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ORIGINAL ARTICLE

## Transcultural Adaptation of Questionnaire to Evaluate Drug Use Among Students: The Use of the EU-Dap European Questionnaire in Brazil

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### ABSTRACT

**Background:** Social and cultural differences between countries stress the need for adapting existent instruments for adequately comparing epidemiological results. However, there are controversies in literature on how to carry out this process. **Objectives:** This study aimed to describe the process of cultural adaptation and evaluation of the Brazilian Portuguese language of the European Drug Addiction Prevention Trial (EU-Dap) questionnaire to identify alcohol, tobacco, and other drug use among adolescents. **Methods:** The cross-sectional study took place in 16 public schools in three Brazilian cities during the year 2013 in a sample of 2,969 adolescents between the ages of 11 and 16. Operating steps involved analysis of qualitative data collected through student's focus group and field notes by interviewers and quantitative data from test–retest evaluation and nonresponse to item. **Results:** The results revealed moderate reliability for the primary outcomes and high levels of nonresponse, mainly in the 2/3 final questions. Focus group provided high-quality information about misconception for the semantic and structure of the questionnaire. Participatory observation helped researchers to tap into the main difficulties of the application context. **Conclusions:** Sociocultural issues related to Brazilian students, the application context, and the structure of the original questionnaire contributed to the unsatisfactory results of the transcultural adaptation process. The results further highlighted the challenge of adapt questionnaires investigating sensitive issues in an age group particularly influenced by educational factors, especially when the countries have different standards of achievement in education.

### KEYWORDS

Transcultural adaptation; drug use; adolescents; mixed methods research; questionnaire reliability; Latin culture; Brazil

### Introduction

Drug use prevention in the school environment has been considered a feasible and effective strategy for adolescents, and tends to be the first choice among public policies aiming to control drug use at this age group. Successful approaches contribute for the positive engagement of adolescents with their families, schools, and communities, which is a protection factor for psychoactive substance use (UNODC, 2013). Many approaches to school-based drug abuse interventions have been described and some are not based on scientific evidences of effectiveness. Substance abuse researchers claim that adolescents are an easy target for the iatrogenic effects of primary drug prevention programs, which means that the program itself may eventually stimulate experimentation and use of substances (Faggiano, 2010; Sloboda & Bukoski, 2003; Stafford, Allsop, & Daube, 2014; Victora, Habicht, & Bryce, 2004). It is necessary to establish rigid evaluation criteria before the implementation of a school-based drug use prevention program as part of a public policy (Faggiano, 2010; Sloboda & Bukoski, 2003; UNODC, 2013).

Brazil, a large middle-income Latin-America country with nearly a quint of its population (34 million) aged 10–19 years, still does not have any official school-based drug preventive program. As a response to this shortcoming, the Brazilian Ministry of Health chose *Unplugged* (Faggiano, Richardson, Bohrn, Galanti, & Group, 2007), a drug abuse prevention program based on the Comprehensive Social Influence model aiming to enhance life-skills (Kreeft et al., 2009), to be implemented in public schools all over the country.

The effectiveness of *Unplugged* is supported by data from science-based evaluation. European students exposed to the *Unplugged* curriculum showed a lower prevalence of daily use of cigarettes, episodes of drunkenness, and cannabis use in the past 30 days (Faggiano et al., 2008).

The evaluation of the *Unplugged* intervention relies on the student-reported outcomes measured by the European Drug Addiction Prevention Trial questionnaire (EU-Dap), an anonymous self-reported questionnaire that collects information on the use of cigarettes, alcohol, and illicit drugs, adolescents' knowledge and opinions

about substances, as well as their social and personal skills. Most items were retrieved from instruments provided in the Evaluation Instruments Bank of the EMCDDA and, apart from language adaptation, the questionnaire was identical in all the seven European countries where the study was conducted: Austria, Belgium, Germany, Greece, Italy, Spain and Sweden (Faggiano et al., 2008).

The EU-Dap questionnaire had its validity documented for the specific settings and languages of those European countries (Faggiano et al., 2008), which includes some of the world's most affluent nations and cannot be easily extrapolated to the school setting in a middle-income country. To be used outside the European setting, the questionnaire must undergo translation and cultural adaptation.

