

## ***Trans-Cultural Adaptation and Psychometric Properties of the 'Sense of Coherence Scale' in Mothers of Preschool Children***

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### **Abstract**

The aim of this paper is to present the trans-cultural adaptation and reliability of the Sense of Coherence scale (SOC-13 from Antonovsky) into Portuguese language using a sample of mothers of preschool children. The originally validated scale demonstrated a low return percentage and high number of extreme answers when applied to mothers of preschool children selected by convenience sampling in Brazil. Adaptations were made through cognitive interviews and involved rewording items, the usage of five rather than seven alternatives and the insertion of middle anchoring phrases. Three independent samples took part in the study for the psychometric tests. These samples consisted of one group of 36 and another of 38 mothers selected by convenience, as well as an additional group of 546 mothers randomly selected from the city of Belo Horizonte, Brazil. Instrument reliability was accessed by internal consistency, test-retest and item-to-total-score correlations with each of the three samples, respectively. Findings indicate that the adapted scale is comprehensible and obtained a greater response rate than the originally validated scale. Internal consistency increased from 0.67 for the original scale to 0.71 for the adapted scale. This value was extended to 0.80 in the test with the randomly selected sample. Medium weighted Kappa coefficients were 49.5%. The Spearman test demonstrated that the questions were correlated with total SOC scores. Results indicate that the adapted scale is valid and consistent for mothers of preschool children from different social classes.

*Keywords:* Sense of coherence (SOC); socio-economic status (SES); validation studies; trans-cultural adaptation.

### **Adaptação Trans-Cultural e Propriedades Psicométricas da 'Escala de Senso de Coerência' em Mães de Crianças Pré-Escolares**

#### **Resumo**

O objetivo do presente estudo é apresentar a adaptação trans cultural e a confiabilidade da escala de Senso de Coerência (SOC-13 de Antonovsky) para a língua portuguesa em uma amostra de mães de crianças pré-escolares. A escala originalmente validada demonstrou um baixo percentual de resposta e um elevado número de respostas extremas quando aplicada a mães de crianças pré-escolares de uma amostra de conveniência na cidade de Belo Horizonte, Brasil. Com o auxílio de entrevistas cognitivas, foram feitas adaptações que envolveram a alteração de palavras, o uso de cinco opções de respostas ao invés de sete e a inserção de explicação por escrito para as respostas intermediárias. Três amostras independentes participaram do estudo para os testes psicométricos. Estas três amostras consistiram de um grupo de 36 e outro de 38 mães selecionadas por conveniência, e um terceiro grupo composto por 564 mães selecionadas aleatoriamente. A confiabilidade foi verificada através da consistência interna,

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teste-reteste e correlação ítem-escore total, em cada uma das três amostras respectivamente. Os resultados indicam que a escala adaptada é consistente e obteve uma taxa de respostas superior à da escala originalmente validada. A consistência interna aumentou de 0,67 para 0,71 para a escala adaptada. Este valor aumentou para 0,80 no teste com a amostra aleatoriamente selecionada. Os coeficientes de Kappa ponderado atingiram valores médios de 49,5%. A correlação de Spearman mostrou que todos os itens se correlacionaram com os escores totais de SOC. Os resultados indicam que a escala adaptada é válida e consistente para mães de crianças pré-escolares de diferentes classes sociais.

*Palabras clave:* Senso de coerência (SOC); classificação sócio-econômica (SES); estudos de validação; adaptação trans-cultural.

The present paper is based on the concept of Salutogenesis, the aim of which is to identify and modify social structure factors that influence the health of individuals. According to the theory, unhealthy factors are part of the environment and a healthy state is more related to the perception and manner of dealing with such factors than to their mere presence (Antonovsky, 1987; Watt, 2002).

This way of perceiving reality is known as a Sense of Coherence (SOC) and is seen as a personality trait that introduces comprehension and gives meaning to events, thereby creating a sense of manageability of the environment and promoting healthy behavior. SOC influences habits that directly affect health and adaptive behavior to stress, and can therefore decrease the severity of illnesses. Furthermore, SOC decreases the perception of environmental stress and the negative emotions stemming from such stress (Antonovsky, 1987; Kivimäki, Feldt, Vahtera, & Nurmi, 2000).

The study of SOC among populations is of great importance, as health goes beyond biological knowledge and other areas of science, demonstrating a strong relationship with quality of life (Watt, 2002). Salutogenesis orientation leads to factors that promote a movement towards health rather than the search for factors that lead to illness.

SOC has three core components: comprehensibility – the ability for people to understand what happens around them, manageability – the extent they feel able to manage the situation, and meaningfulness – the ability to find meaning in a given situation (Eriksson & Lindström, 2005). The way one perceives events according to these factors is developed throughout an individual's life, becoming rather stable at the third decade of life (Antonovsky, 1987; Geyer, 1997).

