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Analysis of a graded readers survey through a structural equation model

Análisis de una encuesta sobre el plan lector a través del modelo de ecuaciones estructurales

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Abstract
This document examines the acquisition of language by primary learners of a school in Bogotá. The quantitative study indicates that the endogenous variable is "Intensive Reading" (acquisition of reading skills in a second language) and it does not have any influence with the "Extensive Reading" (students´ motivational stage to learn), which is the exogenous variable. The study concludes that there is a successful learning effect that comes directly from the "Resources and Materials" use by the teachers.
Key words: latent variables, observable variables, covariance, language acquisition, second language.

Resumen
Este documento examina la adquisición del lenguaje por parte de estudiantes de primaria de un colegio en Bogotá. El estudio cuantitativo indica que la variable endógena es "Lectura Intensiva" (adquisición de habilidades de lectura en un segundo idioma) y no tiene ninguna influencia sobre la "Lectura Extensiva" (etapa de motivación para aprender), que es la variable exógena. Se concluye que hay un efecto de aprendizaje exitoso que proviene directamente del uso de "Recursos y Materiales" por parte de los maestros.
Palabras clave: variables latentes, variables observables, covarianza, adquisición del lenguaje, segunda lengua.

1. Introduction

Numerous studies have shown that fostering reading at a young age brings benefits to our students, as presented by Devine (1984). A high proficiency level in reading enables students to deeply understand the world around them to become competent learners. Schools have then adopted for the last decade new teaching policies to improve students' proficiency levels, for example: "Leer es mi Cuento", policy issued by The Ministries of Education and Culture in Colombia that underpins competences in reading. Furthermore, this policy outlines the government's bilingualism approach to become a bilingual nation (MEN, 2013). Cumbres School is not far from implementing this educational policy that embraces teaching strategies favoring students' learning process. "Leer es mi Cuento" aims to achieve progress on reading by following some principles, such as acquire new

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knowledge, decrease reading difficulties, gain confidence, increase proficiency level in reading, consolidation of language characteristics and participate in the community through the use of leveled books. The reading program at Cumbres School promotes reading as an enjoyable task through a dynamic daily practice. The school has called the program “Graded Readers” as suggested by the Ministries. Thus, a survey has been designed following Likert scale to assess the teaching-learning strategies regarding the graded-leveled readers. The aim of this research was to analyze the gathered data of the survey administered to 4th, 5th and 6th grades students through a design of a Structural Equation Modeling, using Stata 14.0, in order to assess and value the strengths and weaknesses, as well as the strategies implemented by the teachers, that evidence how the reading program has been carried out. Consequently, focusing on the learner needs, roles, contributions and choices have become the primary concerns for the school (Nunan, 2011). This study was enlightened by the following objective: to assess the Graded Readers implementation with primary students through a structural equation model.

1.1. General area for investigation

There has been a great level of research into reading and its effects on young learners. Grabe (1993), states that educators have been highly interested in the processes of literacy development. Research underlines the learning process as a very meaningful method that contributes greatly to the learners’ cognitive achievement, having a procedure of learning-teaching strategies portrayed into intensive as well as extensive reading strategies leading students to rapid improvements in reading comprehension and reading speed. In addition, other studies have been developed to assess reading performance by learning readers’ own perceptions of their reading process. Devine (1984) conducted a study with 20 students with low proficiency reading skills. An interview was carried out to find out their attitudes toward reading and what influenced their reading choices. Devine gathered and then classified the obtained information to conclude: “Those readers who indicated in the interviews that they considered understanding what the author wanted to say as the measure of successful reading (that is, meaning centered readers) not surprisingly demonstrated a good to excellent recall and comprehension of the text. On the other hand, and, again not surprisingly, readers who equated good reading with sound identification or good pronunciation usually failed to understand or recall what they had read” (p. 129).

Devine (1984) concludes that meaning-centered readers can actually perform their internal assumptions and attitudes empowering them to perform their competences. However, the subjects lack development of a reading schema that undergoes cognitive processes, providing a meaningful scaffolding schemata.

Another study, undertook in Karnataka, India (Nag & Snowling, 2011) with students of middle school, suggests that students’ reading skills can be uplifted if some reading strategies are engaged to comply with understanding functions, such as decoding skills, phonological awareness, and knowledge of vocabulary assuring students a better acquisition of their native language, and most importantly making the reading process more natural by respecting individual differences.

