

Learning to spell in Arabic: The impact of script-specific visual-orthographic features

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Aim and rationale



Learning to spell is a complex and challenging process, especially for young learners.

Alongside reading and spelling universals there are also significant writing system specifics that may challenge young readers and writers.

(Daniels & Share, 2018)

Few studies have examined spelling development in non-alphabetic scripts.

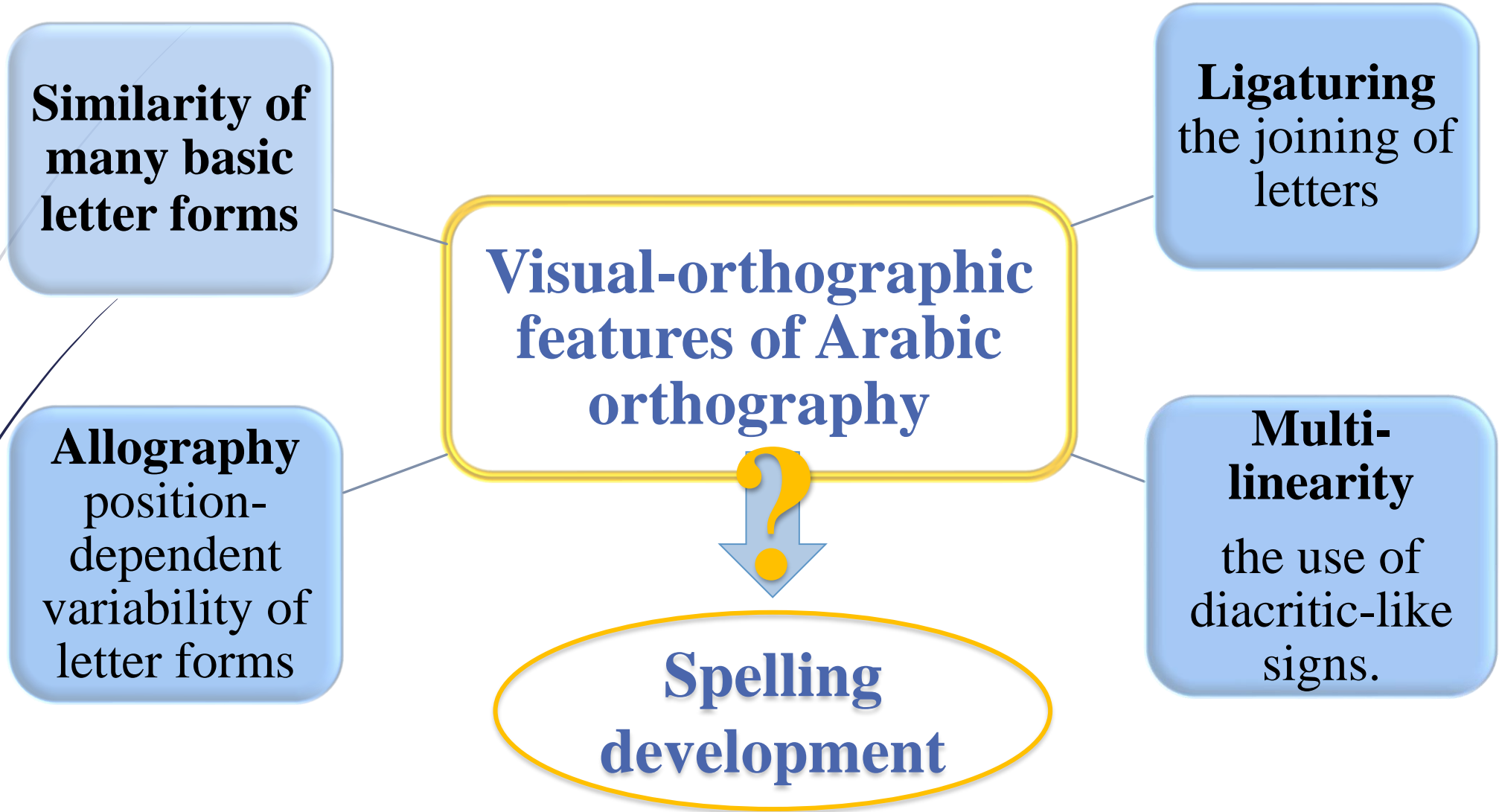


Our choice of Arabic is motivated by a number of factors:

