intake are established, and therefore, children and adolescents are faced with a variety of new consequences that extend and modify their repertory of anticipated effects (Leigh & Stacy, 2004; Randolph et al., 2006).

Within this framework, and considering the difficulties found with the adaptations of the AEQ and the CEOA, a new measurement instrument of alcohol expectancies in adolescents was developed—the Alcohol Expectancy Scale for Argentinean Adolescents (AES-AA). The AES-AA is based on the operational definition of the CEOA (behavioral impairment, risk and aggression, self-perception [negative factors], sociability, liquid courage, and sex [positive factors]), but items have been developed specifically for Argentine adolescents. The AES-AA has shown adequate psychometric properties and there is evidence of validity (Pilatti, Godoy, & Brussino, 2010, 2012).

Application of item response theory (IRT) is becoming increasingly frequent within the health sphere (Bezruczko, 2005). However, as with the CEOA, the psychometric studies conducted with the AES-AA were carried out from the perspective of the classical test theory (CTT). IRT comprehends a series of psychometric models that allow determining the response probability of an item as a function of the subject's level in the construct being measured and of the difficulty of the items. Its diffusion in the health sphere is promoted due to its advantages versus the CTT. Probably, the most important advantage is invariance of parameter estimates. IRT models estimate both item and person parameters with the same model, offer person-free item parameter estimation and item-free person's measure estimation, and provide an optimal scaling of individual differences. Another advantage is that in IRT each person and each item has its own standard error of estimate (SEE). In contrast with CTT, this property provides more information about how the variable is being measured by the test. Also, it is useful to write more items, and to select the best items to develop new instruments or short forms. Another important advantage is that items and persons are measured on an interval scale. This allows applying statistical procedures not available with CTT, in which obtained data are ordinal (Embretson & Reise, 2000; Rupp & Zumbo, 2006).

The present study has the following goals: (a) to determine the psychometric properties of the AES-AA applying a polytomic model of IRT, and (b) to provide evidence of the validity of the construct alcohol expectancies through the map of persons and items.

METHOD

Participants

The sample was comprised of adolescents, defined as aged from 13 to 18 years, who were enrolled in public and private high schools in Córdoba. According to the 2010 National Census, Córdoba is the second largest city in Argentina, with 1,329,694 citizens, 130,816 of whom are adolescents. Schools and classrooms were selected based on accessibility. Only adolescents whose parents provided written consent participated in the study. Adolescents were told the study was aimed at describing their beliefs and customs regarding alcohol use. They were informed that participation was voluntary and that they could refuse to participate or quit at any time without any negative consequences.

Under the assumption of random sampling, the necessary sample size was 598 adolescents, considering the adolescent population of this city, a ± 4 , error margin, a 95% confidence interval, and a $p = q$ distribution. A total of 645 questionnaires were administered, of which 53 were eliminated because the respondents did not complete at least

95% of the questionnaire, so the analyses of the present study were carried out with the data of 592 adolescents.

Of the sample, 59% were female. Mean age was 15.01 ($SD = 1.5$) years, and there were no statistically significant age differences as a function of gender: 38.3% were between 13 and 14 years old, 44% were between 15 and 16 years, and 17.7% were between 17 and 18 years of age.

Instrument

The design of the AES-AA was based on the operational definition of the CEOA. To obtain the information to construct the items addressing the expected effects of alcohol consumption, in a previous study (Pilatti et al., 2010), we administered an open questionnaire to a sample of 212 adolescents. Adolescents were asked the following question to determine the effects they expected from drinking alcohol: How do you feel when you drink alcohol? On the basis of this information, and following psychometric standards, the research team wrote a set of 165 items. Three experts in test construction and studies of alcohol assessed the items in terms of item objective congruence (Rovinelli & Hambleton, 1977), selecting a total of 70 items. Subsequently, this set of items was administered to a different sample of 275 adolescents for psychometric assessment, and reduced to the 45 items that make up the AES-AA. More information about the development and construction of the AES-AA can be found in Pilatti and colleagues (2010) and in Pilatti and colleagues (2012).

The 45 items of the AES-AA are grouped into six scales that assess expectancies about the positive (sociability, relaxation, increase of sexuality) and negative effects (cognitive and behavioral deterioration, risk and aggressiveness, perception of negative moods) of alcohol consumption. The items are rated on a 5-point frequency response format (1 = never, 2 = not very often, 3 = sometimes, 4 = often, 5 = always).