Transcultural adaptation of interventions and research instruments is essential to produce valid measurements and allow for comparisons with the results obtained in other countries (Tuthill et al., 2014). Several methods are available for transcultural adaptation of questionnaires. The most common steps described in literature to achieve equivalence between the original and adapted questionnaires include: forward translation from the original language to the target one, back-translation, and an expert committee (Beaton, Bombardier, Guillemin, & Ferraz, 2000; Tuthill et al. 2014). A literature review aiming to identify the state of art in cross-cultural adaptation of questionnaires (Epstein, Santo, & Guillemin, 2015) suggests that people who are fluent in both languages, are familiar with both culture and have some knowledge of the content of the questionnaire are well-qualified translators. The requirements for and the number of back-translations are a matter of debate. There is literature evidence that back-translation might have limited use, particularly if the adaptation team speaks both source and target languages (Epstein, Osborne, Elsworth, Beaton, & Guillemin, 2015). Semantic equivalence (when the meaning of the items is the same in both cultures) is a necessary step for transcultural adaptation of a questionnaire; however it does not overcome the cultural differences between the two universes explored (Gjersing, Caplehorn, & Clausen, 2010; Pesce et al., 2005; Tuthill et al., 2014). There is still a long way to go before reaching the construct validity. Evidences from literature show that an expert committee could play an important role in assuring equivalence between the translated and the original questionnaire, synthesizing the previous phases of translation and back-translation, and correcting errors (Beaton et al., 2000; Epstein, Osborne et al., 2015; Epstein et al., 2015).

Despite the emphasis found in the literature on the need to use standardized instruments that have gone through a process of transcultural adaptation, there is

no consensus about how this process should be designed (Gjersing et al., 2010).

This study explores the reliability of the Brazilian-Portuguese version of the EU-Dap questionnaire among Brazilian adolescents. Because there is no consensus on how to conduct the transcultural validation process, we will describe a way to go over the process saving time and getting reliable data. Information about the proprieties of the Brazilian-Portuguese version of EU-Dap questionnaire will contribute to the adaptation of the *Unplugged* curriculum for Brazilian adolescents.

## Methods

The study was designed to evaluate the EU-Dap questionnaire about drug consumption behaviors among adolescents, using mixed methods research (Creswell, 2009) with qualitative and quantitative data collection.

The qualitative analysis identified students' perception and attitude regarding the questionnaire, focusing on its linguistic and operational structure, and allowed us to understand the context of administration of the questionnaire. The quantitative analysis compared the stability of repeated answers when the questionnaire was applied in two different occasions, and identified the questions that were more difficult to answer.

Two methodologies were used, allowing for the evaluation of the Brazilian-Portuguese version of the EU-Dap questionnaire: (1) a semantic and operational validity and (2) the stability of repeated measures. In the semantic and operational validity of the Brazilian-Portuguese version of the EU-Dap questionnaire, the data collected was analyzed through: (a) the administration of questionnaire to students in the classroom; (b) focus groups with students; and (c) field notes about the context of the administration in the classroom. The stability of repeated answers measured in two points in time was analyzed applying a "test-retest" evaluation.

### **The instrument evaluated: EU-Dap questionnaire**

The original instrument is a self-administered questionnaire with 42 structured questions, including the following domains: (a) sociodemographic; (b) use of licit and illicit drugs (tobacco, alcohol, marijuana, inhalers, cocaine, crack, and other drugs: LSD, amphetamines, anxiolytic, and hallucinogenic tea) considering "lifetime use," "past year use" (past 12 months), and "past month use" (past 30 days), including age when use started, frequency of use, type of drink consumed, heavy drinking, and episodes of drunkenness; (c) knowledge, beliefs, and attitudes regarding drugs; (d) drug use among family members and friends; (e) family and school context

(including experience of violence, social discrimination and interaction with a social support network); and (f) normative beliefs, and social and personal skills. The answers to the questions were multiple choice or had a Likert scale with four options of answers (for example: very likely; likely; unlikely; or very unlikely).

The original EU-Dap questionnaire in English (fully available in different languages at [www.eudap.net](http://www.eudap.net)) was translated by a bilingual (English–Portuguese) translator, and the translation was proofread by one of the European developers who is fluent in both languages.

