The Quarterly Journal of Experimental Psychology

Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/pqje20

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Published online: 25 Mar 2014.

To cite this article: Fabienne Chetail, Michele Scaltritti & Alain Content (2014) Effect of the consonant-vowel structure of written words in Italian, The Quarterly Journal of Experimental Psychology, 67:5, 833-842, DOI: 10.1080/17470218.2014.898668

To link to this article: http://dx.doi.org/10.1080/17470218.2014.898668

THE QUARTERLY JOURNAL OF EXPERIMENTAL PSYCHOLOGY, 2014
Vol. 67, No. 5, 833–842, http://dx.doi.org/10.1080/17470218.2014.898668

Rapid communication
Effect of the consonant–vowel structure of written words in Italian

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Surprisingly little is known about the nature of intermediary sublexical units in visual word recognition in Italian, a language with a highly consistent print-to-sound mapping, which should enhance reliance on grapheme-to-phoneme correspondences. In the present study, we examined whether Italian readers are sensitive to large orthographic units defined by the consonant–vowel (CV) pattern of words and that do not directly map onto linguistic constituents. Participants had to judge the number of syllables in written words matched for the number of spoken syllables but comprising either one orthographic vowel cluster less than the number of syllables (hiatus words, e.g., *teatro*) or as many vowel clusters as syllables (e.g., *agosto*). Relative to control words, readers were slower and less accurate for hiatus words, for which they underestimated the number of syllables. This underestimation bias demonstrates that Italian readers are sensitive to large orthographic units stemming from a parsing process based on the CV pattern—that is, the arrangement of consonant and vowel letters.

Keywords: Consonant–vowel pattern; Hiatus words; Consistency; Orthographic units; Syllable counting task.

Orthographic consistency refers to the degree to which elements of orthographic strings systematically map onto the phonemic structure of spoken language (e.g., Glushko, 1979). Spelling-to-sound consistency varies across languages (e.g., Frost, Katz, & Bentin, 1987) and this could influence the size of orthographic and phonological reading units, with larger, coarse-grained units being predominant in less consistent writing systems (e.g., Ziegler & Goswami, 2005). Here, we examined whether readers in a highly consistent orthography are nevertheless sensitive to large orthographic units.

In consistent orthographies (e.g., Serbo-Croatian, Italian, Spanish), each letter or letter group almost always represents the same phoneme, and each phoneme almost always corresponds to the same letter or letter group. In contrast, in less consistent orthographies such as English or French, a single letter can map onto different phonemes (e.g., *i* pronounced /ɪ/ in *novice* and /aɪ/ in *bike*), and a phoneme can be

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The present research was supported by a postdoctoral grant from the Belgian National Fund for Scientific Research (FRS–FNRS) allocated to the first author.

represented by different letters or groups of letters (e.g., /i:/ written *ee* in *sheet*, and *ea* in *cheap*). Such relationships constrain reading acquisition and influence the size of orthographic units used to read words even in skilled readers (see Ziegler & Goswami, 2005). In English, for example, the importance of rime units may stem from the fact that consistency is stronger for such large units than for smaller ones (e.g., Treiman, Mullennix, Bijeljac-Babic, & Richmond-Welty, 1995). On the contrary, in orthographically consistent writing systems, the one-to-one mapping between print and speech may increase the reliance on smaller units and the use of grapheme-to-phoneme correspondence rules (e.g., Frost et al., 1987). However, the use of smaller reading units does not necessarily exclude a possible role for larger units, depending on the task and stimuli (e.g., Brown & Deavers, 1999), as supported, for example, by the numerous experiments showing syllable frequency effects in Spanish (see Chetail, 2012, for a review).

