

# Confirmatory Factor Analysis of Sleep Model's Questionnaires

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## Introduction & Purpose

Models that can both explain and evaluate sleep, while being usable in sleep education strategies are lacking <sup>(1)</sup>. In order to fill this gap, the present study aims to test the factor structure of two sleep questionnaires and their internal consistency in a sample of adolescents and their respective parents and to evaluate the validity and robustness of a three-dimensional model about sleep, addressing nine subcategories related to sleep habits, personal factors and environmental factors <sup>(2)</sup>.

## Methods

Participants were recruited from Portuguese schools and the Questionnaires were applied during community projects of "Sleep More to Read Better", a national sleep education project in collaboration with the National Reading Plan and the Sleep Schools Project.

654 Adolescents → My Sleep & I Question.

664 Parents → My Child's Sleep Question.

CONFIRMATORY FACTOR ANALYSIS

## Results

Confirmatory factor analysis indicate that a nine-factor model (AM3) has better fit indices compared with the others tested models for both samples.

Moreover, the comparison of the models through  $\Delta\chi^2$  index (chi-square difference between rival models) indicates a better fit for this model,  $\Delta\chi^2(24) = 186.5, p < .001$  for adolescents and  $\Delta\chi^2(24) = 209, p < .001$  for parents. Also, the three second-order factors have good internal consistency, convergent and discriminant validity for all factors in both samples.

Table 1 - Confirmatory factor analysis: comparison between alternative models for adolescents and parents

	Model	$\chi^2$	df	$\chi^2/df$	GFI	CFI	RMSEA (CI 90%)	ECVI	$\Delta\chi^2$ (Adf)
Adolescents	AM1	1281.2	324	3.95	.86	.62	.067 (.063 - .071)	2.127	249.9* (12)
	AM2	1140.6	321	3.55	.87	.67	.063 (.059 - .066)	1.921	209.5* (9)
	AM3	744.8	288	2.59	.92	.82	.049 (.045 - .054)	1.416	186.5* (24)
	AM4	960.9	314	3.12	.89	.74	.057 (.053 - .061)	1.698	48.7* (2)
	PM	931.3	312	2.98	.90	.76	.055 (.051 - .059)	1.628	-
Parents	AM1	1383.3	324	4.27	.84	.70	.070 (.066 - .074)	2.249	341* (12)
	AM2	1333.7	321	4.15	.85	.71	.069 (.065 - .073)	2.184	291.7* (9)
	AM3	833	288	2.89	.91	.85	.053 (.049 - .058)	1.528	209* (24)
	AM4	1045.8	314	3.33	.89	.79	.059 (.055 - .063)	1.770	3.8 (2)
	PM	1042	312	3.34	.89	.79	.059 (.055 - .063)	1.771	-

	CR	AVE	MSV	ASV	1	2	3
Adolescents	Sleep habits	.98	.95	.51	.48	.97	
	Environmental factors	.87	.69	.45	.45	.67	.83
	Personal	.89	.74	.51	.47	.72	.66
Parents	Sleep habits	.92	.79	.97	.68	.89	
	Environmental factors	.86	.69	.38	.33	.62	.83
	Personal	.83	.62	.97	.62	.98	.53

Table 2 - Indicators of internal consistency and validity

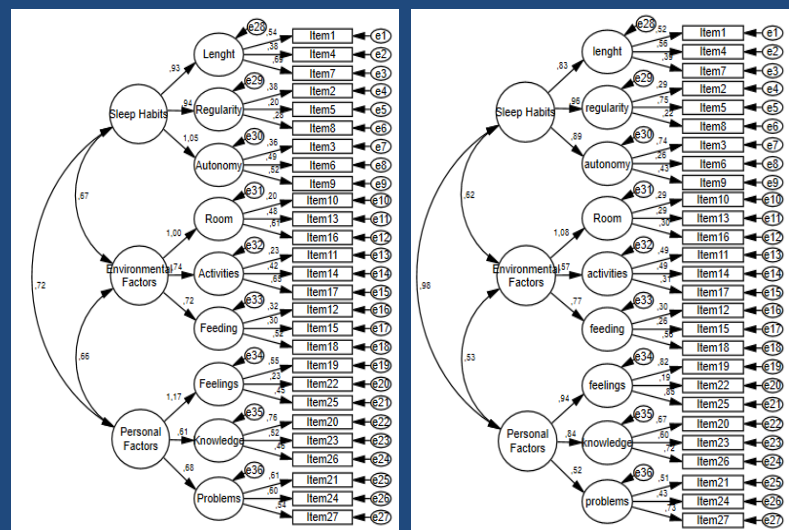


Figure 1 - Three-dimensional model about sleep: sleep habits, personal factors and environmental factors, for adolescents (left) and parents (right)

## Conclusions

Both questionnaires were found to be psychometrically valid instruments that allow a screening about adolescents' and parents' perceptions adolescents' about sleep, according to this three dimensions and respective nine sub-dimensions, materialized in a model of education which includes sleep behavioral, cognitive and affective aspects in the construction and modification of attitudes in this area. This model can lead to a variety of theoretical and practical workshops and trainings, including clinical support.

<sup>(1)</sup> Wolfson, A. (2007). Adolescent sleep update: Narrowing the gap between research and practice. *Sleep Medicine*, 5, 194-209.

<sup>(2)</sup> Rebelo-Pinto, T., Pinto, J., Rebelo-Pinto, H. & Paiva, T. (2014). Validation of a three-dimensional model about sleep: habits, personal factors and environmental factors. Submitted to *Sleep Science*.