In order to measure and qualify SOC in a standardized fashion a Likert-type questionnaire was developed by Antonovsky (1987). The scale consists of 29 questions (SOC-29) and addresses the three dimensions, but does not allow the separate analysis of each component (Eriksson & Lindström, 2005).

Other versions of the instrument have been proposed, including a shorter version with thirteen questions (SOC-13) presented by Antonovsky (1987). Both the

original and short version proved valid and consistent in a number of populations (Antonovsky, 1993; Pallant & Lae, 2002). The SOC-29 and SOC-13 have also been applied in prospective studies with duration of up to five years and had their stability proven (Antonovsky, 1993; Feldt, Leskinen, Kinnunen, & Mauno, 2000; Kivimäki et al., 2000).

SOC questionnaire validation has the purpose of making the variable measurements more reliable, allowing comparisons between different populations and the study of their differences. With this aim, the scale has been translated and validated in several countries like Australia, Belgium, Brazil, Bulgaria, Canada, Czechia, China, Colombia, Denmark, Finland, France, Germany, Greece, Iceland, Israel, Japan, Lithuania, New Zealand, Netherlands, Norway, Poland, Rumania, Russia, Serbia, Singapore, Slovakia, South Africa, Sweden, Switzerland, Thailand, United Kingdom and USA. It arouse the interest of researchers the world over, providing its validation in several languages (Antonovsky, 1993; Bonanato et al., 2008; Eriksson & Lindström, 2005; Freire, Hardy, & Sheiham, 2002; Freire, Sheiham, & Hardy, 2001; Grøholt, Stigum, Nordhagen, & Köhler, 2003).

In Portuguese language the short version of the questionnaire was validated by Freire (1999). The instrument was tested in a random sample of 664 adolescents and 664 mothers presenting satisfactory psychometric properties.

However, the scale validated by Freire (1999) presented a low rate of return and a high prevalence of extreme responses when applied to mothers of preschool children. The aim of this paper was to perform the trans-cultural adaptation and to evaluate the psychometric properties of the SOC-13 with regard to mothers of preschool children enrolled in both public and private schools in Belo Horizonte, the third largest city in Brazil.

## Method

The adaptations made in the originally validated questionnaire to Portuguese (SOC-13) occurred during a one-year study in both private and public schools. This study was approved by the ethics committees of the

participating institutions and informed consent was obtained from each mother selected.

The original SOC-13 entails a seven-point Likert-type scale and there is only wording for the extreme scores (1 and 7). Thus, intermediate answers have no written correspondence but only numbers to be marked. The respondent is expected to notice the degree of the answer through the increase in numbers. The final SOC score is the sum of answers. Almost all questions were constructed in the affirmative form and only one was in the negative, which leads to an inversion of the scores by the time analysis is performed (Antonovsky, 1987).

The methodology was divided into two parts. In the first part, a trans-cultural adaptation was made consisting of four stages. The second part was designed for psychometric tests in order to verify scale reliability and consisted of three stages.

### Trans-Cultural Adaptation

In the first stage, the originally validated questionnaire was used without changes among a group of 42 mothers of one to five-year-old children enrolled in kindergarten and living in the suburbs surrounding the city of Belo Horizonte. The percentage of only extreme answers (1 and 7) was 48%. A first adaptation was made in the set of questions in order to solve this problem (Antonovsky, 1993). The questions were listed in a table format with changes to the order. Questions of a similar type were grouped together. In this first adaptation, the number of answers and descriptive endpoints (1 and 7) of the Likert scale were kept.

A public school was chosen by convenience for the second stage of the study. All the five-year-old children received the questionnaire with the first modifications to deliver to their mothers and hand in to the teacher after the questionnaire had been filled out. A total of 76 questionnaires were sent out and 44.4% of the returned questionnaires presented only extreme answers (1 and 7). The originally validated scale with the initial changes presented a low rate of return (55%).

Some of the mothers that failed to return the questionnaire were invited to an individual interview in order to clarify why they had not answered the questionnaire and to get instructions as to changes needed. None of them refused to participate in this third stage of the study (Eremenco, Cella, & Arnold, 2005). Interviews took place at the school in a separate room where the mothers were given an explanation regarding the aim of the study and the importance of their participation in adapting the questionnaire properly. Interviews reached an end when the response content became repetitive and data saturation was achieved. Thus, the stage was concluded following the 12<sup>th</sup> participant (Eremenco et al., 2005).

Based on the problems pointed out, the scale was changed into a five-point Likert scale. Explanations for

intermediate answers (2, 3, 4, 5 and 6) were given and semantic limits of extreme answers were respected. The inverted scores were reverted so that the size of the number was related to the amount of writing of the responses. The negative question was substituted for its corresponding affirmative form. Some rewording was performed to adjust the meaning to the sample. For example, words such as "frequency" and "extremes" were not well comprehended and required rephrasing.