Italian is one example of an orthographically consistent writing system. Letter-to-sound correspondences are reliable, most of the letters being always pronounced the same way. Few letters have several correspondences (e.g., *c* is /k/ in *clima*, but /tʃ/ in *cinque*), and their pronunciation is fully predictable from the orthographic context (e.g., *c* is always pronounced /tʃ/ when followed by *e* or *i*). Although the high consistency could promote the use of grapheme-to-phoneme correspondences, there is evidence that Italian readers are sensitive to larger units than single letters or pairs of letters in visual word recognition. For example, Burani, Dovetto, Spuntarelli, and Thornton (1999) compared highly interpretable root–suffix pseudowords (e.g., *divanaio*), weakly interpretable root–suffix pseudowords (e.g., *terroraio*), and control no-root–no-suffix pseudowords (e.g., *dalonasa*). Root–suffix pseudowords produced shorter naming latencies than controls, without any difference according to interpretability, suggesting the existence of orthographic representations for morphemes directly associated to the corresponding phonological forms. Moreover, simulations with a parallel distributed processing (PDP)-based connectionist model in Italian support the idea that such units might emerge from the spelling-to-sound regularities captured during the learning process (Pagliuca & Monaghan, 2010). In addition, the complexity of lexical stress implies that several sources of information, including sublexical regularities, may be used for stress assignment (see, e.g., Colombo, Deguchi, & Boureux, in press; Sulpizio, Arduino, Paizi, & Burani, 2013). However, to the best of our knowledge, no direct evidence has been reported for other sublexical units such as graphosyllables or rimes.

The hypothesis that reading units in Italian ensue from the encoding of letter-to-sound mapping regularities is consistent with the more general claim that the orthographic structure of letter strings is constrained by print-to-speech mapping, so that functional units within written words map onto linguistic units (see Ziegler & Goswami, 2005). However, orthographic structure may also emerge from knowledge of letter co-occurrence regularities acquired through print exposure (e.g., Seidenberg, 1987). In addition, recent evidence in French supports the hypothesis that readers are sensitive to orthographic units defined by the organization of consonant and vowel letters (hereafter, the CV pattern), so that each vowel or cluster of adjacent vowel letters constitutes the core of one perceptual unit. These vowel cluster units would determine the orthographic structure of letter strings even when they do not map onto phonological units (Chetail & Content, 2012, 2013, 2014). Thus, Chetail and Content (2012) showed that French readers were slower and less accurate in determining the number of syllables in written hiatus words such as *chaos* (/ka.o/, two syllables, one orthographic vowel cluster; the hiatus is created by the two adjacent vowel letters that map onto two full phonological vowels) than in control words such as *flacon* (/fla.kɔ̃/, two syllables, two vowel clusters). In hiatus words, erroneous responses most often corresponded to the number of vowel clusters (e.g., participants were more likely to respond that *client* had one syllable than to respond that it has three syllables). This effect was interpreted as the consequence of a conflict between the phonological syllabic structure and the orthographic structure derived from the distribution of vowel and consonant letters in the letter

string. Converging evidence was reported in lexical decision, naming, and perceptual judgement tasks (see Chetail & Content, 2012, 2014).

The aim of the present study was to examine whether Italian readers are similarly sensitive to units defined by orthographic cues. As Chetail and Content (2012), we used the syllable counting task on hiatus words and matched control words. Hiatus words entail a systematic discrepancy between the number of orthographic vowel clusters and the number of (phonological) syllables (i.e., *teatro*, /te.a.tro/, two vowel clusters, but three syllables). Hence, if the CV pattern has an influence on orthographic chunking in Italian as in French, syllable counting should be more difficult with hiatus words than matched control words. Evidence for the role of the CV pattern in a consistent orthography such as Italian would further support the idea that the influence of the CV pattern is independent of print-to-sound mapping characteristics and should therefore be present in any orthography comprising consonant and vowel letters. As the position of the primary stress is known to influence spoken production and syllabification (see e.g., Colombo et al., in press; Sulpizio et al., 2013), hiatus and controls were carefully matched on stress position to ensure that the difference could not be attributed to such a confound.

EXPERIMENT 1

Method

Participants

Twenty-one native Italian speakers with normal or corrected-to-normal vision participated in the experiment for course credits.

