SELF-REPORTED L2 INPUT PREDICTS PHONETIC VARIATION IN THE ADAPTATION OF ENGLISH FINAL CONSONANTS INTO ITALIAN

Veronica Miatto[1], Silke Hamann[2], Paul Boersma[2]

[1]Stony Brook University, [2]University of Amsterdam
veronica.miatto@stonybrook.edu, silke.hamann@uva.nl, paul.boersma@uva.nl

ABSTRACT

Italian native speakers often produce short, schwa-like vowels at the end of consonant-final loanwords from English. While past studies on these paragogic vowels investigated intra-speaker variation and looked at factors such as stress, voicing or intonation contours, the present study focuses on variation between speakers. We test the hypothesis that the amount of received native English input predicts how often Italians produce paragogic vowels in English loanwords, with less input causing more inserted vowels. L2 input was estimated on the basis of a questionnaire on the active use and passive exposure to English. Twenty-one Italian native speakers with varying levels of English filled out this questionnaire and took part in an irregular-plural elicitation task containing consonant-final loanwords from English. Our results show that Italian speakers with a higher self-reported level of English exposure produce fewer paragogic vowels, thereby confirming our hypothesis.

Keywords: loanword adaptation, epenthetic vowels, L2 proficiency, Italian, English.

1. INTRODUCTION

Italian is characterized by word-final vowels, as can be observed for the vast majority of native words. Only a very small set of function words have a final sonorant, such as *il* 'the' or *per* 'for'. Over the last decades, however, more and more consonant-final loanwords have been incorporated into Italian. These words are often produced with a short, schwa-like vocalic element word-finally. The English loanword *jet*, for example, has been reported as being realized as [dʒɛt], [dʒɛttə], [dʒɛttᵊ], or [dʒɛtte] by Italian speakers [15].

The status of this vowel insertion is disputed. Some authors claim the process is phonological because it repairs the ill-formed structure of a coda consonant in word-final position by adding a vowel and thus causing resyllabification [1, 3]. If one applied Hall's criteria [9, 10], on the other hand, the optionality of the vowel and its reduced quality could be seen as evidence that it is a phonetic process (see also [15]).

Previous studies on these so-called *paragogic* vowels in Italian loanwords have focused on factors determining intra-speaker variation, such as stress, voicing of the word-final consonant, word length, and intonation contour, which have all been found to affect the likelihood of producing such a vowel [3, 8]. While variation between speakers has been noticed, its conditions are mostly unexplored. The present study focuses on this inter-speaker variation in paragogic vowels, and tries to relate it to the amount of English input the Italian native speakers have received.

A substantial body of literature showed that when a speaker acquires more than one language, the phonological systems of the two (or more) languages influence each other. With respect to an L1 influence on L2, Flege, Schirru & MacKay [7] e.g. showed that age of arrival (AoA) is a key factor to the native-like production of English /e/ by Italian immigrants to Canada. They found that the older the immigrants, the more influence their L1 still had on their L2, and only speakers with a very low AoA were able to produce /e/ in a native-like way. The reverse influence of L2 on L1, especially in the adaptation of loanwords into the L1, was established in multiple studies, e.g. on epenthetic vowels in the adaptation of English non-words into Korean [12], Korean-English phoneme mapping [11], and the perception of epenthetic vowels by Japanese learners of English [13]. These studies agree that knowledge of L2 affects how speakers perceive and produce L2 loanwords in their L1, in that the perception and production of the L1 moves towards that of the L2.

The above-mentioned studies vary widely in the methodologies they use to measure L2 knowledge, including AoA in the L2 country [7], degree of bilingualism (early vs. late) [12], and L2 proficiency [11, 13], where the latter has also been measured in different ways. All these methods try to capture the difference in L2 input that speakers receive, as it is by now accepted, in accordance with stochastic models of language acquisition, that languages are learned through statistical inference from the input.

The primary aim of the present paper is to establish whether inter-speaker variation in the insertion of word-final paragogic vowels in English loanwords is directly related to the amount of English input that Italian speakers have received.

Information on the latter is obtained from a self-reported estimation of hours of received L2 input.

This methodology is especially suited to the present study because of the linguistic environment in Italy. Italian speakers do not generally come into contact with native English speakers, as English in school is usually taught by Italian native speakers, and foreign television and cinema are always dubbed. Therefore, native English has to be purposely sought. Younger generations (the target population of this study) do so by spending time abroad, by taking university courses taught by native English speakers, or by watching movies and TV shows in English on streaming services. This makes estimating their received input feasible, as speakers are well aware of when they have been listening to native English, since they purposefully looked for it.

2. PRODUCTION EXPERIMENT

2.1. Participants

The experiment featured 21 native Italian speakers (4 males, 17 females), between 19 and 39 years of age (mean = 25;0), born and raised in Veneto, with Northern Italian parents. All of them were university students, with different levels of proficiency in English (tested as described in §2.2).