The adapted questionnaire form was reviewed by two independent researchers who were professors at the School of Dentistry of the Federal University of Minas Gerais and had not taken part in the adaptation process (Eremenco et al., 2005).

In the fourth stage, the final adapted scale was tested in two different groups of mothers of preschool children from one private and one public school. A total of 43 questionnaires were sent to the mothers and the rate of return was 72%. No difference was noticed between the mothers from public and private schools regarding the rate of return and the answers given. There were no questionnaires with only extreme answers (1 and 5). No number choice was preferred over the others, including the middle number (81.4% of the questionnaires presented less than four middle answers). Figure 1.1 displays the SOC-13 adaptation stages.

### Psychometric Tests

To test the psychometric properties of the questionnaire adapted, three different groups of mothers of five-year-old children were selected from several suburbs of the city (Figure 1.2). Inter-item internal consistency was verified by the Cronbach alpha coefficient. Weighted Kappa and Spearman correlation were used for test-retest reliability. The Spearman test was performed for the item-score correlation, as data was not normally distributed. Data set was analyzed using the Statistical Package for Social Science (SPSS 12.0) and Excel for Windows XP. The significance level adopted was  $p \leq .05$ .

*Internal Inter-Item Consistency.* Among the 42 mothers who took part in the initial stage of the present study and had answered the originally validated version into Portuguese, a group of 36 was recalled 10 months later to answer the final adapted version (Figure 1.2A). In this fifth stage, the questionnaire was sent through the children's schools to be answered at home. The  $\alpha$  scores of the original and adapted versions were compared.

*Reliability.* Assessment of the reliability of the answers was carried out in the sixth stage among a sample of 38 mothers of children who were enrolled in one public and one private school. A researcher handed out questionnaires to be answered at home. The mothers answered only the final adapted version of the scale at two different times with a fifteen-day interval between the two events (Figure 1.2B).

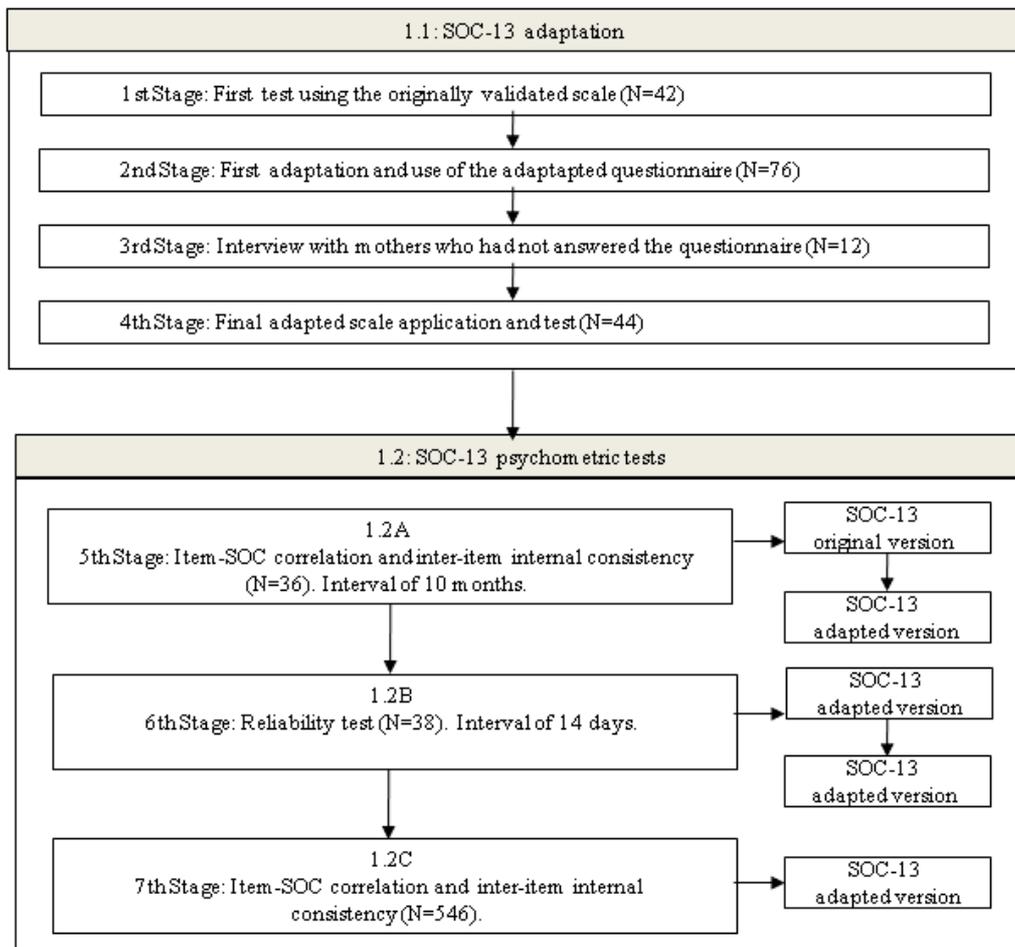


Figure 1. Flow chart of the trans-cultural adaptation stages (1.1) and psychometric tests (1.2) for SOC-13. 1.2A – Correlation and internal consistency. 1.2B – Reliability test. 1.2C – Correlation and internal consistency