- Arabic is the sixth most spoken language in the world with close to **274 million speakers** (Eberhard, 2022). It is the official language of **22 countries** (Bokova, 2012).
- The **Arabic abjad** is unique.
- Shedding light on these unique features is essential for a complete science of literacy learning.
- Growing number of studies have begun to investigate the effect of Arabic visual-orthographic features on reading, but none has yet examined this issue in **spelling** (e.g., Asaad & Eviatar, 2013; Dai, Ibrahim, & Share, 2013 ; Ibrahim, Khateb & Taha, 2013).



The current study



Arabic orthography



اللُّغَةُ الْعَرَبِيَّةُ هِيَ أَهَمُّ لُغَاتِ الْعَالَمِ.

اللغة العربية هي أهم لغات العالم.

Visual-orthographic features

(i) The similarity of many basic letter forms

ب ت ث

ج ح خ

د ذ ص ض

ر ز ط ظ

س ش ع غ

ف ق

(ii) Ligaturing/Cursivity

23 letters can connect to the adjacent letter on both sides.

6 letters can connect only from the right but not the left side.

ح ص ف

ا د ذ ر ز و

Fully connected

بيت

bayt 'home'

Partly connected

مولود

mawlu:d 'born'

Entirely unconnected

ورود

wuru:d 'roses'

(iii) *Allography*: The variability of the letter forms

Position in the word
initial, medial,
or final

+

Ligaturing
whether or not it
connects to the
letter that
precedes it

=

6 letters have two forms
23 letters have four letter-forms

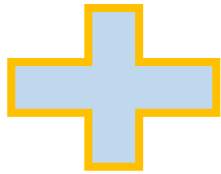
wa:w
و و
سور ولد

Examples of four letter-forms of different letters

Final unligatured	Final ligatured	Medial ligatured	Initial (or medial not right-ligatured)	IPA	
ب درب	ب رطب	ب جبل	ب برد	<i>ba:ʔ</i>	1
ع أسبوع	ع شمع	ع سعيد	ع عيد	<i>ʕi:n</i>	2
ه جاره	ه وجه	ه شهر	ه هلال	<i>ha:ʔ</i>	3

(iv) *Tashkil and multi-linearity*

letter dots
ض ت ث



tashkil

phonemic
◌◌◌ ◌◌◌ ◌◌◌ ◌◌◌ ◌◌◌
◌ ◌ ◌

morpho-syntactic
◌◌◌ ◌◌◌ ◌◌◌
◌◌◌ ◌◌◌ ◌◌◌

The goal of the current study



To examine the frequency and distribution of **visual-orthographic spelling errors** and their development across three grades (1st, 2nd, and 4th grades)

Method

- **Participants**: 96 pupils from three different grades: 32 first graders, 32 second graders, and 32 fourth graders (16 girls from each grade).
- **Materials**: Picture Story Writing Task “*Frog, where are you?*” (adapted from Mayer, 1969).
- **Procedure**: The same task was administered to all three age groups in the four schools (around 45 mins), toward the end of the school year.

Picture Story Writing Task “*Frog, where are you?*” (adapted from Mayer, 1969).



Error Analysis

Corpus of 45 key words:
common to almost all productions
across the three grade levels

**37 content
words**

19 nouns

ضُفْدَاع

dʿufdaʕ

‘frog’

18 verbs

بَحَثَ

baħaθa

‘looked for’

**8 function
words**

فِي

fi:

‘in’

Error Analysis

Total number of words

Words from the Corpus of 45 words

Spelling errors

1. Visual-orthographic errors

Letter-form confusion

Ligaturing

Allography

Multi-linearity

Letter shape formation

Other

6 additional error categories:

2. Phonological

3. Spelling conventions

4. Morpho-orthographic


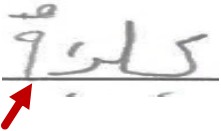
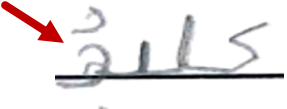
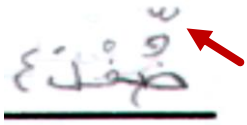
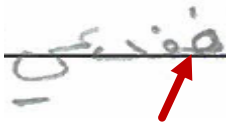

5. Morpho-syntactic

6. Diglossic




7. Other error types

Daniels and Share (2018)

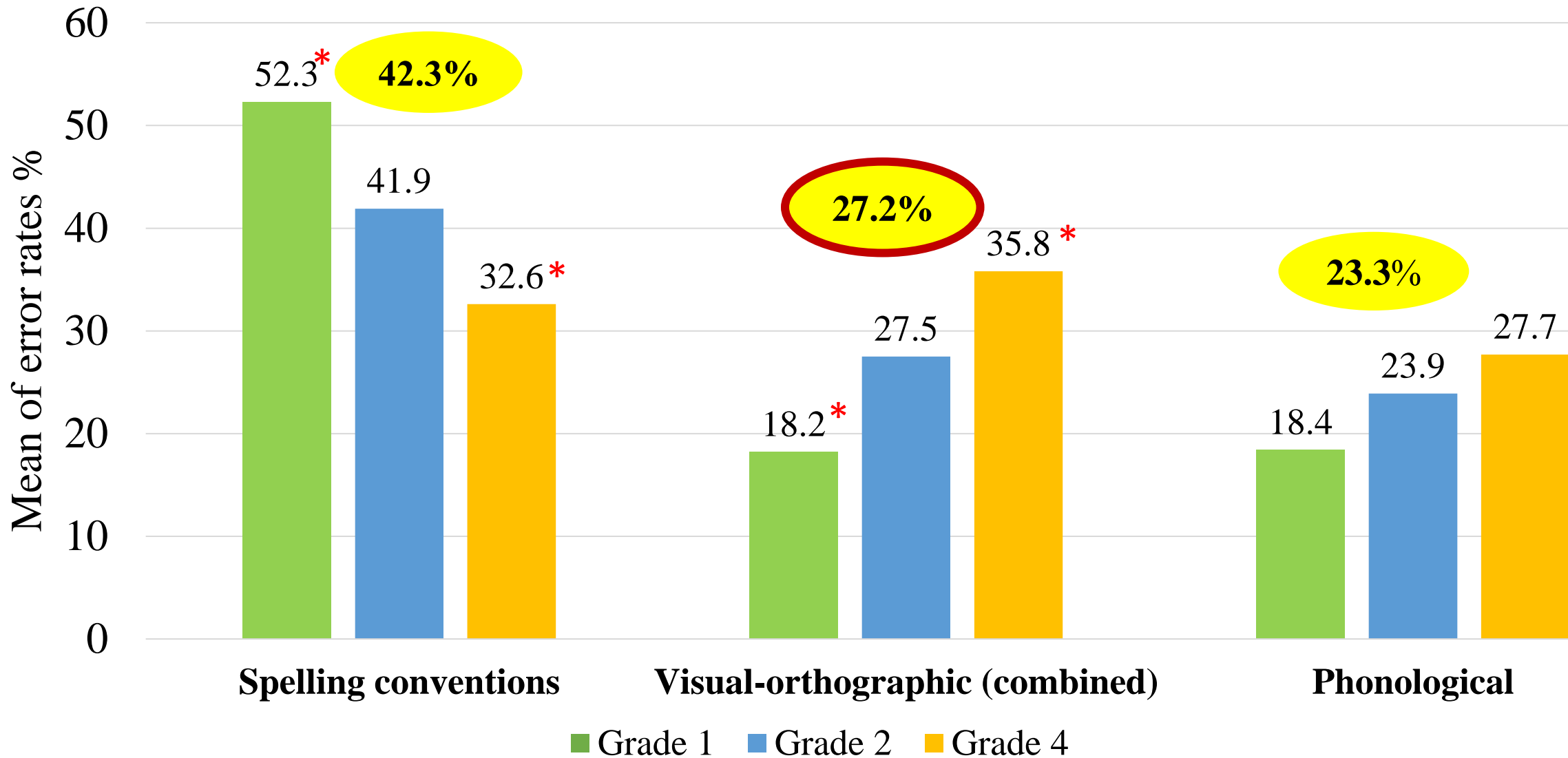
Visual-orthographic categories