Procedure

First, a member of the research team contacted the headmaster of the school. The headmaster was informed of the goals of the study, its anonymous nature, and any doubts about it were clarified. After the school had authorized the administration of the questionnaires, the parents were informed about the study. They were requested to sign an informed consent form before the students completed the questionnaire. The questionnaire was administered collectively in the classrooms by a trained researcher during the course of a regular school day. No personal information was requested. The teachers were not present during the administration. The administration lasted approximately 45 minutes. All participants were recruited and surveyed in a similar manner.

Analysis

The IRT model applied was the Rating Scale Model (RSM). This model belongs to the Rasch models (Rasch, 1960), and it is an extension of the dichotomic model for polytomically scored items. According to the model, the probability of a person's response to an item is expressed in the following equation (Wright & Masters, 1982):

$$P_{nix} = \frac{\sum_{j=1}^k (\beta_n - (\delta_i + \tau_j))}{1 + \sum_{k=1}^m \exp \sum_{j=1}^k (\beta_n - (\delta_i + \tau_j))}$$

$x = 1, 2, 3 \dots m$

where β_n is the person's location or scale value n , δ_i is the location or scale value of the item i , and τ_j is the category threshold parameter, representing the locations of step m relative to the scale value of the item. In this model, the only difference between items is due to their different location (δ_i) on the one-dimensional continuum of the variable being measured (Masters, 1980). The values of τ_j should remain constant across all the items of the scale, and it is assumed that they only depend on the proposed response categories (Wright & Masters, 1982).

When Rasch models are used, before interpreting the results, the first step is to verify the fit of the data to the model. This analysis will determine the extent to which the empirically obtained data match the prediction of the model. This analysis is normally carried out through the mean square residual—Mnsq—and the standardized mean square residual—Zstd. The analysis of residuals is performed with two indexes: the INFIT and the OUTFIT. INFIT is an internal fit index assessing the fit with regard to proximal parameters, whereas OUTFIT is an external fit index assessing the fit with regard to distal parameters. Following Wright and Linacre (1994), values of Mnsq between 0.6 and 1.4 indicate acceptable fit. For the Zstd, fit is considered adequate when the values are between -2.0 and $+2.0$.

The values provided by this model are expressed in a logit scale, which is a logistic transformation of the observed scores, with a mean of 0 and standard deviation of 1.

RESULTS

Fit Analysis

The verification of the global fit of the data showed adequate indexes for persons and items (Table 1). The detailed analysis of persons showed that 91.3% of the adolescents' response patterns matched the predictions of the model. Of the 45 items that make up the scale, only 3 items (Items 1, 7, and 26) had inadequate fit indexes. As seen in Table 1, in these three items, the values of the fit indexes exceeded the established limit, which indicates that the

observed response patterns are unpredictable. This happens because the model predicted that adolescents with higher levels of alcohol expectancies would have high scores, and adolescents with lower levels of alcohol expectancies would have low scores. However, adolescents with high and adolescents with low levels of alcohol expectancies have similar answers in those three items.

Category Probability Curve

The lower part of Table 1 shows the values of the threshold parameters for each response category. The threshold parameter corresponding to the categories *not very often* and *sometimes* was lower than that observed between *never* and *sometimes*. This means that the threshold parameters of these categories are disordered. Their impact on the Category Probability Curve can be seen in Figure 1. On the ordinate axis, the *not very often* category was not the most probable in any segment of the continuum (abscissa axis) and it fell below the curves of the other response categories.

Item Map

The map of persons and items shows their distribution on the continuum of expectancies about alcohol (Figure 2). On the one hand, most of the items were located in a central position with regard to the adolescents being assessed. Moreover, considering the position of the items corresponding to the response categories 1 (never) and 5 (always), the items were adequately distributed on the continuum. Only 2.8% of the adolescents had scores lower than the scale value of the items corresponding to the lowest response category.

With regard to the content measured by the items, adolescents' least frequent expectancies about alcohol consumption were related to sexual behavior (positive expectancies): among the six items with higher scale values were four items that belong to this dimension. In contrast, on the lower part of the continuum, among the 10 items with a lower scale value were 7 items that correspond to the sociability scale (positive expectancies) and 3 items that belong to the cognitive and behavioral deterioration dimension (negative expectancies).

Information Function and Invariance

The information function shows that the highest precision of the test was found in the intermediate values (Figure 3). The mean error of the item parameter was 0.04 logits. The separation index value was 7.55 and item reliability was .98.

