On Italian derivatives with antesuffixal glides*

ANNA M. THORNTON

1. INTRODUCTION

The Italian denominational adjectival suffixes -ale, -oso, -ario, and the denominal verbal suffix -are,1 sometimes appear preceded by orthographic <i>e> or <u>, which can be realized as high vowels /i, u/ or glides /i, w/ (cf. (1a)). A glide realization is almost exceptionless in the case of the front vowel, while the realization of the back vowel is more subject to individual and diaphasic variation (see Marotta 1987 for discussion). Nothing of what I will say in the following hinges on whether the segment which occurs between root and suffix is a vowel or a glide; therefore, following my own usage, I will consider these segments glides. Examples of words showing the alternation under discussion are given in (1b). As the data in (1b) show, both glides can appear, apparently unpredictably, in contexts (1bil-iii) which are virtually identical from the segmental point of view to the ones in which no glide appears (1bi).

(1) Pretheoretical overview of the data to be discussed

a. Suffixes

-ale/-i ale/-uale  
\( [X]_N + \text{suffix } \)_A

-oso/-i oso/-uso  
\( \_\)  

-ario/-i ario/-uario  
\( \_\)  

-are/-i are/-uare  
\( [X]_N + \text{suffix } \)_V

b. Examples of derivatives

-ale  
i. strad+a  
ii. mond+i o  
iii. grad+i o

strad+ale  
mond+i+ale  
grad+i+ale

-oso  
i. ferr+i o  
ii. mister+i o  
iii. mostr+i o

ferr+i oso  
mister+i+oso  
mostr+i+oso

-ario  
i. second+i o  
ii. fond+i ario  
iii. cens+i ario

second+iario  
fond+i+ario  
cens+i+ario

-are  
i. sched+i a  
ii. distanz+i a  
iii. accent+i a

sched+i are  
distanz+i+are  
accent+i+are

What conditions govern the presence vs. absence of the glides in derivatives of the kind presented in (1b)?
I will show that, in spite of the superficial similarity of the contexts in which the two glides appear, their distribution is governed by fairly different conditions.

Geert Booij and Jaap van Marle (eds.), Yearbook of Morphology 1998, 103-120.
The back glide /w/ is part of a root allomorph that is developed by bases conforming to a certain schema (in the sense of Bybee and Slobin 1982; Bybee and Moder 1983; cf. § 3). This analysis has consequences for the choice between two alternative models of Italian denominal derivation, as I will briefly show in § 4.

The front glide /j/ appears mostly after bases ending in certain suffixes; although its overall distribution in the Italian lexicon can still be accounted for by means of two schemata à la Bybee (cf. § 5), its behaviour in neologic creations (§ 6) is better captured by positing a morphologically conditioned readjustment rule which operates when the suffix -ale attaches to bases containing certain other suffixes (§ 7). The analysis of derivatives with /j/, therefore, shows that the devices needed to account for productive lexeme formation processes can be different from those used for the analysis of existing complex words.

2. THE CORPUS

The present research is based on a corpus containing all the derivatives in -iale, -uale, -iose, -uoso, iario, -uario, -iare, -uare present in a reverse dictionary of Italian, and in five dictionaries of Italian neologisms of the Eighties. The number of words with each final shape in the corpus is shown in (2):

(2) Number of words with each final shape in the corpus

<table>
<thead>
<tr>
<th></th>
<th>iale</th>
<th>uale</th>
<th>ioso</th>
<th>uoso</th>
<th>iario</th>
<th>uario</th>
<th>iare</th>
<th>uare</th>
</tr>
</thead>
<tbody>
<tr>
<td>95</td>
<td>49</td>
<td>19</td>
<td>27</td>
<td>15</td>
<td>17</td>
<td></td>
<td>29</td>
<td>12</td>
</tr>
</tbody>
</table>

For convenience, a rough number of derivatives with each of the suffixes under discussion not preceded by any glide is given in (3).

(3) Rough number of derivatives with -ale, -oso, -ario, -are not preceded by glides

<table>
<thead>
<tr>
<th></th>
<th>±850</th>
<th>±540</th>
<th>±360</th>
<th>±900</th>
</tr>
</thead>
</table>

Clearly, the derivatives which display a glide between the root of the base and the suffix are the exception rather than the rule. Our task, then, is to find out what conditions determine the appearance of the glides.

We will discuss the derivatives with the front glide and those with the back glide separately.

