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**ROMANIAN TRANSLATION AND LINGUISTIC VALIDATION  
OF THE ADOLESCENT RISK-TAKING BEHAVIOR SCALE  
(ARQ-B)**

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***Abstract***

Adolescence has been characterized as a developmental period sensitive to risky behavior engagement. Previous research suggests that risky behaviors are connected to low academic performance and school dropout. Adolescent Risk-taking Behavior Scale (ARQ-b) (Gullone, Moore, Moss & Boyd, 2000) is a self-reporting scale measuring the frequency with which adolescents engage in risky behaviors. The scale was translated into Romanian and tested for content clarity, following standard procedures. Data collection has taken place at two time points. Participants (24 students, aged 14 to 19) were asked to complete the Romanian translated ARQ-b, followed by a two-week intermission before the completion of the original English ARQ-b begun. A preliminary reliability analysis was run, for the Romanian translated and the English version of the scale. The Wilcoxon test was used to check for significant differences between the Romanian translated ARQ-b scores and the English ARQ-b scores. A Spearman correlation analysis was run to analyze the relation between the translated ARQ-b scores and original ARQ-b scores. Based on the obtained results, a few minor corrections were made to the Romanian translated items of ARQ-b, with the purpose of securing the conceptual clarity of the content and the semantic equivalence of the translated items with the original ones. Furthermore, Cronbach's alpha coefficient of the Romanian translated ARQ-b was calculated on a larger sample of respondents (260 high-school students). Results of the psychometric analysis of the Romanian translated ARQ-b are further discussed in this paper.

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## 1. Introduction

Risk-taking behavior is defined in various ways in the literature, but is commonly accepted that it refers to engagement in behaviors that are associated with undesired psycho-social outcomes at individual, group or society levels (Irwin, 1993). Moore & Gullone (1996) defined risk-taking as „*behavior that involves potential negative consequences (loss) but is balanced in some way by perceived positive outcomes (gain)*” (p. 347). According to some authors, a behavior can be classified as risk-taking when the following conditions are met: (1) the behavior can lead to several outcomes and (2) at some degree, the outcomes are undesirable or threatening for the individual’s physical or mental health (Furby & Beyth-Marom, 1992). According to these definitions, a wide range of behaviors can qualify as risk-taking, such as: sexual behaviors, substance use, eating behavior, delinquency, dangerous vehicle use, etc. (Furby & Beyth-Marom, 1992; Irwin, 1993; Moore & Gullone, 1996).

Adolescence is described in the literature as a fragile developmental period marked by changes in several domains: biological, cognitive, social and affective (Steinberg, 2005; Choudhury, Blakemore & Charman, 2006). The prevalence of risk-taking behaviors is high in the adolescence years (Arnett, 1992; Irwin, 1993; Gullone, Moore, Moss & Boyd, 2000; Rai et al., 2003). During these years, some of the risk-taking behaviors are considered to be developmentally appropriate and this specific category of behaviors is known in the literature as *exploratory behaviors*, such as roller skating (Irwin, Igra, Eyre & Millstein, 1997). Whilst adolescent exploratory behavior, in positive circumstances, can enhance individual abilities, risk-taking behaviors can endanger both physical and mental health. *Risk-taking behaviors* are differentiated from the exploratory behaviors by simply weighing their potential negative consequences (Irwin, Igra, Eyre & Millstein, 1997). Thus, the level of riskiness of a specific behavior can be established by the balance between positive and negative consequences at individual and social levels (Gullone, Paul & Moore, 2000). Extremely risky behaviors are characterized by a high propensity of negative outcomes occurrence and strong severity of such consequences. On the other hand, if the positive consequences outweigh the negative ones, the behavior is more likely considered exploratory, rather than risky (Gullone, Paul & Moore, 2000).