With regard to the precision with which the adolescents are measured, 7.6% fell within the range of scores between $-\infty$ and -1.5 logits, and this corresponded to a mean estimation error of 0.87 logits. And 24.7% fell within the range

TABLE 1
Fit Indexes of the Model and the Items

		<i>Measure</i>	<i>Error</i>	<i>INFIT</i>		<i>OUTFIT</i>	
				<i>Mnsq</i>	<i>Zstd</i>	<i>Mnsq</i>	<i>Zstd</i>
Persons	Mean	-0.34	0.15	1.03	-0.1	1.03	-0.1
	<i>SD</i>	0.69	0.08	0.53	1.0	0.52	1.0
	Max	1.39	0.99	3.53	2.7	3.86	2.8
	Min	-4.06	0.12	0.1	-3.0	0.11	-3.0
Items	Mean	0.0	0.04	1.01	0.0	1.03	0.1
	<i>SD</i>	0.29	0.0	0.15	1.0	0.21	1.0
	Max	0.49	0.04	1.44	2.7	1.69	3.2
	Min	-0.6	0.04	0.79	-1.6	0.77	-1.3
Items	i1. Have fun at parties	-0.24	0.04	1.37	2.4	1.69	3.2
	i2. Be cheerful	-0.12	0.04	1.19	1.3	1.32	1.6
	i3. Amusing	-0.08	0.04	1.16	1.1	1.2	1.0
	i4. Slow responses	0.07	0.04	0.96	-0.3	0.98	-0.1
	i5. Bother others	0.05	0.04	1.01	0.1	0.99	0.0
	i6. Talkative	-0.34	0.04	1.0	0.0	1.26	1.4
	i7. Be able to sleep better	0.19	0.04	1.44	2.7	1.45	1.9
	i8. Be calm	0.41	0.04	1.09	0.6	1.09	0.4
	i9. Lack of balance	-0.45	0.04	1.12	0.8	1.16	0.8
	i10. Do funny things	-0.60	0.04	0.85	-1.0	0.82	-1.0
	i11. Calm down if anxious	0.27	0.04	0.99	-0.1	1.04	0.2
	i12. Headache	-0.43	0.04	1.09	0.6	1.18	0.9
	i13. Self-critical	0.30	0.04	0.88	-0.8	0.88	-0.5
	i14. Sexually aroused	0.49	0.04	1.02	0.1	0.95	-0.2
	i15. Easy to talk	-0.27	0.04	0.99	-0.1	1.04	0.2
	i16. Feel relaxed	0.09	0.04	0.97	-0.2	0.97	-0.2
	i17. Sleepy	-0.26	0.04	1.15	1.0	1.25	1.3
	i18. Feel anxious	0.31	0.04	0.94	-0.4	0.98	-0.1
	i19. Easy to talk to the opposite sex	-0.32	0.04	0.89	-0.8	0.86	-0.8
	i20. Aching muscles	0.22	0.04	0.88	-0.8	0.85	-0.8
	i21. Feel confused	-0.12	0.04	0.79	-1.6	0.78	-1.3
	i22. Perform dangerous behaviors	-0.01	0.04	0.96	-0.3	0.97	-0.2
	i23. Guilty about my behavior	0.02	0.04	1.06	0.5	1.12	0.6
	i24. How to relate to others	-0.20	0.04	0.8	-1.5	0.84	-0.9
	i25. Disorganized	-0.21	0.04	0.98	-0.1	0.99	-0.1
	i26. Guilty for having consumed	0.16	0.04	1.29	1.9	1.56	2.4
	i27. Would like to have sex	0.25	0.04	1.2	1.3	1.21	0.9
	i28. Be less shy	-0.46	0.04	0.9	-0.7	0.87	-0.8
	i29. Disoriented	-0.02	0.04	0.82	-1.4	0.81	-1.1
	i30. Be aggressive	0.42	0.04	0.96	-0.2	0.88	-0.5
	i31. Guilty about what I say	0.13	0.04	0.91	-0.6	0.87	-0.7
	i32. Enjoy sex	0.44	0.04	1.17	1.0	1.1	0.4
	i33. Be likeable	-0.29	0.04	1.01	0.1	1.06	0.3
	i34. Say nonsense	-0.49	0.04	0.83	-1.2	0.81	-1.1
	i35. Insulting	0.19	0.04	0.81	-1.4	0.77	-1.2
	i36. Doing things I regret	-0.18	0.04	0.83	-1.3	0.78	-1.3
	i37. Being a better lover	0.39	0.04	1.18	1.1	1.11	0.5
	i38. Being friendly	-0.30	0.04	1.1	0.7	1.12	0.7
	i39. Fighting with people	0.33	0.04	1.02	0.1	0.92	-0.4
	i40. Saying things I regret	-0.12	0.04	0.85	-1.2	0.83	-1.0
	i41. For there to be group companionship	-0.09	0.04	0.96	-0.3	0.97	-0.2
	i42. Argue easily	0.19	0.04	0.85	-1.1	0.78	-1.2
	i43. Ashamed of my behavior	0.14	0.04	1.06	0.4	1.06	0.3
	i44. Seem more sensual	0.34	0.04	0.95	-0.3	0.99	0.0
	i45. Get angry easily	0.22	0.04	1.1	0.7	1.04	0.2
	Threshold parameter			$\tau_1 = -0.18$	$\tau_2 = -0.28$	$\tau_3 = 0.14$	$\tau_4 = 0.32$

