



CAN A PARENT QUESTIONNAIRE MAKE A USEFUL CONTRIBUTION TO THE ASSESSMENT OF CHILDREN'S SPEECH ?



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THE VALIDITY, RELIABILITY AND ACCURACY OF THE FRENCH VERSION OF THE INTELLIGIBILITY IN CONTEXT SCALE (ICS-F)

INTRODUCTION

Speech sound disorders (SSD) are associated with developmental language disorders (DLD), with difficulties in communication, social participation, literacy, and learning [1-3]. SSD and their effects may have long-lasting consequences [4]. Therefore, early identification is essential to prevent these consequences [2].

Subjective measures of functional intelligibility, such as the Intelligibility in Context Scale (ICS), have already proven to be a very useful tool for the early identification of SSD in preschoolers [6,7].

The ICS is a free parent-report scale that allows parents to rate their child's speech intelligibility based on seven conversational partners. The ICS is a widely used tool that has been translated into more than 60 languages and validated in 10 languages [6].

The ICS has been translated into French, but has not yet been validated or standardized. In contrast, the French-speaking context still requires an increase in the number of tools and measures for screening for SSD [5].

GOALS

1 To determine the psychometric properties of the French version of the ICS (ICS-F) in terms of validity & reliability, sensitivity & specificity, using objective measures of speech.

2 To develop normative data for the ICS-F

To contribute to current advances in screening for SSD in French-speaking children

METHODS

189 monolingual French Speakers
+ parents
35 to 67 months
 $\mu = 50$; $SD = 8.9$

SSD
n = 42

Typically developing (TD)
n = 147

Speech assessment
Children
French standardized picture-naming task = Exalang 3-6 [8]
→ Speech performance (standard score)
→ Percent consonant correct (PCC)
→ Percent phones correct (PPC)
→ Percent vowels correct (PVC)
Transcription and speech analyses → Phon [9]

Measures
Parents
You (Parents)
Close family
Extended family
Child's friends
Child's friends
Acquaintances
Child's teachers
Strangers

ICS-F

Controlled for

- IQ & Audition,
- Medical & linguistic history,
- Lexical & Morphosyntactic level

Exclusion

- IQ \leq P16, hearing loss \geq 25dB,
- multilingualism, preterm birth (<37 weeks),
- DLD profile

Reliability

- Internal consistency
- Test-retest (on 30% of the sample)

Validity

- Concurrent validity

Norms development

- Based on average ICS-F scores of TD children
- 5 age groups, with 6-month intervals
- Calculation of percentiles and mean + SD

Discriminant accuracy analyses

1) Classification SSD – TD according to the ICS-F norms

	TD	SSD
Scores >P16 on ICS-F standard scores		
Scores \leq P16 on ICS-F standard scores		

2) Comparison with the group classification

- Sensitivity * + Specificity *

RESULTS

1 Validity

Concurrent validity

PCC, PPC, PVC, Standard score, Average ICS-F

$r_s = 0.67^{**}$, $r_s = 0.67^{**}$, $r_s = 0.49^{**}$, $r_s = 0.65^{**}$

2 Reliability

Test-retest reliability

189 parent-child pairs

63 parent-child pair

Completed ICS-F for 2nd time (after 3 weeks)

Table 1. Intra-class correlation coefficients (ICC_{agreement})

Item	ICC _{agreement}	Item	ICC _{agreement}
ICS-F average score	0.86**	Friends	0.71**
Parents	0.77**	Acquaintances	0.73**
Close Family	0.72**	Teachers	0.68**
Extended Family	0.75**	Strangers	0.79**

Internal consistency

1) Cronbach's alpha = 0.96 (Excellent)

2) Inter-item correlations (spearman's rho) ranged

- from moderate ($r_s = 0.58^{**}$)
- to very strong ($r_s = 0.93^{**}$)

1 Sensitivity & Specificity

Figure 2. Sensitivity and specificity analyses, with P16 as threshold

Whole group	Sensitivity	Specificity
Whole	59,5 %	86,4 %
3-3;6	45,5 %	84,4 %
3;6-4	83,3 %	96 %
4-4;6	54,5 %	97,3 %
4;6-5	66,7 %	81 %
5-5;6	60 %	84,4 %

2 Normative data

Table 2. Normative data of the ICS-F for the 5 age intervals and the whole group

Age groups	n	P3	P16	P50	Mean	SD
3-3;6	32	3.27	3.99	4.21	4.29	0.54
3;6-4	25	3.98	4.14	4.57	4.57	0.42
4-4;6	37	4.14	4.54	5.00	4.81	0.3
4;6-5	21	4.00	4.06	5.00	4.74	0.41
5-5;6	32	4.13	4.71	5.00	4.87	0.27
Whole group	147	3.67	4.14	5.00	4.66	0.45

DISCUSSION POINTS

This study replicates the methods of previous research on ICS in other languages [6,7,10].

Similar to these studies, we found that the ICS-F :

- has good validity and reliability scores
- has slightly higher central distribution values, but still close to those of other languages

Previous works on the ICS reported varying levels of accuracy [6,7,10].

Our study showed low sensitivity (<80%) and fair specificity (>80%)

- In line with the varying levels of accuracy observed in previous works
- Variations can be explained by \neq on age ranges, threshold selection, the type of gold-standard [11]

Limitations/Perspectives :

Our sensitivity/specificity rates indicate that the ICS-F is currently more of a confirmatory tool than a screening tool. However, as the ICS is designed to be a screening tool [6], perspectives could be considered :

- Perform an ROC curve analysis to determine satisfactory sensitivity levels.
- Norms for each age group were developed with a small number of participants
- We could extend the age groups to 1 year intervals
- 5 groups \rightarrow 3 groups

The ICS-F appears to be a valid and reliable tool for assessing functional speech intelligibility in the French-speaking context. Normative data are also available.

The good psychometric properties of the ICS-F encourage its use by SLPs with French-speaking children.

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***FOOTNOTE**

Sensitivity = the ability of a test to detect a true positive, being based on the true positive rate, reflecting a test's ability to correctly identify all people who have a condition [11]

Specificity = the ability of a test to detect a true negative, being based on the true negative rate, correctly identifying people who do not have a condition [11]

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