The first version in Brazilian–Portuguese was presented to 13 Brazilian health and education professionals, experts in adolescent education (middle school), adolescent drug use or adolescent health promotion, in order to evaluate the clarity of terms and if constructs were appropriate to the target population with which the instrument would be administered. The experts were indicated by the Ministry of Health and Ministry of Education coordinators and were selected among their teams. The adaptations led to the second version in Brazilian–Portuguese. Questions about sexuality and the Brazilian criterion for economic classification (ABEP, 2010) were added at the end of the Brazilian–Portuguese version of the EU-Dap questionnaire, reaching a total of 52 questions, and 234 sub-items distributed in 16 pages.

### Study design and sampling process

A pilot cross-sectional study was conducted in 16 Brazilian schools in the cities of São Paulo (SP), São Bernardo do Campo (SP) and Florianópolis (SC), between August and November 2013, to evaluate the feasibility of implementing the *Unplugged* Program adapted to the Brazilian culture. São Paulo, São Bernardo, and Florianópolis are one of the richest cities in Brazil with an Human Development Index (HDI) of 0.805, 0.805, and 0.847, respectively. However, income concentration is particularly high in these locations, with the Gini coefficient reaching 0.64 in São Paulo, 0.54 in São Bernardo, and 0.55 in Florianópolis. As a consequence, there are extreme differences in the socioeconomic status of their inhabitants. Although students attending public schools represent 83% of the students population, they usually come from families with medium to low socioeconomic status and living in the most deprived neighborhood (Inep, 2012).

The participating schools were selected by the municipal and state departments of education following two criteria: not have an active program for drug use prevention, and not face intense drug problems among students. In the evaluation process, the Brazilian–Portuguese version of the EU-Dap questionnaire was administered to students to collect information on drug use.

Questionnaires were administered in the classrooms, without the presence of a teacher, to all students enrolled in grades 6th to 9th in the schools selected, reaching a total of 4,259 students, and they had to be completed in the time designated for a curricular class: 45 to 50 minutes. In São Paulo, 2,756 students were enrolled, and in Florianópolis, 1,503. The inclusion criteria were (a) age between 12 and 16 years, (b) be present in the day of application, (c) consent to participate in the survey and, (d) not having any special needs. Out of the 4,259 students who fulfilled the criteria, 3,511 answered the questionnaire in the initial administration of the instrument, generating an index of answer of 82.4%. Absences in the day of data collection corresponded to 14.7%, and refusals to participate, to 2.2%. Among the participants, 2,969 questionnaires were considered valid, with secret codes correctly filled and students without special needs.

### Data collection and measures

#### Missing values

Compliance to the response system was evaluated in all valid questionnaires ( $N = 2,969$ ) through the missing values, that is, each question underwent a descriptive analysis to evaluate the proportion of adolescents who did not fill out any answer. The number of missing questions per student was calculated by the median, percentile 25% (P25%), and percentile 75% (P75%), considering that the questionnaire had 234 items to be answered. The difference between the proportion of completely filled questionnaires in two age groups (11–12 and 13–14 years old) was also calculated by the use of the Chi-square test, as well as the difference between the medians of missing questions, which was calculated by the use of the Wilcoxon test.

#### Test–retest reliability

A recognized method to evaluate the quality of information in epidemiological studies is testing data reliability. In data collected through questionnaires, what is tested is the instrument's capacity of generating the same results in different moments of administration (Lopes & Faerstein, 2001).

The reliability of the Brazilian–Portuguese version of the EU-Dap questionnaire was tested with its administration in two occasions to a sub-sample of students who participated in the *Unplugged* program evaluation project pilot study. The questionnaires were administered with an interval of 21 days to guarantee that the drug use patterns in the month had not changed. In the initial administration, 256 students answered the Brazilian–Portuguese version of the EU-Dap questionnaire, and 268



students answered the questionnaire in the final administration. This difference in the numbers is mainly due to school absences in the day of administration (94 absences in the first administration and 82 absences in the second time). Among the participants, 160 questionnaires were paired in the two occasions by using the Levenshtein algorithm. Considering as a base for pairing only the students present in both times of collection ( $N = 174$ ), the proportion of questionnaires paired was 92%. The secret code involved the generation of letters and numbers was based on the following information: name, last name, date of birth, mother's name, father's name, paternal grandmother's name, and eye color. The codes generated allowed researchers to pair individual questionnaires in the two times of the study, and, at the same time, protected participants, offering anonymity and confidentiality, which are essential for a study on illicit behaviors (Galanti et al., 2007).