of values between -1.49 and -0.05 logits with a mean estimation error of 0.15 logits. Another 63.3% were located between the values of -0.49 and 0.49 logits with a mean

error of 0.121, and 4.4% had scores higher than $+1.5$ logits, with a mean estimation error of 0.145 logits. The separation index was 3.53 and person reliability was .93.

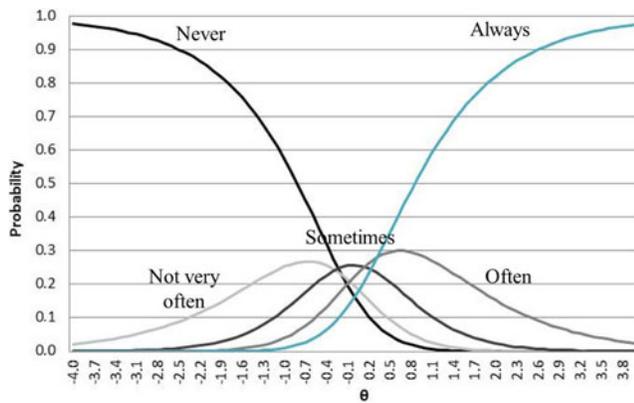


FIGURE 1 Category probability curves.

The study of the invariance of the AES-AA was carried out by randomly dividing the sample into two groups and applying regression analysis. The results showed a value of $r = 0.989$, and the value of the constant was 0.029 and $\beta = 0.998$, so parameter invariance can be assumed.

DISCUSSION

The aim of this study was to determine the psychometric properties of the AES-AA by applying the RSM. Relative to the CTT perspective, IRT models have a number of advantages: invariance of item and persons parameters, empirical testing of the model, items and persons are measured on an interval level, or error in measurement for each person and each item—not for the entire instrument or for all persons globally (Hays, Morales, & Reise, 2000). Moreover, the results obtained by applying these models lead to better comprehension from the viewpoint of the validity of the construct being explored (Baghaei, 2008).

Application of the RSM has allowed us to examine the psychometric properties of the AES-AA in detail. In general, the results have shown the feasibility of this test to measure adolescents' expectancies about alcohol: the fit analysis shows a consistent response structure, the measurement error of the items is low, and item parameters are invariant. These properties are discussed next.

The fit of the data to the model has revealed that most of the adolescents (91.3%) showed agreement with the test items, or at least, it was possible to identify the response patterns that could be predicted by the model. Regarding item analysis, the fit was satisfactory for 42 of the 45 items that make up the AES-AA. The Mnsq values obtained for the three items that did not fit indicate a behavior that is not very predictable by the model (Linacre, 2002b). Examination of the reasons for the lack of fit (Karabastos, 2000) reveals that the discrimination parameters are not different from those of the rest of the items, and they measure contents for which other items have shown adequate fit. Further

studies are needed in order to consider the possibility of not including these items.

The response alternatives are an aspect of the test that should be reviewed. It was noted that the alternative "sometimes" was never the most probable response, independently of the adolescents' level of expectancies. This happens because ordinal numbering of categories does not accord with their substantive meaning (Linacre, 2002a), making more complex the interpretation of patterns of responses. These results led the authors to consider the possibility of choosing a model with four response alternatives. In general, from the CTT perspective, this reduction of the response alternatives would foreseeably lead to lower test reliability due to the reduction of the variability (Maydeu-Olivares, Kramp, García-Forero, Gallardo-Pujol, & Coffman, 2009). However, the results of this study have shown that a better fit of this test to adolescents' discriminative capacity would be achieved. Future studies should consider both options to obtain empirical evidence of the most adequate format.

In terms of precision, it was noted that the estimation error of all the items is relatively low (0.04 logits). Likewise, it was observed that most of the adolescents were located in the section of the alcohol expectancies continuum where the test measures more precisely. With regard to the persons and items reliability indexes, they are both very high, which indicates that the location of persons and items could be reproduced foreseeably (Andrich, 1982).

