Bilingual spelling instruction: Language-specific effects of spelling instruction

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The rationale

- Primary school children are increasingly faced with the task of learning two or more spelling systems simultaneously, one of which is English;

- Need of scientific evidence that could inform spelling instruction;

- Rare or none experimental studies testing the effects of bilingual spelling intervention

Bilingual spelling intervention

Language-integrated spelling instruction?

- Language-integrated view of spelling development: Learning to spell involves the same language-learning skills across alphabetic systems
- Language-specific view of spelling development: the specific features of a language/spelling system determine which learning mechanisms will be most effective in learning to read and spell in that language
- Can the same spelling training be equally effective for learning to spell in a shallow and opaque orthography?

An intervention study

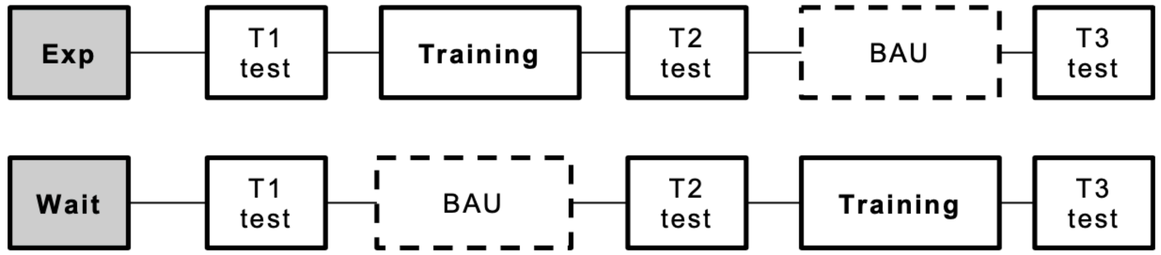
- A RCT examined the language-specific effects of a bilingual spelling intervention
- The intervention: The mind's ear and eye training (Berninger et al. 1998)
- Participants: 6- to 9 year-old Italian children exposed to Italian (L1) and English (AL) spelling instruction

The study

Stepped-wedge random cluster randomized trial

Children were trained on the spelling of English words and Italian words containing orthographic difficulties that required switching from phoneme–grapheme spelling correspondences to larger grain size (multiletter) spelling units.

The training was adapted from Arfé et al. (2018)



Duration: 4 weeks (bi-weekly sessions)

The mind’s ear and eye training

Six steps

1. Word in lower case printed letters
2. Read aloud
3. Named letter-by-letter
4. **Read again syllable-by-syllable (parsing multiletter units)**
5. Make a mental picture of the word
6. Read it from memory and write it down
7. Compare with target

Classroom training

+ home practice (12 words)

Participants

Italian children (N = 108); ages 6 to 9 years

Table 1. Participants' Characteristics.

Variable	Experimental (n = 52) M (SD)	Waiting list (n = 56) M (SD)	p
Gender (girls %)	23 (44%)	27 (48%)	.68
Age	7.87 (0.97)	7.95 (0.94)	.66
SES	6.33 (1.11)	6.25 (0.95)	.69
Nonverbal IQ	107.63 (12.26)	107.54 (14.26)	.97
Alphabet task: Letters in 60 s	21.65 (15.15)	25.29 (15.01)	.21
DDE-2 words (errors)	7.02 (6.60)	4.98 (5.61)	.09
DDE-2 pseudowords (errors)	6.27 (4.78)	5.63 (3.58)	.43
PAL-II word choice	10.12 (6.50)	11.27 (6.45)	.36
Italian trained word list	14.81 (7.04)	15.07 (6.21)	.84
Italian untrained word list	15.13 (5.73)	15.25 (5.36)	.91
English trained word list	3.87 (4.17)	3.64 (3.10)	.75
English untrained word list	3.52 (3.79)	3.25 (3.35)	.70

Note. SES = socioeconomic status; DDE-2 words = Italian standardized test of word spelling; DDE-2 pseudowords = Italian standardized test of pseudoword spelling; PAL-II word choice = English standardized test of orthographic knowledge.