“This survey of Kannada gives us some preliminary clues of the nature of the relationship between oral language, decoding and reading comprehension. We do not as yet understand what slows down some children from learning about the vocabulary and grammar of their language, even when it is the dominant language of their home, neighborhood and school books. But it is clear that we must develop multi-dimensional programs focused on oral language and decoding if we want to support children’s reading” (Nag & Snowling, 2011, p. 7).

It has been well argued the contributions this study provided to students from Kannada in order to make them competent performers. Teachers should address both decoding skills and broader oral language to reach the cognitive domain in their dominant language.

Guyotte (1997) also researched about reading comprehension skills of subjects in a Japanese University. Medical text passages were taken to measure content knowledge and its significant effect on the subjects. They identify

logical relationships in the text passage. Logical relationships were understood as information that can be classified immediately. However, subjects had a hard time identifying such information. In sum, the research study concluded that schema-building activities and tasks should be taught before students attempt to read. Students are almost never exposed to pre-reading activities as a learning alternative.

Lastly, an investigation using structural equation modeling to determine the factors that affect students´ reading skills was carried out with students of 15 years old from Turkey (Albayrak, 2015). In order to determine the factors, data from PISA 2009 was implemented to create the model. Reading attitudes, study habits, stimulation and strategies the teacher used are determined as independent latent variables. The main objective of the study was to find out students´ reading comprehension skills and the relationship between the four latent variables with the questionnaire. The model confirms that the variable the variable with the most influence on the students´ reading comprehension skills was the "strategies used by teachers" (Albayrak, 2015). Then, it is pretty much better how the teachers convey and use their didactical as well as pedagogical strategies to enhance reading skills, such as: scaffolding content, meaningful experiences for homework development, among others.

These studies caused a positive teaching impact that was later on reflected on students´ reading strategies.

2. Methodology

The study was conducted at Cumbres School (located in Bogotá) where their education policy is to strengthen learner's language abilities in English. The learners should reach a language level that is required at the end of the academic school year. By 6th grade students should achieve an independent user A2 level of English as a foreign language. As a result, the English department at Cumbres School modified and updated the teaching-learning Graded Readers' teaching plan that looked for a relationship between students' improvement on reading skills and teacher's best practices that could benefit students' reading competence and performance.

This research study was carried out with 4th, 5th and 6th graders. There was a total of 92 students participating in the project. The learners were A1 independent users who could understand and use familiar everyday expressions intended at the satisfaction of needs of a concrete use. Students´ English level revealed the descriptors for a language proficiency level framed by the Common European Framework (Council of Europe, 2018). The subjects of this study were selected among the whole primary learners because they evaluate factors associated with their learning experience due to their language acquisition which allowed them to clearly understand the questions stated in the survey.

2.1. Instrument

The education field is not far from designing surveys to collect information from a community's attitude and expectations (Cohen & Manion, 1985). Therefore, to assure reliability and validity to this research project, some control issues were taken into consideration as well as ethical issues to elicit information from the subjects. A survey of 24 items was designed to gather information about the learners' opinions, perceptions and suggestions of graded readers. Dornyei (2003) states, surveys are used to ask factual, behavioral and attitudinal questions.

The procedure followed to build the survey favored the national reading program fostered by the Ministry of Education (2013) to support learners' learning process in a foreign language. The construction of items guided the process of grouping each item into constructs. Then, to be more accurate of what students were going to be asked, such items were located into indicators. The Likert Scale was chosen as a means of assessing the reading program, due to the participants' age. Hence, the number of answers (five) helped learners to focus on only those five options, rating from 1 to be the lowest score to 5 the highest score.

2.2. Validation of the instrument through judges

Concerns arise regarding the lack of reliability of valid items on instruments for data collection. Therefore, expert judges determine if the item should be revised for further inquiry or if the item complies with its effectiveness of content and validity (Hardesty & William, 2003). In order to assure consistency in content validity and accuracy of each item, two expert judges were asked to assess each item to conclude if the item represented what each construct intended to. One of the judges was an expert validating instruments for quality management system in education. The other judge was an expert evaluating face validity of items on evaluation systems. The last question targets students´ interests in sharing their opinions regarding the selection of the graded readers for future generations.

Symmetric Measures concluded that .233 represented a fair strength of inter agreement between the judges, as suggested by Cohen's Kappa (Sim & Wright, 2005).

