

# **What is intelligence? The effectiveness of the WISC-IV for measuring it.**

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**What is intelligence?  
The effectiveness of  
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# INTRODUCTION

 What intelligence is, its concept and understanding the validity of I.Q. tests for measuring it, are keys for guiding the development of pupils, given that the psychometric concept of intelligence forms part of the diagnosis and prognosis both in the DSM-IV-TR as well as in the CIE-10. The I.Q. tests offer an image of the child as a student; a precise, overall picture of their capabilities; they highlight strengths and weaknesses; they offer multiple evaluation sources for monitoring progress; they offer useful information for learning and they deal with processes and products.

# INTRODUCTION

- 1. Is the new WISC-IV effective for measuring intelligence? The effectiveness of the WISC-IV as a psychometric clinical measurement of intelligence. Validation study in relation to the Stanford-Binet (Form L-M)**

# INTRODUCTION

**2. Is the WISC-IV equally effective for the entire range of intelligence?**

**The effectiveness of the WISC-IV as a psychometric clinical measure of intelligence.**

**A validation study in relation to the Stanford-Binet (Form L-M) in children with high, average and low normative intelligence (IQ range between 70 and 130).**

# INTRODUCTION

**3. Will the same relationship between the WISC-IV and the SBL-M with the sample of gifted children continue to be observed?**

**The effectiveness of the WISC-IV as a psychometric clinical measurement of intelligence for evaluating highly gifted children (IQ equal to or higher than 130).**



# INTRODUCTION

**4. Which of the indices of the WISC-IV are the best measurements for predicting intellectual capacity, taking the SBL-M as a reference?**

# INTRODUCTION

**5. Which of the subtests of the WISC-IV predict a better execution in the SBL-M?**



# INTRODUCTION

**6. Which cut-off score should be used to determine that a pupil is psychometrically gifted?**

# INTRODUCTION

**7. Which of the definitions of intelligence throughout history is nearest to the reality of the concept of intelligence, in accordance with research results and new theories?**

# INTRODUCTION

**8. Which is the best intelligence test for identifying gifted children?**

# CONTENTS

1. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence. Validation research in relation to the SBL-M (Stanford-Binet Forma L-M).
2. Effectiveness of the WISC-IV in relation to the SBL-M with children of low, normal low, normal, normal high and high intelligence.
3. Effectiveness of the WISC-IV in relation to the SBL-M with children at the extreme ends of the normal curve: Intellectually Gifted.
4. Which of the definitions of intelligence, throughout history, is the nearest to reality? The concept of intelligence in accordance with the results of the research and the new theories.

# **CONTENTS:**

- 1. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence. Investigation into its validation in relation to the SBL-M (Stanford-Binet Forma L-M)**



# What do I.Q. tests measure?

- **Wechsler**: what we measure with the tests is not only information, spacial perception and an ability to reason. This is only a means to achieve an end. What I.Q. tests measure is something more important: it is the capacity of a subject to understand the world which surrounds him and the set of resources which he possesses for confronting the challenges which are presented to him.
- **Binet** suggested that intelligent thinking has three distinct elements which he called: *direction*, *adaptation* and *criticism*. *Direction* implies knowing what to do and how to do it; *adaptation* refers to the creation of a strategy for performing a task and then conserving the print of the strategy and adapting it at the same time as it is applied; and *criticism* is the ability to criticise ones own thoughts and actions.



# CONTENTS:

**1. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence. Investigation into its validation in relation to the SBL-M (Stanford-Binet Forma L-M)**

■ **Methodology.**

■ **Statistical description of the sample.**

■ **Correlation of the SBL-M and WISC-IV tests.**

# CONTENTS:

## 1. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence. Investigation into its validation in relation to the SBL-M (Stanford-Binet Forma L-M)

### Methodology:

- a) Number of children selected: 84, of which 51 are gifted and 33 are not.
- b) No criterion of exclusion.
- c) From all parts of Spain.
- d) Middle and upper-middle class.
- e) To all the children in the sample the complete WISC-IV was applied (including all the complementary tests) and the SBL-M.
- f) The correction of the tests was carried out separately by two people trained for that end.