*Total Item-Score Correlation and Inter-Item Internal Consistency in a Representative Sample.* The relation between the SOC scores in its final adapted version and the answers to the 13 adapted SOC questions was tested in the seventh stage among a representative sample of mothers in the city of Belo Horizonte. A total of 546 mothers of preschool children were randomly selected from an official list of schools. The sample size was calculated using caries prevalence data for six-year-old children (Santos, 1996). The relationship between the children’s experience with caries and their mother’s SOC will be discussed in another paper. The questionnaire was sent through the children’s schools to be answered at home. The children studied at both public and private schools from different parts of the city, thereby forming a heterogeneous sample. Inter-item internal consistency was also verified in this stage (Figure 1.2C).

**Results**

The internal consistency in the fifth stage increased from an  $\alpha$  value of 0.67 for the originally validated scale

to 0.71 after the changes were performed. The percentage of only extreme answers (1 or 7) was 38.9% when the questionnaire was initially used among 36 mothers. The second time, none of the questionnaires presented only extreme answers.

In the sixth stage, the reliability test revealed an average Kappa of 49.5%, with a large variation among the questions but indicating a discrete agreement (Table 1). The Spearman’s rank correlation coefficient for the total scores was 0.757 ( $p < .000$ ).

Table 2 displays the descriptive analysis regarding the representative sample of mothers of preschool children in the seventh stage. The Cronbach  $\alpha$  value of the scale was 0.80.

The Spearman test for this stage showed that the adapted SOC was positively correlated with all questions, presenting  $r$  values between 0.619 and 0.272 ( $p < .001$ ). The inter-item correlation was positive for 84.6% of the questions, presenting high significance in 66.7% and significance in another 17.9% ( $r$  between 0.086 and 0.619). Table 3 displays the inter-item and item-score correlations in the representative sample.

Table 1  
*Weighted Kappa Values for the 13 SOC Questions in a Convenience Sample of 38 Mothers of Five-year-Old Children from Different Suburbs of Belo Horizonte*

	Questions												
	1	2	3	4	5	6	7	8	9	10	11	12	13
<i>Weighted Kappa</i>	76.4	54.9	45.1	61.6	53.1	29.9	52.9	41.5	28.9	50.6	66.1	47.1	35.5

Table 2  
*Descriptive Data: Median, Standard Deviation and Total of Cases (N) observed for SOC Scores and for Each Question in a Representative Sample of 546 Mothers of Five-year-old Children from Different Suburbs of Belo Horizonte*

	SOC	1	2	3	4	5	6	7	8	9	10	11	12	13
<i>Median</i>	46.6	4.0	4.0	4.3	3.6	3.6	4.2	2.9	3.2	3.6	2.8	3.6	3.6	3.5
<i>SD</i>	6.8	0.7	0.8	0.9	0.9	0.9	0.9	0.9	1.1	1.2	0.9	0.9	1.1	0.8
<i>Total</i>	546	535	540	540	541	538	542	539	538	539	540	542	545	528

Table 3  
*Spearman Correlation (r) for the Total Score of the adapted SOC with respective Questions and Inter-item Correlation in a Representative Sample of 546 Mothers of Five-year-old Children from Different Suburbs of Belo Horizonte*

	SSOC	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13
SOC <i>r</i>	1.000													
P1 <i>r</i>	.304***	1.000												
P2 <i>r</i>	.357***	.344***	1.000											
P3 <i>r</i>	.338***	.192***	.258***	1.000										
P4 <i>r</i>	.431***	.126**	.097**	*	1.000									
P5 <i>r</i>	.612***	.164***	.181***	.149***	.335***	1.000								
P6 <i>r</i>	.596***	.285***	.335***	.201***	.290***	.388***	1.000							
P7 <i>r</i>	.530***	*	*	.113**	.275***	.302***	.258***	1.000						
P8 <i>r</i>	.619***	.140***	.159***	.158***	.227***	.430***	.311***	.375***	1.000					
P9 <i>r</i>	.556***	*	.114**	.180***	.210**	.351***	.278***	.255***	.396***	1.000				
P10 <i>r</i>	.460***	*	*	*	.185***	.246***	.162***	.560***	.292***	.244***	1.000			
P11 <i>r</i>	.547***	.157***	.194***	.098**	.300***	.331***	.372***	.292***	.378***	.268***	.244***	1.000		
P12 <i>r</i>	.578***	.086**	.125**	.125**	.235***	.387***	.372***	.268***	.395***	.314***	.289***	.421***	1.000	
P13 <i>r</i>	.272***	*	.131**	*	*	.100**	.194***	*	.088**	.105**	.127**	.093**	*	1.000

Note. \*\*\*  $p \leq .001$ ; \*\*  $p \leq .05$ ; \*  $p > .05$ .