3. DERIVATIVES WITH /w/?

3.1. Data

Historically, most of the bases of these derivatives go back to Latin fourth declension nouns, whose stem ended in -u (4a); there are, however, a number of derivatives from bases of other kinds, as the data in (4b-e) show:

(4) Bases of derivatives with /w/ (total = 82)

<table>
<thead>
<tr>
<th></th>
<th>Derivatives already existing in Latin are <strong>underlined</strong>. Neologisms are in <strong>boldface</strong>.</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Descendants of Latin fourth declension nouns (-u stems) (total = 48)</td>
<td>Examples:</td>
</tr>
<tr>
<td>accento 'stress'</td>
<td>→ accentuale 'accentual', accentuare 'to accentuate'</td>
</tr>
<tr>
<td>arco 'bow, arch'</td>
<td>→ arcuare 'to bend', arcuato 'bent, arched'</td>
</tr>
<tr>
<td>caso 'case'</td>
<td>→ casuale 'casual; relating to case'</td>
</tr>
<tr>
<td>evento 'event'</td>
<td>→ eventuale 'contingent'</td>
</tr>
<tr>
<td>lusso 'luxury'</td>
<td>→ lussuoso 'luxurious'</td>
</tr>
<tr>
<td>porto 'harbour'</td>
<td>→ portuale, portuario 'relating to a harbor', portuoso 'having many harbors'</td>
</tr>
<tr>
<td>b. Descendants of Latin nouns alternating between fourth and second declension (total = 8)</td>
<td>Examples:</td>
</tr>
<tr>
<td>tumulo 'riot'</td>
<td>→ tumultuoso 'tumultuous'</td>
</tr>
<tr>
<td>punio 'point'</td>
<td>→ punctuale 'punctual'</td>
</tr>
<tr>
<td>c. Descendants of Latin nouns of the second declension (-o stems) (total = 18)</td>
<td>Examples:</td>
</tr>
<tr>
<td>santo 'saint'</td>
<td>→ santuario 'sanctuary'</td>
</tr>
<tr>
<td>mostro 'monster'</td>
<td>→ mostruoso 'horrible'</td>
</tr>
<tr>
<td>talexto 'talent'</td>
<td>→ talentuoso 'talented'</td>
</tr>
<tr>
<td>delitto 'crime'</td>
<td>→ delittuoso 'criminal'</td>
</tr>
<tr>
<td>d. Descendants of Latin nouns of the third declension (-C stems) (total = 4)</td>
<td>Examples:</td>
</tr>
<tr>
<td>monte 'mount'</td>
<td>→ montuoso 'mountainous'</td>
</tr>
<tr>
<td>pone 'bridge'</td>
<td>→ pontuale 'relating to bridges' (rare)</td>
</tr>
<tr>
<td>voltà 'pleasure'</td>
<td>→ voluttuoso, voluttuario 'voluptuous'</td>
</tr>
<tr>
<td>boud' root mens- 'month'</td>
<td>→ mensuale 'monthly' (rare, antiquated)</td>
</tr>
</tbody>
</table>
e. New bases (not attested in Latin according to Lewis and Short)
   *brevetto* 'patent' → *brevettuale* 'concerning patents'
   *contorno* 'contour' → *contornuale* 'concerning contours'
   *per cento* 'per cent' → *percentuale* 'percentual, percentage'
   *rapporto* 'relationship' → *rapportuale* 'concerning relationships'

The bases exemplified in (4) do not share any morphological property, except for a clear preponderance of nouns of masculine gender (only two bases, *volutue* and *mano* 'hand', are feminine). We will comment later on the relevance of this feature.

3.2. Segmental conditions

From the segmental point of view, it is striking that the overwhelming majority of the bases (95.1%) have a root ending in a coronal anterior segment.9

However, a root ending in a coronal anterior segment does not automatically yield the insertion of /w/ before one of our suffixes, as the data in (5) show:

(5) Rough number of derivatives from bases with a root ending in a coronal anterior segment and without /w/ between root and suffix

<table>
<thead>
<tr>
<th></th>
<th>-ale</th>
<th>-oso</th>
<th>-ario</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;300</td>
<td>-100</td>
<td>&gt;100</td>
<td></td>
</tr>
</tbody>
</table>

Examples:

- *fate* → *fatale* 'fatal'
- *dialect* → *diattale* 'dialectal'
- *nose* → *nasale* 'nasal'
- *colossed* → *colossale* 'colossal'
- *culturte* → *culturale* 'cultural'
- *spirito* 'humour' → *spiritoso* 'humorous'
- *sasso* 'stone' → *sassoso* 'full of stones'

Thus, having a root ending in a coronal segment seems to be at most a necessary, but by no means a sufficient, condition to yield a derivative with a /w/ between root and suffix. Therefore, it cannot be incorporated into a phonological rule or a readjustment rule.