The analysis of the map of persons and items provided information that might be useful in the design of preventive campaigns. More specifically, alcohol expectancies are susceptible to modification, and as a result, are considered useful factors to target during treatment and interventions focus in preventing and decreasing underage drinking (Randolph et al., 2006). This information on how alcohol expectancies are organized is, therefore, useful to develop interventions focused on changing adolescents' cognitions regarding alcohol effects. For example, the highest scale value was showed for the expectancies related to sexual behavior. In general, this indicates that it is not likely for adolescents to think that alcohol consumption will have a positive impact on their sexual behavior. At the same time, adolescents with higher expectancies that alcohol consumption will affect their sexual behavior were also very likely to obtain high scores in the rest of the expectancies assessed. On the other hand, the most likely expectancies among adolescents were those related to sociability and cognitive and behavioral deterioration.

Several aspects concerning this result deserve further comment. First, in order to improve the efficiency of preventive campaigns targeting adolescents, we should first and foremost deal with their sociability expectancies, in an attempt to reduce them. As we have seen, the second aspect to underline is that adolescents frequently believe that alcohol consumption generates cognitive and behavioral impairment.

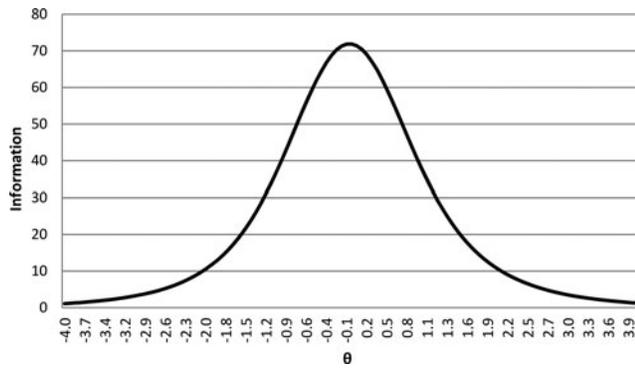


FIGURE 3 Test information function.

(Borsari & Carey, 2001; D'Amico & McCarthy, 2006). Social models of alcohol use emphasize the importance of peers' influences as an important target to reduce excessive alcohol drinking (Borsari & Carey, 2001). This type of intervention includes motivational interviewing to change perceived norms for alcohol drinking. Perceived norms refer to perceptions or misperceptions about what constitutes typical drinking behavior among peers (Borsari & Carey, 2001). Adolescents tend to overestimate peers' alcohol drinking, which may result in the reinforcement and perpetuation of abusive drinking patterns (Borsari & Carey, 2001). Interventions are focused on correcting these misperceptions to reduce alcohol use (Cimini et al., 2009; Labrie, Cail, Pedersen, & Migliuri, 2011; Schulte, Monreal, Kia-Keating, & Brown, 2010).

One of the limitations of this study is the use of a nonprobabilistic sample. This may have affected the estimation of the item parameters. However, as shown herein, item parameters are invariant when they are calculated from two randomly extracted samples of adolescents. Moreover, this limitation is not a determinant factor for the calculation of the item and person parameters when using Rasch models, although this is not the case for other IRT models (Glas, 1989).

From the results presented herein, it is concluded that the AES-AA is an appropriate tool for measuring the expectancies about alcohol in adolescents from the local environment. In this sense, by means of the application of this instrument, valid and reliable information about the construct of expectancies about alcohol can be obtained, which can be employed not only for research but also, as noted earlier, for practical ends to identify adolescents who are more vulnerable to the development of risky alcohol consumption.