Methods

Pretest-posttest assessment

- *Nonverbal abilities.* The Primary Mental Ability spatial relations subscale (Thurstone & Thurstone, 1963)
- *Graphomotor abilities*. The alphabet task (Berninger et al., 1997)
- *Italian spelling abilities*. Battery for the Assessment of Dyslexia and Dysorthographia (DDE-2; Sartori et al., 2007)
- *English spelling abilities.* Orthographic task (PAL-II, Berninger, 2007)

- *Ad hoc Italian spelling task:* 48 three- and four- syllable words containing context-sensitive graphemes (*g*, *c*; i.e., letter strings such as *chi*, *gli*, *gni*, *ghi*, or *sci*, as in **scia**tore/skier or rin**ghi**era/railing), geminates (-*tt*- or -*ss*- as in pa**ss**erotto/sparrow), or the */kw/* group (as in a**cqu**itrino/marsh or obli**quo**/oblique)

25 trained — r =.89 — 23 untrained

- *Ad hoc English spelling task. 50 one- to three-syllable words selected from English textbooks and from the Children's Printed Word database (Stuart et al., 1996).*

25 trained — r =.88 — 25 untrained

Results

Gains between Time 1 and 2 and between Time 2 and 3

Table 2. Differences in Spelling Gain Scores Between the Experimental and Waiting List Groups.

	T1–T2 gain			T2–T3 gain		
Measure	Experimental *M (SD)*	Waiting list *M (SD)*	*p*	Experimental *M (SD)*	Waiting list *M (SD)*	*p*
Italian trained word list	4.86 (3.49)	2.59 (3.10)	<.001	0.00 (2.22)	2.73 (2.78)	<.001
Italian untrained word list	1.61 (2.80)	1.59 (2.50)	.99	1.29 (2.98)	1.28 (2.80)	.76
English trained word list	4.38 (3.51)	0.66 (1.74)	<.001	0.23 (2.17)	5.30 (2.90)	<.001
English untrained word list	2.29 (1.89)	1.30 (1.75)	.005	0.77 (2.06)	3.00 (2.24)	<.001
DDE-2 words (errors)	−1.61 (3.90)	−0.59 (3.87)	.20	−2.11 (2.96)	−1.59 (3.78)	.50
DDE-2 pseudowords (errors)	−0.40 (3.64)	–0.30 (2.88)	.30	−0.96 (3.29)	−2.18 (3.17)	.05
PAL-II word choice	1.71 (3.66)	0.13 (2.82)	.01	0.67 (2.72)	2.02 (3.24)	.02

Note. T1–T2 gain = difference in spelling accuracy scores between Times 2 and 1; T2–T3 gain = difference in spelling accuracy scores between Times 3 and 2. DDE-2 words = Italian standardized test of word spelling; DDE-2 pseudowords = Italian standardized test of pseudoword spelling; PAL-II word choice = English standardized test of orthographic knowledge.