3.3. The schema

I propose that this condition functions rather as a schema, in the sense of Bybee and Slobin (1982) and Bybee and Moder (1983). These authors introduce the concept of

schema in relation to the past tenses of English irregular verbs. These past tense forms

arerote-learned and stored in the lexicon, but this does not prevent speakers from formulating generalizations about these forms. These generalizations are not in the form of rules that derive one thing from another by changing features. Thus we will not call them rules, but will rather refer to them as schemas. A schema is a statement that describes the phonological properties of a morpho-logical class [...]. It is not a constraint which rigidly specifies what can and cannot occur, but it is rather a much looser type of correlation [...] (Bybee and Slobin 1982: 267).

Bybee and Slobin (1982: 279) exemplify their notion of schema with a class of English verbs whose past tense has the shape in (6):

(6) *aŋ(ŋ) k* /verb
       past

They comment that "the schema defines a prototype of the category (in the sense of Rosch and Mervis 1975), in that *sing* or *drink* are the best exemplars - but *swim* and *begin* may also belong to the category because they end in nasals, although not velar nasals" (Bybee and Slobin 1982: 279).

The theory of Bybee and colleagues, then, is that a schema defines the prototype of a category that functions as a natural class, i.e., a schema defines/describes a class by referring to its prototype, which is defined on the basis of its phonological shape. The phonological shapes of the members of the class form a series of family resemblances rather than sharing a discrete set of features. The "most common and best exemplars" of the class conform to the schema, i.e., to the prototype.

Using this notion of schema, and the idea that morphological classes, like natural categories, can be defined not only by a necessary and sufficient set of features but by their clustering around a prototype, we could say that there is a prototypic shape of the bases of derivatives displayng /w/ before one of the suffixes in (1a); bases which differ from the prototype by one feature only often still behave like the prototype, i.e., belong to the class of bases which display a /w/ in derivatives containing one of the suffixes in (1a), while progressively more distant bases display progressively less often the /w/ before these suffixes.

The prototype of bases displaying /w/ is shown in (7):
difference between the prototype and the \( N^u \) shape is highly significant (\( \chi^2(1) = 22.81, p < .001 \)).

This leads to the hypothesis that there is a hierarchy among the features characterizing the prototype: having a \( C_1 \) before \( C_2 \) is more important than having exactly /u/ as \( C_2 \), and the feature [Coronal] is more important than the feature [- Continuant].

Even more striking in their conformity to the prototype are the data which result from taking into account only the bases of the ‘new’ derivatives with /w/, i.e., the bases of those derivatives that did not exist in Latin (according to Lewis and Short). These data are shown in (10).

(10) Number and percentage of new derivatives from bases with different final shapes

<table>
<thead>
<tr>
<th>Final shape of the base</th>
<th>Number of derivatives</th>
<th>Percentage</th>
<th>Cumulative percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>/Cu/</td>
<td>41</td>
<td>66.1</td>
<td>66.1</td>
</tr>
<tr>
<td>/Cs/</td>
<td>9</td>
<td>14.5</td>
<td>80.6</td>
</tr>
<tr>
<td>/Nu/</td>
<td>6</td>
<td>9.7</td>
<td><strong>90.3</strong></td>
</tr>
<tr>
<td>Other</td>
<td>6</td>
<td>9.7</td>
<td></td>
</tr>
</tbody>
</table>

It seems that the likelihood for a base to develop a /w/ final root allomorph is directly proportional to the closeness of the base to the prototype defined by the schema in (7), and decreases abruptly for bases differing from the prototype by more than one feature, again with certain features being more important than others in defining the shape of the prototype.

The characteristics recognized by Bybee and Slobin in the schemas for English irregular past tenses and considered by these authors as general characteristics of all morphological schemata are listed in (11):

(11) Characteristics of the schemas for English irregular past tenses

(a) Their defining properties are phonological and can range over more than one segment.

(b) Classes of items covered by schemas are defined in sets of family resemblances, not by sets of strictly shared properties.

(c) Though schemas do not in themselves change features, they are used in lexical selection; and they may serve as the basis of new formations occasionally, either in speech errors [...] or in so-called analogical formations [...] (Bybee and Slobin 1982:285).
The schemata we have established to describe the class of bases that may develop a /w/ final root allomorph, which is then used before one of the suffixes in (1a), have the characteristics (11b) and (11c); as far as characteristic (11a) is concerned, although the definition of our schema is primarily phonological, some other conditions seem to play a role: the bases should be masculine,12 and should not contain the suffix -mento, although it has the appropriate phonological shape.13 The generalization in (12) holds both in the attested lexicon and in neologisms:

(12) -mento → -mentale *mentuale
   e.g.: ornare → ornamento → ornamentale *ornamentuale
        fondare → fondamento → fondamentale *fondamentuale

Furthermore, there is another characteristic which distinguishes the schema we have established to describe the set of bases that may develop a /w/ final root allomorph from Bybee and Slobin’s schemata. Bybee and Slobin claim that schemata are product-oriented generalizations: one of their schemata “does not relate a base form to a derived one, as a rule does, but describes only one class of forms (the product class, in terms used by Zager 1980)” (Bybee and Slobin 1982: 267). Our schema in (7), on the contrary, is not product-oriented but base oriented (or ‘source-oriented’, in Zager’s terms): the relevant conditions are defined over the base and not over the derivative (or at least, there is no gain in defining them over the derivative).