# CONTENTS:

**1. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence. Investigation of its validation in relation to the SBL-M (Stanford-Binet Forma L-M)**

**Statistical distribution of the sample according to SBL-M**

<b>IQ</b>	<b>N</b>
<b>&lt;100</b>	<b>5</b>
<b>100-109</b>	<b>4</b>
<b>110-119</b>	<b>6</b>
<b>120-129</b>	<b>18</b>
<b>&gt;129</b>	<b>51</b>
<b>Total</b>	<b>84</b>

# CONTENTS:

## 1. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence. Investigation into its validation in relation to the SBL-M (Stanford-Binet Forma L-M)

### Correlation between the SBL-M and the WISC-IV

Correlations

		IQ	WISC-IV
IQ	Correlation of Pearson	1	,823**
	Sig. (bilateral)		,000
	N	84	84
WISC-IV	Correlation of Pearson	,823**	1
	Sig. (bilateral)	,000	
	N	84	84

\*\* Correlation sig. 0,01 (bilateral)

# CONTENTS:

## 1. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence. Investigation into its validation in relation to the SBL-M (Stanford-Binet Forma L-M)

- **Correlation between the SBL-M and the WISC-IV bigger than with the version of the WISC-R, which correlation with the SBL-M, according to the investigation realized by Wechsler (n= 108 children), was  $r= 0,73$  (Wechsler 1974, p.15). The found correlation in the actual investigation between the SBL-M and the WISC-IV is  $r= 0,823$  (n= 84 children).**

# CONTENTS:

## 1. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence.

### Investigation into its validation in relation to the SBL-M (Stanford-Binet Forma L-M)

#### Correlation of the SBL-M test with the WISC-IV

Correlations

		IQ	VCI	PRI	WMI	PSI
<b>IQ</b>	Correlation of Pearson Sig. (bilateral) N	1	,761** ,000 84	,737** ,000 84	,491** ,000 84	,360** ,001 84
<b>VCI</b>	Correlation of Pearson Sig. (bilateral) N	,761** ,000 84	1  84	,712** ,000 84	,453** ,000 84	,234* ,032 84
<b>PRI</b>	Correlation of Pearson Sig. (bilateral) N	,737** ,000 84	,712** ,000 84	1  84	,400** ,000 84	,279* ,010 84
<b>WMI</b>	Correlation of Pearson Sig. (bilateral) N	,491** ,000 84	,453** ,000 84	,400** ,000 84	1  84	,246* ,024 84
<b>PSI</b>	Correlation of Pearson Sig. (bilateral) N	,360** ,001 84	,234* ,032 84	,279* ,010 84	,246* ,024 84	1  84

\*\* . Correlation sig. 0,01 (bilateral)

\* . Correlation sig. 0,05 (bilateral)



# CONTENTS:

## Analysis of the internal structure of the results of our total sample in the WISC-IV in comparison with the results of the sample from the technical manual of the WISC-IV

Internal structure of inter-correlations: convergent and discriminate validity. Average correlations between the test and indices. Technical manual and interpretation  
WISC-IV, page 63. Table 6.1.

Coefficient of Pearson correlation	WISC-IV FSIQ
VCI	0,82
PRI	0,82
WMI	0,70
PSI	0,57

Internal structure of inter-correlations: convergent and discriminate validity. Average correlations between test and indices. Results of our sample

Coefficient of Pearson correlation	WISC-IV FSIQ
VCI	0,847
PRI	0,826
WMI	0,669
PSI	0,536

# CONTENTS:

**Analysis of the internal structure of the results of our total sample in the WISC-IV in comparison with the results of the sample from the technical manual of the WISC-IV**

**Internal structure of inter-correlations: convergent and discriminate validity**

**Average correlations between test and indices. Results of our sample**

		WISC-IV, FSIQ
<b>VCI</b>	Correlation of Pearson	,847(**)
	Sig. (bilateral)	,000
	N	89
<b>PRI</b>	Correlation of Pearson	,826(**)
	Sig. (bilateral)	,000
	N	89
<b>WMI</b>	Correlation of Pearson	,669(**)
	Sig. (bilateral)	,000
	N	89
<b>PSI</b>	Correlation of Pearson	,536(**)
	Sig. (bilateral)	,000
	N	89

# CONTENTS:

**2. Effectiveness of the WISC-IV in relation to the SBL-M with children of low, normal low, normal, normal high and high intelligence**

## **CONTENTS:**

**2. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence. Investigation into its validation in relation to the SBL-M with children of low, normal low, normal, normal high and high intelligence**