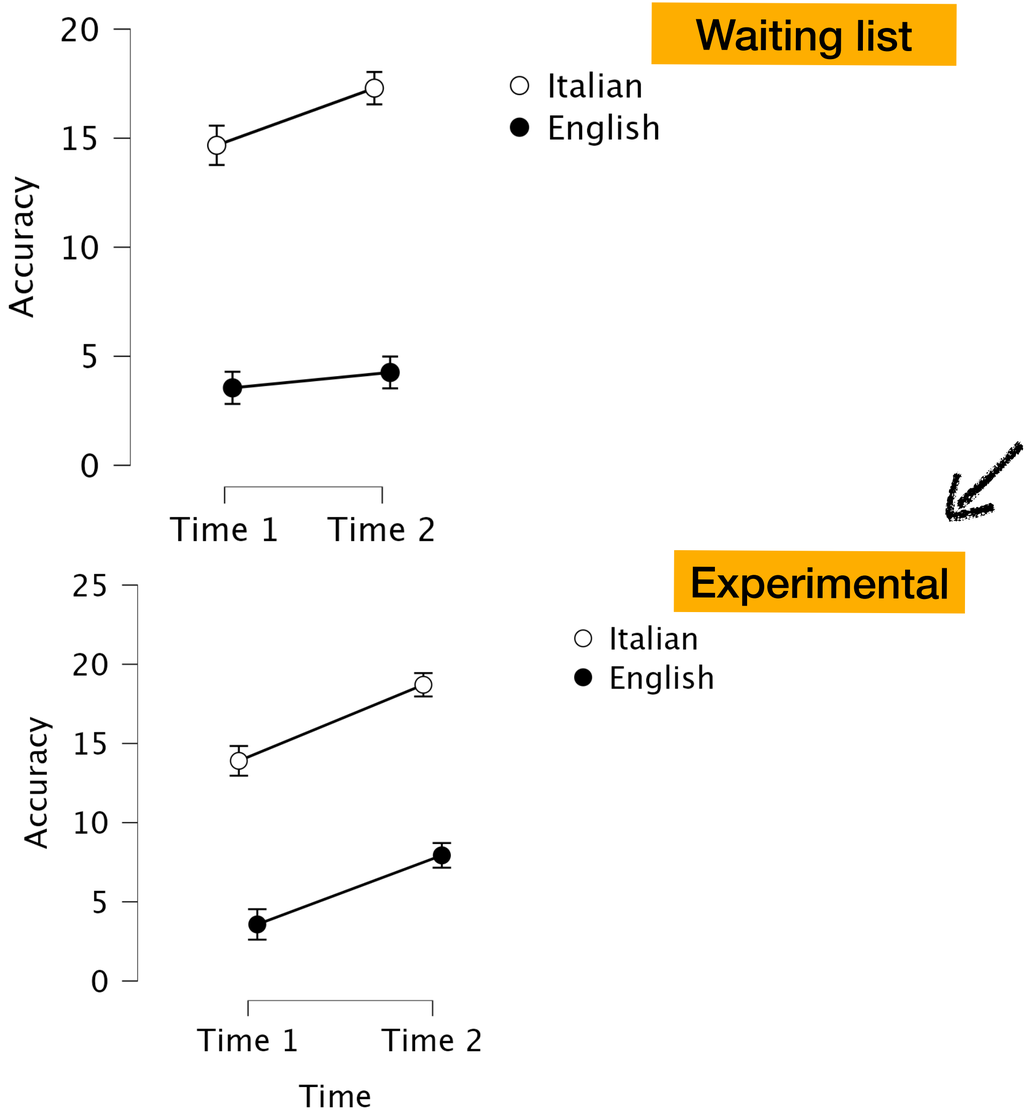
Results: trained word list

T1-T2 gains

1. Children's spelling skills improved significantly **more with the intervention**, both in Italian (*d* = 0.69) and in English (*d* = 1.36)