Last, the judges seemed to share the same belief about the constructs. They claimed the constructs focused on learners' needs, roles, contributions and choices. Table 1 shows the results done by the experts assessing content validity.

Table 1
Judging Content Validity

Expert judging´s validity				
Construct	**Indicator**	**Number of questions**	**Initial number of items before judging**	**Number of items in the final survey**
a. Intensive Reading	1. Build reading comprehension 2. Conventions and standard English 3. Vocabulary acquisition and use 4. Assignments and assessments	1-12	16	12
b. Extensive Reading	1. Increase fluency 2. Increase motivation 3. Increase confidence	13-18	7	6
c. Teaching Strategies	1. Before reading activities 2. While reading activities 3. After reading activities	19-21	2	3
d. Materials and Resources	1. Technological tools 2. Traditional materials	22-23	1	2
24. Would you like to be part of selecting Grader Readers?				
Number of experts judging: 2				

Source: authors´ own elaboration

2.3. Data analysis

The analysis was conducted in STATA (version, 2014) through a structural equation modeling (SEM), using the survey data of graded-leveled readers. SEM was selected in this research study that allows to pair the graders reading data with the hypothesis made by the researcher and to prove if such claims are compatible with each other. The purpose of SEM is to inquire about the pair of relations between variables. Hoyle (1995), states that SEM is a statistical approach used to test models in order to identify the observable as well as the latent variables. The research indicates that the dependent variable is "Intensive Reading" (acquisition of reading skills in a second

language) and the independent variable is "Extensive Reading" (students´ motivational stage to learn). The accuracy of the model constructed by the researcher with the most relevant factors is verified in SEM.

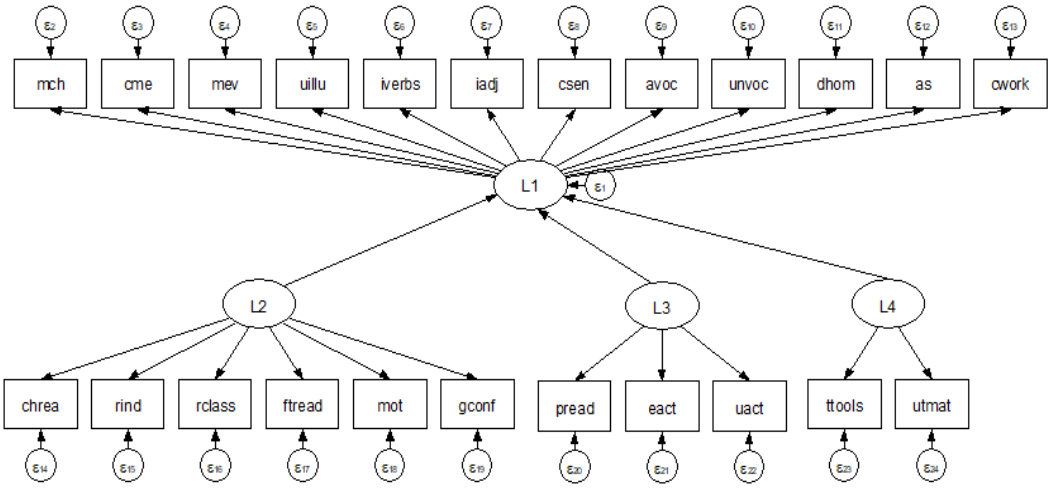
2.4. Models

A model was theoretically developed first in light of general area of investigation, as suggested by Nunan (2011) who conducted a study about Reading comprehension skills which provided valuable information of how to enhance reading skills in young learners. The questions of the survey were grouped in 4 constructs, which were the latent variables of the study: Intensive reading, extensive reading, teaching strategies and materials and resources (app. 1). These constructs provided a systematic and suitable method for labeling certain patterns found in data. In this sense, the researcher could classify and group similar types of behaviors in the findings. The latent variables were assessed through the confirmatory factor analysis (CFA) and the fit indexes.

The 23 variables were labeled using the first letter of each indicator: Main character (mch), central message (cme), main events (mev), understanding illustrations (uillu), identify verbs (iverbs), identify adjectives (iadj), components of a sentence (csen), acquisition of vocabulary (avoc), using new vocabulary (unvoc), usefulness when doing homework (dhom), assessment (as), collaborative work (cwork), choral reading (chread), individually reading (rind), reading in class (rclass), free time reading (ftread), motivation (mot), gaining confidence (gconf), predicting readings (pread), extra activities (eact), usefulness of activities (uact), technological tools (ttools), and usefulness of traditional materials (utma). The descriptive statistics of these variables can be observed in app. 2.