### **Semantic and operational validity**

The semantic and operational validity of the Brazilian-Portuguese version of the EU-Dap questionnaire was analyzed through:

### **Focus groups**

Four focus groups were conducted, with a total of 28 students enrolled in the 6th, 7th, 8th, and 9th grades of schools in the control group in the evaluation project pilot study. The focus groups were conducted in the school context in the cities of São Paulo/SP and Florianópolis/SC. Sampling was intentional, including students with average performances regarding grades and behaviors. Despite not being a representative sampling of the student population, the inclusion criteria determined by the researchers made the sample relevant to reach the objectives of the study.

The data collection through focus groups allowed for the identification of information that emerged in the discussion about the questionnaire based on the interactions among participants (Côté & Turgeon, 2005). The goal was to identify words or statements that did not produce the same effect proposed in the original questionnaire. The students who had already had the experience of answering the questions told us the difficulties they had faced, and what were some weaknesses and strengths of the Brazilian-Portuguese version of the EU-Dap questionnaire. The group's mediator read the questions and asked students to write down their answers, and then discussed the meaning, unknown words, difficulties to answer it, and the group's proposal to adapt the questionnaire. Focus groups lasted for an average of 90 minutes and were recorded and transcribed to be analyzed.

### **Field notes**

Field notes were semi-structured instruments filled out by researchers during and after the administration of a questionnaire in the classroom. The notes included general information about the school, the behaviors of the group, misconduct in the class, peer or teacher-student conflict, class size, the number of students present and absent in the classroom during the administration, and the refusals to participate. They also included an open field to describe difficulties faced in the context of administration. One of the potentials of this data collection method is that it allows for the identification of situations that depend on the context of administration of the questionnaire, whose results in the performance of the instrument could have been wrongly attributed to the questionnaire. A total of 100 field notes were analyzed in order to evaluate the open field "events in the classroom."

### **Analysis approach**

#### **Quantitative data analysis**

Reliability was described by Kappa statistics, which measures the level of consistency in the answers in the first and second administration, beyond the level that would be expected randomly. We used the criteria proposed by Landis & Koch (Landis & Koch, 1977) to classify consistency in the two times of administration based on the Kappa values: almost perfect ( $>0.79$ ); substantial (0.60 to 0.79); moderate (0.40 to 0.59); regular (0.20 to 0.39), and low (0.0 to 0.19). For the reliability analysis, questions were grouped in three domains: (1) Sociodemographic (gender, month and year of birth, people living in student's home, siblings, parents' education, family owning a car, student having their own bedroom, vacation trip with the family in the previous year, and total number of computers at home); (2) Use of licit and illicit drugs (number of times getting drunk or consuming licit or illicit drugs, total number of cigarettes smoked in a week); (3) Behaviors related to or predicting drug use (probability of certain situations happening in the following month due to tobacco, alcohol and marijuana consumption, probability of consuming licit and illicit drugs in the following year, binge drinking in the past 30 days, knowledge about the effects of drugs, perception of the level of risks in drug consumption, drug consumption among friends and people their age, perception of friend's approval on drug consumption, consumption of licit drugs by family members, student's relationship with family members, parents' permission to consume licit drugs, school grades in the previous year, feelings regarding the school, problems faced in the previous 12 months, decisions made, probability of getting involved in situations of consumption of licit drugs, statements about themselves, how easy and difficult

it is to deal with situations when they need to ask for help, and consistency of statements about feelings and actions).

The non-response analysis (% of missing values for each answer) has allowed for the identification of the questions with the lowest number of responses.

The quantitative analysis was conducted using *Stata* version 12.

### Qualitative data analysis

The qualitative data analysis (focus group and field notes) was based on content analysis and Grounded Theory (Strauss & Corbin, 2008). This analysis strategy was chosen due to its richness to build categories of analysis based on the context studied. Grounded Theory was appropriate to shed light on the difficulties experienced by students in answering the questionnaires. The analysis of the focus groups transcriptions was done through in-depth reading of the text in order to get into exhaustive contact with the material. After that, with the objective of allowing for data triangulation to evaluate the reliability of the Brazilian–Portuguese of the EU-Dap questionnaire, the content analysis aimed to create explanatory categories based on the consensus among the focus groups around the main difficulties in completing the questionnaire. Therefore, it was possible to determine three main categories of analysis: (1) semantic difficulties; (2) difficulties related to the structure of questions; and (3) environmental characteristics that facilitated or hindered the completion of the questionnaires. All of the qualitative analyses were conducted using the NVIVO10 software.