It seems, therefore, that the study of the Italian bases which employ a /w/ final root allomorph before certain suffixes has led us to widen the concept of morphological schema, to include also source-oriented generalizations that define classes of bases rather than classes of outputs.

4. A MODEL OF ITALIAN DENOMINAL DERIVATION

Some observations are in order here about the actual mechanics of the derivation of denomin al lexemes which display a /w/ between root and suffix.

It is customary to refer to Italian nouns through a citation form which ends in a vowel. In denomin al derivatives, however, the final vowel of the base’s citation form does not appear. This vowel is lacking not only in derivatives with /w/ before the suffix, but in all the derivatives we are considering (cf. 1b), and in fact in all Italian denomin al derivatives. To explain why this is so, we must consider in full the working of Italian denomin al (and dejectival) derivation.

Some models of Italian derivation (notably that of Scalise 1983, 1984) claim that denomin al and dejectival derivation in Italian takes as a base an “abstract word” homophonous with the citation form of the lexeme (the singular of nouns, and the masculine singular of adjectives). When a vowel-initial suffix is added, the final vowel of the base, if unstressed, is deleted by a vowel deletion rule characterized as in (13):

(13) \[ V \rightarrow \emptyset / \_ + V \]

[-stress]

(Scalise 1984: 68)

Other authors, however, (notably, Peperkamp 1995) observe that practically all denomin al and dejectival suffixes of Italian are vowel-initial, so that rule (13) must operate in practically all instances of denomin al or dejectival derivation in Italian. This is rather uneconomical; an account of Italian denomin al and dejectival derivation in which the root of a nominal or adjectival lexeme is assumed as the actual base to which suffixes attach is therefore preferable.

Further evidence that the base of denomin al and dejectival derivation in Italian is the root is provided, according to Peperkamp (1995: 214-215), by the behavior of -cino and -cetto, two consonant-initial allomorphs of the diminutive suffixes -ino and -etto. “These allomorphs are selected with bases that end in a sequence -on plus vowel” (Peperkamp 1995: 215), and in the output the root of the base appears: leon-e → leoncino ‘lion → DIM.’, poltron-a → poltronzina ‘armchair → DM.’. If suffixes were to attach to bases containing the final vowel, there would be no way to explain the lack of the vowel in these outputs, as the vowel deletion rule only applies with vowel initial suffixes, and sequences like *leoncino, *poltronzina are not ruled out by any phonotactic constraint (cf. the existing words lumin cino ‘small light, Terracina (toponym)). “If, on the other hand, the base of suffixation is the root, we can simply state that bases in -on select for the allomorph -cino and -cetto and no vowel deletion needs to apply” (Peperkamp 1995: 215).

The assumption that Italian denomin al and dejectival derivation takes as bases abstract words that end in a vowel and are homophonous with free forms seems to have arisen out of a misunderstanding of Aronoff’s (1976) word-based hypothesis. As Aronoff (1994) has made clear, the hypothesis that derivational morphology is word-based must be understood in the sense that it is lexeme-based, and not in the sense that the base must be (homophonous with) a word used as a free form. Aronoff (1994: 7) explicitly states: “I especially did not mean that the base or stem for a word formation rule had to be a complete word or free form, only that the base should be a lexeme and the stem some form of a lexeme”. A model of Italian denomin al and dejectival derivation which assumes the lexeme’s root as base is then fully compatible with Aronoff’s (1994) model of lexeme-based morphology.