REFERENCES

- Aas, H. N., Leigh, B. C., Andersen, N., & Jakobsen, R. (1998). Two-year longitudinal study of alcohol expectancies and drinking among Norwegian adolescents. *Addiction*, 93, 373–384.
- Alderete, E., & Bianchini, P. (2008). Consumo de alcohol en la consulta de una sala de emergencia [Alcohol consumption in the emergency room]. *Medicina*, 68, 31–36.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, D.C.
- Andrich, D. (1982). An index of person separation in latent trait theory, the traditional KR.20 index, and the Guttman scale response pattern. *Education Research and Perspectives*, 9, 95–104.
- Baghaei, P. (2008). The Rasch model as a construct validation tool. *Rasch Measurement Transaction*, 22(1), 1145–1146.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bezruczko, K. (2005). *Rasch measurement in health science*. Maple Grove, MN: JAM Press.
- Borsari, B. G., & Carey, K. (2001). Peer influences on college drinking: A review of the research. *Journal of Substance Abuse*, 13, 391–424.
- Brown, S. A., Christiansen, B. A., & Goldman, M. S. (1987). The Alcohol Expectancy Questionnaire: An instrument for the assessment of adolescent and adult alcohol expectancies. *Journal of Studies on Alcohol*, 48, 483–491.
- Cameron, C. A., Stritzke, W. G. K., & Durkin, K. (2003). Alcohol expectancies in late childhood: An ambivalence perspective on transition toward alcohol use. *Journal of Child Psychology and Psychiatry*, 44, 687–698.
- Cimini, M. D., Martens, M. P., Larimer, M. E., Kilmer, J. R., Neighbors, C., & Monserrat, J. M. (2009). Assessing the effectiveness of peer-facilitated interventions addressing high-risk drinking among judicially mandated college students. *Journal of Studies on Alcohol and Drugs*, 16, 57–66.
- Cruz, I. Y., & Dunn, M. E. (2003). Lowering risk for early alcohol use by challenging alcohol expectancies in elementary school children. *Journal of Consulting and Clinical Psychology*, 71, 493–503.
- D'Amico, E. J., & McCarthy, D. M. (2006). Escalation and initiation of younger adolescents' substance use: The impact of perceived peer use. *Journal of Adolescent Health*, 39, 481–487.
- Darke, J., & Goldman, M. S. (1998). Expectancy challenge and drinking reduction: Process and structure in the alcohol expectancy network. *Experimental and Clinical Psychopharmacology*, 6, 64–76.
- DeWit, D. J., Adlaf, E. M., Offord, D. R., & Ogborne, A. C. (2000). Age at first alcohol use: A risk factor for the development of alcohol disorders. *American Journal of Psychiatry*, 157(5), 745–750.
- Embretson, S. E., & Reise, S. P. (2000). *Item response theory for psychologists*. Mahwah, NJ: Laurence Erlbaum Associates.
- Fromme, K., Stroot, E., & Kaplan, D. (1993). Comprehensive effects of alcohol: Development and psychometric assessment of a new expectancy questionnaire. *Psychological Assessment*, 5, 19–26.
- Galduróz, J. C., & Carlini, E. A. (2007). Use of alcohol among the inhabitants of the 107 largest cities in Brazil, 2001. *Brazilian Journal of Medical and Biological Research*, 40, 367–375.
- Glas, C. A. W. (1989). *Contributions to estimating and testing Rasch models* (Unpublished doctoral dissertation). Technical University of Twente, Netherlands: Cip-Gegevens Knoinglijke Bibliotheek.
- Goldman, M. S., Brown, S. A., Christiansen, B. A., & Smith, G. T. (1991). Alcoholism and memory: Broadening the scope of alcohol-expectancy research. *Psychological Bulletin*, 110, 137–146.
- Ham, L. S., Stewart, S. H., Norton, P. J., & Hope, D. A. (2005). Psychometric assessment of the Comprehensive Effects of Alcohol Questionnaire: Comparing a brief version to the original full scale. *Journal of Psychopathology and Behavioral Assessment*, 27, 141–158.
- Hays, R., Morales, L., & Reise, S. (2000). Item response theory and health outcomes measurement in the 21st century. *Medical Care*, 38(9 suppl), I128–I142.
- Herrán, O. F., & Ardila, M. F. (2007). Validez factorial del cuestionario de expectativas hacia el consumo de alcohol (AEQ-III), en adultos de Bucaramanga, Colombia [Factorial validation of the alcohol expectancy