### Ethical consideration

This project was approved by the Ethics in Research Committees at University of São Paulo (#473.498) and Federal University of Santa Catarina (#711.377), and all stages of the project were compliant with the Declaration of Helsinki.

## Results

2,969 students between the ages 11 and 16 years participated in the study, with a predominance of females (52.5%), except for those participating in the focus groups (52.8% males). Most participants were between the ages 13 and 14 (58.4%), were enrolled in 6th or 7th grade (57.2%) and studied in São Paulo (64.3%; Table 1).

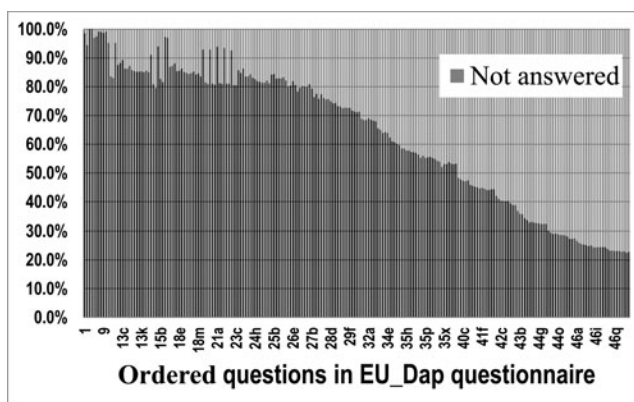
Figure 1 shows the proportion of nonresponses according to the order of the question in the questionnaire. A systematic increase was observed in the proportion of missing data in the subsequent questions in the instrument. From question 27 and up, the proportion of missing data stayed consistently above 20%, reaching 77.5% in question 46.

**Table 1.** Characteristics of public school students in the validation study of the Brazilian–Portuguese version of EU-Dap questionnaire, 2013.

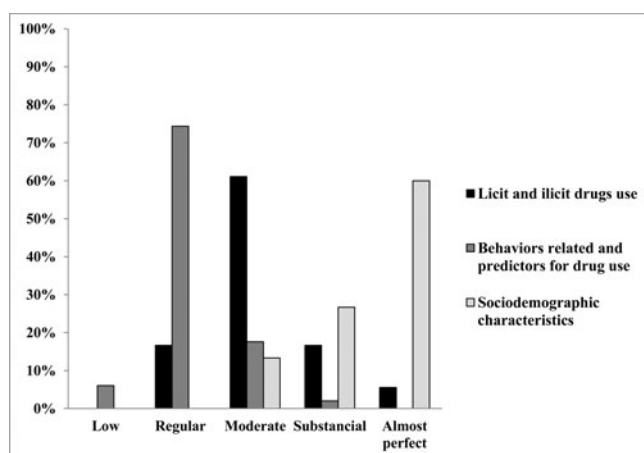
Characteristics	Nonresponses ( <i>n</i> = 2,969) <i>N</i> (%)	Test–retest ( <i>n</i> = 160) <i>N</i> (%)	Focus Groups ( <i>n</i> = 36) <i>N</i> (%)
Sex			
Male	1410 (47.5)	75 (46.9)	19 (52.8)
Female	1559 (52.5)	85 (53.1)	17 (47.2)
Age (years)			
11	423 (14.2)	32 (20.0)	7 (19.4)
12	787 (26.5)	41 (25.6)	10 (27.8)
13	893 (30.1)	37 (23.1)	8 (22.2)
14	866 (29.2)	35 (21.9)	11 (30.6)
15 and 16	0 (0.0)	9 (5.6)	0 (0.0)
No Information	0 (0.0)	6 (3.8)	0 (0.0)
Grade			
6th	811 (27.3)	48 (30.0)	10 (27.8)
7th	885 (29.8)	43 (26.9)	11 (30.6)
8th	831 (28.0)	38 (23.7)	8 (22.2)
9th	442 (14.9)	31 (19.4)	7 (19.4)
Cities			
Florianopolis	1088 (36.6)	26 (16.2)	16 (44.4)
São Paulo	1881 (63.4)	134 (83.8)	20 (55.5)

The proportion of nonresponse was nonexistent (0%) for simple and unambiguous language phrased questions (Q3—“Which of the following people live in the same household with you?”), and higher (20%) when the respondent was faced with a long list of scales or choices, even in beginners’ question [Q14—“How many times (if any) have you drunk alcoholic beverages? (never = 0). (a) In your lifetime, (b) During the last 12 months, (c) During the last 30 days].