### **Methodology:**

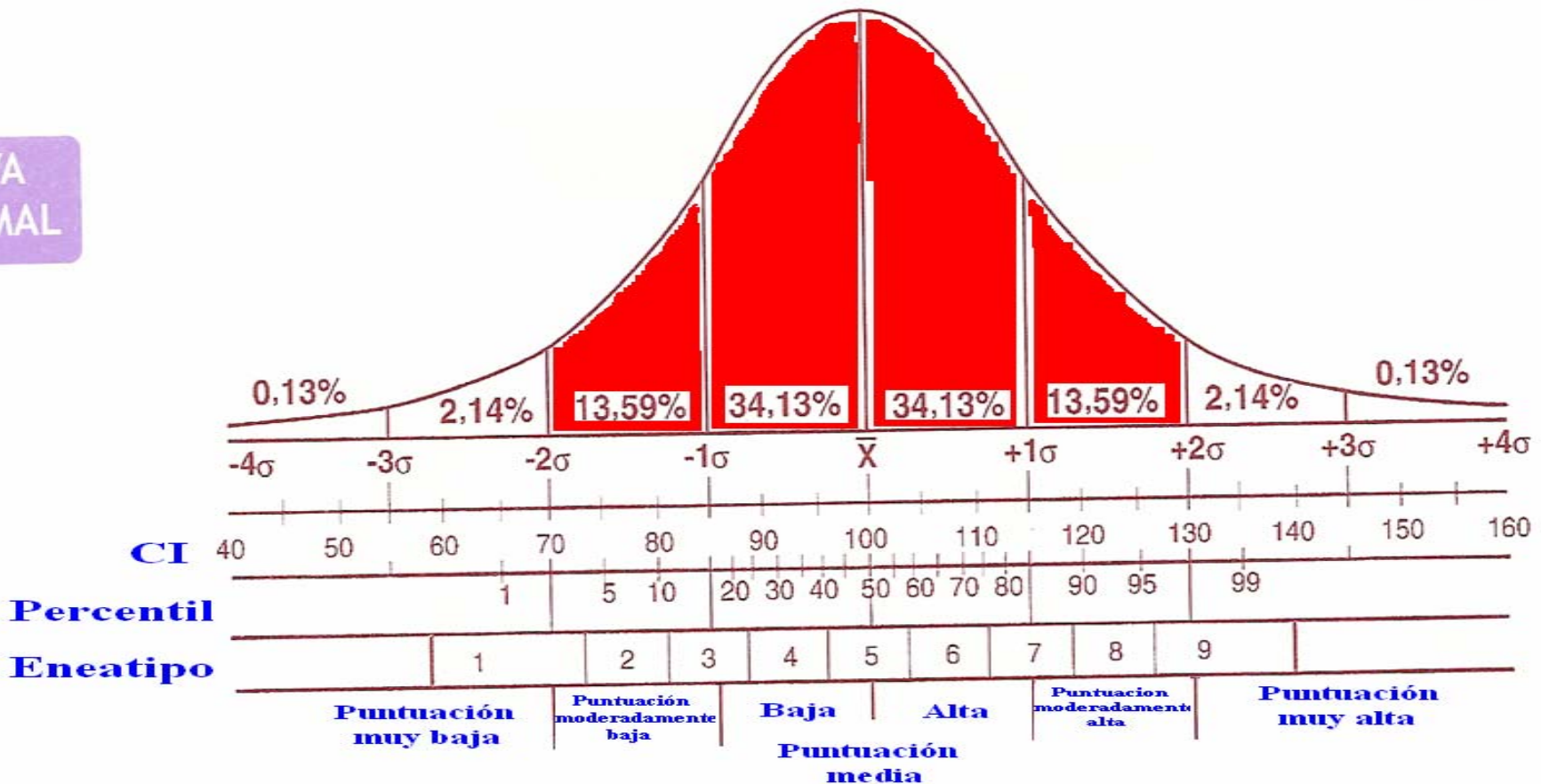
- a) All the children selected except those who are intellectually gifted.**
- b) Statistical description of the sample.**
- c) Correlation of the SBL-M and WISC-IV test.**

# CONTENTS:

## 2. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence.


Investigation into its validation in relation to the SBL-M with children of low, normal low, normal, normal high and high intelligence

CURVA NORMAL



# CONTENTS:

2. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence. Investigation into its validation in relation to the SBL-M with children of low, normal low, normal, normal high and high intelligence