Extensive research attempted to identify connections between various external and internal factors and risk-taking behaviors in adolescence. A series of internal factors were linked to risk-taking behavior in adolescence such as biological factors (*e.g.* genetic factors, hormonal aspects, pubertal evolution) (Irwin & Millstein, 1986; Irwin & Ryan, 1989) or psychological factors (*e.g.* cognitive factors, decision-making mechanisms, dispositional traits) (Irwin & Millstein, 1986; Sales & Irwin, 2013). In addition, a wide range of external factors was associated with risk-taking behaviors: environmental models (*e.g.* family, peers, insitutions) (Irwin & Millstein, 1986; Irwin & Ryan, 1989), socio-economic environment (*e.g.* social support, relationship quality, parental involment in risk behaviors) (Irwin & Millstein, 1986; Irwin & Ryan, 1989) or educational environment (*e.g.* school failure, academic achievement, school transitions) (Irwin & Millstein, 1986; Sales & Irwin 2013).

## 2. Problem Statement

The discrepancies in conceptualization and definition of risk-taking behavior led to the development of several measurement instruments and assessment techniques of the variables related to this concept. Some of the available measures were considered less efficient, due to their limitation to a singular type of risk-taking behavior, such as substance use or sexual risky behaviors (Moore & Gullone, 1996). Furthermore, most of the available measures were relying on a list of researcher nominated risk-taking behaviors. This type of measurement approach might not always reflect the state of the phenomenon, due to the fact that adolescents may have a completely different definition of risk-taking behaviors, as opposed to adults (Moore & Gullone, 1996). In order to address the above mentioned measurement-related issues, Gullone, Moore, Moss & Boyd (2000) developed the Adolescent Risk-taking Questionnaire (ARQ), using a contrasting focus compared to previous approaches (which were directed from researcher towards the targeted group) (Moore & Gullone, 1996; Gullone, Moore, Moss & Boyd, 2000). Hence, the development of ARQ was initiated based on the reports of a large sample of adolescents, in which they were asked to nominate up to four behaviors considered risky by them (Gullone, Moore, Moss & Boyd, 2000). Subsequently, a series of procedural steps followed and the questionnaire was revised in order to obtain the final version (for details see Gullone, Moore, Moss & Boyd, 2000).

ARQ (Gullone, Moore, Moss & Boyd, 2000) is a self-reporting measure, developed to assess risk-taking behavior in adolescence and it delivers a comprehensive bidimensional insight on: (a) risk-behavior engagement and (b) adolescent perceptions of riskiness regarding specific behaviors. The questionnaire comprises two distinct scales, each measuring one of the above mentioned dimensions of risk-behavior in adolescence. The scales can be used and interpreted separately. ARQ encompasses four subscales, each assessing a specific category of risk-behavior (Gullone, Moore, Moss & Boyd, 2000): (1) thrill-seeking behavior (*e.g.* flying in a plane, snow skiing), (2) rebellious behaviors (*e.g.* smoking, getting drunk), (3) reckless behaviors (*e.g.* driving without a license, having unprotected sex) and (4) antisocial behaviors (*e.g.* teasing and picking on people, cheating).

Taking into account that at the time the present research was conducted, we did not succeed to identify scientifically validated measures of risk-taking behavior, linguistically appropriate for the Romanian adolescent population, there was a need to deliver such instruments, in order to facilitate the measurement of risk-taking engagement and the associated variables, in a Romanian sample.

## 3. Research Questions

The process of linguistic validation of ARQ - Behavior scale (ARQ-b) (Gullone, Moore, Moss & Boyd, 2000) was guided by the following research questions:

- Is the Romanian translated version of ARQ-b (Gullone, Moore, Moss & Boyd, 2000) conceptually equivalent to the original English version of the instrument?

- Is the Romanian translated version of ARQ-b (Gullone, Moore, Moss & Boyd, 2000) a psychometrically sound measure of risk-taking behavior in adolescent Romanian population?

#### **4. Purpose of the Study**

The purpose of this study is to deliver a linguistic validated Romanian version of the ARQ - Behavior scale (ARQ-b) (Gullone, Moore, Moss & Boyd, 2000) in order to assess the risk-taking behaviors of adolescents in general and of the public school students in particular. The translated version might be used to identify factors which could be linked to the educational outcomes of the Romanian adolescents. The Romanian translated ARQ-b may assist reaching a more effective understanding of the adolescent risk-behavior engagement phenomenon and its' associated variables, such as the academic level, motivation to attend school or the intention of school abandonment.