### Discussion

The SOC questionnaire originally validated to Portuguese presented no adequate properties for application to the population of mothers of preschool children living in different social conditions. The low rate of return and high level of only extreme answers indicated the need for a new trans-cultural adaptation. The author of the SOC has commented on the possibility of this type of problem (Antonovsky, 1993).

In the first two stages of the project, there were similar percentages of only extreme answers to the questionnaires. This indicated difficulty in comprehension either of the meaning of the questions or the answering format, as was pointed out during the interviews, and may have led to a bias. To solve this problem, Antonovsky (1993) suggests clearer instructions or the insertion of a middle anchoring phrase. The third stage version, with final adaptations applied, did not have this kind of trouble.

Another problem brought out in the interviews was the number of possible answers. According to Oppenheim (1966), the number of answers for Likert-type scales should be 4 or 5, preferably respecting this limit. Another author indicated the number 5 in a study where the scale presented a Cronbach alpha value of 0.76, which was similar to the one obtained in the fifth stage of the present study (Nyamathi, 1991). Validation studies of other scales generally achieve similar values (Alonso, Lucas, Izquierdo, & Lobera, 2006; Garcia, 2006).

The absence of concentration concerning questions noticed in the fourth stage of the adaptation process is another positive feature, especially with regard to the intermediate answer (number 3). Although a neutral response does not represent the middle of the scale, the answers marked in the middle column can indicate a lack of enthusiasm or certainty, and can also indicate a duality of the response (Oppenheim, 1966).

Like the SOC, the Likert scale is designed to measure ordinal qualitative variables. According to Oppenheim (1966), if higher scores signify a lower total depending on the objective of the scale, the scores are reverted to evaluate the final score, as with the original SOC (Oppenheim, 1966). However, the results in this paper show the respondents had difficulty in understanding this type of question, which may have occurred due to some social particularity of the sample, such as level of education.

According to Friberg, Martinussen and Rosenvinge (2006), questions in the negative form should be avoided, as such questions appear to be less valid, as occurred in the present study. Thus, the negative question was substituted for its affirmative form and the results achieved in the seventh stage confirmed its consistency.

The first study of the scale validation into Portuguese was made using a sample of middleclass Brazilian students with a high level of education. The samples for the following stages consisted of adolescent students. This leads us to think that their families gave importance to formal education beyond the age of 14 (Freire, 1999). In the present study, the sample consisted of the mothers of preschool children, who might have their kids at school as a necessity. This could have led this sample to greater difficulty in understanding the questions (Tinanoff & O'Sullivan, 1997). Thus, in spite of the validation into Portuguese, the scale still required trans-cultural adaptation. This is confirmed by the increased rate of return from the first to fourth stages and by the evidence of no further preference to certain responses.

The cross-cultural and trans-cultural questionnaire adaptation process involves semantic equivalence and depends on the comprehension of expressions by the population. Therefore, the item formulation must be suitable to the sample environment, which must be

previously verified in pilot studies (Eremenco et al., 2005). The cognitive interview is one of the methods applied to perform cross-cultural and trans-cultural scale adaptations. Interviews reach an end when data saturation is achieved, which generally occurs between the third and tenth participant (Eremenco et al., 2005). In this paper, saturation occurred by the fourth interview among the 34 interviewees of non-returned questionnaires, thereby allowing the conclusion of the stage following the 12<sup>th</sup> participant.

Even adapted cross-cultural questionnaires may need to undergo further changes in order to be applied to other groups of the same language. In this case, the translation and back-translation stages are not necessary and the psychometric properties are tested again, as done in the current study (Antonovsky, 1993).

The results of the fifth stage revealed the internal consistency that arose after the adaptation process (0.71), reaching higher values for the representative sample in the seventh stage (0.80). In a cross-lagged longitudinal study that took place in Israel, some questions were taken out of the SOC-29 for being considered improper for the sample (Antonovsky & Sagy, 1986). The scale presented an  $\alpha$  value of 0.638, which was lower compared to the current study. Similar  $\alpha$  values were observed in other validations of the SOC scales, ranging from 0.70 and 0.92 in several countries (Eriksson & Lindström, 2005). Those values were 0.92 in Sweden, 0.79 in French and in 0.81 Brazil (Freire et al., 2001; Gana & Garnier, 2001; Söderhamn & Holmgren, 2004).