 **Statistical description of the sample.**

IQ	N
<100	5
100-109	4
110-119	6
120-129	18
Total	33



# CONTENTS:

## 2. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence.

Investigation into its validation in relation to the SBL-M with children of low, normal low, normal, normal high and high intelligence

### Correlation between the SBL-M and the WISC-IV

#### Correlations

		IQ	WISC-IV
IQ	Correlation of Pearson	1	,828**
	Sig. (bilateral)		,000
	N	33	33
WISC-IV	Correlation of Pearson	,828**	1
	Sig. (bilateral)	,000	
	N	33	33

\*\* . Correlation sig. 0,01 (bilateral)

## **CONTENTS:**

**2. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence.**

**Investigation into its validation in relation to the SBL-M with children of low, normal low, normal, normal high and high intelligence**

**Correlation between the SBL-M and the WISC-IV in the actual investigation  $r = 0,828$**

# CONTENTS:

## 2. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence.

### Investigation into its validation in relation to the SBL-M with children of low, normal low, normal, normal high and high intelligence

#### Correlation of the SBL-M test with the WISC-IV

Correlations

		IQ	VCI	PRI	WMI	PSI
<b>IQ</b>	Correlation of Pearson	1	,728**	,784**	,479**	,184
	Sig. (bilateral)		,000	,000	,005	,306
	N	33	33	33	33	33
<b>VCI</b>	Correlation of Pearson	,728**	1	,796**	,392*	,000
	Sig. (bilateral)	,000		,000	,024	1,000
	N	33	33	33	33	33
<b>PRI</b>	Correlation of Pearson	,784**	,796**	1	,353*	,222
	Sig. (bilateral)	,000	,000		,044	,214
	N	33	33	33	33	33
<b>WMI</b>	Correlation of Pearson	,479**	,392*	,353*	1	-,051
	Sig. (bilateral)	,005	,024	,044		,779
	N	33	33	33	33	33
<b>PSI</b>	Correlation of Pearson	,184	,000	,222	-,051	1
	Sig. (bilateral)	,306	1,000	,214	,779	
	N	33	33	33	33	33

\*\* . Correlation sig. 0,01 (bilateral)

\* . Correlation sig. 0,05 (bilateral)

# CONTENTS:

**3. Effectiveness of the WISC-IV in relation to the SBL-M in children at the extreme ends of the normal curve: Intellectual Giftedness**

## CONTENTS:

**3. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence at the extreme ends of the normal curve. Investigation into its validation in relation to the SBL-M: Intellectual Giftedness**

### **Methodology:**

- a) Gifted children: that is,  $>130$ .
- b) Statistical description of the sample.
- c) Correlation of the SBL-M test and the WISC-IV.
- d) Validity with special groups: Intellectual giftedness.
- e) Which indices of the WISC-IV best predict performance in the SBL-M?
- f) Which subtests of the WISC-IV differentiate gifted children?
- g) Which cut-off number should be used to determine that a child is gifted in the WISC-IV?