2.2. Materials

The experiment consisted of two parts. The first was an irregular-plural elicitation task, in which participants where orthographically presented with a countable noun on the screen and first had to produce the singular, as displayed, preceded by the numeral *un/uno/una* 'one', and then the plural, preceded by the numeral *due* 'two'. This context ensured an Italian language mode even when an English loanword was displayed. Examples of two expected answers are given below, (1) for a control and (2) for a target token.

(1) *una casa* *due case*
'one house' 'two houses'

(2) *un tunnel* *due tunnel*
'one tunnel' 'two tunnels'

The task contained 75 English consonant-final loanwords (25 ending in sonorants, 25 ending in voiced stops, and 25 ending in voiceless stops) and 50 fillers. All words were one to three syllables long. The loanwords were judged to be frequent in Italian by two native speakers (one of them the first author). The great majority of these words have been incorporated into Italian more than 50 years ago (according to [6]), with some recent exceptions such as *computer* and *piercing*, which were judged to be extremely frequent. The aim of this selection was to present the participants with words they were familiar with and would not associate with the source language.

In the second part of the experiment, participants had to answer a sociolinguistic questionnaire with 18 questions. Five of these enquired about the speakers' linguistic background, and eleven were directed towards estimating as precisely as possible the amount of native English input the participants had received through various sources. These included periods spent in English-speaking countries, watching English-spoken movies or TV shows (with or without English subtitles), and other regular interactions with native English speakers. Crucially, both active and passive interactions with native English speakers were taken into account. The participants reported weekly numbers of hours for each question, which were later summed and multiplied by 52 to obtain a yearly estimate. The final two questions enquired about the speakers' attitude towards English, though the answers to these questions were too similar to allow the inclusion of attitude in our analysis.

Additionally, we administered a self-assessment test of English proficiency to the participants. The test consisted of *can-do* statements based on the indicators of the *Common European Framework of Reference* (CEFR, [5]). This type of test was chosen because such statements have been found particularly reliable in L2 self-assessment [4].

For each of the five fields of reading, listening, oral interaction, writing and speaking, the participants had to choose one of six statements that matched their performance best. These statements correspond to the six levels of the CEFR. Each level was then assigned a grade from 1 (for A1) to 6 (for C2), and on the basis of this an average proficiency score for each speaker was calculated. An example of a *can-do* statement for writing (from [5]) is given in (3), corresponding to level B1:

(3) I can write simple connected text on topics which are familiar or of personal interest. I can write personal letters describing experiences and impressions.

2.3. Procedure

The experiment was carried out at the phonetics laboratory of the *Istituto di Scienze e Tecnologie della Cognizione* in Padua, Italy. For the elicitation task, speakers were seated in front of a computer screen and a microphone in a soundproof booth.

Table 1: Self-reported input (in hours per year) and proficiency of participants, ranked according to input.

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Input	0	0	104	128	156	208	246	262	364	450	618	726	776	862	988	1216	1274	1708	1776	2800	3674
Prof.	1.9	2.7	3.2	3.3	3.4	5.3	3.8	4.4	4.3	3.2	4.8	3.8	4.2	5	3	5.2	3.2	5.4	5.5	5.4	4.7

The recording session usually lasted around five minutes, which was followed by the questionnaire and the self-assessment proficiency test, resulting in a total testing time of about 30 minutes.

2.4. Analysis

In total, 3,150 experimental tokens were collected. Data analysis was carried out with Praat [2], in which the presence or absence of a word-final paragogic vowel was indicated for each token. The presence of such a vowel was determined on the basis of the following criteria: the presence of a periodic waveform of at least three glottal periods (or minimally 10 ms), and the presence of a voice bar and formants in the spectrogram. Figure 1 shows a token of the word *jet* categorized as having a paragogic vowel.

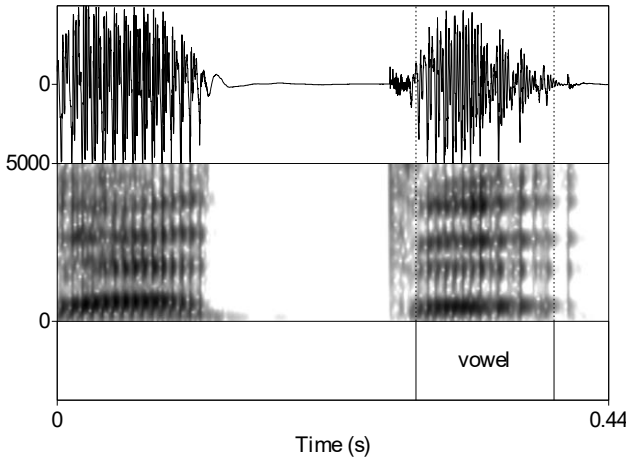

Figure 1: Waveform and spectrogram of the word *jet* with a paragogic vowel (as indicated by the boundaries), uttered by one of the participants.