Escobedo *et al*. (2016), claim that SEM is useful because it assesses the relationship of dependent and independent variables. In addition, it captures the unobservable relationship among some variables and to find the mean error in the estimation process. In order to acknowledge the latent variable in this study -"Intensive Reading" (acquisition of reading skills in a second language)- with the students´ perceptions towards the graded readers. The specification of the theoretical model is described below, in fig. 1.

Figure 1
Theoretical model. Data taken from a survey administered
to 4-6th of graded students, 2017-2018 academic school year



Source: authors own elaboration

The 23 variables are the observable, endogenous variables, and L1 is the endogenous latent variable labeled as “Intensive Reading” (acquisition of reading skills in a second language). The exogenous latent variables were L2, L3 and L4 and they correspond to “Extensive Reading (students´ motivational stage) L3 is “Teaching Strategies”, and L4 is “Materials and Resources” consecutively.

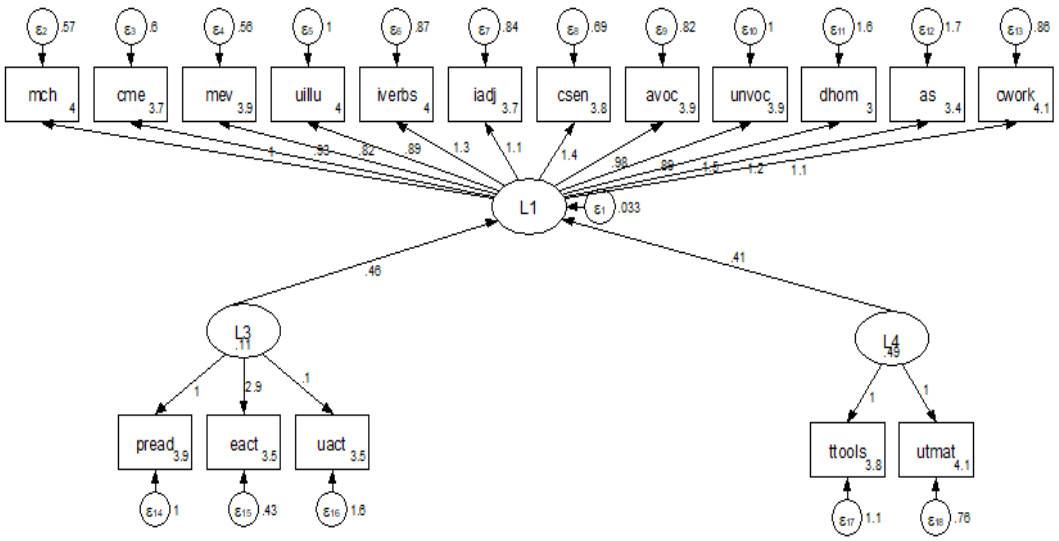
3. Results

The Structural Equation Model was tested with Stata 14.0 (app. 3). After 15 thousand iterations of the Structural Equation Model, it never converged into a unique solution. Then, the L2 “Extensive Reading”, being the exogenous latent variable, was deleted from the model, since the statistics relationship among the observable variables did not allow to establish a relationship between the latent variable L2 and with the other latent variables (endogenous). In despite of the results obtained from the model about deleting the L2 “Extensive Reading” which addressed motivational learning factors; numerous researchers have shown the opposite in regards of motivation in learning, as Harmer (2001) states that learners’ motivational level is meaningful in learning because it increases confidence in building fluency and proficiency. Also, motivation empowers learners visualize the progress they make, which will increase their interest for learning resulting in a more autonomous learning. Therefore, the model converged after 11 iterations, and results are presented in fig. 2. L2 did not have any likelihood estimation in the model. The conclusion made is that L2 “Extensive Reading” comes more from students. It does not have a high contribution on students´ perceptions and needs to develop their reading skills.

Figure 2

Structural equation model testing graded readers program.