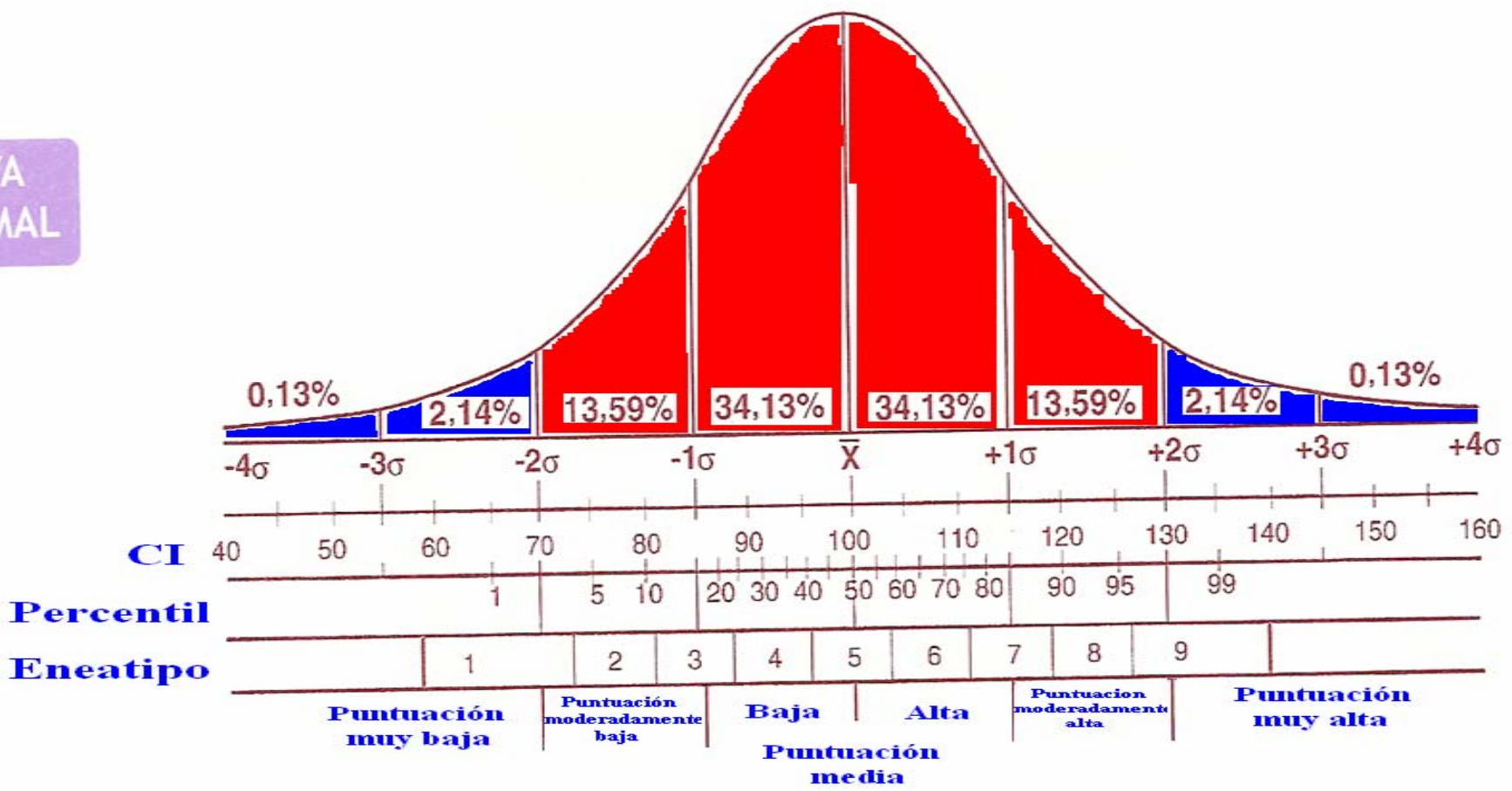


# CONTENTS:

## 3. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence.

### Investigation into its validation in relation to the SBL-M: Intellectual Giftedness

CURVA NORMAL





# CONTENTS:

## 3. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence. Investigation into its validation in relation to the SBL-M: Intellectual Giftedness

 **Statistical description of the sample.**

IQ	N
130-139	26
140-149	21
150-159	3
>159	1
<b>Total</b>	<b>51</b>

# CONTENTS:

## 3. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence.

### Investigation into its validation in relation to the SBL-M: Intellectual Giftedness.

#### Correlation between the SBL-M and the WISC-IV

##### Correlations

		IQ	WISC-IV
IQ	Correlation of Pearson	1	,408**
	Sig. (bilateral)		,003
	N	51	51
WISC-IV	Correlation of Pearson	,408**	1
	Sig. (bilateral)	,003	
	N	51	51

\*\* . Correlation sig. 0,01 (bilateral)

## **CONTENIDOS:**

**3. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence. Investigation into its validation in relation to the SBL-M: Intellectual Giftedness.**

**Correlation between the SBL-M and the WISC-IV in the actual investigation  $r = 0,408$**

# CONTENTS:

## 3. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence.

### Investigation into its validation in relation to the SBL-M: Intellectual Giftedness

Which indices of the WISC-IV best predict performance in the SBL-M?