2.5. Statistical analysis

The data was statistically analysed with a generalized linear mixed-effects model using *glmer* in R [14]. The dependent variable is the presence of a *vowel* (with 1 for present and 0 for absent), while the predictors are amount of English *input* (a continuous numeric variable, which was centred) and *type* of consonant (with the three levels *sonorant*, *voiced obstruent* and *voiceless obstruent*, contrast-coded as respectively –2/3, +1/3, +1/3 for *obstruency*, and as 0, +1/2, –1/2 for *voicing*). The statistical design also features random intercepts for participants and words, and as random slopes for type by participant and for input by word, see (4).

(4) vowel ~ input * type
+ (type | participant) + (input | word)

In a first model we also included proficiency of participants as predictor. This, however, turned out to correlate strongly with estimated input (for individual values see Table 1) and was therefore removed (see http://www.fon.hum.uva.nl/archive/ for details, data, and analysis scripts).

2.6. Results

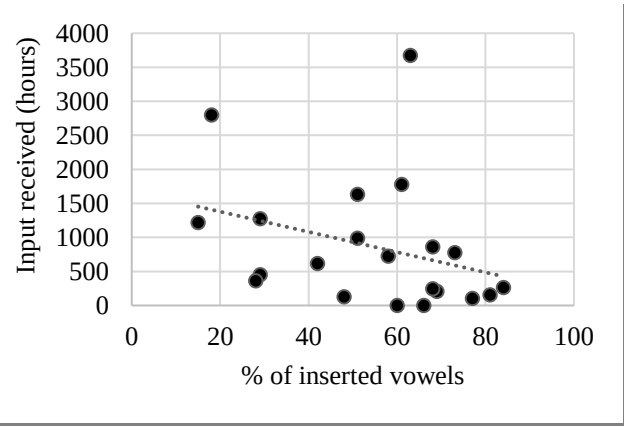

Figure 2: Percentage of inserted vowels according to the amount of native English received in hours per year.

Figure 2 reports the number of word-final vowels inserted by the speakers, according to the estimated amount of native English input received. The scatterplot shows a clear trend to produce fewer word-final epenthetic vowels with an increase in self-reported English input. This is borne out by the results of the generalized linear mixed-effects regression, shown in Table 2.

Table 2: Results of the model.

	Estimate	**z-value**	**Pr (>|z|)**
Intercept	0.262	0.909	0.3631
Input	–0.048	–1.678	0.0934
Type obstruency	1.208	3.595	0.0032
Type voicing	1.801	4.362	$1.3 \cdot 10^{-5}$
Input × Type obstr.	–0.021	–0.839	0.4013
Input × Type voicing	0.013	0.392	0.6951

Table 2 suggests that the dependent variable (presence of the epenthetic vowel) may fall with increasing input: the odds of vocalic elements being produced decreases by $e^{0.048} = 1.049$ times for every

100 hours of English native input received (95% CI 0.991 .. 1.110 times, $p = 0.093$). A one-sided test could be feasible because an *increase* is not expected, and would give a *p*-value of 0.047 (this reasoning is admittedly dubious not just because one-sided tests are dubious after looking at the result of a two-sided test, but also because proficiency could have been an alternative predictor instead of input). This means that with increasing input of English, Italian speakers insert less vocalic elements in consonant-final loanwords.

Furthermore, our model shows that obstruents trigger significantly more paragogic vowels than sonorants ($p = 0.0032$), and within the group of obstruents it is the voiced ones that cause more paragogic vowels than the voiceless ones ($p = 1.3 \cdot 10^{-5}$), as found in previous experiments [3].

3. DISCUSSION

The present study showed a correlation between the received amount of native English input and the number of vocalic elements produced by Italian speakers in the adaptation of loanwords from English into Italian. We could therefore add to the existing literature that the variation in the insertion of paragogic vowels is not only of intra-speaker, linguistic nature but depends also on the exposure to English, which differs from speaker to speaker.

The method of self-reported L2 input that we employed here proved useful and has several advantages compared to other methods. The first advantage is that it measures more directly the exposure of a speaker to the L2. It therefore does not rely on a measure such as L2 proficiency, which, by its holistic nature, includes several skills (such as writing and vocabulary) that are not directly relevant to the acquisition of sound structure. Moreover, our self-report measure takes into account both active and passive input. This was crucial in the present study, as over half of the participants did not have other regular exposure to English aside from TV shows and media content. Their gradiency in vocalic insertion could not have been accounted for if we had not included passive input in our measure.