#### **5. Research Methods**

##### **5.1. Participants**

Data collection was conducted online. Permission from the high-school institutional board was obtained in order to disseminate the link for data collection among the students. Participants (N=24), 14 to 19-year-old high-school students ( $m=16.61$ ,  $SD= 2.00$ ) from Cluj-Napoca, individually signed an agreement of participation to the study. Prior to completion, parental consent was retrieved for minor participants, via a written consent form, in which a statement regarding the confidentiality of the information was included. From the sample of respondents, 62.5 % were females (N=15).

##### **5.2. Measures**

The Adolescent Risk-taking Questionnaire (Gullone, Moore, Moss & Boyd, 2000) is a 22-item self-reporting scale, each item specifying an individual risk-taking behavior. For both Behavior scale and Perception scale that are included in the questionnaire, the items are organised into four subscales, each one corresponding to a category of risk-taking behavior, such as: thrill-seeking, rebellious risk, reckless risk and antisocial risk (Gullone, Moore, Moss & Boyd, 2000). Thrill-seeking behavior subscale includes actions generally socially accepted, with potential consequences of low severity (Gullone, Moore, Moss & Boyd, 2000). Rebellious risk subscale and Antisocial risk behavior subscale comprise behaviors which can generate threatening social or legal consequences upon the individual and his/her social environment (Gullone, Moore, Moss & Boyd, 2000). Behaviors enveloped by the Reckless risk subscale are considered the most dangerous in terms of potential consequences upon the individual (Gullone, Moore, Moss & Boyd, 2000). The Total risk behavior score can be computed by adding up the ratings for all the items of the scale.

Respondents are asked to rate the incidence with which they engage in a list of 22 specific behaviors, from 0 - which corresponds to „Never done”, to 4- which stands for „Done very often” (Gullone, Moore, Moss & Boyd, 2000). ARQ has demonstrated good psychometric properties in the studies done so far. Thus, the authors reported internal consistency coefficients greater than .8 (Gullone, Paul & Moore, 2000). Test-retest reliability coefficients ranged between .6 and .8 (Gullone, Paul & Moore, 2000). The confirmatory factor analysis validated the four-factor structure of the instrument, for both Behavior and Perception scale (Gullone, Paul & Moore, 2000).

### **5.3. Procedure**

The translation was unfolded according to the literature recommendations (Tsang, Royse & Terkawi, 2017). First, the items of the scale were translated from the source language (*i.e.* English) to target language (*i.e.* Romanian) by two translators. Subsequently, the translation has undergone through a revision process provided by experts in the field of psychology. Furthermore, to avoid potential bias, an authorized translator blindly translated the Romanian items to the source language (*i.e.* back-translation). The de-centering stage followed: the back-translated items of ARQ-b were compared the original English items of the scale by the experts in the field of psychology, with the purpose of assuring the semantic and conceptual correspondence between the translated and the original items. Lastly, a few corrections were made and discrepancies were discussed before achieving the final Romanian translated ARQ-b.

In the next phase (*i.e.* piloting), an agreement for the use of the ARQ-b (Gullone, Moore, Moss & Boyd, 2000) in order to linguistically validate the Romanian translated version, was directly obtained from the corresponding author (Gullone, written personal communication, April 20, 2016). Data collection has taken place at two separate time points, during November 2016. First, participants (N=24) completed online the Romanian translated ARQ-b items (Gullone, Moore, Moss & Boyd, 2000). Two weeks following the completion of the Romanian ARQ-b, the data collection on the English ARQ-b was initiated. The collected data was statistically processed using IBM SPSS Statistics 20.0 package. Furthermore, 260 adolescent students completed the Romanian translated ARQ, along with other questionnaires measuring psycho-social variables.