Correlations

		IQ	VCI	PRI	WMI	PSI
<b>IQ</b>	Correlation of Pearson Sig. (bilateral) N	1 51	,440** ,001 51	,224 ,114 51	,202 ,155 51	,033 ,820 51
<b>VCI</b>	Correlation of Pearson Sig. (bilateral) N	,440** ,001 51	1 51	,157 ,270 51	,257 ,069 51	,124 ,387 51
<b>PRI</b>	Correlation of Pearson Sig. (bilateral) N	,224 ,114 51	,157 ,270 51	1 51	,166 ,246 51	-,058 ,686 51
<b>WMI</b>	Correlation of Pearson Sig. (bilateral) N	,202 ,155 51	,257 ,069 51	,166 ,246 51	1 51	,330* ,018 51
<b>PSI</b>	Correlation of Pearson Sig. (bilateral) N	,033 ,820 51	,124 ,387 51	-,058 ,686 51	,330* ,018 51	1 51

\*\* . Correlation sig. 0,01 (bilateral)

\* . Correlation sig. 0,05 (bilateral)

# Highest and lowest scores in the study of gifted children from the technical manual of the WISC-IV and in our study of gifted children

## Intellectually Gifted

Highest Subtest: Scaled Score

- Vocabulary: 14,6
- Arithmetic: 14,2
- Similarities: 14,1
- Comprehension: 14,1

Lowes Subtest: Scaled Score

- Digit span: 12,0
- Coding: 11,5
- Cancellation: 11,0

## Intellectually Gifted

- Vocabulary: 16,57
- Information: 16,47
- Matrix reasoning: 15, 78
- Riddles: 15,59

- Symbol search: 12,22
- Coding: 11,35
- Cancellation: 11,29



# CONTENTS:

## 3. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence at the extreme ends of the normal curve.

### Investigation into its validation in relation to the SBL-M: Intellectual Giftedness

#### Validity of the WISC-IV with special groups: Intellectual Giftedness.

- It included 63 pupils previously identified as gifted for having an I.Q. level which was above the two typical deviations of the average in a standardized measure of intelligence.
- It is unclear whether individual or collective tests were used for initially identifying these subjects.
- The mean FSIQ of the WISC-IV in gifted people is too low (IQ = 123) (n= 59). It cannot only be due to the Flynn effect nor to the regression to the mean.
- The study showed significant differences in the gifted children in favour of the control group in all the indices and in the subtests except for that of Cancellation (n= 24).

NOTE: WISC-IV Flanagan and Kaufman and Technical Manual WISC-IV www.pgd-design.com



## CONTENTS:

### 3. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence. Investigation into its validation in relation to the SBL-M: Intellectual Giftedness

**Which indices of the WISC-IV best predict performance in the SBL-M?**

Índices	
Verbal Comprehension Index	VCI
Perceptual Reasoning Index	PRI
Working Memory Index	WMI
Processing Speed Index	PSI

# CONTENTS:

## 3. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence.

### Investigation into its validation in relation to the SBL-M: Intellectual Giftedness

Which indices of the WISC-IV best predict performance in the SBL-M?

**Comparative study SBL-M and WISC-IV.**

**ALL**

Model	R	R squared	Typ. error of the estimation	Significant Variable
	0,823	0,665	9,15	VCI –PRI - PSI

**Comparative study SBL-M and WISC-IV.**

**NOT GIFTED**

Model	R	R squared	Typ. error of the estimation	Significant variable
	0,784	0,602	8,63	PRI

**Comparative study SBL-M and WISC-IV.**

**GIFTED**

Model	R	R squared	Typ. error of the estimation	Significant variable
	0,44	0,177	5,69	VCI

# CONTENTS:

## 3. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence.

### Investigation into its validation in relation to the SBL-M: Intellectual Giftedness

Subtest	
Block Design	CC
Similarities	S
Digit Span	D
Picture Concepts	Co
Coding	Cl
Vocabulary	V
Letter-Number Seq	LN
Matrix Reasoning	M
Comprehension	C
Symbol Search	BS
(Picture Completion)	FI
(Cancellation)	An
(Information)	I
(Arithmetic)	A
(Word Reasoning)	Ad

Which subtest of WISC-IV predict higher performance on the SBL-M?

# CONTENTS:

## 3. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence.

### Investigation into its validation in relation to the SBL-M: Intellectual Giftedness

Which subtests of the WISC-IV differentiate the gifted children?

**Comparative study SBL-M and WISC-IV.**

**ALL**

Model	R	R squared	Typ. error of the estimation	Signif. variable
	0,87	0,745	7,98	V-I-M-A

**Comparative study SBL-M and WISC-IV.**

**NOT GIFTED**

Model	R	R squared	Typ. error of the estimation	Signif. variable
	0,892	0,767	6,6	V-I-A-M

**Comparative study SBL-M and WISC-IV.**

**GIFTED**

Model	R	R squared	Typ. error of the estimation	Signif. variable
	0,466	0,185	5,66	I-S

# CONTENTS:

## 3. Effectiveness of the WISC-IV as a psychometric clinical measure of intelligence.

### Investigation into its validation in relation to the SBL-M: Intellectual Giftedness

Which cut-off score should be used for determining that a child is gifted in the WISC-IV?