The weighted Kappa coefficient was applied as a stability measurement for each question in the sixth stage, as the SOC scale is ordinal. Simple Kappa would not have taken differences in the variety of the answers into account, because it only considers exact answers and does not consider the distance between concordances or the severity of non-agreement. Weighted Kappa, however, is equal to the Intra-Class Correlation Coefficient considered in ratio scales, where zero has a real value, differently from the SOC scale (Macclure & Willet, 1987).

Scale reliability exhibited considerable variation from one question to the other. This can be understood as a remaining difficulty in some questions from the adapted scale or a possible non-stability in these questions. However, this test was not applied in the first validation study into Portuguese (Freire, 1999). Oppenheim (1966) suggests a one-hour to one-year interval between applications in order to perform reliability tests, but the best choice would be from 12 to 14 days, as done in the present study. The significance may be influenced by the size of the sample. Thus, Kappa values would be raised in the representative sample (Macclure & Willet, 1987). A number of other countries confirm the stability of the SOC scale in correlation tests ranging from 0.69

to 0.72 (Eriksson & Lindström, 2005; Feldt et al., 2000; Freire et al., 2001; Kivimäki et al., 2000) as with the present study. However, studies by Feldt, Leskinen, Kinnunen and Ruoppila (2003) and Smith, Breslin and Beaton (2003) did not verify such stability. Nonetheless, it appears that SOC tends to increase with age throughout the life span (Eriksson & Lindström, 2005).

The Spearman correlation applied in the representative sample of the seventh stage revealed encouraging data. Nearly all questions exhibited relations and there was coherence among them. There was also an association among all the questions and the final SOC scores, demonstrating that they were coherent with the scale. These correlation values (0.272 to 0.619) were lower than those reached in other studies in the USA and Israel (0.52 to 0.91), as well as Sweden (0.02 to 0.71) (Antonovsky, 1987; Söderhamn & Holmgren, 2004). Nonetheless, correlations were highly significant for all the questions proposed in this paper.

The adaptation of the previously validated questionnaire is taken as necessary regarding its application in samples from different cultures. The method applied for this next step was the use of the questionnaire in a target group, with the aim of testing the understandability and stability of meaning of items. The words that needed to be substituted were adequate, as confirmed by the psychometric tests in accordance to the skills described in the literature (Eremenco et al., 2005). During the first stages, the sample was composed of people living in financially limited areas, where understanding was naturally more restricted. For the final tests, the sample chosen was composed of people from different social classes, as suggested in the literature (Eremenco et al., 2005; Guillemin, Bombardier, & Beaton, 1993), but the minimum of 30 participants was kept for the reliability and correlation tests, as suggested by Eremenco et al. (2005).

Another important point to bear in mind is that the percentage of blank questionnaires in the early stages of trans-cultural adaptation is not in accordance that observed by Antonovsky (1987), who stated that such an event was extremely rare and that the population seemed to be happy to answer the questions. However, the prevalence of blank answers in the present study diminished with the changes. This result demonstrates that the trans-cultural adaptation improved the comprehensiveness of the scale, resulting in an increased ability of parts of the sample to answer the questionnaire.

Antonovsky (1993) reviews published papers that used the SOC in its different forms. The author concludes that several researchers noticed the occurrence of only extreme answers, which is one of the problems of the scale that merits longer studies. Thus, the author concludes that the scale needs to be validated to each specific population and new adap-

tations may be necessary for differentiated contexts. The reduction in the number of possible answers from seven to five was made in at least one previous study and validity was maintained (Nyamathi, 1991). Furthermore, the original author states that there is no gold standard for measuring the SOC. Adaptations made in the questionnaires have led to both doubts and solutions proposed by the author of the theory and the original scale.

The proposed trans-cultural adaptation for the SOC-13 proved to be consistent and reliable for the urban population of mothers in different social conditions.