In such a model, the lexical entries for Italian nouns might be organized around roots, and look like the ones in (14):
(14) A possible format of the lexical entries for Italian nouns

<table>
<thead>
<tr>
<th>Root</th>
<th>/kas-/</th>
<th>/libr-/</th>
<th>/floc-/</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syntactic info.</td>
<td>N, fem</td>
<td>N, masc</td>
<td>N, masc</td>
</tr>
<tr>
<td>Semantic info.</td>
<td>'house'</td>
<td>'book'</td>
<td>'flower'</td>
</tr>
<tr>
<td>Morphological info.</td>
<td>class 2</td>
<td>class 1</td>
<td>class 3</td>
</tr>
<tr>
<td>sg. -a</td>
<td>sg. -o</td>
<td>sg. -e</td>
<td></td>
</tr>
<tr>
<td>pl. -e</td>
<td>pl. -i</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If a noun has root allomorphy, this can be represented as in (15):

(15) Representation of *uomo* (pl. *uomini*) 'man'

| Root 1 | /wom-1/ |
| Root 2 | /womin-1/ |
| Syntactic info. | N, masc |
| Semantic info. | 'man' |
| Morphological info. | class 1 |
| sg. -o, select root 1 |
| pl. -i, select root 2 |

In representations like those in (14) and (15), the citation form does not appear; the surface forms of both singular and plural can be computed on the basis of the morphological information provided. 14

This model of Italian denominal derivation has welcome consequences for our analysis of derivatives with /w/. We have assumed that lexical items whose root conforms to the schema in (7) develop a root allomorph ending in -u, which is then selected as the base to which one of the suffixes in (1) attaches. 15 The possibility of having more than one root allomorph, with conditions stating the distribution of each, is required independently, as we have seen in (15). There is therefore no principled reason to exclude the presence of a /w/ final root allomorph, in addition to the bare root, in the representation for certain words, as in (16):

(16) Representation of *monte*

| Root 1: | /monte-1/ |
| Root 2: | /montu-1/ |
| Syntactic info. | N, masc |
| Semantic info. | 'mountain, mountain' |
| Morphological info. | class 3 |
| sg. -e |
| pl. -i |

Select root 2 with -osa, ...
Select root 1 elsewhere

Notice that if a vowel deletion rule such as (13) existed, the final /w/ of Root 2 would never have a chance to surface, as it would be deleted when followed by a vowel-initial suffix. Instead, in our account of Italian denominal derivation, we define Root 2 as a root allomorph employed with certain suffixes and, as derivation is root based and no vowel deletion rule exists, the /w/ surfaces, changing to /w/ for certain speakers (cf. § 1, *supra*), so that, e.g., *montuaro* can be syllabified either as /mon. tu/ 'o.s.o/ or as /mon. tw.o.s.o/.

5. DERIVATIVES WITH /j/

I have been able to collect 118 bases which have at least one derivative in which one of the suffixes in (1a) is preceded by /j/. There is no strong historical relation among these bases, comparable to the descent from nouns belonging to the Latin IV declension for the bases of derivatives with /w/.

5.1. Two schemata

The best way to account for all the derivatives with /j/ between root and suffix attested in the Italian lexicon seems to be the hypothesis of the existence of phonologically defined schemata, as in the case of derivatives with /w/. There are two schemata, shown in (17), which can define the bases which yield derivatives with /j/.

(17) Schemata of the bases which yield /j/ derivatives

a. "ts" schema

Prototype: Base ends in C₁ C₂₁⁶ i.e., base ends in /Ct/ /j/

[- Continuant] [+ Continuant]
[- Sonorant] [- Sonorant]
[- Voice] [- Voice]
Coronal
Coronal

[+Anterior] [+Anterior]

Examples: *esistenza → existenziale, razza → razziale*

Shapes differing from the prototype by one or more features:

Base ends in /Ct/ lack of the [+ Continuant] unit
Base ends in /Ct/ lack of the [- Continuant] unit
Base ends in /Vt/ V instead of C₁
Base ends in /Vt/ lack of the [+ Continuant] unit, V instead of C₁
Base ends in /Vt/ lack of the [- Continuant] unit, V instead of C₁
Examples: veste → vestiario

b. "r" schema

Prototype: Base ends in $V\ C$ i.e., base ends in $/Vt/$

[- Sonorant]
[- Continuant]
[- Voice]
Coronal
[-Anterior]
[- Lateral]

Examples: ministero → ministeriale, imprenditore → imprenditoriale

Shapes differing from the prototype by one or more features:

Base ends in $/V/$  [- Lateral] $C$
Base ends in $/Ct/$ $C$ instead of $V$ before $/t/$

Examples: umile → umiliare, nobile → nobiliare

The table in (18) shows the number and percentage of new derivatives with $/f/$ from bases of different final shapes.