2. For the experimental group, the **intervention effects** were **similar in the two languages** (Italian and English)

3. The **waiting list** group showed **greater time effects in Italian** than in English



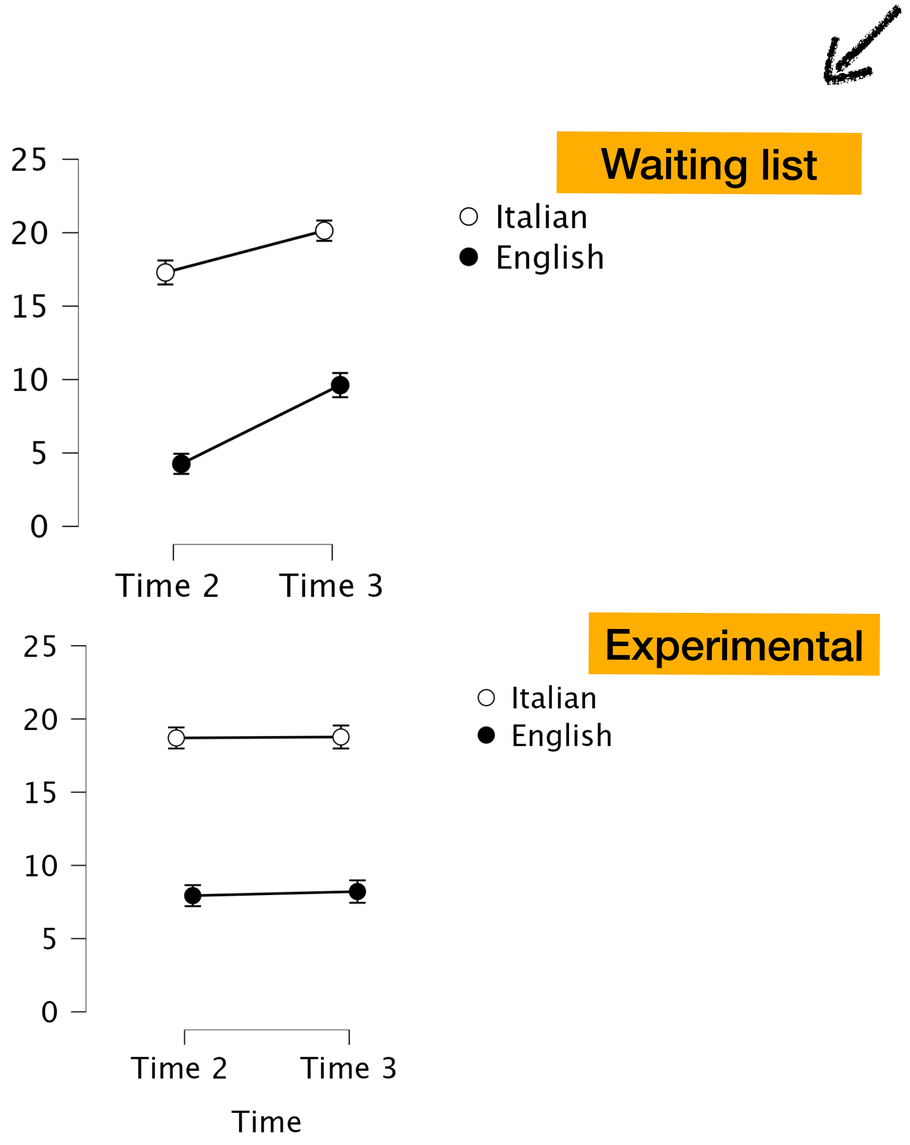
Results: trained word lists

T2-T3 gains

1. Children's spelling skills improved significantly **more with the intervention** both in Italian (*d* = 1.08) and English (*d* = 1.97)

2. **Language-specific effects**: for the waiting list group the intervention was more effective on English spelling

3. **Maintenance** of the training effects were observed for the experimental group