Among the 11- to 12-year-old students, only 12.5% (151/1,210) have answered the full questionnaire, while in the oldest group (13–14 years old) this proportion reached 28.8% (507/1,759), showing that older students are more likely to complete the questionnaire ( $p < .001$ ). When the number of missing questions per questionnaire was analyzed, it was found that among the 11- to 12-year-old group, the median of missing answers per



**Figure 1.** Proportion of missing data in the Brazilian–Portuguese version of EU-Dap questionnaire ( $N = 2,969$ ) ordered by the number of the question in the self-response instrument.



**Figure 2.** Level of intraobserver agreement according to Kappa statistic in the reliability study of the Brazilian–Portuguese version of EU-Dap questionnaire ( $N = 160$ ) by the domains: sociodemographic, drug use, and behaviors related to drug use. The Kappa's range for each level of agreement: almost perfect ( $> 0.79$ ); substantial ( $0.60$  to  $0.79$ ); moderate ( $0.40$  to  $0.59$ ); regular ( $0.20$  to  $0.39$ ); and low ( $0.0$  to  $0.19$ ).

questionnaire was 112 ( $P25\% = 66$  and  $P75\% = 146$ ), while in the oldest group (13–14 years old), the median was lower (61;  $P25\% = 18$ ;  $P75\% = 110$ ,  $p < .001$ ).

In the final questions, the proportion of missing data was higher (47%) for questions which would be instantly understood (*Q38—How were your grades during the last school year?*), as well as for that with phrases linguistically difficult (52%) (*Q40—“How much do you agree with the following descriptions of your school?” (a) The students in my class enjoy being together, (b) Most of the students in my class are kind and helpful, (c) Other students accept me as I am, (d) How I do in school matters a lot to me, (e) I have great respect for what my teachers tell me*).

Figure 2 presents the Kappa values according to the domain of questions. The level of consistency was substantial (Kappa:  $0.60$ – $0.79$ ) or almost perfect (Kappa  $> 0.79$ ) for sociodemographic questions, moderate (Kappa:  $0.40$ – $0.59$ ) for the primary outcomes (drug consumption variables), and low (Kappa:  $0.20$ – $0.39$ ) for questions dealing with risk factors for drug use.

In direct participatory observation in the classroom, potential barriers to the questionnaire's administration were identified. Misconduct and discipline-related problems in class, peer or teacher–student conflict, and refusals to participate were notable factors related to non-compliance of the task within the stipulated time (45 minutes in Santa Catarina and 50 minutes in São Paulo). Organizational factors added to the students' difficulties: crowded classrooms, students being late, and frequent interruptions by the teacher or other school staff. In addition to the social roles and organizational barriers field

notes highlighted that the quality of the questionnaire is sometimes below par. Filling out the secret code took 15 minutes in some cases, 1/3 of the total time available for completing the questionnaire. Ambiguous language, lack of understanding of concepts and the complex phrasing in some questions were also questionnaire-related problems. The words probability, extroverted, harm, fully, hashish, and inhalers were not known by most of the students. The Likert scale used in many questions was a source of doubts because students hardly differentiate between the answers “unlikely” and “very unlikely.”

Although the application time has been insufficient for the completion of the questionnaire many students gave up before the time due to “tiredness.”

High levels of students' absences in the application days were often reported in the field notes, as in the example:

In the classes where we administered the questionnaires, the number of students absent reached 20%, we asked if it was common for so many students to be absent and the answer was positive. We also had problems with students refusing to participate in a large number of classes, in some of them getting to a point that students would sing funk songs and make apology to sex and drugs.

Focus groups data confirmed most of the questionnaire-related problems registered in the field notes. It was observed that the terms “probability,” “illicit,” “rigorous,” “tolerance” (to drugs), “extroverted,” “harm,” and “fully” were interpreted by students with multiple meanings. Most students did not know the following drugs: “ether spray” and “anxiolytic,” mentioned in the original questionnaire.