(18)

<table>
<thead>
<tr>
<th>Final shape</th>
<th>Number of bases</th>
<th>Percentage</th>
<th>Cumulative percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. /Cts/</td>
<td>55</td>
<td>46.6</td>
<td>46.6</td>
</tr>
<tr>
<td>/Cu/</td>
<td>8</td>
<td>6.8</td>
<td>53.4</td>
</tr>
<tr>
<td>/Cs/</td>
<td>2</td>
<td>1.7</td>
<td>55.1</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>2.4</td>
<td></td>
</tr>
<tr>
<td>b. /Vts/</td>
<td>29</td>
<td>24.6</td>
<td>24.6</td>
</tr>
<tr>
<td>/Vu/</td>
<td>6</td>
<td>5.1</td>
<td>29.7</td>
</tr>
<tr>
<td>/Ct/</td>
<td>2</td>
<td>1.7</td>
<td>31.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>86.5</td>
</tr>
</tbody>
</table>

A chi-square test shows that the difference between the number of bases in the prototype and in the second and third row in (18a) respectively is highly significant (/Cts/ vs. /Cu/: $\chi^2 (1) = 129.73$, $p < .001$; /Cts/ vs. /Cs/: $\chi^2 (1) = 20.47$, $p < .001$).

The table in (19) shows the number and percentage of new derivatives with $/f/$ from bases of different final shapes:

(19)

<table>
<thead>
<tr>
<th>Final shape</th>
<th>Number of derivatives</th>
<th>Percentage</th>
<th>Cumulative percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. /Cts/</td>
<td>77</td>
<td>62.6</td>
<td>62.6</td>
</tr>
<tr>
<td>/Cu/</td>
<td>1</td>
<td>0.8</td>
<td>63.4</td>
</tr>
<tr>
<td>/Cs/</td>
<td>1</td>
<td>0.8</td>
<td>64.2</td>
</tr>
<tr>
<td>/Vts/</td>
<td>1</td>
<td>0.8</td>
<td>65.0</td>
</tr>
<tr>
<td>/Vu/</td>
<td>1</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>/Vt/</td>
<td>1</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>/Vu/</td>
<td>24</td>
<td>19.5</td>
<td>19.5</td>
</tr>
<tr>
<td>/Vts/</td>
<td>6</td>
<td>4.9</td>
<td>24.4</td>
</tr>
<tr>
<td>/Ct/</td>
<td>2</td>
<td>1.6</td>
<td>26.0</td>
</tr>
</tbody>
</table>

Here again, bases conforming to the prototype are the vast majority.

Now that we have seen the schemata at work with derivatives which display a $/f/$, we can compare them with the schema at work with $/w/$ derivatives. The interesting point is that there are certain phonological configurations that could be members of classes defined by two different schemas, yielding root allomorphs with different glides. For example, bases ending in /Cu/, besides conforming to the prototype of the class defined by the schema in (7), are also good members of the class defined by the schema in (17a), differing from the prototype for this class in only one feature, the lack of a [-continuant] unit; bases ending in /Cs/ differ from bases ending in /Ct/ (prototype of the class defined by the schema in (7)) only in the feature [-continuant], and from bases ending in /Cts/ (prototype of the class defined by the schema in (17a)) by the lack of the [-continuant] unit. The prediction, in such a case, would be that we should find, at least occasionally, derivatives from bases of
these shapes with both glides. This prediction is borne out by data such as those in (20):

(20)   /Cs/ base          derivative with /j/          derivative with /w/

asse 'axis'       assiale 'axial'        assiale 'sexual'
seesso 'sex'      —                  sessuale 'sexual'

5.2. Morphological conditions

As we have just seen, phonologically defined schemata account well for the appearance of /j/ between stem and suffix in certain derivatives. Therefore, we could offer an account parallel to the one given for the appearance of /w/: the bases defined by the schemata in (17) develop a root allomorph ending in /j/ which is then selected to be used with the suffixes in (1a).

It is worth considering, however, that many of the bases of these derivatives end in one of the suffixes -tore, -anza, -enza, as shown in (21):

(21) Number of bases in -tore, -anza, -enza which have one or more /j/ derivatives

-tore (deverbal suffix forming agent nouns) 15
-anza (deßegative/deverbal suffix forming quality nouns) 5
-enza " " 48

Thus, we could hypothesize that at least in these cases it is the suffix in the base which is responsible for the appearance of the glide, and we could try to write a readjustment rule inserting /j/ after these suffixes. But there are two problems with this account. In the first place, about half of the derivatives with /j/ remain unexplained, as they do not come from bases with these suffixes; some examples are given in (22):

(22) Base           Derivative

ministero 'ministry'               ministeriale 'ministerial'
mondo 'world'                      mondiale 'world-wide'
razza 'race'                       razziale 'racial'
grande 'big'                       grandioso 'grand'
umile 'humble'                    umiliare 'to humiliate'
terzo 'third'                      terziario 'tertiary'

More crucially, there are counterexamples to the generalization that bases with the suffixes in (21) yield a derivative with /j/. These counterexamples are shown in (23):

(23) Derivatives from bases in -anza, -enza, -tore without /j/ (neologisms are in boldface)

-ale: semenzale, influenzale, pastorele, cletorele, dottorale
-oso: burbanzoso, baldanzoso, speranzoso, vacanzoso
-ico: scadenziario

Therefore, it is not possible to predict the occurrence of /j/ before one of our suffixes on morphological grounds, at least if we want to predict the distribution of /j/ in the whole Italian lexicon.

