

# Identifying language impairment in bilingual children: issues of (mis)diagnosis

## KEY POINTS

**1** Bilingual children with typical development can be overdiagnosed as having language impairment when tested in their less dominant or weaker language.

**2** Bilingual children with language impairment can be underdiagnosed when information about typical bilingual development is scarce and bilingual norms are missing.

**3** Impairment will affect both languages of the bilingual individual. Poor performance on one of the two languages and normal performance in the other language is not an indicator of language impairment.

**4** Information about the child's development in the language spoken in the home is essential for the diagnosis of language impairment in children.

**5** The development of linguistically informed assessments for both languages of the bilingual individual is essential for the accurate diagnosis of language impairment in bilingual children.

## Background: Bilingualism and language impairment

The identification of language disorders in children growing up in bilingual contexts poses a major challenge for clinicians, educators and researchers. This is because we don't fully understand what constitutes typical and impaired bilingual language development.

How do we know if a child's language difficulties are due to language impairment or due to insufficient exposure to the language being assessed?

With these questions in mind, we investigated which combination of language tasks can better identify language impairment in bilingual children and successfully separate them from children with typical development.

This project focused on one type of pediatric language impairment called Specific Language Impairment (SLI) that affects approximately 7% of the school population.

Wales is the only officially bilingual country in the UK, and therefore might be considered the "best case scenario" for bilingual assessment of SLI. However, across the UK there is a lack of bilingual norms and of assessments in languages other than English— and Welsh is no exception. We used the Welsh context as a case study to investigate:

- (i) misclassification of language impairment using assessments designed for monolingual children;
- (ii) potential differences in clinical markers for SLI in English and Welsh.

The findings have implications for the assessment of bilingual children across the UK, regardless of languages spoken, and contribute to our understanding of what constitutes typical and impaired language development in bilingual children.



## The study

29 Welsh-English bilingual children aged 4-to-6-years took part in the study. All attended Welsh-medium education and Welsh was their dominant language. Seven children had a formal diagnosis of language impairment and were attending special schools. The remaining 22 children were in mainstream education. Of these, 5 were identified as at risk of language impairment based on parental questionnaires and teachers' feedback, but did not have a clinical diagnosis.

The parental questionnaire (developed as part of European COST Action IS0804) examined the family and individual history of language and other learning disorders [1]. This questionnaire also helped establish the quality and quantity of language exposure between birth and time of testing, as this can affect children's performance on language tasks. We also tested children's non-verbal abilities and found no differences between typically developing and language-impaired children.

Next, a battery of English and Welsh language assessments was administered to the children over multiple sessions. The tests assessed language abilities in areas known to cause problems for children with language impairment: phonological (speech sounds) processing, comprehension and production of vocabulary and grammar, production of morphological structures (linguistic "units" such as affixes and root words), and narrative abilities. The tasks across the two languages were matched in design and language area as much as possible (see task details, opposite).

The English-language tests are widely used in SLI diagnosis across the UK and have been normed on monolingual children. Our aim in using these tasks was to assess to what extent English-language tasks standardised with monolingual children can successfully diagnose language impairment in bilingual children.

The Welsh tasks were developed during this project and have not yet been standardised. Our aim with these tasks was to determine which aspects of language are most effective in diagnosing language impairment in Welsh-English bilingual children - in other words, to identify clinical markers for SLI in this population. These findings will not only inform assessment of Welsh-English bilinguals, but also allow us to draw broader conclusions

about the degree to which clinical markers for English monolinguals transfer to bilingual populations.

### Phonology tasks:

Phonological skills are intact in typically developing children but can be impaired in children with SLI

English	Welsh
Non-word repetition	Repetition of late-acquired sounds in real words

### Vocabulary tasks:

Bilingual children often have smaller vocabularies in one language and can perform within language impaired norms when tested on assessments standardised with monolingual children

English	Welsh
Receptive vocabulary	Receptive vocabulary; Expressive vocabulary (naming)

### Grammar tasks:

An established indicator of SLI in monolinguals

English	Welsh
Sentence comprehension & production; Sentence repetition	Sentence repetition

### Morphology tasks:

Tense is a clinical marker for SLI in English: children omit third person -s and past tense -ed

English	Welsh
Verbs (tense)	Verbs (tense); Nouns (plurals)

### Narrative tasks:

A more natural assessment tool: children with language impairment have difficulty understanding temporal and inferential properties of narratives

English	Welsh
Narrative production & comprehension	Narrative production & comprehension



## Findings

### Typical assessments over-diagnose SLI in typically developing bilingual children

According to clinical practice with monolingual children, if a child performs below -1.25 standard deviations (SD) on standardised assessments in two areas of language, the child is flagged as having language impairment [2]. When we applied these criteria to the data from our bilingual sample, 15 of the 29 children performed below age-appropriate norms on a combination of at least two tasks, and would therefore be classified as language impaired.

In reality, only 7 of these children had a formal diagnosis, with a further 5 children classified “at risk”. The remaining 3 children had never given any cause for concern. In other words, 20% of those classified as language impaired using the monolingual norms were not considered at risk by parents, teachers, or previous clinicians’ assessments. This level of misdiagnosis in the real world would have vast implications for clinicians’ workload and resources.

### Assessments should take account of the child’s dominant language

To overcome the potential problems of over- and under-identification, the COST European action developed a new set of guidelines for diagnosing language impairment in bilingual children [3]. According to these guidelines, if the available monolingual norms are in the bilingual child’s weaker language, then these norms need to be adjusted to take into consideration the child’s language dominance before being classified as having language impairment.

When we applied these new guidelines to our bilingual sample, only those children who were formally diagnosed or considered “at risk” were classified as language impaired. The 3 minimal-risk children who were classed as atypical using the monolingual norms now fell within the typically developing range. Therefore, newly developed bilingual norms may help prevent over-identification of language impairment in typically developing bilingual children.