Questions that quantified drug use in a seven-point scale and three temporal dimensions (in life, in the year, and in the past 30 days) were considered confusing. Part of the difficulty was that the scale included zero (0) meaning “never used” and the students interpreted differently, leading to a higher number of blank answers (missing data).

Some students reported difficulties in questions with a four-point Likert scale because they could not differentiate the categories “I don't like it very much” and “I don't like it at all.” For others, however, the fact that the scale changed (from the most positive to the most negative, and vice-versa), intentionally done in the original questionnaire to reduce the possibility of systematically choosing the same answer, put them off and was an additional source of mistakes. One student commented: *I would like to say one thing, in the following questions there is a problem with the order for each question, and sometimes the position changes (in the values in the Likert scale). This makes it a lot more difficult. Because we are used to one (type of scale), and continue answering and oops! It has changed, it's not*



*like that anymore ... And then it's not the same anymore, making it a bit difficult.*

Focus groups in São Paulo summarized their perception about how hard it was to answer the questionnaire, attributing a grade 4 in a 1 to 5 scale (1 = easy, 5 = very difficult). When asked what they would do if they had to fill out the questionnaire and felt tired or misunderstood the questions one student said: *"I would indiscriminately tick the boxes"*; and his speech was followed by the agreement of the others.

The probability of a question to have a missing value was related to the difficulty in understanding the question, given that every mandatory question always has a possible answer, or the lack of time to answer it, particularly in the final questions in the questionnaire.

## Discussion

The reliability of the Brazilian–Portuguese version of the EU-Dap questionnaire among students between 11 and 16 years old enrolled in public schools in Brazil was investigated through qualitative and quantitative research methods. The triangulation of data sources (structured questionnaires, focus groups with students and field notes) presented high levels of consistency among the results and complementarity of information, allowing for a more significant understanding and explanation of the difficulties related to the process of transcultural adaptation of the instrument (Kitzinger, 1995).

Differently from studies conducted in European countries (Faggiano et al., 2008), the performance of the Brazilian–Portuguese version of the EU-Dap questionnaire applied in Brazilian schools was unsatisfactory and presented linguistic and operational problems.

Reliable questionnaires yield consistent results from repeated samples and different researchers (Boynton & Greenhalgh, 2004). That was not the case for the Brazilian–Portuguese version of the EU-Dap questionnaire.

The transcultural adaptation process aims to produce equivalence between the original and translated versions of the research instrument. The main challenge of that process is to preserve the validity of the original instrument (the ability to actually measure what the instrument aims to measure) and its reliability [the capacity to give the same responses in different administrations of the instrument (Beaton et al., 2000)]. One assumption behind this issue is that preserving semantic and structural fidelity to the original instrument will ensure validity. However, the lower reliability achieved in our study showed that keeping fidelity to the original questionnaire did not guarantee validity.

Factors related to the conditions of application (Cahill, 2007) or to some structural inadequacy in the original instrument could be related to the inconsistency between the European and Brazilian results in reliability.

High-quality questionnaires must use short and simple sentences, avoiding the use of difficult words or simultaneously asking more than one question by sentence (Terwee et al., 2007). Judging by the reports of students and interviewers, part of the results on missing data and lower Kappa values were associated with high inconsistencies in how the questions were understood. The meaning of a question may be obvious for an European student, but this does not mean that a Brazilian student will interpret it in a similar way.

Corroborating with that hypothesis, a review of literature on the reliability of assessing recent use of tobacco in anonymous self-administered questionnaires indicated a high level of agreement (Post et al., 2005). The EU-Dap questionnaire in its original version, administered to students in Germany, Austria, Belgium, Spain, Italy, and Sweden has demonstrated test–retest consistency above 90% in questions about recent use of cigarette, marijuana, and episodes of drunkenness (Rothwell, 2005). It was not the case for Brazilian students, our results have demonstrated reliability of 49%, 56%, and 49%, respectively, for these primary outcomes measures, not reaching rates above 70%, which is the minimum amount reported by previous studies to confirm the quality of an instrument (Terwee et al., 2007).