A drawback of this methodology is its limited applicability. Just as AoA is a type of measure applicable only to immigrants, input estimation is only applicable to certain populations and certain linguistic contexts. University students (speakers that are relatively young), who grew up in an environment in which exposure to the L2 is very limited (such as Italy) are perfect for this methodology; older speakers and more diverse environments make its application difficult.

Another drawback is the fact that the estimation of input relies completely on the awareness of the speakers. They can easily over- or underestimate the number of hours they interact with native speakers, especially if they spent a considerable amount of time abroad.

Finally, as mentioned in the introduction, the interpretation of the results depends on the phonological status of the vowel insertion process under study. If it is a phonological process, as some authors suggest, the motivation for insertion is of a phonological nature, namely to repair a consonant-final syllable in word-final position. This is supported by instances of word-final consonant gemination, implying that the second part of the long consonant resyllabifies as part of the onset of the newly-built syllable, with the paragogic vowel as nucleus. Under this view, our results indicate that exposure to English modifies Italian phonotactic restrictions in such a way that consonant-final syllables in word-final position become more acceptable. Thus, under this view, exposure to native English changes Italian *phonology*.

If, on the other hand, the inserted vocalic elements are phonetic, their insertion has the purely phonetic function of strengthening the consonant release. This is supported by the optionality and schwa-like quality of the vocalic elements and the fact that they cannot be perceived by native speakers. Under this view, Italian phonology already tolerates consonant-final words (probably due to the introduction of consonant final loanwords) and just happens to be a language that requires its consonants to be strongly released. Sometimes this happens with the help of word-final vocalic elements, as opposed to English or Korean, which require their consonants to have weaker releases or no release at all. Following this line of thought, our results imply that exposure to English reduces the strength required for the release of Italian consonants. Therefore, what exposure to English shapes is not phonology, but *phonetics*. This latter explanation seems a more likely interpretation of our results because of the variability in paragogic vowel insertion. However, we leave further evidence regarding the status of paragogic vowel insertion in Italian for future research.

4. ACKNOWLEDGMENTS

We would like to thank Cinzia Avesani and the *Istituto di Scienze e Tecnologie della Cognizione* in Padua, Italy, for allowing us to use their phonetic laboratory. We furthermore thank all our speakers for participating in the experiment.

5. REFERENCES

[1] Bafile, L. 2005. Struttura sillabica e consonanti finali in varietà italiana. Quaderni del Dipartimento di Linguistica - Università di Firenze 15, 1–25.

[2] Boersma, P., Weenink, D. 2018. Praat: Doing phonetics by computer (Version 6.0.37) [Computer program]. http://www.fon.hum.uva.nl/praat/

[3] Broniś, O. 2016. Italian vowel paragoge in loanword adaptation: Phonological analysis of the Roman variety of Standard Italian. *Italian Journal of Linguistics* 28, 25–68.

[4] Brown, N.A., Dewey, D.P., & Cox, T.L. 2014. Assessing the Validity of can-do statements in retrospective (then-now) self-assessment. *Foreign Language Annals* 47, 261–285.

[5] Council of Europe. 2001. *Common European framework of reference for languages: learning, teaching, assessment.* Cambridge: Cambridge University Press.

[6] De Mauro, T. 2018. *Il Nuovo De Mauro.* Available online at: https://dizionario.internazionale.it/

[7] Flege, J. E., Schirru, C., MacKay, I. R. A. 2003. Interaction between the native and second language phonetic subsystems. *Speech Communication* 40, 467–491.

[8] Grice, M., Savino, M., Caffò, A., Roettger, T. B. 2015. The tune drives the text - Schwa in consonant-final loan words in Italian. *Proc. 18th ICPhS* Glasgow, 1–5.

[9] Hall, N. 2006. Cross-linguistic patterns of vowel intrusion. *Phonology* 23, 387–429.

[10] Hall, N. 2011. Vowel epenthesis. In: van Oostendorp, M., Ewen C. J., Hume, E., Rice, K. (eds), *The Blackwell Companion to Phonology*. Oxford: Blackwell, 1576–1596.

[11] Kang, Y., Schertz, J. 2017. *The influence of perceived L2 sound categories in on-line adaptation and implications for loanword phonology* (unpublished manuscript). Retrieved from https://www.yoonjung kang.com/

[12] Kwon, H. 2017. Language experience, speech perception and loanword adaptation: Variable adaptation of English word-final plosives into Korean. *Journal of Phonetics* 60, 1–19.

[13] Nomura, J., Ishikawa, K. 2018. Effects of first language processes and representations on second language perception: The case of vowel epenthesis by Japanese speakers. *International Journal of Bilingualism* 22, 69–87.

[14] R Core Team. 2016. *R: A language and environment for statistical computing. R Foundation for Statistical Computing*, Vienna. https://www.R-project.org/

[15] Repetti, L. 2012. Consonant-final loanwords and epenthetic vowels in Italian. *Catalan Journal of Linguistics* 11, 167–188.