

## *Assessment of Temperament in Children: Translation of Instruments to Portuguese (Brazil) Language*

**Vivian Caroline Klein**

*Universidade de São Paulo, Ribeirão Preto, Brasil*

**Samuel P. Putnam**

*Bowdoin College, Brunswick, USA*

**Maria Beatriz Martins Linhares<sup>1</sup>**

*Universidade de São Paulo, Ribeirão Preto, Brasil*

### **Abstract**

International research has increasingly considered temperament as a relevant personal variable in child developmental pathways. The purpose of the present study was to describe the methodology for translation to Portuguese (Brazil) of three child temperament assessment instruments based on Rothbart's theoretical approach. An original translation was modified, based on feedback by two professional translators, three bilingual psychologists, and a sample of 15 Brazilian mothers. A back-translation by a professional translator was then assessed by the authors of the original (English language) instruments. For the final version of the measure, authors of the original instrument judged that 100% of items were consistent with the original items, and a second sample of 15 Brazilian mothers identified no problems with the Portuguese items.

*Keywords:* Temperament; Assessment; Children; Translating.

### **Avaliação do Temperamento em Crianças: Tradução de Instrumentos para a Língua Portuguesa (Brasil)**

#### **Resumo**

A pesquisa internacional tem crescentemente considerado o temperamento como uma variável pessoal relevante na trajetória de desenvolvimento da criança. O objetivo do presente estudo foi descrever a metodologia de tradução para a Língua Portuguesa (Brasil) de três instrumentos de avaliação do temperamento baseados na abordagem teórica de Rothbart. A tradução inicial foi modificada com base na avaliação de dois tradutores profissionais, três psicólogos bilíngües e uma amostra de 15 mães brasileiras. A retro-tradução realizada por um terceiro tradutor profissional foi avaliada pelos autores dos instrumentos originais. Para a versão final, os autores dos instrumentos originais julgaram que 100% dos itens eram consistentes com os itens originais e uma segunda amostra de 15 mães brasileiras não identificou problemas em compreender os itens dos instrumentos na Língua Portuguesa.

*Palavras-chave:* Temperamento; Avaliação; Crianças; Tradução.

Temperament can shape and be shaped by individual adaptation through different pathways (Rothbart, Posner, & Kieras, 2006). Although systems underlying aspects of temperament undergo substantial development, the construct of temperament is typically viewed as complementary to the study of normative development because of its focus on individual differences in these systems (Martin & Fox, 2006). In addition, temperament is a relevant construct for understanding of individual differences which may constitute psycho-

pathological disorders, or predispositions to them (Rothbart, 2004).

The most frequently-used theoretical approach in recent empirical studies about temperament in infancy and childhood is that proposed by Rothbart (Klein & Linhares, 2009). In this model, temperament is defined as constitutionally-based individual differences in reactivity and self-regulation, influenced over time by heredity, maturation, and experience (Rothbart, 1981). *Constitutional* refers to the individual's relatively enduring biological make-up, influenced over time by both genes and the environment. *Reactivity* refers to the onset, intensity, and duration of emotional, motor, and orienting reactions. According to Rothbart's perspective, temperament is not restricted to affective processes (Rothbart, Posner, & Hershey, 1995). It also includes behavioral aspects such as approach and withdrawal,

<sup>1</sup> Address: Universidade de São Paulo, Faculdade de Medicina, Laboratório de Pesquisa – Prevenção de Problemas de Desenvolvimento e Comportamento da Criança, Prédio da Saúde Mental, Avenida Tenente Catão Roxo, 2650, salas 52 e 53, Ribeirão Preto, SP, Brasil, CEP 14049-900. Tel.: (55) (16) 3602 4610; Fax: (55) (16) 3602 4504. E-mail: linhares@fmrp.usp.br

and attentional processes, including orientation maintenance and executive control, which form the basis for the development of self-regulation (Rothbart et al., 2006).

