



Investigating the relationship between spelling ability and sentence comprehension in German-English bilinguals

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Introduction

- Recent figures show that more than half of the population in the world is bilingual (Spitzer, 2016).
- Bilingualism is defined as the ability to speak two languages fluently.
- In Germany, 56% of the population are fluent in English (Ryan, 2022).
- Language proficiency depends on two factors: firstly, how much individuals get to practise the language in real life (Guoi, 2011) and secondly whether individuals will be immersed into the language at a later stage (Genesee, 1983).



Introduction - Spelling

- Spelling is defined as the ability to arrange letters in the correct sequence to produce appropriate orthographic forms.
- L2 learners experience severe difficulties with spelling, particularly vowels (James et al., 1993).
- English is a complex and opaque orthography (Spencer, 2007)
 - not all letters in words correspond to sounds and are pronounced differently to how they are spelt.



Introduction - Listening

- Listening comprehension is the ability to accurately receive and understand messages in sounds of speech including conversations, stories and informational oral texts.
- Due to the complexity of the English language, learning how to listen remains a demanding cognitive task.
- Two significant predictors of listening comprehension levels;
 - 1. Oral language (Babayiğit, 2014)
 - 2. A high vocabulary knowledge (MacCutcheon et al., 2019)



Hypothesis and Aims

Hypothesis

- Immersed bilinguals will perform better at both tasks than non-immersed bilinguals.
- Participants will be more likely to make more errors in spelling difficult to spell words than easy to spell words.
- Individuals that perform well in the spelling ability task, will ultimately score high in the listening comprehension task.

Aims

- The three specific aims of the study were:
 - 1 → to explore whether immersed bilinguals are more likely to make fewer errors than non-immersed bilinguals.
 - 2 → to investigate whether the level of difficulty has an effect on an individual's performance.
 - 3 → if there is an interaction between the group and the level of difficulty.



Methods

- Participants

- A total of 43 participants, aged between 20-65 years, were recruited using opportunity sampling.
- Five participants were removed due to having a low or medium level of proficiency in English.
- A total of 38 adults, consisting of 18 women, 19 men, and one non-binary participant were included in the analysis.
- All participants were self-reported bilinguals and were either residing in a German-speaking country (Germany or Switzerland) or in an English-speaking country.

Methods

- Materials

Sentences

- Teaching books were used to select easy, medium and difficult to spell words
- Target words were chosen and placed into different sentences, and recorded by a native English speaker

Comprehension questions

- The comprehension questions were multiple choice and all created by the researcher
- Participants could choose between three possible answers, by pressing the letter keys A, B or C to respond to the correct answer.



Example sentence

Yesterday the *thunderstorm* delayed the delivery of the mail, so that the scarf Tom ordered did not arrive in time

Which of the following is true?

- A) *Tom's gloves did not arrive in time yesterday*
- B) *The thunderstorm caused a delay in the delivery of the mail yesterday*
- C) *On Monday, Tom's scarf did not arrive in time*

Methods

- Design

The online study consisted of two tasks:

1. *Spelling ability task* - Participants were asked to listen to single English sentences and to type the sentences out.
2. *Listening comprehension task* - Participants completed a comprehension task about the sentences they had listened to

Two independent variables (IV)

1. the group (immersed vs. non-immersed)
2. the difficulty of the words (easy, medium, and difficult).

Two dependent variables (DV)

1. Spelling accuracy
2. Sentence comprehension scores

Results

- Descriptive statistics

Table 1. presents descriptive data (means and standard deviations) for the spelling accuracy- and comprehension scores in immersed- and non-immersed bilinguals.

A high score on either scale would indicate a high level of English proficiency.

Table 1. Mean and Standard Deviation Scores for Comprehension and Spelling Accuracy

	Immersed Bilinguals (n=19)	Non-immersed Bilinguals (n=19)
Comprehension Accuracy Score	0.93 (0.06)	0.86 (0.09)
Spelling Accuracy Score	0.81 (0.12)	0.66 (0.18)

Results

- Descriptive statistics

Table 2. presents descriptive data (means and standard deviations) for the comprehension scores in immersed- and non-immersed bilinguals in all three conditions (easy, medium and difficult).

Comprehension scores were found to be higher in the immersed group compared to the non-immersed group.

Table 2. Mean and Standard Deviation Scores for Difficulty Levels of Comprehension Accuracy

	Immersed Bilinguals (n=19)	Non-immersed Bilinguals (n=19)
Easy	0.97 (0.06)	0.87 (0.13)
Medium	0.93 (0.10)	0.85 (0.11)
Difficult	0.88 (0.09)	0.85 (0.09)

Results

- Descriptive statistics

Table 3. presents descriptive data (means and standard deviations) for the Spelling accuracy scores in immersed- and non-immersed bilinguals in all three conditions (easy, medium and difficult).