Data taken from a survey administered to 4-6th grade students, 2017-2019 academic´s school year



Source: authors own elaboration

It is observed that the latent variables L3 “Teaching Strategies” and L4 “Materials and Resources” explain L1, that framed motivation in education which influences the learners to improve their learning process and develop self-efficacy that will evolve into better reading comprehension skills. Despite the fact that L2 was taken away from

the theoretical model, due to the lack of estimations and because it is an unobservable variable within the model, it is concluded that the model displays great coefficient results different from zero.

The Goodness-of-Fit indexes are displayed in app. 4. In general terms the Goodness-of-Fit indicates an acceptable fit and a significant model. The obtained fit indexes were: a 117 chi-square´s degrees of freedom; then it took 208.56 value with a p-value=0.0000 which is then, significant. The RMSEA value was 0.092, and a p-close of 0.001, which is below than 5%. The CFI and TLI, with 0.6 y 0.535 values respectively, may be interpreted as that the model does not have a perfect fit using these variables (Kline, 2016).

4. Conclusions

The SEM model verified that the latent variable related to "Intensive Reading" (acquisition of reading skills in a second language) is not explained by students' motivation for learning, despite the fact that they have been studies ensuring this claim as mentioned by Beers & Howell (2003). Regardless of how relevant is motivation to education and the benefits this brings to learners´ ongoing learning process (Clarke & Dede, 2005), the latent variable "Extensive Reading" (motivational reasons) was removed from the model since it did not have a relationship with the improvement of the reading skills. Learners do not find the use of materials relevant to uplift their motivational stages for learning. However, there is a strong relation between teacher´s teaching strategies with the materials and resources teachers use in class. This relationship is strongly bonded because the support material enhances learning and engages students to learn especially with those who are visual learners. It is observed how students find useful the materials teachers rely on when teaching Graded Readers in a second language. They seem to find resources as a means of teaching a subject. Moreover, students react positively when they support their understanding with very useful resources that will help them to comprehend much better (Linse, 2005).

It is recommended for future studies to use a model that lets the researcher analyze information from a data panel which involves measurements over time. Furthermore, it traces students´ perceptions and attitudes towards Graded Readers and how much those attitudes and perceptions have evolved over time. In this particular case of having the structural equation model was insufficient for the analysis, since this model only serves to scrutinize cross-sectional data.

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Annexes

Appendix 1

Survey

		Survey Scale	**Very dissatisfied**	**Somewhat dissatisfied**	**Neither satisfied nor dissatisfied**	**Somewhat satisfied**	**Very satisfied**
Var.	**Abrev.**	**Statement**	**1.**	**2.**	**3.**	**4.**	**5.**
1	*mch*	I identify the main characters of a story in graded readers.					
2	*cme*	I describe the central message in graded readers.					
3	*mev*	I describe the connection between a series of events in graded readers.					

		Survey Scale	Very dissatisfied	Somewhat dissatisfied	Neither satisfied nor dissatisfied	Somewhat satisfied	Very satisfied
4	*uillu*	I understand the illustrations and information in a text and the relationship between them.					
5	*iverbs*	I identify verbs in graded readers.					
6	*iadj*	I identify adjectives in graded readers.					
7	*csen*	I identify the main components of a sentence in graded readers.					
8	*avoc*	I increase my vocabulary in graded readers.					
9	*unvoc*	I use the vocabulary learned when need it.					
10	*dhom*	I like to do homework before or after reading a story.					
11	*as*	I like to be assessed individually after reading.					
12	*cwork*	I like to be assessed collaboratively after reading.					
13	*chread*	I read orally paying attention to punctuation in graded readers.					
14	*rind*	I prefer reading alone the graded readers.					
15	*rclass*	I prefer reading in class the graded readers.					
16	*ftread*	I enjoy reading during my free time the graded readers.					
17	*mot*	My grades motivate me to read more the graded readers.					
18	*gconf*	I make effective use of graded readers to express myself with confidence.					
19	*pread*	I find interesting the prediction activities before reading.					
20	*eact*	I find useful when the teacher assigns activities while reading.					
21	*uact*	I consider useful doing all the activities after reading.					

		Survey Scale	Very dissatisfied	Somewhat dissatisfied	Neither satisfied nor dissatisfied	Somewhat satisfied	Very satisfied
22	*ttools*	I find the technological tools (digital paths, blogs) useful to understand a story.					
23	*utma*	I find the use of common materials (worksheets, movies, audios) helpful to understand a story.					