#### Comparative study of SBL-M and WISC-IV.

##### Cut-off scores for selecting gifted children with WISC-IV FSIQ

Cut-off scores	Sensitivity	Specificity
>115	100%	48%
>125	83%	72%
>135	36%	93%

#### Comparative study of SBL-M and WISC-IV

##### Cut-off scores for selecting gifted children with WISC-IV GAI

Cut-off scores	Sensitivity	Specificity
>120	100%	52%
>125	93%	62%
>130	71%	83%
>135	38%	90%

# CONTENTS:

4. Which of the definitions of intelligence, throughout history, is nearest to the reality of the concept of intelligence, according to the results of the investigation and the latest theories?



# CONTENTS:

**4. Which of the definitions of intelligence, throughout history, is nearest to the reality of the concept of intelligence, according to the results of the investigation and the latest theories?**

- 🍷 The SBL-M and the monolithic theories of intelligence.**
- 🍷 WISC and monolithic theories.**
- 🍷 WISC-R, WISC-III and general intelligence as a sum of aptitudinal components.**
- 🍷 New tests and WISC-IV, CHC theory (Cattell- Horn-Carrol).**

# CONCLUSIONS, IMPLICATIONS OF THE STUDY AND FUTURE RESEARCH

- **The WISC-IV, taking into account the relationship with the measurement of the SBL-M, is effective for evaluating low, normal low, normal, normal high and high intelligence, and the present correlation is greater between both scales than in previous versions of the Wechsler scale.**
- **It would be advisable to review the consideration of the Information subtest as an optional subtest given the relevance which the latter has in determining intelligence for all the pupils.**
- **The WISC-IV is not as effective for accurately measuring those intellectually gifted children in the correlations found with the SBL-M, and they show, at the same time, that both tests measure different aspects for this group of children. Therefore, it is necessary to use the SBL-M in the evaluation of possibly gifted pupils.**

# CONCLUSIONS, IMPLICATIONS OF THE STUDY AND FUTURE RESEARCH

- **Within the indices of the WISC-IV, that which best predicts performance in the SBL-M, is that of Verbal Comprehension (VCI).**
- **Of the subtests of the WISC-IV, those which best predict performance in the SBL-M, are those of Information and Similarities.**
- **The cut-off point which should be used for deciding whether a child needs a special education is, in the WISC-IV, an FSIQ= 125 or a GAI= 130.**

# CONCLUSIONS, IMPLICATIONS OF THE STUDY AND FUTURE RESEARCH

- **We consider, with respect to the study of the validity of the WISC-IV as observed in the Technical Manual of the latter, that in the evaluation of intellectually gifted children (given the international importance which the Wechsler scales have on evaluation) the diagnosis and orientation of the pupils, the little care and appropriateness when it comes to selecting the sample are worrying factors, which makes it difficult for the WISC-IV to be able to measure accurately the upper end of intelligence.**
- **The SBL-M continues to be the only scale which makes it possible to measure extreme scores, in the case of children up to 11 years old and in people with mental deficiency up to adulthood.**

# CONCLUSIONS, IMPLICATIONS OF THE STUDY AND FUTURE RESEARCH

- **Foster suggested an emergent theory of intelligence: in the same way that water changes its properties at different degrees, intelligence can change its properties when it reaches a critical point. Leta Stetter Hollingworth thought that the cut-off point would be IQ= 145.**
- **Considering the latter point, we could propose certain questions: would the correlation of the SBL-M and the WISC-IV increase or decrease or would it not vary in those children with an IQ of over 145? Would the subtests of Information and Similarity continue to be the most significant in determining intelligence?**

# CONCLUSIONS, IMPLICATIONS OF THE STUDY AND FUTURE RESEARCH

- **How is it possible that a test created at the beginning of the XX century, based on the old theories of intelligence correlates so significantly with the WISC-IV, based on new theories of intelligence which serve as the base for the updating of the tests and for the creation of the new tests of intelligence in the XXI century?**



# Conclusion

- The two principles of a Quality Educational System are Fairness and Flexibility.
- Identification of the pupils is essential, taking into consideration the right to education.

- *Thank you very much*

*The aim is not to make exceptional adults, but rather happy children*