Stimuli

A set of 68 words was selected among 80,000 Italian words obtained by merging the Colfis database (Laudanna, Thorton, Brown, Burani, & Marconi, 1995), which provides lexical frequency estimates, and the Festival database (Cosi, Tesser, Gretter, Avesani, & Macon, 2001), which provides phonological characteristics. Items were selected by pair so that one word contained a hiatus—that is, two contiguous vowel graphemes (e.g., *trio*, *teatro*)—and was matched with a control word that did not exhibit a hiatus (e.g., *lino*, *agosto*). In Italian, a hiatus pattern is present whenever the string includes two adjacent strong vowels (A, E, O, e.g., *croato*) or when a stressed weak vowel (I, U) precedes (e.g., *dio*) or follows (e.g., *cocaina*) a strong vowel. Out of the 34 pairs, 14 included bisyllabic words, and 20 included trisyllabic ones (see Table 1 and Appendix A). Forty monosyllabic words and 12 bisyllabic words were added as fillers so that the same number of responses "one", "two", and "three" should be elicited.

Procedure

Participants performed a syllable counting task programmed with the E-Prime software. Each trial started with a fixation cross for 500 ms in the centre of the screen, followed by a lower-case word written in Courier New font, which remained on the screen until the participants responded or 3000 ms had elapsed. Participants had to decide as quickly and as accurately as possible whether the target word had one, two, or three syllables. They responded by pressing one of three contiguous keys on the keyboard with the three central fingers of their dominant hand. Response times were measured from target onset. Participants performed nine practice trials before receiving the 120 trials in a variable random order.

Results

The mean correct reaction times (RTs) and error rates averaged over participants are presented in Table 2. For three participants, RTs were not considered because the error rates were very high in one of the hiatus word sets (78%, 93%, and 100%) but their data were retained in the error analysis.[1]

[1]In both experiments, the pattern of results and the significance of the effects do not change when the error data of the participants with a very high error rate are also removed.

Table 1. *Characteristics of the experimental words used in Experiment 1*

	Number of syllables					
	Two			*Three*		
Variables	*Control word*	*Hiatus word*	p *value*	*Control word*	*Hiatus word*	p *value*
Example	*moli*	*neon*	—	*alpino*	*trofeo*	—
Number	14	14	—	20	20	—
Lexical frequency	281.24	208.61	.23	17.18	19.29	.42
Number of letters	3.36	3.36	—	5.40	5.40	—
Number of phonemes	3.36	3.43	.58	5.40	5.45	.33
Stress position	1.00	1.00	1	1.60	1.70	.16
OLD20	1.36	1.52	.15	1.80	1.89	.28
Summed bigram frequency	25,717	28,031	.83	41,247	40,353	.89

Note: Lexical frequency and summed bigram frequency are given in number of occurrences per million. OLD20 was computed with the vwr R package (Keuleers, 2013). For bisyllabic words, the high lexical frequency mean was driven by two very frequent word pairs: lui/uno (he/one), and due/era (two/was). If these pairs were removed, the mean frequencies fall to 22.21 and 23.66 for bisyllabic hiatus and controls, respectively.

Table 2. *Mean reaction times and percentage of errors on target words in Experiment 1*

	Word type		
Number of syllables	*Hiatus*	*Control*	*Differences*
Two	1431 (41.50)	1133 (21.43)	298 (20.07)
Three	1459 (28.33)	1128 (5.95)	331 (22.38)

Note: Reaction times in ms. Percentage of errors in parentheses.

First, we conducted separate analyses of variance on the participant (F_1) and item means (F_2) with word type (control, hiatus) and number of syllables (two, three) as main factors. Hiatus words elicited longer RTs than control words [$F_1(1, 17) = 71.33$, $p < .001$; $F_2(1, 64) = 68.40$, $p < .001$], and there was no significant effect of the number of syllables, Fs < 1, and no interaction, Fs < 1. Error rates were larger for hiatus words than for control words [$F_1(1, 20) = 16.19$, $p < .001$; $F_2(1, 64) = 51.11$, $p < .001$], and for tri- than for bisyllabic words [$F_1(1, 20) = 30.68$, $p < .001$; $F_2(1, 64) = 22.11$, $p < .001$], and there was no significant interaction between number of syllables and word type, Fs < 1. One reviewer attracted our attention to the existence of an Italian syllabic database (Stella & Job, 2001) to check that the word type effect was not due to syllable frequency variations. A posteriori, the summed syllable frequency (token count) was higher in control than in hiatus words (405,189 vs. 196,467 respectively, $p < .001$). However, covariate analyses clearly showed that the word type effect remained highly significant when syllable frequency was controlled for, both on reaction times, $F(1, 65) = 71.58$, $p < .001$, and on error rates, $F(1, 65) = 21.51$, $p < .001$.