### **5.4. Data analysis**

First, a preliminary internal consistency analysis was conducted for the original and the translated versions of the scale (N=24). Further, the internal consistency analysis was replicated on a larger sample (N=260 adolescents from 4 public high schools in Cluj-Napoca, Romania; *Note:* the data collection on the larger sample was performed within a different study investigating the relation between academic performance, risk taking behaviors and emotional intelligence of Romanian adolescents) and Cronbach's alpha coefficient scores were calculated for the Total ARQ-b scores and for subscales scores (*i.e.* Thrill seeking, Rebellious risk, Reckless risk and Anti-social risk) (N=260). Secondly, the equivalence between the Romanian and English ARQ-b was checked via Wilcoxon Test and Spearman's Rank correlation

analysis. The Wilcoxon Test was used to investigate if there were any significant differences between the medians of the two versions of the scale. Spearman's Rank Correlation analysis was used to explore the relation between the scores of the two versions of the scale.

## 6. Findings

### 6.1. Descriptive analysis

The descriptive results are presented in Table 1. Mean values were calculated for Total scores and subscales scores, for both English and Romanian translated ARQ-b.

**Table 01.** Mean scores of the Romanian translated ARQ-b and original English ARQ-b (N=24 respondents)

Item	ARQ-b Romanian translated		ARQ-b English	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Total score	12.55	5.06	13.61	6.48
Thrill seeking	5.16	3.38	5.22	3.49
Rebellious risk	2.88	1.71	3.33	1.60
Reckless risk	1.00	1.23	1.38	1.50
Antisocial Risk	3.50	2.06	3.66	3.06

### 6.2. Psychometrics

The preliminary reliability analysis (N=24) revealed Cronbach's alpha values for the Romanian translated version of ARQ-b of  $\alpha=.71$ , whilst for the original English version of ARQ-b,  $\alpha=.74$ . Due to the limited number of participants of the initial sample, further reliability analysis followed on a larger sample (N=260). Cronbach's alpha values (N=260) of the Romanian translated ARQ-b ranged from .85 to .68, with two coefficients holding values below .7, *i.e.* Thrill-seeking behavior subscale,  $\alpha=.68$  and Antisocial behavior subscale  $\alpha=.69$  (see Table 2 for detailed reliability data). Considering these results, based on the experts' recommendations, only a few minor adjustments were made to the Romanian translated items of ARQ-b, focusing on the meaning of the concepts.

**Table 02.** Summary of reliability data of the Romanian translated version of ARQ-b (N=260 respondents)

Item	Cronbach's Alpha ( $\alpha$ )
Overall scale	.85
Thrill-seeking	.68
Rebellious	.80
Reckless	.72
Antisocial	.69

*Note.*  $\alpha$  based on standardized items

The results of the Spearman's correlation analysis (N=24) highlighted a strong, positive correlation between the Romanian translated ARQ-b and original English ARQ-b Total scores ( $r_s=.70$ ,  $p<.01$ ). Strong

( $r_s=.60$ ,  $p<.05$  for Reckless behavior subscale) to very strong ( $r_s= .80$ ,  $p<.01$  for Thrill-seeking behavior subscale) positive correlations were found among the subscales. Item correlation coefficients varied from moderate ( $r_s=.50$ ,  $p<.05$  for Items number 3 and 4) to very strong correlations ( $r_s=.87$ ,  $p<.01$  for Item number 12). Further results of the correlation analysis can be inspected in Table 3.

**Table 03.** Correlation analysis results between Romanian translated and original English ARQ-b scores (N=24 respondents)

Item	Spearman's rho
Total score	.70**
Thrill-seeking behavior	.80**
Rebellious behavior	.79**
Reckless behavior	.60*
Antisocial behavior	.64**
Item 1	.81**
Item 2	.85**
Item 3	.50*
Item 4	.50*
Item 5	.57*
Item 6	.54*
Item 7	.61*
Item 8	.80**
Item 9	.76**
Item 10	.73**
Item 11	.74**
Item 12	.87**
Item 13	.70**
Item 14	.79**
Item 15	.67**
Item 16	.75**
Item 17	.54*
Item 18	.70**
Item 19	.64**
Item 20	.79**
Item 21	.60**
Item 22	.85**

Note. \*\* $p<0.01$  \* $p<0.05$  Pre-test – Romanian translated ARQ-b; Post-test – English ARQ-b

The results of the Wilcoxon test failed to reveal significant differences between the Romanian ARQ-b ranks and the English ARQ-b ranks for Total scores ( $Z=-.858$ ,  $p =.391$ ). Similar results were found for the subscales ranks (see Table 4).