Visual-orthographic categories	Incorrect Spelling	Correct spelling
Letter-form confusion		الغرفة 'the room'
Ligaturing		كلبه 'his dog'
Allography		كلبه 'his dog'
Multi-linearity		الضفدع 'the frog'
Letter shape formation		ضفدعي 'my frog'
Other (unclassifiable)		يَنظُران 'they are looking'

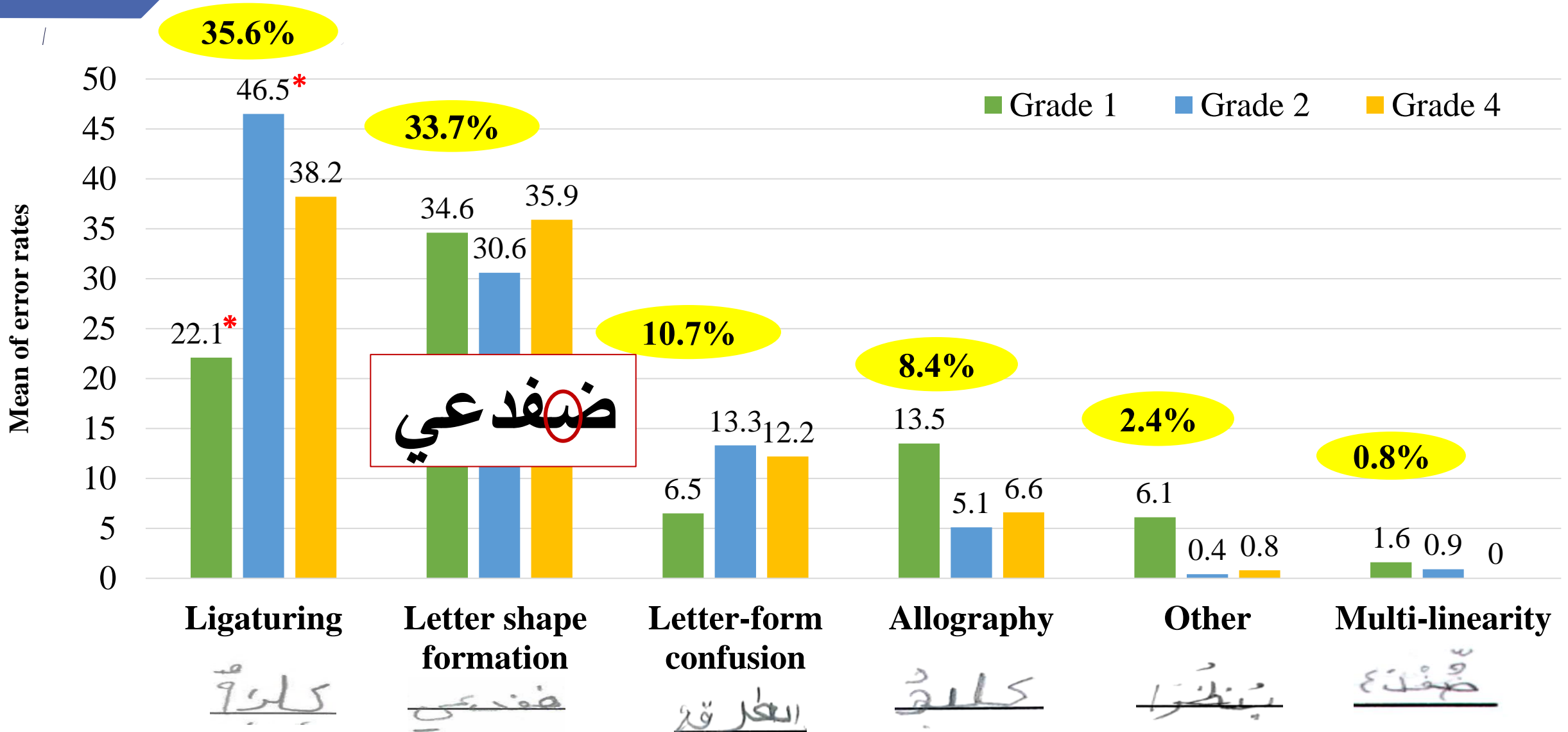
Results

	Grade 1	Grade 2	Grade 4
Total words produced	43.1 (9.67)	64.6 (20.55)	82.9 (32.43)
			