## References

- Alonso, J. L. N., Lucas, J. M. A., Izquierdo, J. G. N., & Lobera, F. G. (2006). Validación de la escala de Motivación Educativa (EME) en Paraguay. *Interamerican Journal of Psychology*, 40, 391-398.
- Antonovsky, A. (1987). *Unraveling the mystery of health: How people manage stress and stay well*. San Francisco: Jossey-Bass.
- Antonovsky, A. (1993). The structure and properties of the sense of coherence scale. *Social Science and Medicine*, 36, 725-733.
- Antonovsky, H., & Sagy, S. (1986). The development of a sense of coherence and its impact on responses to stress situations. *The Journal of Social Psychology*, 126, 213-225.
- Bonanato, K., Scarpelli, A. C., Goursand, D., Mota, J. P. T., Paiva, S. M. P., & Pordeus, I. A. (2008). Sense of coherence and dental caries experience in preschool children from Belo Horizonte city. *Journal of Dental Science*, 23, 251-255.
- Eremenco, S. L., Cella, D., & Arnold, B. J. (2005). A comprehensive method for the translation and cross-cultural validation of health status questionnaires. *Evaluation & the Health Professions*, 28, 212-232.
- Eriksson, M., & Lindström, B. (2005). Validity of Antonovsky's sense of coherence scale: A systematic review. *Journal of Epidemiology Community Health*, 59, 460-466.
- Feldt, T., Leskinen, E., Kinnunen, U., & Mauno, S. (2000). Longitudinal factor analysis models in the assessment of the stability of the sense of coherence. *Personality and Individual Differences*, 28, 239-257.
- Feldt, T., Leskinen, E., Kinnunen, U., & Ruoppila, I. (2003). The stability of the sense of coherence: Comparing two age groups in a five-year follow up study. *Personality and Individual Differences*, 35, 1151-1165.
- Freire, M. C. M. (1999). *Oral health and sense of coherence: A study of Brazilian adolescents and their mothers*. Unpublished doctoral dissertation, University College London.
- Freire, M. C. M., Hardy, R., & Sheiham, A. (2002). Mothers' sense of coherence and their adolescent children's oral health status and behaviors. *Community Dental Health*, 19, 24-31.
- Freire, M. C. M., Sheiham, A., & Hardy, R. (2001). Adolescents' sense of coherence, oral health status and oral health related behaviors. *Community Dentistry and Oral Epidemiology*, 29, 204-212.
- Friborg, O., Martinussen, M., & Rosenvinge, J. H. (2006). Likert-based vs. semantic differential-based scorings of positive psychological constructs: A psychometric comparison of two versions of a scale measuring resilience. *Personality and Individual Differences*, 40, 873-884.
- Gana, K., & Garnier, S. (2001). Latent structure of the sense of coherence scale in a French sample. *Personality and Individual Differences*, 31, 1079-1090.
- García, J. M. R. (2006). Análisis comparativo de confiabilidad e validez de dos escalas de Anomia. *Interamerican Journal of Psychology*, 40, 193-204.

Geyer, S. (1997). Some conceptual considerations on the sense of coherence. *Social Science and Medicine*, 44, 1771-1779.

Grøholt, E. K., Stigum, H., Nordhagen, R., & Köhler, L. (2003). Is parental sense of coherence associated with child health? *European Journal of Public Health*, 13, 195-201.

Guillemin, F., Bombardier, C., & Beaton, D. (1993). Cross-cultural adaptation of health-related quality of life measures: Literature review and proposed guidelines. *Journal of Clinical Epidemiology*, 46, 1417-1432.

Kivimäki, M., Feldt, T., Vahtera, J., & Nurmi, J. E. (2000). Sense of coherence and health: Evidence from two cross-lagged longitudinal samples. *Social Science and Medicine*, 50, 583-597.

Macclure, M., & Willet, W. (1987). Misinterpretation and misuse of the Kappa statistic. *American Journal of Epidemiology*, 126, 161-169.

Nyamathi, A. M. (1991). Relationship of resources to emotional distress, somatic complaints, and high-risk behaviors in drug recovery and homeless minority women. *Research in Nursing Health*, 14, 269-277.

Oppenheim, A. N. (1966). *Questionnaire design and attitude measurement*. New York: Basic Books.

Pallant, J., & Lae, L. (2002). Sense of coherence, well-being, coping and personality factors: Further evaluation of the sense of coherence scale. *Personality and Individual Differences*, 33, 39-48.

Santos, R. M. (1996). *Distribuição das doenças da cavidade bucal nos usuários do Sistema Único de Saúde de Belo Horizonte: Um estudo de prevalência*. Unpublished master's thesis, School of Dentistry, Federal University of Minas Gerais, Belo Horizonte, MG.

Smith, P. M., Breslin, F. C., & Beaton, D. E. (2003). Questioning the stability of sense of coherence: The impact of socio-economic status and working conditions in the Canadian population. *Social Psychiatry Psychiatric Epidemiology*, 38, 475-484.

Söderhamn, O., & Holmgren, L. (2004). Testing Antonovsky's sense of coherence (SOC) scale among Swedish physically active older people. *Scandinavian Journal of Psychology*, 45, 215-221.

Tinanoff, N., & O'Sullivan, D. M. (1997). Early childhood caries: Overview and recent findings. *Pediatric Dentistry*, 19, 12-16.

Watt, R. G. (2002). Emerging theories into the social determinants of health: Implications for oral health promotion. *Community Dentistry and Oral Epidemiology*, 30, 241-247.

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**Appendix - Originally Validated Questionnaire**

**INSTRUÇÕES:**

Aqui estão 13 perguntas sobre vários aspectos da sua vida. Cada pergunta tem sete respostas possíveis. Marque, por favor, o número que expresse a sua resposta, sendo o 1 e o 7 as respostas extremas. Se para você a resposta for a 1, faça um círculo em 1, se for a 7, faça um círculo em 7. Se nenhuma destas respostas for a sua, faça um círculo no número que melhor expresse a sua maneira de pensar e sentir em relação à pergunta. Dê apenas uma única resposta em cada pergunta, por favor.