Source: authors´ own elaboration

Appendix 2

Descriptive statistics for graded-leveled readers variables´ model.

stats	mch	cme	mev	uillu	iverbs	iadj	csen	avoc	unvoc	dhom
mean	4.01087	3.652174	3.891304	4	4	3.673913	3.804348	3.858696	3.923913	3.043478
min	2	1	2	1	1	1	1	1	1	1
max	5	5	5	5	5	5	5	5	5	5
sd	.8579885	.8572225	.8181529	1.079275	1.079275	1.017524	.9971292	.9898554	1.071444	1.397903
p50	4	4	4	4	4	4	4	4	4	3
kurtosis	2.630475	2.865542	2.701813	2.833037	2.53827	2.225238	2.989019	3.619708	3.134365	1.822574
skewness	-.5455403	-.1114127	-.4038953	-.8437356	-.7910021	-.2584358	-.6709714	-.8765688	-.8723748	-.150477

stats	as	cwork	chrea	rind	rclass	ftread	mot	gconf	pread	eact
mean	3.413043	4.065217	3.902174	3.228261	3.902174	2.804348	3.576087	3.326087	3.934783	3.543478
min	1	1	1	1	1	1	1	1	1	1
max	5	5	5	5	5	5	5	5	5	5
sd	1.391909	1.035675	.9145921	1.569652	1.214019	1.439163	1.081652	1.130095	1.077281	1.152284
p50	4	4	4	3	4	3	4	3	4	4
kurtosis	1.891642	3.252665	3.684457	1.563548	2.75732	1.622445	2.64493	2.383193	3.113046	2.557663
skewness	-.3726388	-.9660123	-.7593186	-.2617848	-.8864761	-.0099433	-.5115802	-.2057933	-.8776992	-.5182992

stats	uact	ttools	utmat
mean	3.5	3.771739	4.119565
min	1	1	1
max	5	5	5
sd	1.288154	1.267543	1.146829
p50	4	4	5
kurtosis	2.379589	2.341371	2.741443
skewness	-.6203114	-.671608	-.9822552

Source: authors´ own elaboration

Appendix 3

SEM using Stata 14.0.

```
Endogenous variables

Measurement:  mch cme mev uillu iverbs iadj csen avoc unvoc dhom as cwork pread eact uact ttools utmat
Latent:       L1

Exogenous variables

Latent:       L3 L4

Fitting target model:

Iteration 0:   log likelihood = -2270.5558  (not concave)
Iteration 1:   log likelihood = -2257.8728  (not concave)
Iteration 2:   log likelihood = -2252.8222  (not concave)
Iteration 3:   log likelihood = -2251.2161  (not concave)
Iteration 4:   log likelihood = -2250.5076
Iteration 5:   log likelihood = -2249.7327
Iteration 6:   log likelihood = -2248.9144
Iteration 7:   log likelihood = -2248.7841
Iteration 8:   log likelihood = -2248.7243
Iteration 9:   log likelihood = -2248.7151
Iteration 10:  log likelihood = -2248.7144
Iteration 11:  log likelihood = -2248.7142

Structural equation model                       Number of obs     =         92
Estimation method  = ml
Log likelihood     = -2248.7142

 ( 1)  [mch]L1 = 1
 ( 2)  [pread]L3 = 1
 ( 3)  [ttools]L4 = 1
```

	OIM Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
Structural						
L1 <-						
L3	.4591092	.2638855	1.74	0.082	-.0580969	.9763153
L4	.4148354	.1536463	2.70	0.007	.1136942	.7159766
Measurement						
mch <-						
L1	1	(constrained)				
_cons	4.01087	.0881795	45.49	0.000	3.838041	4.183698
cme <-						
L1	.9265268	.3360588	2.76	0.006	.2678636	1.58519
_cons	3.652174	.088211	41.40	0.000	3.479284	3.825064