Children's temperament has been measured via parent report, observer ratings, and direct observations in both the home and laboratory (Rothbart & Hwang, 2002). Despite concerns over rater bias (Kagan, 1994), substantial objective validity of parent-report measures of temperament has been supported (Rothbart, Chew, & Gartstein, 2001; Rothbart & Hwang, 2002). Parent report allows for measurement of individual differences both broadly and narrowly, taking advantage of the caregiver's extensive amount of observation (Rothbart, Chew, et al., 2001) and the ability of parents to view their children in a wide range of situations that are ethically and logistically impossible to recreate in the laboratory (Putnam, Ellis, & Rothbart, 2001; Rothbart & Bates, 1998). This measurement approach allows for the assessment of several dimensions that compose the temperament construct. The systematic review of the literature recently conducted by Klein and Linhares (2009) showed that 88% of studies about temperament carried out between 2001 and 2006 used caregiver-report measures to assess temperament, and these instruments were primarily completed by mothers.

Although temperament refers to relatively stable tendencies, its elicitors and expressions often change across development. Changes in emotion and attention processes over time necessitate temperament measures that focus on multiple stages of the life span (Putnam et al., 2001). Based on Rothbart's approach, a battery of theory-derived instruments for temperament assessment have been developed targeting different stages of human development, including infancy (Gartstein & Rothbart, 2003; Rothbart, 1981), toddlerhood (Putnam, Gartstein, & Rothbart, 2006), early to middle childhood (Rothbart, Ahadi, Hershey, & Fisher, 2001), middle childhood (Simonds & Rothbart, 2004), adolescence (Ellis & Rothbart, 2001) and adulthood (Capaldi & Rothbart, 1992). The current study concerns translation of instruments aimed at the three earliest stages: the Infant Behavior Questionnaire-Revised ([IBQ-R]; Gartstein & Rothbart, 2003; Rothbart, 1981), the Early Childhood Behavior Questionnaire ([ECBQ]; Putnam et al., 2006) and the Children's Behavior Questionnaire ([CBQ]; Rothbart, Ahadi, et al., 2001). These measures have been shown to demonstrate satisfactory inter-rater reliability, internal consistency, and longitudinal stability, both within and across instruments (Putnam, Rothbart, & Gartstein, 2008). Furthermore, factor analyses of the IBQ-R, ECBQ and CBQ scales reliably recover a similar

three-factor solution indicating three broad domains of temperament: Negative Affect, Surgency/Extraversion and Regulatory Capacity/Effortful Control (Putnam et al., 2001).

These instruments have been translated to several languages, including Chinese, Dutch, Japanese, Norwegian, and Spanish (see *Mary Rothbart's Temperament Questionnaires* at Mary Rothbart Temperament Lab, 2006). The translated versions of these instruments have been used in cross-cultural temperament studies (Ahadi, Rothbart, & Ye, 1993; Gartstein et al., 2006; Gartstein, Knyazev, & Slobodskaya, 2005; Gonzalez, Hidalgo, Carranza, & Ato, 2000; Ye, Ming, & Rothbart, 1988). To date, however, no publications have specifically focused on the translation process itself, leading to a lack of standardization in this practice. In addition, to the best of our knowledge, there are no validated instruments available in Portuguese (Brazil) for the assessment of child temperament. The aim of the present study was to describe the methodological procedures for translation of the IBQ-R, ECBQ and CBQ into the Portuguese (Brazil) language.

## Method

### Participants

Thirty mothers of children ranging in age from three months to seven years (Mean=29 months;  $SD= \pm 22$  months) were located and consented participation in the study. Mothers of 15 children were recruited from a child-care center from the city of Ribeirão Preto, São Paulo (Southeast Brazil). Mothers of 15 children born preterm and very low birth weight were recruited from a pediatric context from the same city. The mothers' average age was 32 years ( $SD= \pm 6,2$  years). Eighty percent had elementary grade level education, and 20% had high school grade level. Fifty percent of the mothers were housewives and 50% worked outside the home. The majority of the mothers (83%) were from low socioeconomic status. This is a convenience sample, including 10 mothers of children in the age range specific to each instrument (from 3 to 12 months; from 18 to 36 months; and from 3 to 7 years of age).