01- Você tem a sensação de que você **NÃO** se interessa realmente pelo que se passa ao seu redor?

	1	2	3	4	5	6	7	
Muito raramente ou nunca								Muito frequentemente

02- Já lhe aconteceu no passado você ter ficado surpreendida pelo comportamento de pessoas que você achava que conhecia bem?

	1	2	3	4	5	6	7	
Nunca aconteceu								Sempre aconteceu

03- Já lhe aconteceu ter ficado desapontada com pessoas em quem você confiava?

	1	2	3	4	5	6	7	
Nunca aconteceu								Sempre aconteceu

04- Até hoje a sua vida tem sido:

	1	2	3	4	5	6	7	
Sem nenhum objetivo ou meta clara								Com objetivos e metas muito claros

05- Você tem a impressão de que você tem sido tratada com injustiça?

	1	2	3	4	5	6	7	
Muito freqüentemente								Muito raramente ou nunca

06- Você tem a sensação de que está numa situação pouco comum, e sem saber o que fazer?

	1	2	3	4	5	6	7	
Muito freqüentemente								Muito raramente ou nunca

07- Aquilo que você faz diariamente é:

	1	2	3	4	5	6	7	
Uma fonte de profundo sofrimento e aborrecimento								Uma fonte de prazer e satisfação

08- Você tem idéias e sentimentos muito confusos?

	1	2	3	4	5	6	7	
Muito freqüentemente								Muito raramente ou nunca

09- Você costuma ter sentimentos que gostaria de não ter?

	1	2	3	4	5	6	7	
Muito freqüentemente								Muito raramente ou nunca

10- Muitas pessoas (mesmo a que têm caráter forte) algumas vezes sentem-se fracassadas em certas situações. Com que freqüência você já se sentiu fracassada no passado?

	1	2	3	4	5	6	7	
Nunca								Muito freqüentemente

11- Quando alguma coisa acontece na sua vida, você geralmente acaba achando que:

	1	2	3	4	5	6	7	
Você deu maior ou menor importância ao que aconteceu do que deveria ter dado								Você avaliou corretamente a importância do que aconteceu

12- Com que freqüência você tem a impressão de que existe pouco sentido nas coisas que você faz na sua vida diária?

	1	2	3	4	5	6	7	
Muito freqüentemente								Muito raramente ou nunca

13- Com que freqüência você tem sentimentos que você não tem certeza que pode controlar?

	1	2	3	4	5	6	7	
Muito freqüentemente								Muito raramente ou nunca



## Adapted Questionnaire

As perguntas a seguir são muito importantes, pois falam de você, **MAMÃE**, suas idéias e sentimentos, o que é muito importante neste estudo. Peço que respondam com carinho e atenção marcando *apenas uma resposta para cada pergunta*. Não existem respostas certas ou erradas para nenhuma delas. Preste atenção nas instruções para responder cada tipo de pergunta.

**INSTRUÇÕES PARA AS PERGUNTAS:** Aqui estão 13 perguntas sobre vários aspectos da sua vida. Cada pergunta tem cinco respostas possíveis. Marque com um X a opção que melhor expresse a sua maneira de pensar e sentir em relação ao que está sendo falado. Dê apenas **uma única resposta** em cada pergunta, por favor.

		Um enorme sofrimento e aborrecimento	Um sofrimento e aborrecimento	Nem aborrecimento nem satisfação	Um prazer e satisfação	Um enorme prazer e satisfação
01	Aquilo que você faz diária-mente é:					
		Sem nenhum objetivo	Com poucos objetivos	Com alguns objetivos	Com muitos objetivos	Repleta de objetivos
02	Até hoje a sua vida tem sido:					

		Nunca	Poucas vezes	Algumas vezes	Muitas vezes	Sempre
03	Você tem interesse pelo que se passa ao seu redor?					
04	Você acha que você é tratada com injustiça?					
05	Você tem idéias e sentimentos confusos?					
06	Você acha que as coisas que você faz na sua vida têm pouco sentido?					
07	Já lhe aconteceu ter ficado desapontada com pessoas em quem você confiava?					
08	Você tem sentimentos que gostaria de não ter?					
09	Você tem dúvida se pode controlar seus sentimentos?					
10	Já lhe aconteceu de ficar surpreendida com o comportamento de pessoas que você achava que conhecia bem?					
11	Em algumas situações, as pessoas sentem-se fracassadas. Você já se sentiu fracassada?					
12	Você sente que está numa situação pouco comum, e sem saber o que fazer?					
		Totalmente errada	Errada	Nem correta e nem errada	Correta	Totalmente correta
13	Às vezes acontecem coisas na vida da gente que depois achamos que não demos a devida importância. Quando alguma coisa acontece na sua vida, você acaba achando que deu a importância:					