**Table 04.** Wilcoxon test results for ARQ-b Romanian translated and ARQ English version (N=24 respondents)

	Z	p	Mdn	
			Translated ARQ-b	English ARQ-b
Total score	-.858	.391	10.50	11.00
Thrill-seeking behavior	-.343	.732	4.50	4.50
Rebellious behavior	-1.72	.225	2.50	3.00
Reckless behavior	-1.31	.190	.50	1.00
Antisocial behavior	-.142	.887	3.00	3.00

Note. Asymptotic significances are displayed.  $p < .05$

## 7. Conclusion

The present study aimed to provide a psychometrically valid Romanian translated version of the Adolescent Risk-taking Questionnaire - Behavior Scale (Gullone, Moore, Moss & Boyd, 2000).

The results on the process of the linguistic validation, even though on a small sample, indicate that Romanian ARQ-b is a reliable measure of risk engagement in adolescence. The internal consistency of the overall scale was found acceptable in the preliminary psychometric analysis. Moreover, the results of the reliability analysis on the larger sample revealed good reliability of the overall scale, implying that the Total score was an appropriate measure of risk-behavior engagement in adolescents. These results are in line with the results highlighted by Gullone, Paul & Moore (2000), who reported good reliability values of ARQ. Similar values were found regarding the internal consistencies of Rebellious risk subscale and Reckless risk subscale. However, two of the subscales, *i.e.* Antisocial risk behavior subscale and Thrill seeking behavior subscale, revealed internal consistency values below 0.7 (see Table 2). According to George & Mallery (2003), values of internal consistency below 0.7 may be questionable. In this study, some explanations of these values (below 0.7) might come from the size of the sample and from diversity in the level of comprehensibility of some of the items.

The correlation coefficients of the items pairs held values ranging from moderate to very strong correlations and some diversity among the values of Spearman coefficient can be observed. Hence, item-to-item correlation analysis revealed very high values for some pairs of items, such as item number 2, 12, or 22 and lower correlation values for items number 3 or 4. This variance may be due to the cultural universality (or perfect linguistic equivalence) of some of the underlying concepts (*e.g.* items number 2, 12, or 22), both in English and Romanian. On the other hand, there are syntagms in English which do not have corresponding perfect synonyms in Romanian language, which could explain, in part, the lower item-to-item correlation values. However, despite the displayed variance, all pairs of items held at least acceptable correlation values. Furthermore, the results of the Wilcoxon Test suggest that Romanian ARQ-b and English ARQ-b are linguistically equivalent.

The results obtained in this linguistic validation study may support a better understanding of the factors that hinder positive developmental outcomes in adolescents in general, and in specific high school



settings reporting low school performance in students, for example, or high rates of school abandonment the (*i.e.* in terms of using the linguistic validated form of the instrument).

Additionally to the particular sensitivity of adolescents to risk behavior engagement, (Arnett, 1992; Gullone, Moore, Moss & Boyd, 2000; Rai et al., 2003), it has been also noted that specific risk-behaviors can lead to serious long-term consequences on physical and mental health (McCambridge, McAlaney & Rowe, 2011). Thus, it is essential to investigate in-depth the phenomena and to further develop interventions to diminish it.

The data provided through the translated version of ARQ-b might support Romanian researchers to understand more effectively adolescent risk-behavior engagement. Furthermore, the scale might assist Romanian specialists in the field of education in understanding risk-behavior engagement of adolescents in relation to (a) school performance and (b) several psycho-social characteristics of adolescent high-school students and to further devise intervention strategies that promote optimal educational functioning of adolescents.

Withal, this study has some limitations. First, a convenience small sample of adolescents was employed in the preliminary analysis in which the two versions of the scale were compared. Second, the majority of respondents were females. The gender bias might be a reflection of the majority of feminine population in Romania (Holdcroft, 2007; National Institute of Statistics, 2013). The gender variable can be controlled in the future studies. Future investigations need to be carried out on the psychometric characteristics of the ARQ-b Romanian translated, as well as the relationship of risk-engagement in Romanian adolescents and other associated factors.

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