### Instruments and Measures

*Infant Behavior Questionnaire- Revised* ([IBQ-R]; Gartstein & Rothbart, 2003). This instrument is composed of 184 items that assess the following 14 dimensions of temperament in infants aged 3 to 12 months: Activity Level, Distress to Limitations, Approach, Fear, Duration of Orienting, Smiling and Laughter, Vocal Reactivity, Sadness, Perceptual Sensitivity, High Intensity Pleasure, Low Intensity Pleasure, Cuddliness, Soothability, and Falling Reactivity. Parents are asked

to rate the frequency of specific temperament-related behaviors observed over the past week (or sometimes 2 weeks) in an ordinal scale ranging from 1 (never) to 7 (always). Gartstein and Rothbart (2003) reported internal consistency of scales ranging from .71 to .90 (average  $a = .81$ ) and inter-rater agreement ranging from .06 to .75 (average  $r = .42$ ).

*Early Childhood Behavior Questionnaire* ([ECBQ]; Putnam et al., 2006). This instrument is composed of 201 items that assess the following 18 dimensions of temperament in toddlers aged 18 to 36 months: Activity Level, Attentional Focusing, Attentional Shifting, Cuddliness, Discomfort, Fear, Frustration, High Intensity Pleasure, Impulsivity, Inhibitory Control, Low Intensity Pleasure, Motor Activation, Perceptual Sensitivity, Positive Anticipation, Sadness, Shyness, Sociability, and Soothability. Parents are asked to rate the frequency of specific temperament-related behaviors observed over the past two weeks in an ordinal scale ranging from 1 (never) to 7 (always). Putnam et al. (2006) reported internal consistency of scales ranging from .57 to .90 (average  $a = .81$ ) and inter-rater agreement ranging from .09 to .57 (average  $r = .39$ ).

*Children's Behavior Questionnaire* ([CBQ]; Rothbart, Ahadi, et al., 2001). This instrument is composed of 195 items that assess the following 15 domains of temperament in children aged 3 to 7 years: Activity Level, Anger/ Frustration, Approach, Attentional Focusing, Discomfort, Falling Reactivity, Fear, High Intensity Pleasure, Impulsivity, Inhibitory Control, Low Intensity Pleasure, Perceptual Sensitivity, Sadness, Shyness, and Smiling and Laughter. Parents are asked to rate how much the items describe the children's behavior in the past two months on an ordinal scale ranging from 1 (extremely untrue) to 7 (extremely true). Rothbart, Ahadi, et al. (2001) reported internal consistency of scales ranging from .64 to .92 (average  $a = .74$ ) and inter-rater agreement across three samples ranging from .17 to .79 (average  $r = .43$ ).

#### Procedures for Translation of the Instruments

After receiving authorization from the authors of the instruments, the following translation procedures were employed:

*Step 1-First Version.* Two authors of this study (Translators A and B) translated the three instruments from English to Portuguese. Those translations and the original English (USA) versions were sent to two professional translators (Translator C was a North American living in Brazil and Translator D was a Brazilian) with no experience in Psychology. Translators C and D reviewed the proposed translation independently and suggested some changes. Translators A and B considered these suggestions and made changes to the measures where appropriate.

*Step 2 - Researcher Evaluation (Second Version).* The translated instruments created in Step 1 were sent, along with the original versions, to three bilingual psychologists who were experts in human development and developmental psychopathology. The psychologists judged whether the items evaluated the theoretical constructs of the original instruments. Suggested changes made by these psychologists were considered and added to the translation, resulting in the second version.

*Step 3 - Parent Evaluation (Third Version).* The second version instruments were administered to a sample of 15 mothers selected from a child care center. The examiner, the lead author of this study, explained the aim of the study, described the ordinal response scale and provided some examples. The items of the instruments were read one-by-one to individual mothers. In order to help the participants understand the ordinal response scale of each instrument, a printed colored scale adapted from the original version was displayed during the interview. The interviews lasted 45 to 90 minutes. During the interview, when mothers had doubts about certain questions, these items were marked to be reviewed and rephrased. After administering the instruments to the entire sample, the questions identified as problematic were reviewed and the authors of this study made the necessary changes to adapt the items to the study sample, resulting in the third version of the instruments.