6. PRODUCTIVITY

In this section we will look at the neologisms formed with our suffixes, to see whether the glides appear with new derivatives.

While the formation of denominal verbs in -are seems to be slightly, if at all, productive in contemporary Italian (cf. Iacobini and Thornton 1992: 32), all three adjectival suffixes are productive in a Schultinkian sense, i.e., new words are formed with them. Among neologisms, however, we find glide final root allomorphs employed essentially only in the formation of -ale derivatives. The table in (24) gives an outline of the data.
(24) Neologisms with the suffixes -ale, -oso and -ario

<table>
<thead>
<tr>
<th>Neologisms from prototypic bases</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ct</strong></td>
</tr>
<tr>
<td><strong>Cts</strong></td>
</tr>
<tr>
<td><strong>Vr</strong></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Neologisms from non-prototypic bases

| epocal | camoniale | decizionale | promotizionale | sociale |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Contrary to what has been observed in the attested lexicon, no glide-final root allomorph is employed to create new derivatives in -ario in two cases (cercarote, eccedentario), there is no glide in derivatives from a base which corresponds to the prototype of one of the classes defined by the schemata we have discovered. With -oso, the /CI/ schema for /w/ seems active, and the /CIz/ schema for /I/ seems inactive (there are two derivatives, vaccompasso and incassoso that have no glide in spite of the fact that their bases fit the schema). As to the status of the /IVr/ schema, the three derivatives which display a glideless root allomorph in the relevant segmental conditions (cactaroso, cereso, paperoso), are from feminine bases (caciara ‘noise (dialectal), cera ‘wax’ and papera ‘slip of the tongue’ (literally, ‘duck’), respectively. It might be that feminine bases are excluded from the schema, as was the case with the /CI/ schema. In any case, -ario and -oso neologisms from prototypic bases are so few that the evidence for or against the productivity of the schemata with them is hardly conclusive.

With -ale, all three schemata seem active, and neologisms in -ale without glide from bases which match the prototype of one of the schemata are extremely rare and can in most cases be accounted for.

Among neologisms from bases apparently conforming to the prototype of the /CI/ schema, giuntale is from a feminine base (giunta), and as we have seen, masculine gender constitutes a condition defining the /CI/ schema: comportamentale is from a noun in -menso, not fitting the schema because of the restriction in (12); appendizizale is from appendizizi ‘apprentice’, a noun that can be both masculine and feminine, and in any case ends in -a, an ending typical of feminine nouns. It might be that a /w/ root allomorph is not created in this case because the base is formally too similar to a feminine base. Finally, frattale is an loanword from English fractal and/or French fractal.

Among neologisms from bases matching the /IVr/ schema, figural, infrastructural and conguinariare are from feminine bases, and anticonquintariale is a prefixed derivative from conquintariale. It is possible that masculine gender is a condition to be added also to the definition of the prototype of the /IVr/ schema, as derivatives from feminine bases that match the phonological definition of this schema also fail to display the glide with -oso, as we have seen. Cantatorizale (from cantautore ‘singer-author’, a blend from cantare ‘singer’ and autore ‘author’) is a real counterexample, as there is no glide in a derivative from a base ending in -tore, while all the other derivatives with /I/ from bases in the /IVr/ schema are from nouns in the Agentive/Instrumental suffix -tore or from English bases with the comparable suffixes -er, -or (manageriale, teenegeriale, monistoriale). No neologism in -ale from a base matching the /CI/ schema appears without /I/, but all the neologic derivatives in this schema are from bases in -enza.

The schemata we have discovered for /I/, therefore, seem to be active mostly in the derivation with the most productive suffix in our set, -ale, and with this suffix they appear to be defined by a morphological condition (the base should end in the suffixes -enza, -tore, -er or -or) rather than by a purely phonological one.

7. DISCUSSION

Let us summarize our findings.

To account for derivatives with /w/, we have hypothesized that certain bases, whose root corresponds to a prototype described by the phonologically and morphologically definable, base-oriented schema in (7), may have or develop a root allomorph ending in /w/, which is employed in the derivation of adjectives in -ale and occasionally in -oso, and which is also observable in the attested lexicon in derivatives in -ario and -are. Productivity is scanty (only 7 neologisms), as expected with morphological processes regulated by a schema rather than by a rule.