### Parental questionnaires can complement clinical diagnosis

Five children in our sample were identified as “at risk” based on parents and teachers expressing concerns about language development in the child’s **dominant** language (Welsh). Using bilingual norms that take into account language dominance, these 5 children plus those with an existing formal diagnosis were classified as being language impaired. No other children were classified as language impaired.

In other words, information gathered through parental questionnaires mapped well onto assessment classification using bilingual norms. This finding suggests that parental questionnaires can be a useful tool for diagnosis. Crucially, children were only classed as at risk if concerns were raised about development in their dominant language. A child with poor second language skills but whose dominant language does not raise any concerns should not be considered at risk.

#### Sample questionnaire items

Child’s date of birth

What languages does your child speak now?

Which language do you think your child feels most at home with?

How old was your child when s/he spoke her first word?

How old was your child when s/he first put words together to make short sentences *e.g. more water, more milk*

Before your child was 3 or 4 years old, were you ever concerned about his/ her language?

Has your child ever had any hearing problems or frequent ear infections?

At what age was your child first in contact with each of his/her languages?

*Questions taken from Tuller, 2015, p323*

Table 1. Sensitivity and Specificity on English and Welsh tasks.

Figures are based on standard scores for the English tasks and on raw scores for the Welsh tasks.  
> 80% = acceptable; > 90% = good to excellent.

Language domain	English tasks		Welsh tasks	
	Sensitivity	Specificity	Sensitivity	Specificity
Phonology	58.3%	83.4%	94.1%	83.3%
Vocabulary	66.7%	80%	76.5%	75%
Grammar	66.7%	70.6%	88%	75%
Morphology	23% (verbs)	18% (verbs)	94.1% (verbs) 76.5% (nouns)	75% (verbs) 83.3% (nouns)
Narratives	33%	82.4%	88.2%	42%

### Tests in the child's second language show poorer identification of language impairment than tests in the home language

After classifying children as typically developing or language impaired based on their bilingual profiles, we examined the diagnostic accuracy of individual assessments more closely. This allowed us to investigate which aspects of language might act as clinical markers in bilingual children. To achieve this, we measured each task's sensitivity and specificity.

Sensitivity measures how accurately a test correctly identifies language impairment (to avoid under-identification), and specificity measures how accurately a test correctly identifies typical development (to avoid over-identification). Sensitivity and specificity values of at least 80% are regarded as acceptable, whereas levels of 90%+ are regarded as good to excellent.

When the Welsh-English bilingual children were tested in their second language (English), most tasks had poor sensitivity and specificity. Based on raw scores, only the task for vocabulary comprehension had acceptable sensitivity (83.3%). Based on standard scores, none of the English tasks - including vocabulary comprehension - had acceptable sensitivity (see Table 1). In other words, the English tasks failed to correctly identify bilingual children with language impairment.

In contrast, the diagnostic accuracy of the Welsh tasks ranged from acceptable to excellent. In particular, the Welsh tasks examining children's phonological, lexical and morphological abilities (production of verb forms) had excellent specificity. This means that assessing bilingual children in their dominant language using language specific tasks provides better identification than assessing children in their weaker language.

### Sample narratives: retelling the “cat story”

Typically developing bilingual child (boy, 5 years 6 months old):

“The cat saw the butterfly sitting on the bush. The cat jumped dros [Welsh for “over”] the bush and the butterfly fled away. The little boy came and saw the bucket of fish and he saw the cat running after the butterfly and the buy rush... The cat got hurt in the bush. The boy was surprised he losted it... The ball roll in the water. The boy was sad. The cat got... The cat saw the boy’s bucket of fish and go and eat one. The boy bought a fishing net. The cat going on one of his fish. The boy was happy. He wasn’t saw the cat stolen one of his fish.”

Bilingual child with SLI (boy, 5 years 6 months old):

“Gweld [Welsh for “see”] a yellow butterfly. The cat he go out. Very hungry. A ball in the water. And a cat. Catch a ball. The boy get a ball back. Cat eating a fish. He’s getting a ball back. Cat eating a fish. He’s getting a ball back. The end.”

#### Language abilities of typically developing versus language impaired bilingual children

The children classified as language impaired based on bilingual norms exhibited a profile commonly found in monolingual children with SLI [4]. In particular:

- Difficulty repeating three and four syllable nonwords;
- Difficulty pronouncing consonant clusters, e.g. /nt/ /mp/;
- Smaller receptive vocabularies in both languages;
- Tendency to omit grammatical words such as articles (the, a) and prepositions (in, on, at), as well as verbs;
- Poorer comprehension skills when processing narratives.

However, unlike previous studies of English-speaking monolingual children, we found no difference between language impaired and typically developing children’s production of English past tense. The language-impaired children had equal proportion of omissions, e.g. he jump vs. he jumped (past tense for the verb jump) and regularisations, he caught vs. he caught (past tense for the verb catch) as their typically developing peers.

**This finding suggests that clinical markers for SLI in monolingual children are not always present when testing bilingual children with little exposure in that language.**

## IMPLICATIONS FOR POLICY AND PRACTICE

When possible, bilingual children should be tested in both their languages. Language impairment affects all language spoken by the child, so concerns should be apparent in both languages.

When assessment and diagnosis in both languages of the bilingual individual is not possible, clinicians and teachers should establish whether the language that the child is being tested in is their weaker language, so that monolingual norms can be adjusted.

Using basic translations of English tasks to develop assessments in the child’s other language can mask language-specific problems, if English and the other language are typologically different.

The use of detailed parental and teacher questionnaires can facilitate and complement diagnosis of language impairment in bilingual children.

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