Spelling accuracy scores were found to be higher in the immersed group than in the non-immersed group.

Table 3. Mean and Standard Deviation Scores for Difficulty Levels of Spelling Accuracy

	Immersed Bilinguals (n=19)	Non-immersed Bilinguals (n=19)
Easy	0.87 (0.15)	0.77 (0.20)
Medium	0.81 (0.15)	0.64 (0.18)
Difficult	0.77 (0.16)	0.58 (0.24)

Results

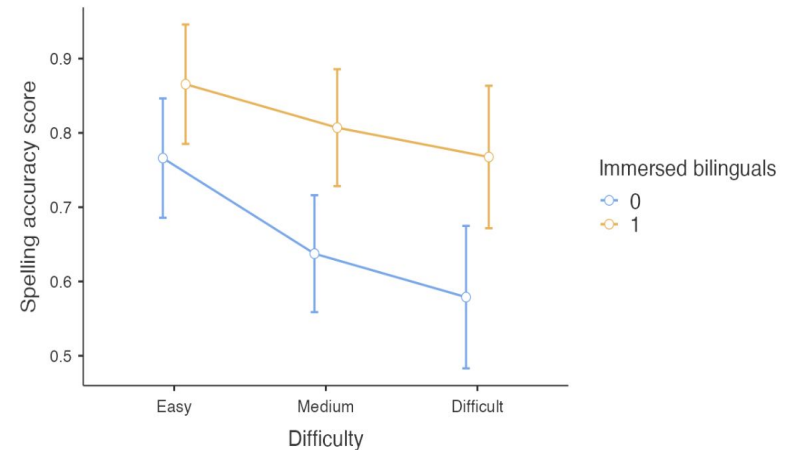
- Inferential statistics

Spelling ability

- Immersed bilinguals scored higher in the spelling ability task than non-immersed bilinguals (*significant effect of being immersed*).
- Holm-Bonferroni post hoc tests showed that the group level was highest for Medium difficulty, followed by difficult, with easy being the lowest (*significant effect of difficulty*).
- The interaction was not found to be significant, indicating that immersion does not affect the ability to spell easy or difficult words in particular, but all types of words to the same extent.

Figure 1

Mean spelling accuracy score of the easy, medium and difficult conditions in the immersed (1- orange) and non-immersed (0 - blue) group



Results

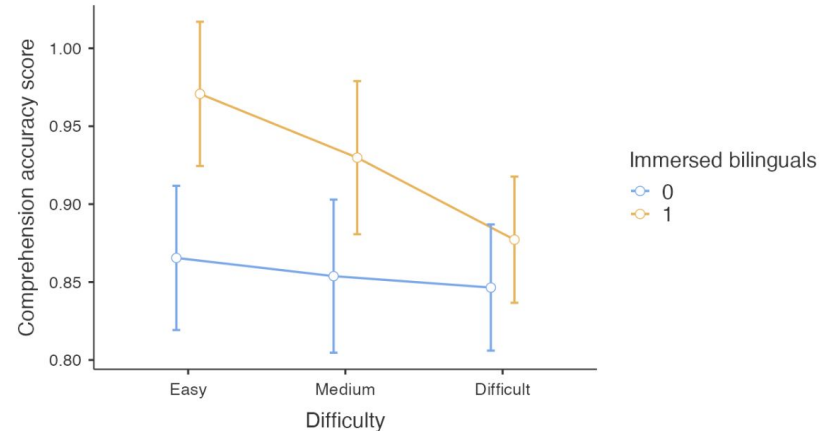
- Inferential statistics

Listening Comprehension

- Immersed bilinguals scored higher in the listening comprehension score compared to non-immersed bilinguals (*significant effect of being immersed*).
- Holm-Bonferroni post hoc tests showed that the group level was highest for Medium difficulty, followed by difficult, with easy being the lowest. (*significant effect of difficulty*).
- There was weak evidence for an interaction between difficulty and immersed bilinguals.

Figure 2

Mean comprehension accuracy score of the easy, medium and difficult condition in immersed (1- orange) and non-immersed (0 - blue) group





Results

- Inferential statistics

- A correlation analysis was conducted, in order to see if an individual's spelling ability influences one's comprehension accuracy.
- The correlation found that a model containing the mean score for spelling accuracy was a highly significant predictor of an individual's comprehension accuracy.
- This correlation indicates that overall, participants with higher scores in the spelling task have higher scores in the comprehension task.



Conclusion

- Immersion is a valid predictor variable in an individual's overall language proficiency, with immersed bilinguals performing significantly better overall.
- Immersion is particularly beneficial with learning challenging words (*strong effect of difficulty*).
- Living in an English speaking country in which English is used all the time helps in developing one's spelling and listening comprehension.
- Immersion does not affect the ability to spell easy or difficult words in particular, but it does affect all types of words to the same extent (*interaction between the groups and the level of difficulty*).

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