Second, we analysed the type of errors for bisyllabic words, as those words allowed for both underestimation (response "one") and overestimation (response "three") errors. Hiatus words led to more underestimation errors than overestimation errors, $F(1, 20) = 32.44$, $p < .001$, which was also true for control words, $F(1, 20) = 20.63$, $p < .001$. However, the interaction between the type of errors and word type showed that the effect was stronger in hiatus words, $F(1, 20) = 10.06$, $p = .005$ (Figure 1).

Discussion

Hiatus words were processed more slowly and less accurately than control words. These results replicate previous findings in French (Chetail & Content, 2012) and suggest that Italian readers are sensitive to the CV pattern, leading to a conflict

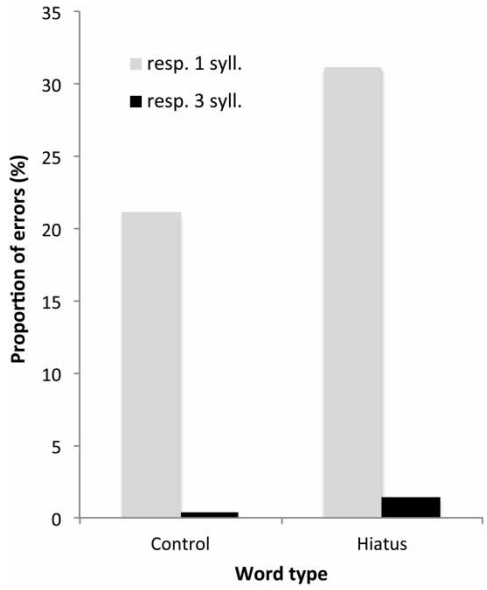

Figure 1. *Proportion of underestimation and overestimation errors for bisyllabic words in Experiment 1.*

between the orthographic structure derived from the distribution of vowel and consonant letters in the letter string and the phonological syllabic structure. The absence of a main effect of number of syllables may appear surprising, but it should be noted that neither the effect of number of syllables nor the interaction between word type and number of syllables should be interpreted directly, as item matching was performed according to word type only.

One interesting aspect of the syllable counting task is that the examination of errors provides information on the preferred segmentation. According to the CV pattern hypothesis, hiatus words should lead to underestimation errors (e.g., response "one" for *trio*, "two" for *croata*) because they have one orthographic unit less than their number of syllables. This is actually what we found. However, unexpectedly, the number of units was also significantly underestimated in bisyllabic control words, leading to a high error rate in bisyllabic control words (21.4%). We hypothesized that this might be caused by the presence of very short bisyllabic words (three or four letters) for which participants might have based their decisions on length in letters rather than on orthographic and/or phonological structure. To eliminate this potential strategy, we conducted a second experiment with words of three and four syllables (instead of two and three), and we selected longer words.

EXPERIMENT 2

Method

Participants

Twenty-seven new native Italian speakers with normal or corrected-to-normal vision participated in the experiment for course credits.

Stimuli

Items were selected as in Experiment 1, except that target words were three and four syllables long. A set of 50 pairs of hiatus and control was used, with half of the pairs including three-syllable-long words and the other half including four-syllable-long words (see Table 3 and Appendix B). Fifty bisyllabic fillers were added.

Procedure

The procedure was identical to that of Experiment 1 except that the participants had to decide whether the target word had two, three, or four syllables.

Results

The mean correct RTs and error rates averaged over participants are presented in Table 4. Reaction time data from three participants were not considered because their error rates were very high for one of the hiatus word sets (78%, 91%, and 96%).