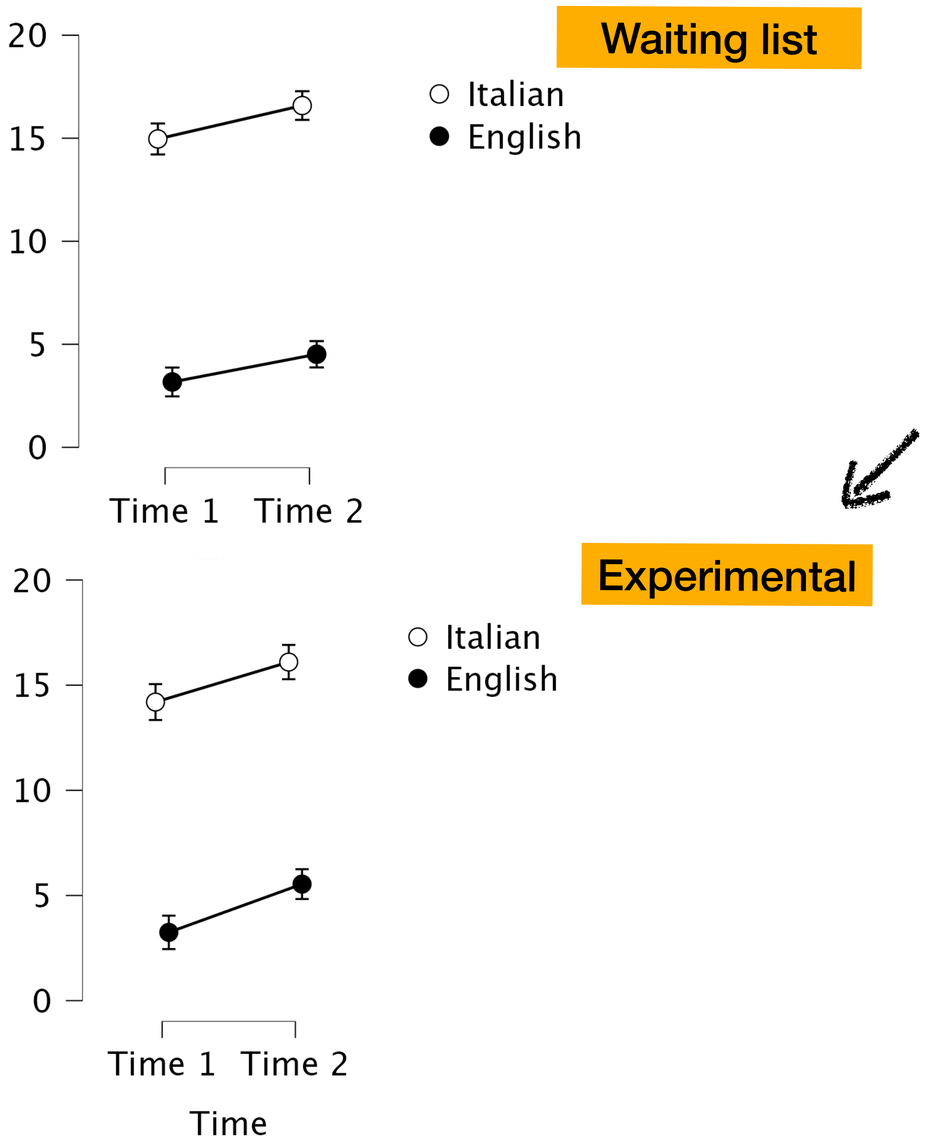
Results: Generalization to untrained words

T1-T2 gains

1. For the experimental group, the **effects of the intervention** were **similar in the two languages**

2. Between Time 1 and Time 2, the two groups (experimental and waiting list) showed **similar improvement in Italian**

3. **Differences were observed in English:** the experimental group improved more than the waiting list group (*d* = 0.54)