An under reported issue in assessment of applicability of questionnaire is the age of participants. Questionnaires appropriately designed should be answered by people with reading skills of a 12 years old (Terwee et al., 2007). In the Brazilian sample, 20% of the students were 11 years old and it should be expected that they would experience some difficulties in answering the questionnaire. Older students were more likely to complete the questionnaire; however, over 70% of the 13–14 years old did not answer some items. It is noticeable that the reading skills of Brazilian students tend to be below the one of European students, suggesting that low literacy should be at some degree related to the poor performance of the questionnaire. Brazilian students have been rating lower scores in the *Program for International Student Assessment* (PISA). In 2012, in the reading competence test, only 50% scored beyond the baseline level of proficiency (INEP, 2012). However, according to Boynton & Greenhalgh (2004), if you want to produce high-quality generalizable data from a questionnaire questions must be phrased appropriately for the target audience. In the same direction, some studies (Epstein, Osborne et al., 2015) have discussed the cross-cultural adaptation of instruments and suggested



that the robustness of the original questionnaire have a relationship with no change in the performance of the versions that have passed through different adaptation processes. Although the administration time could be acting as a barrier to complete the questionnaire, it is noteworthy here that several students shut themselves off before the time due to the ambiguity in the items.

The context of application is another concern that deserves attention. As previously observed in others studies, overcrowded classrooms and low standards of discipline may have contributed to the low stability of the questionnaire in our study (Allen, Coombes, & Foxcroft, 2007).

Allen et al. (2007) appropriately call *cultural accommodation* the process of integrating the cultural context to the design and implementation of prevention instruments and programs that have been designed for other populations. The lack of awareness of the issue may undermine the efforts for cultural adaptation.

In consonance with other studies (Allen et al., 2007; Fernandez-Hermida, Calafat, Becoña, Tsertsvadze, & Foxcroft, 2012; Rothwell, 2005), our results highlighted the relevance in considering literacy and context of application besides the sociocultural characteristics of the target population in the transcultural adaptation of self-administered questionnaire. Differently from what is recommended, our results suggest that sometimes it is necessary to replace sentences, items or scales in the original instrument to guarantee conceptual equivalence and validity of the measurements (Beaton et al., 2000).

In a controversial field such as transcultural adaptation of research instruments, the use of data triangulation and analysis, incorporating qualitative and quantitative data, was relevant to understand the reasons that led to low values of reliability in the questionnaire, and to identify the questions that will need to be modified in the questionnaire to measure the effectiveness of *Unplugged* in Brazilian schools.

The main limitation of this study is sampling. This study was part of a research to evaluate the implementation of a cultural adaptation of *Unplugged* in Brazil, so the Departments of Education indicated the schools in which principals would collaborate more with the project. Therefore, the schools were selected towards convenience rather than random sample, which may have compromised representativeness. However, the large number of participants increased the sensitivity to detect problems. The local research approach allowed to identify school and classroom related factors that are potentially useful indicators of the difficulties that researchers, performers, and policymakers may encounter in transcultural adaptation of a questionnaire.

## Conclusions

The goal of this study was to evaluate the performance of the Brazilian–Portuguese version of the EU-Dap, a self-reported questionnaire on drug use applied in Europe, using a mixed research method. Contrary to what has been observed in developed countries, the transculturally adapted version answered by Brazilian students' revealed low reliability and high levels of nonresponse. Literacy and school management barriers may have influenced this result. We hypothesize that some weakness in original questionnaire could be amplifying the effects of the students' low reading competence and school structural factors in the psychometric properties measured.

The mixed methods approach combining quantitative survey analysis and qualitative Focus Group and Participatory Observation helped to clarify the complex and dynamic process that produced the observed unsatisfactory result.

The results highlighted the challenge of adapting questionnaires to investigate sensitive issues in an age group particularly influenced by educational factors, especially when countries have different standards of achievement in education, as can be seen in emerging economies. This study has exposed some barriers to be addressed in future transcultural adaptation of drug use questionnaires to an adolescent age group.

## Glossary

*Measurement equivalence between languages:* Is achieved in transcultural adaptation if there is no important difference in the psychometric properties (construct validity, reliability, responsiveness) of the two versions of questionnaire.

*Mixed methods:* The simultaneous use of qualitative and quantitative study designs to improve validity.

## Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

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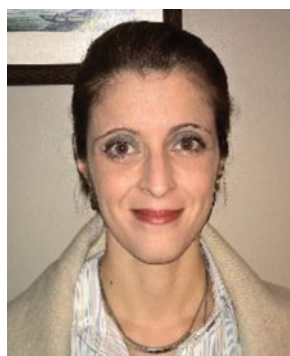
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