First, analyses of variance showed that hiatus words elicited longer RTs than control words [$F_1(1, 23) = 67.45$, $p < .001$; $F_2(1, 96) = 52.35$, $p < .001$] and that words with four syllables were processed more slowly than trisyllabic words [$F_1(1, 23) = 17.74$, $p < .001$; $F_2(1, 96) = 25.20$, $p < .001$]. The effect of word type was larger for three-syllable-long words than for four-syllable-long ones [$F_1(1, 23) = 17.75$, $p < .001$; $F_2(1,$

Table 3. *Characteristics of the experimental words used in Experiment 2*

	Number of syllables					
	Three			*Four*		
Variables	*Control*	*Hiatus*	p *value*	*Control*	*Hiatus*	p *value*
Example	*confido*	*bronzeo*	—	*arsenale*	*creatore*	—
Number	25	25	—	25	25	—
Lexical frequency	13.82	13.43	.67	6.64	6.12	.74
Number of letters	6.24	6.24	—	7.56	7.56	—
Number of phonemes	6.32	6.32	1	7.72	7.72	1
Stress position	1.64	1.64	1	2.64	2.68	.33
OLD20	1.93	2.08	.09	2.34	2.33	.91
Summed bigram frequency	62,217	56,777	.51	47,137	50,540	.49

Note: Lexical frequency and summed bigram frequency are given in number of occurrences per million. OLD20 was computed with the vwr R package (Keuleers, 2013).

Table 4. *Mean reaction times and percentage of errors on target words in Experiment 2*

	Word type		
Number of syllables	*Hiatus*	*Control*	*Differences*
Three	1659 (27.86)	1294 (4.03)	365 (23.83)
Four	1701 (30.41)	1553 (13.05)	148 (17.36)

Note: Reaction times in ms. Percentage of errors in parentheses.

96) = 15.20, $p < .001$], and simple effects showed that the word type effect was present for both three-syllable-long words [$F_1(1, 23) = 58.84$, $p < .001$; $F_2(1, 96) = 61.98$, $p < .001$], and four-syllable-long words [$F_1(1, 23) = 21.49$, $p < .001$; $F_2(1, 96) = 5.57$, $p = .02$]. Analyses on error rates showed that hiatus words produced more errors than controls [$F_1(1, 26) = 26.92$, $p < .001$; $F_2(1, 96) = 94.09$, $p < .001$]. Words with four syllables elicited more errors than trisyllabic words [$F_1(1, 26) = 7.89$, $p = .009$; $F_2(1, 96) = 6.65$, $p = .01$]. The effect of word type tended to be larger for three-syllable-long words than for four-syllable-long words [$F_1(1, 26) = 4.66$, $p = .04$; $F_2(1, 96) = 2.86$, $p = .09$], and it was significant for both trisyllabic words [$F_1(1, 26) = 22.79$, $p < .001$; $F_2(1, 96) = 64.82$, $p < .001$], and four-syllable-long words [$F_1(1, 26) = 27.23$, $p < .001$; $F_2(1, 96) = 32.05$, $p < .001$]. As in Experiment 1, the summed syllable frequency computed a posteriori was higher in control than in hiatus words (463,678 vs. 314,350, respectively, $p < .001$). Nevertheless, covariate analyses showed that the word type effect remained highly significant when syllable frequency was controlled for, both on reaction times, $F(1, 97) = 34.20$, $p < .001$, and on error rates, $F(1, 97) = 79.07$, $p < .001$.

Second, the analysis of the type of errors in trisyllabic words (for which the task makes it possible to compare over- and underestimation responses) showed that three-syllable-long hiatus words led to more underestimation than overestimation errors, $F(1, 26) = 14.88$, $p < .001$, whereas there was no difference for control words, $F < 1$ (Figure 2). Accordingly, the interaction between word type and type of errors was highly significant, $F(1, 26) = 16.31$, $p < .001$.

Discussion

The results replicate the hiatus effect obtained in Experiment 1. In contrast, no hint of underestimation errors was observed for control words, suggesting that, contrary to Experiment 1, length in letters was not used by the participants of Experiment 2 to perform the task. Hence, the influence of letter length appears to be limited to