- questionnaire (AEQ-III), in adults living in Bucaramanga, Colombia]. *Revista Médica de Chile*, 135, 488–495.
- Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2010). *Monitoring the Future national survey results on drug use, 1975–2009: Volume I, secondary school students (NIH Publication No. 10–7584)*. Bethesda, MD: National Institute on Drug Abuse.
- Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2011). *Monitoring the Future national results on adolescent drug use: Overview of key findings, 2010*. Ann Arbor, MI: Institute for Social Research, The University of Michigan.
- Karabatsos, G. (2000). A critique of Rasch residual fit statistics. *Journal of Applied Measurement*, 1, 152–176.
- Kuntsche, E., Knibbe, R., Gmel, G., & Engels, R. (2006). Who drinks and why? A review of socio-demographic, personality, and contextual issues behind the drinking motives in young people. *Addictive Behaviors*, 31, 1844–1857.
- Labrie, J. W., Cail, J., Pedersen, E. R., & Migliuri, S. (2011). Reducing alcohol risk in adjudicated male college students: Further validation of a group motivational intervention. *Journal of Child & Adolescent Substance Abuse*, 20, 82–98.
- Lau-Barraco, C., & Dunn, M. E. (2008). Evaluation of a single-session expectancy challenge intervention to reduce alcohol use among college students. *Psychology of Addictive Behaviors*, 22, 168–175.
- Leigh, B. C. (1999). Thinking, feeling, and drinking: Alcohol expectancies and alcohol use. In S. Peele, & M. Grant (Eds.), *Alcohol and pleasure: A health perspective* (pp. 215–231). Philadelphia, PA: Brunner/Mazel.
- Leigh, B., & Stacy, A. (2004). Alcohol expectancies and drinking in different age groups. *Addiction*, 99, 215–227.
- Linacre, J. M. (2002a). Optimizing rating scale category effectiveness. *Journal of Applied Measurement*, 3(1), 85–106.
- Linacre, J. M. (2002b). What do infit and outfit, mean-square and standardized mean? *Rasch Measurement Transaction*, 16(2), 878.
- Mackintosh, A. M., Earleywine, M., & Dunn, M. E. (2006). Alcohol expectancies for social facilitation: A short form with decreased bias. *Addictive Behaviors*, 31, 1536–1546.
- Martino, S. C., Collins, R. L., Ellickson, P. L., Schell, T. L., & McCaffrey, D. (2006). Socio-environmental influences on adolescents' alcohol outcome expectancies: A prospective analysis. *Addiction*, 101, 971–983.
- Masters, G. N. (1980). A Rasch model for rating scales. *Dissertation Abstracts International*, 41, 215A–216A.
- Maydeu-Olivares, A., Kramp, U., García-Forero, C., Gallardo-Pujol, D., & Coffman, D. L. (2009). The effect of varying the number of response alternatives in rating scales: Experimental evidence from intra-individual effects. *Behavior Research Methods*, 41, 295–308.
- McCarthy, D. M., Kroll, L. S., & Smith, G. T. (2001). Integrating disinhibition and learning risk for alcohol use. *Experimental and Clinical Psychopharmacology*, 9, 389–398.
- Mora-Ríos, J., Natera, G., Villatoro, J., & Villalvalzo, R. (2000). Validez factorial del Cuestionario de Expectativas hacia el Alcohol (AEQ) en estudiantes universitarios. *Psicología Conductual*, 8, 319–328.
- Oei, T. P. S., & Lee Jardim, C. (2007). Alcohol expectancies, drinking refusal self-efficacy and drinking behaviour in Asian and Australian students. *Drug and Alcohol Dependence*, 87, 281–287.
- Pérez-Aranibar, C., Van den Broucke, S., & Fontaine, J. (2005). Validation of the Alcohol Expectancy Questionnaire (AEQ-A) for Peruvian university students. *Journal of Alcohol & Drug Education*, 49, 63–84.
- Pilatti, A., & Cassola, I. (2005). *Conductas de riesgo, expectativas hacia el alcohol y consumo de alcohol en adolescentes de poblaciones carenciadas de la ciudad de Córdoba*. Córdoba, Argentina: Secretaría de Extensión Universitaria. Facultad de Psicología. Universidad Nacional de Córdoba.
- Pilatti, A., Cassola, I., Godoy, J. C., & Brussino, S. A. (2005). *Validez factorial del Cuestionario de Expectativas hacia el Alcohol*. Mar del Plata, Argentina: Las Ciencias del Comportamiento en los Albores del siglo XXI. Universidad Nacional de Mar del Plata.
- Pilatti, A., Godoy, J. C., & Brussino, S. A. (2010). Construcción y valoración psicométrica del Cuestionario de Expectativas hacia el Alcohol para Adolescentes de Argentina (CEA-A). *Anales de Psicología*, 26, 288–301.
- Pilatti, A., Godoy, J. C., & Brussino, S. A. (2011). Alcohol expectancies and alcohol use among children and adolescents from Argentina. *Revista Internacional de Psicología y Terapia Psicológica*, 11, 13–32.
- Pilatti, A., Godoy, J. C., & Brussino, S. A. (2012). Adaptación de instrumentos entre culturas: ejemplos de procedimientos seguidos para medir las expectativas hacia el alcohol en el ámbito argentino [Adaptation of instruments across cultures, Examples of procedures used to measure alcohol expectancies in the Argentine area]. *Trastornos Adictivos*, 14, 58–64.
- Randolph, K. A., Gerend, M. A., & Miller, B. A. (2006). Measuring alcohol expectancies in youth. *Journal of Youth and Adolescence*, 33, 939–948.
- Rasch, G. (1960). *Probabilistic models for some intelligence and attainment tests*. Copenhagen, Denmark: Danish Institute for Educational Research.
- Read, J. P., Wood, M. D., Lejuez, C. W., Palfai, T. P., & Slack, M. (2004). Gender, alcohol consumption, and differing alcohol expectancy dimensions in college drinkers. *Experimental and Clinical Psychopharmacology*, 12, 298–308.
- Rojas-Guiot, E., Fleiz-Bautista, C., Medina-Mora, E., Morón, M. A., & Domenech-Rodríguez, M. (1999). Alcohol and drug consumption among students in Pachuca. *Salud Pública de México*, 41, 297–308.
- Rönback, S. A., Ahllund, N. K., & Lindman, R. E. (1999). Confirmatory factor analysis of the AEQ-A questionnaire in Finland. *Scandinavian Journal of Psychology*, 40, 11–19.
- Rovinelli, R. J., & Hambleton, R. K. (1977). On the use of content specialists in the assessment of criterion-referenced test item validity. *Dutch Journal of Educational Research*, 2, 49–60.
- Rupp, A., & Zumbo, B. (2006). Understanding parameter invariance in unidimensional IRT models. *Educational and Psychological Measurement*, 66(1), 63–84.
- Schulte, M. T., Monreal, T. K., Kia-Keating, M., & Brown, S. A. (2010). Influencing adolescent social perceptions of alcohol use to facilitate change through a school-based intervention. *Journal of Child & Adolescent Substance Abuse*, 19, 372–390.
- Secretariat for the Prevention of Drug Abuse and Drug Trafficking [Secretaría de Programación para la Prevención de la Drogadicción y la Lucha contra el Narcotráfico (SEDRONAR)]. (2011). *Epidemiology Information System in Mental Health and Addiction* [Sistema de Vigilancia Epidemiológica en Salud Mental y Adicciones]. Buenos Aires, Argentina: Ministerio de Salud.
- Smith, G. T., & Anderson, K. G. (2001). Personality and learning factors to create risk for adolescent problem drinking. In P. M. Monti, S. M. Colby, & T. A. O'Leary (Eds.), *Adolescents, alcohol, and substance abuse* (pp. 109–141). New York, NY: Guilford.
- Smith, G. T., & Goldman, M. S. (1994). Alcohol expectancy theory and the identification of high-risk adolescents. *Journal of Research on Adolescence*, 4(2), 229–247.
- Stein, L. A., Katz, B., Colby, S. M., Barnett, N. P., Golembeske, C., Lebeau-Craven, R., & Monti, P. M. (2006). Validity and reliability of the Alcohol Expectancy Questionnaire—Adolescent, Brief. *Journal of Child & Adolescent Substance Abuse*, 16, 115–125.
- Tush, C., & Wiers, R. W. (2007). Explicit and implicit alcohol-related cognitions and the prediction of future drinking in adolescents. *Addictive Behaviors*, 32, 1367–1383.
- Urbán, R., Kökönyi, G., & Demetrovics, Z. (2008). Alcohol outcome expectancies and drinking motives mediate the association between sensation seeking and alcohol use among adolescents. *Addictive Behaviors*, 33, 1344–1352.