mev <-						
L1	.8215423	.2923309	2.81	0.005	.2485843	1.3945
_cons	3.891304	.0842789	46.17	0.000	3.726121	4.056488
uillu <-						
L1	.8923112	.3793727	2.35	0.019	.1487544	1.635868
_cons	4	.1114136	35.90	0.000	3.781633	4.218367
iverbs <-						
L1	1.349333	.470791	2.87	0.004	.4265991	2.272066
_cons	4	.1107728	36.11	0.000	3.782889	4.217111
iadj <-						
L1	1.104087	.4144218	2.66	0.008	.2918356	1.916339
_cons	3.673913	.1047003	35.09	0.000	3.468704	3.879122
csen <-						
L1	1.389066	.4235843	3.28	0.001	.5588561	2.219276
_cons	3.804348	.1020864	37.27	0.000	3.604262	4.004434
avoc <-						
L1	.9809751	.3495618	2.81	0.005	.2958465	1.666104
_cons	3.858696	.1019836	37.84	0.000	3.658811	4.05858
unvoc <-						
L1	.8897674	.3907304	2.28	0.023	.1239498	1.655585
_cons	3.923913	.1106008	35.48	0.000	3.707139	4.140687
dhom <-						
L1	1.461468	.5343572	2.74	0.006	.4141474	2.508789
_cons	3.043478	.1439197	21.15	0.000	2.761401	3.325556
as <-						
L1	1.245922	.4946247	2.52	0.012	.276475	2.215368
_cons	3.413043	.1435764	23.77	0.000	3.131639	3.694448
cwork <-						
L1	1.131257	.4302969	2.63	0.009	.2878907	1.974624
_cons	4.065217	.1065569	38.15	0.000	3.85637	4.274065
pread <-						
L3	1	(constrained)				
_cons	3.934783	.1117022	35.23	0.000	3.71585	4.153715

eact <-						
L3	2.878127	2.866337	1.00	0.315	-2.73979	8.496044
_cons	3.543478	.1194836	29.66	0.000	3.309295	3.777662
uact <-						
L3	.1025594	.5596788	0.18	0.855	-.9943908	1.19951
_cons	3.5	.1335674	26.20	0.000	3.238213	3.761787
ttools <-						
L4	1	(constrained)				
_cons	3.771739	.1314303	28.70	0.000	3.51414	4.029338
utmat <-						
L4	1.048499	.319842	3.28	0.001	.4216201	1.675378
_cons	4.119565	.1189136	34.64	0.000	3.886499	4.352632
var(e.mch)	.5746995	.0938672			.4172649	.7915345
var(e.cme)	.59512	.0941797			.4364144	.8115403
var(e.mev)	.558535	.0894473			.4080691	.7644818
var(e.uillu)	1.03	.1585299			.7617749	1.392668
var(e.iverbs)	.8728012	.1502244			.6228861	1.222987
var(e.iadj)	.8370542	.138049			.6058587	1.156474
var(e.csen)	.6873911	.1192581			.4892442	.9657887
var(e.avoc)	.8215038	.1285964			.6044555	1.11649
var(e.unvoc)	1.014037	.155749			.7504384	1.370226
var(e.dhom)	1.605156	.2543379			1.17664	2.18973
var(e.as)	1.678159	.2600426			1.238607	2.273698
var(e.cwork)	.864597	.138789			.6312117	1.184275
var(e.pread)	1.041328	.1844785			.7358533	1.473614
var(e.eact)	.4304646	.8588123			.0086242	21.48594
var(e.uact)	1.640183	.2420017			1.228291	2.190197
var(e.ttools)	1.096667	.2176795			.7432209	1.618196
var(e.utmat)	.7594532	.1954675			.4585845	1.257716
var(e.L1)	.033431	.0370556			.0038077	.2935202
var(L3)	.1065907	.1248261			.0107373	1.058139
var(L4)	.4925349	.2236022			.202305	1.199133

LR test of model vs. saturated: chi2(117) = 208.56, Prob > chi2 = 0.0000

Source: authors´ own elaboration

Appendix 4

The Goodness-of- Fit Model

Fit statistic	Value	Description
Likelihood ratio		
chi2_ms(117)	208.555	model vs. saturated
p > chi2	0.000	
chi2_bs(136)	364.708	baseline vs. saturated
p > chi2	0.000	
Population error		
RMSEA	0.092	Root mean squared error of approximation
90% CI, lower bound	0.072	
upper bound	0.112	
pclose	0.001	Probability RMSEA <= 0.05
Information criteria		
AIC	4603.428	Akaike's information criterion
BIC	4737.083	Bayesian information criterion
Baseline comparison		
CFI	0.600	Comparative fit index
TLI	0.535	Tucker-Lewis index
Size of residuals		
SRMR	0.105	Standardized root mean squared residual
CD	0.939	Coefficient of determination

Source: authors´ own elaboration