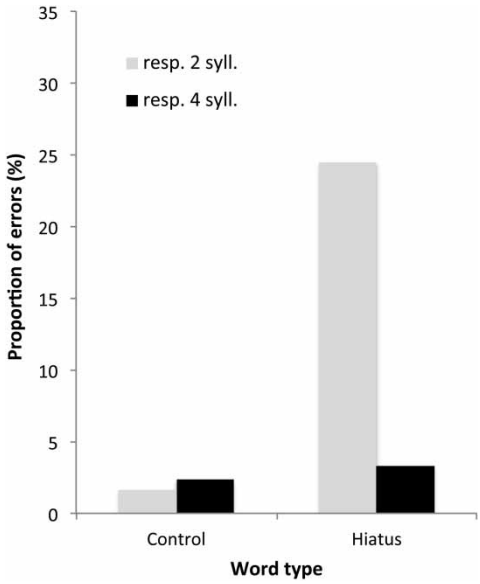

Figure 2. *Proportion of underestimation and overestimation for trisyllabic words in Experiment 2.*

very short words. Additionally, although the stress position was strictly controlled, some hiatus words had their stress falling on the hiatus cluster (tonic syllable: 32 words), and others did not (24 words). Post hoc analyses on reaction times showed that the word type effect did not vary according to stress position ($p = .92$), and accordingly the effect was present both when the stress fell on the hiatus ($p < .001$) and when it did not ($p < .001$). Similarly for error rates, the word type effect was highly reliable whether the hiatus was stressed ($p < .001$) or not ($p < .001$), although it was stronger in the latter case ($p < .001$). This clearly shows that the word type effect cannot be explained in terms of tonic syllables in hiatus words. Furthermore, the fact that the strength of the effect is affected by the stress position is consistent with the influence of stress in spoken word syllabification in Italian (see Colombo et al., in press; Sulpizio et al., 2013), words with a tonic syllable coinciding with the hiatus being potentially syllabified more easily than other hiatus words.

GENERAL DISCUSSION

In both experiments, we found that hiatus words were processed less efficiently than control words and led to underestimation errors. Participants were asked to make judgements on phonological units, but the thrust of the study lies in the indirect effect of the orthographic CV pattern on these judgements. In hiatus words, there is systematically one orthographic vowel cluster less than the number of syllables. We assume that it is the mismatch between the number of syllables and the number of vowel clusters that leads either to errors in favour of orthographic structure or to prolonged response times, induced by the conflict between orthographic and phonological structure.[2]

The underestimation bias in syllable counting suggests that Italian readers are sensitive to orthographic units stemming from a parsing process based on the CV pattern, and the effect highlighted by the present experiments truly seems to originate at an orthographic level. There is direct evidence in French that the hiatus effect is not driven by phonological or production characteristics. Chetail and Content (2012) compared two kinds of hiatus words, both exhibiting two contiguous phonological full vowels. In one case, the hiatus corresponded to adjacent vowel letters (e.g., *chaos*, /ka.o/), thus entailing an orthographic/phonological mismatch as in the present study, whereas in the other case, the hiatus pattern corresponded to two vowel letters separated by a silent consonant (e.g., *bahut*, /ba.y/), thus leading to two orthographic vowel clusters. In the latter words, although the phonological form contains two contiguous vowels, the alternation of orthographic consonants and vowels determines a segmentation that is consistent with the syllabification (i.e., two vowel clusters in bisyllabic words). Accordingly, orthographic hiatus words like *chaos* but not phonological hiatus words like *bahut* were processed less efficiently than the control words (see also Chetail & Content, 2014). In sum, the present experiments support

[2]Post hoc analyses showed that lexical/semantic variables such as lexical frequency, familiarity, age of acquisition, word imageability, syllable frequency, or morphological structure could not explain this pattern.

the psychological reality of multiletter orthographic units determined by the arrangement of consonant and vowel letters in Italian. Whether this structure mediates visual word recognition and at which level (or levels) are questions for future research.

The present results are highly similar to those reported in French (Chetail & Content, 2012), suggesting that the effect of the CV pattern is independent of the consistency of print-to-sound mapping correspondences. One reason to suspect that the effect could be specific to French was that French comprised a large number of vowel bigrams that constitute complex graphemes (e.g., *ou* for /u/). This is not the case in Italian, implying that the hiatus effect cannot be explained in terms of graphemic segmentation ambiguity. Accordingly, bigrams marking hiatus patterns in Italian do not correspond to complex graphemes (e.g., the bigram *eo* always corresponds to /eɔ/ in Italian, while it corresponds either to /i/ or /əʊ/ in English, *people* vs. *video* respectively).[3] The emergence of a unit centred on the bigram *eo* cannot therefore be driven by pure phonological factors, but seems genuinely due to the CV status of letters.