*Step 4 - Author Evaluation (Final Version).* A third professional translator (Translator E), who was not familiar with the original version ("blinded examiner") back-translated the third Portuguese version to the original language (English). These back-translations of the three instruments were sent to two North-American researchers, who were authors of the instruments. Items in each instrument that did not have the same meaning as the original ones were identified and modified according to the suggestions and explanations of the authors of the instruments and sent to Translator E. After the translator back-translated the modified items, this version was sent to the instrument authors once more. At this point, the instrument authors agreed that the substantive meaning of all items and scales of the original English versions had been maintained, and approved the final translation of the IBQ-R, ECBQ, and CBQ to Portuguese (Brazil).

*Assessment of Feasibility.* The final Portuguese (Brazil) versions were administered to 15 mothers of children selected from a pediatric setting, with five from each age-group (3-12 months; 18-36 months; 3-7 years) in order to verify the applicability of the instruments. The items of the instruments were read one-by-one in individual interviews with the mothers.

## Results

After the second version of the instruments had been administered to a sample of Brazilian mothers, 20% (36 items) of the IBQ-R, 16% (32 items) of the ECBQ and 17% (33 items) of the CBQ were reviewed and

rewritten. In order to enhance the comprehension of the mothers from our sample, 7% (12 items) of the IBQ-R, 2% (3 items) of the ECBQ, and 4% (7 items) were adapted (see Table 1), resulting in the third versions of the instruments.

Table 1

*Summary of the Items Modified to Enhance the Comprehension of the Children's Temperament Assessment Instruments by Brazilian Mothers*

Instrument	Item	Original Version	Portuguese (Brazil) Version*
IBQ-R	6	nursery rhymes	canções infantis/songs for children
	8	high chair	cadeira de bebê/baby chair
	9	when s/he was ready for more food	quando queria mais comida/when she/he wanted more food
	14	seem unresponsive	parece irresponsivo (sem ação)/seem unresponsive (actionless)
	15,16, 17	after sleeping	ao acordar/soon after waking up
	79, 80	Peekaboo game	brincadeira de "escondeu-achou" (quando alguém esconde o rosto e depois reaparece, dizendo "achou!")/"hide and find game" (when someone conceals his/her face and then shows up again saying: " You found it !")
	82	bouncer chair	cadeirinha de balanço para bebê/rocking chair for baby
	138	a bird or a squirrel up in a tree	um passarinho em uma árvore/a bird in a tree
	166	caregiver is gone for an unusually long period of time	o cuidador se ausentou por um tempo muito longo (mais que o de costume)/the caregiver went away and stayed out for a long time (more than usual)
	ECBQ	13	jungle gym
30		nursery rhymes	canções infantis/rhyming songs for children
44		choose to take chances for the fun and excitement of it	decide correr risco só pela sua diversão/ decide to take risk just for the fun of it
CBQ	20	is good at games like "Simon Says", "Mother, May I?" and "Red Light, Green Light"	é boa em jogos como "Estátua"/ (brincadeira que tem que obedecer à ordem de parar ou iniciar ações)/ is good at games like "Statue" (game in which a child has to stop or start actions)
	51	choose to take chances for the fun and excitement of it	decide correr risco só pela sua diversão/decide to take risk just for the fun of it
	111	isn't interested in watching quiet TV shows such as "Mister Rogers"	não se interessa muito em assistir programas de televisão calmos/isn't interested in watching quiet TV shows
	126	plays games slowly and deliberately	joga devagar e com cuidado em comportar-se corretamente/ plays games slowly, being careful to behave in a correct way
	135	Doesn't often giggle or act "silly"	não ri nem faz "palhaçadas" com frequência/doesn't often laugh or do funny things
	145	sits quietly in the bath	fica sentada sossegada e quieta no banho/stays easy and quiet during the bath
	151	nursery rhymes	canções infantis/rhyming songs for children

*Note.* \*In the column "Portuguese (Brazil) version", the sentences in English refer to a literal translation of what the original items mean in Portuguese (Brazil).