Mean words out of the corpus of 45 key words	29.1 (6.34)	34.9 (9.73)	46.1 (14.98)
			
Total spelling errors (in the 45-word corpus)	20.7 (10.39)	22.2 (10.78)	22.7 (14.64)
			
Error rate per word	0.71 (0.32)	0.68 (0.37)	0.48 (0.25)

Means (%) of error rates for the **combined visual-orthographic category** and the additional categories at three grade levels.



Means (%) of error rates for the **separate visual-orthographic categories** across three grade levels.



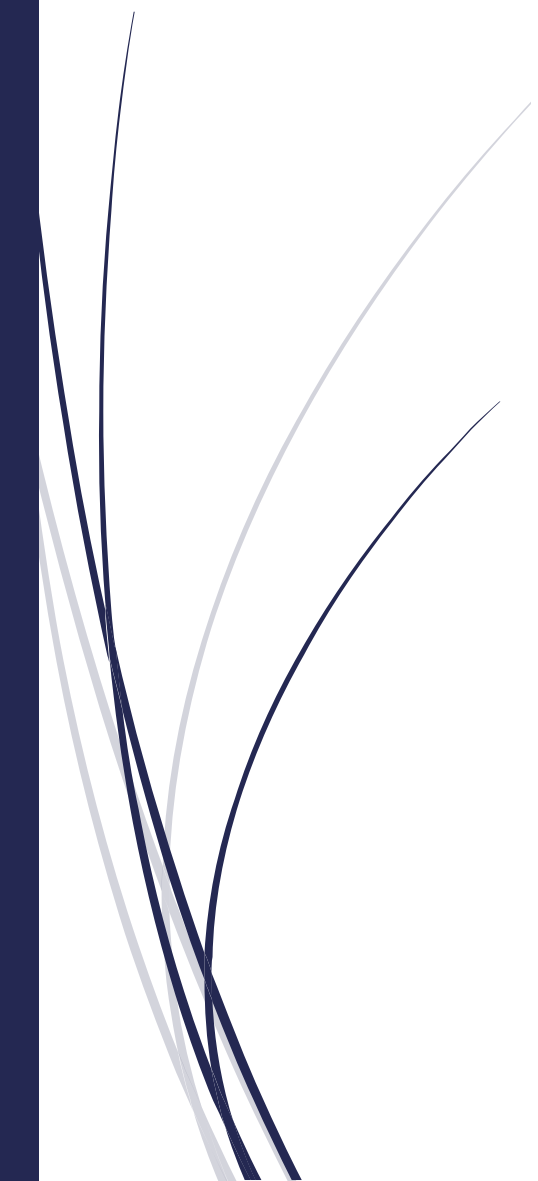
Conclusions and teaching implications

The visual-orthographic dimensions pose non-trivial challenges for acquiring basic skills that are essential for competent written language production.



More emphasis should be allocated to the instruction of those visual-orthographic features of written Arabic that children find difficult at the onset of literacy acquisition.

This implication is supported by Treiman's (1993) conclusion that children can master and gain knowledge of the easy aspects of literacy learning on their own, but they need explicit instruction regarding challenging aspects that they struggle with.



תודה
 Dankie Gracias
 Спасибо
 شكرًا
 Merci Takk
 Köszönjük Terima kasih
 Grazie Dziękujemy Děkojame
 Ďakujeme Vielen Dank Paldies
 Kiitos Tänname teid 谢谢
Thank You Tak
 感谢您 Obrigado Teşekkür Ederiz
 Σας ευχαριστούμε 감사합니다
 Bedankt Дěkujeme vám
 ありがとうございます
 Tack