The respective role of consonants and vowels in visual word recognition has been an issue of major interest over the last decades, and it has been approached from different perspectives. First, Berent and Perfetti (1995) proposed that the conversion of consonants and vowels occurs separately, with consonants being processed faster than vowels. The hypothesis was supported by evidence from English but the two-cycle hypothesis has not been confirmed in Italian (Colombo, Zorzi, Cubelli, & Brivio, 2003), suggesting that it may be dependent on the differential consistency of vowels and consonants in a given language. Second, studies disturbing consonant or vowel information by selective transpositions or deletions suggest that consonants provide stronger constraints on lexical selection than vowels, in both consistent (e.g., Duñabeitia & Carreiras, 2011; Perea & Acha, 2009) and inconsistent (e.g., Lupker, Perea, & Davis, 2008; New, Araújo, & Nazzi, 2008) orthographies. Third, the present findings, together with other recent studies, show that consonants and vowels provide orthographic cues that determine the perceptual structure of letter strings and help parse them into multiletter chunks. The original findings were reported in French (Chetail & Content, 2012). Here, we offer clear-cut evidence that even in transparent orthographies such as Italian, letter strings are segmented into letter groups and that the CV pattern—the arrangement of consonants and vowel letters—is an influential factor constraining segmentation. This, moreover, suggests that these units originate from the frequent exposure to a recurrent feature of the writing system, over and above its relationship with phonology.

Original manuscript received 19 September 2013
Accepted revision received 5 February 2013
First published online 25 March 2014

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[3]The only exception concerns bigrams with a weak vowel (I, U) followed by a strong vowel (A, E, O), which sometimes map onto a hiatus pattern (e.g., IO in *lavorio*, /la.vɔ.ri.ɔ/) or to two phonemes within a syllable, thus not corresponding to a hiatus (e.g., IO in *idiozia*, /i.djɔ.zi.a/). In Experiment 2, only two hiatus words (out of 50) included such cases, ruling out the possibility that the hiatus effect was driven by such cases.

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APPENDIX A

List of experimental stimuli used in Experiment 1

Number of syllables	*Control words*	*Hiatus words*
2	uno	lui
2	era	due
2	eco	pio
2	uso	dio
2	ira	neo
2	ago	zoo
2	oca	reo
2	ape	duo
2	amo	zio
2	muta	scia
2	lino	trio
2	tana	prua
2	dose	stia
2	moli	neon
3	edera	apnea
3	abito	museo
3	alibi	video
3	acuto	soave
3	amaro	leale
3	avena	purea
3	umido	boato
3	edito	roseo
3	epico	cereo
3	amaca	pareo
3	alito	alveo
3	amata	ebreo
3	pulita	croato
3	rugosa	sleale
3	canoro	coatto
3	agosto	teatro
3	finire	creare
3	veneto	nucleo
3	mucosa	livrea
3	alpino	trofeo

APPENDIX B

List of experimental stimuli used in Experiment 2

Three-syllable words		*Four-syllable words*	
Control	*Hiatus*	*Control*	*Hiatus*
pulita	croato	anonima	cocaina
veleno	platea	operato	alleato
sonoro	contea	animale	lineare
somalo	ferreo	abitato	neonato
rugosa	sleale	ironica	poetica
canoro	coatto	inedito	teorico
agosto	teatro	italico	caotico
finire	creare	educato	irreale
debito	corteo	enoteca	liceale
veneto	nucleo	ipoteca	odissea
levare	spiare	odorato	lavorio
mucosa	livrea	organico	estraneo
satura	lattea	luminoso	creativo
ibrida	lignea	officina	creatura
insita	cornea	numeroso	leopardo
ardito	pigmeo	litorale	nucleare
catino	vitrea	virtuale	balneare
ispido	creolo	ricavare	ricreare
alpino	trofeo	artefice	geometra
tedesco	maestro	fanatico	calcareo
cicogna	creanza	recapito	geografo
tremulo	plumbeo	regicida	cineasta
confido	bronzeo	obsoleta	realista
scenata	trachea	idrofilo	fulmineo
pagella	trincea	arsenale	creatore