- Valdivia, I., & Stewart, S. H. (2005). Further examination of the psychometric properties of the Comprehensive Effects of Alcohol Questionnaire. *Cognitive and Behavioral Therapy, 34*, 22–33.
- Vélez-Blasini, C. (1997). A cross-cultural comparison of alcohol expectancies in Puerto Rico and the United States. *Psychology of Addictive Behaviors, 11*, 124–141.
- Vik, P. W., Carello, P. D., & Nathan, P. E. (1999). Hypothesized simple factor structure for the Alcohol Expectancy Questionnaire: Confirmatory factor analysis. *Experimental and Clinical Psychopharmacology, 3*, 294–303.
- Windle, M., Spear, L. P., Fuligni, A. J., Angold, A., Brown, J. D., Pine, D. ... Dahl, R. E. (2008). Transitions into underage and problem drinking: Developmental processes and mechanisms between 10 and 15 years of age. *Pediatrics, 121*(Suppl 4), S273–S289.
- World Health Organization (WHO). (2009). *Global health risks: Morbidity and burden of disease attributable to selected major risks*. Geneva, Switzerland: World Health Organization.
- World Health Organization (WHO). (2010). *Global status report on noncommunicable diseases*. Geneva, Switzerland: World Health Organization.
- Wright, B. D., & Linacre, J. M. (1994). Reasonable mean-square fit values. *Rasch Measurement Transaction, 8*(3), 370.
- Wright, B. D., & Masters, G. N. (1982). *Rating scale analysis*. Chicago, IL: Mesa Press.