According to the evaluation of the original authors, the third versions of the translation of the instruments presented 92% agreement for the IBQ-R, 95% for the ECBQ and 97% for the CBQ. Fifteen items from the

IBQ-R, 9 items from ECBQ and 6 items from the CBQ were modified according to the original authors' suggestions. After reviewing the modified items, the original instrument authors agreed that all the final

versions of the translations reached 100% linguistic equivalence with the original English versions of the temperament assessment instruments.

The final versions of the instruments were administered to a sample of mothers from a pediatric setting and no problems for understanding or answering the items were identified.

The original versions of those instruments, as well as their translations to Portuguese, can be obtained free of charge for authorized use in research from the original authors at the “*Mary Rothbart’s Temperament Questionnaires*” website (Mary Rothbart Temperament Lab, 2006).

### Discussion

The study of child temperament, which has been increasing in *developed countries*, needs to expand to the vast majority of the world’s children who live in *developing countries*, and who encounter multiple and chronic life stresses, as highlighted by Wachs (2006). In order to reach this goal, properly validated instruments for assessing temperament must be translated and adapted to specific cultures. This study provides the translation to the Portuguese language of fine-grained instruments used for temperament assessment of children between three months and seven years in several cultures (Gartstein et al., 2006; Gartstein et al., 2005).

The Portuguese-language versions of the IBQ-R, ECBQ and CBQ were created through a careful process of translation and adjustment. In addition, the methodology used in this study was rigorous in the examination of translation accuracy via back-translation, as recommended by Rothbart, Ahadi, et al. (2001). The present versions can be considered equivalent to the original forms in terms of conceptual definitions and items included. The final back-translations were accepted by the authors of the original instruments, and were thus designated the official Portuguese (Brazil) language versions of the IBQ-R, ECBQ and CBQ (see *Mary Rothbart’s Temperament Questionnaires* at Mary Rothbart Temperament Lab, 2006). Also, the feasibility of the instruments was supported by administration to a second sample of mothers, including five mothers for each instrument.

The Brazilian version of the ECBQ has recently been completed by mothers in recent studies including different Brazilian samples. Twenty five toddlers born preterm and very low birth weight were compared to 23 toddlers born full-term in regard to temperament; the findings revealed that the preterm toddlers exhibited higher scores on Perceptual Sensitivity, Motor Activation, and High Intensity Pleasure, and lower scores on Cuddliness than the full-term ones (Klein, Martinez,

& Linhares, 2008). In a sample of 31 toddlers selected from a day-care center, high scores on the Negative Affect temperament factor were associated with more internalizing and externalizing problems, high scores on the Surgency temperament factor were associated with more externalizing problems, and low scores on the Effortful Control temperament factor were associated with fewer externalizing problems (Rocha, Klein, & Linhares, 2008).

Despite the care taken in acquiring linguistic equivalence, our study has several limitations. The sample size of the present study is small and from just one city of Southeast Brazil. The translation process was developed only with mothers completing the questionnaires. Also, the comprehension of the items of each instrument was verified only in interview form.

It is important that further studies involve larger samples from different regions of Brazil. Moreover, future studies could examine the applicability of these versions with fathers, because gender differences may exist in the comprehension of specific items. Further studies should test the self-administered application form, to verify if Brazilian mothers are able to understand the items without the mediation of the interviewer. Finally, psychometric studies with larger samples are needed in order to assess the psychometric properties of the Brazilian versions of children’s temperament assessment questionnaires, such as internal consistency, factorial structure, and predictive validity, to further validate the Portuguese language versions of these instruments.

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**Vivian Caroline Klein.** Universidade de São Paulo, Ribeirão Preto, Brasil.

**Samuel P. Putnam.** Bowdoin College, Brunswick, USA.

**Maria Beatriz Martins Linhares.** Universidade de São Paulo, Ribeirão Preto, Brasil.