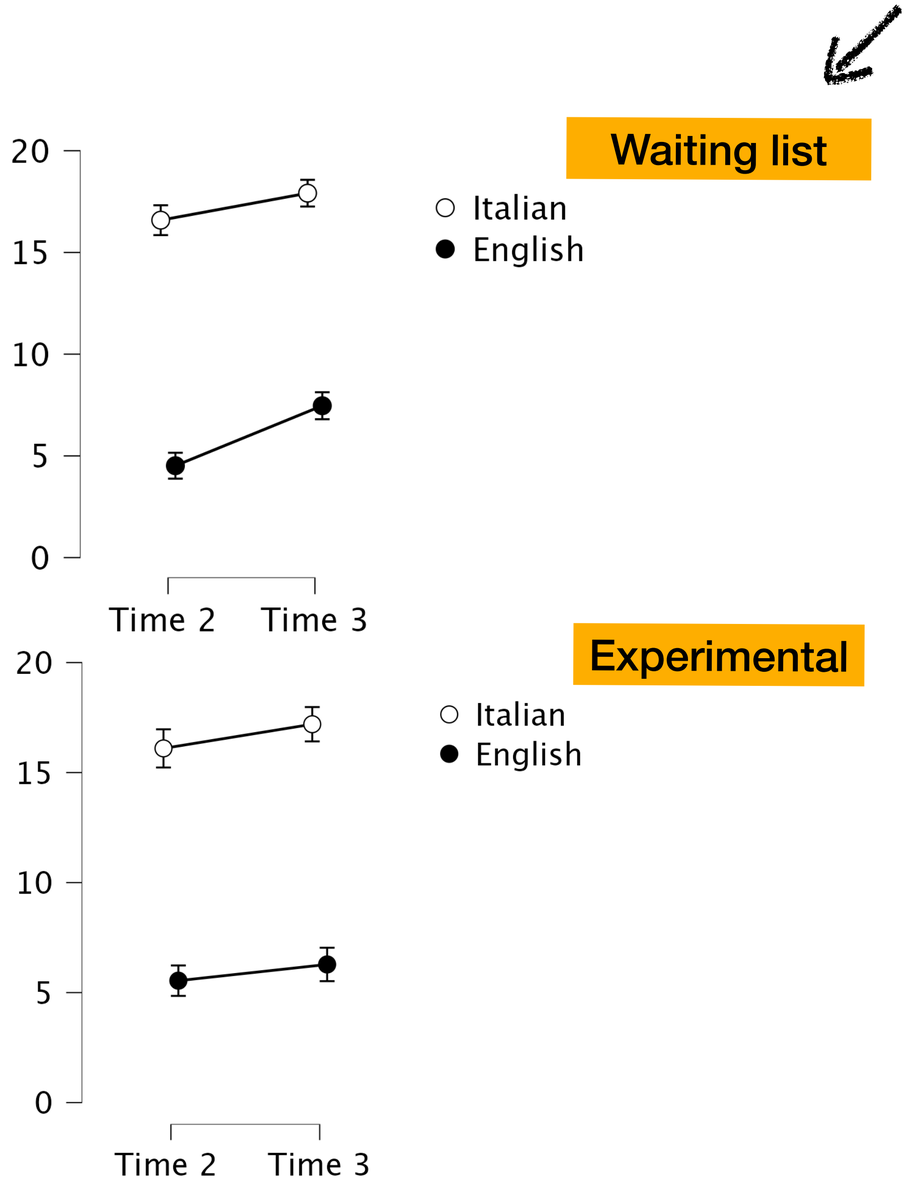
Results: Generalization to untrained words

T2-T3 gains

1. For the waiting list group the **effects of the intervention** were **greater in English** (*d* = 0.49)

2. Between Time 2 and Time 3, the **improvement** of the two groups was **similar in Italian**

3. Whereas, **in English, the waiting list group showed greater gains** (*d* = 1.03)



Discussion

Language-general effects

- Correlations between spelling accuracy in the two languages were *r* = .62 for the trained lists and *r* = .56 for the untrained ones

- The language-integrated spelling intervention proved effective in both languages: With the intervention, children improved significantly in spelling both the Italian and the English **trained word lists.**

Discussion

Language-specific effects

- Generalization of the acquired spelling knowledge to the untrained word lists was significant for both groups only in English.
- Regularities are typically abstracted in Italian and English from spelling units of different size: smaller one-to-one phoneme–grapheme spelling units in Italian (L1) and larger, multiletter spelling units in English
- The greater generalization of the training effects in English suggests that the participants were better at extracting spelling patterns and rules when trained in their AL, rather than in their L1

A final note..

- **The younger children in this study generalized more** the acquired spelling knowledge to the new (untrained) Italian words.
- Language specific effects may be greater for older writers

Thanks..

Article

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Language-Specific Effects in Response to Spelling Intervention in Italian and in English as an Additional Language

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