Bybee and Meder, following Rosch, call our attention to the factor of ‘cue validity’ as predictor of the productivity that a morphological class defined by means
of a schema can attain. According to Rosch, "cues for a given category Y [...] increases as the frequency with which cue X is associated with category Y increases, and decreases as the frequency with which cue X is associated with categories other than Y increases" (Rosch 1978: 30).

In the case of the category of bases which display a root allomorph ending in /w/, the cue validity of the schema we have established is very low, as most of the bases that match the prototype in the language do not in fact display a glide-final root allomorph. There are almost 2000 masculine nouns whose root ends in /CU/, and only 51 have a root allomorph with final /w/.

Thus, the schema for root allomorphs with final /w/ is not very productive, but, like some of the schemata discovered by Bybee and colleagues, "can serve as the basis of new formations occasionally" (Bybee and Simbion 1998: 285, cf. (11) above). There are in fact a few newlogisms in -ale and -aceto from bases that conform to the prototype, as we have seen in (24), and in a pilot test I have been able to elicit oral production of -ale derivatives from bases which do not have an established adjectival derivative in the language and whose phonological shape conforms to the schema in (7).

As for cases in which a /j/ appears, different analyses are possible. If we want to take into account the whole Italian lexicon, the analysis will be parallel to that offered for /w/ derivatives: certain bases, conforming to one of the two phonologically defined schemata in (17), may have or develop a root allomorph ending in /j/, which is employed in derivatives with one of the suffixes in (1a).

But another analysis is possible for derivatives in -iale. Let us consider the data in (25), which show the number of derivatives in -ale (excluding newlogisms) with and without /j/ from bases in -anza, -enza, and -tore.

(25) Number of derivatives in -ale (excluding newlogisms) with and without /j/ from bases in -anza, -enza, and -tore

<table>
<thead>
<tr>
<th>Base</th>
<th>with /j/</th>
<th>without /j/</th>
</tr>
</thead>
<tbody>
<tr>
<td>-anza</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>-enza</td>
<td>42</td>
<td>2</td>
</tr>
<tr>
<td>-tore</td>
<td>14</td>
<td>2</td>
</tr>
</tbody>
</table>

From the data in (25), we can see that the presence of one of the three suffixes -anza, -enza and -tore has high cue validity in predicting that a derivative in -ale will display a /j/ before this suffix, as there are very few counterexamples to this generalization.

If, then, we hypothesize the existence of morphologically defined schemata such as the ones in (26), which define a base containing one of these suffixes as prototypic for derivatives in -jale, such schemata would have a high cue validity, contrary to the low cue validity of the purely phonologically defined schemata in (17).

(26) Morphologically defined schemata of bases which have /jale/ derivatives

a. Base ends in -anza
b. Base ends in -enza
c. Base ends in -tore

The morphologically defined schemata in (26) are not mutually exclusive with the phonologically defined ones in (17). Of course, there is overlapping between the sets of bases captured by the morphologically defined schemata in (26a-b) and the phonologically defined schemata in (17a), and by the schema (26c) and the schema (17b). But the interesting point is that the two sorts of schemata have different cue validity: this is quite low for the phonologically defined schemata in (17), but quite high for the morphologically defined ones in (26).

According to Bybee's (1988) approach, in which the difference between rules and schemata is not qualitative but purely quantitative, in that "rules are highly reinforced representational patterns or schemata" (Bybee 1988: 135), we would predict that a 'highly reinforced' schema, i.e., a schema with high cue validity, such as the ones in (26), is almost non-distinct from a rule. And in fact, this is the case: remember that with -ale all but one of the newlogisms from bases conforming to the morphologically defined schemata in (26) display the /j/, and conversely, only one newlogism displaying the /j/ (hardoxtale < Bardolet/bardo/ta) is not derived from a base defined by one of the schemata in (26). This almost categorical behavior is typical of a productive lexeme formation rule.

So, if we do not aim at generating the whole Italian lexicon, but limit our aim only to the characterization of productive processes, the establishment of a morphological condition is possible. As we have seen (cf. (24) above), /j/ appears in neologisms only in derivatives with -ale from bases ending in the suffixes -anza, -tore or English -er, -or. In this case, we might analyze the data both as cases of morphologically governed base allomorphy (as in (27a)) or of morphologically governed suffix allomorphy (as in (27b)):

(27) Two possible analyses for the appearance of /j/ in neologisms with -ale


Up to a point, the decision between analyses (27a) and (27b) is arbitrary, as both correctly describe the facts.

Analysis (27a) would be preferred on historical grounds, as the source for the
observed allomorphy is in the fact that the Latin suffix -entia yielded derivatives in -entialis, and the Latin suffix -torias (+tor+i-as) yielded derivatives in +torialis, which then formed the model for analogical creations in -enziale, -toriale from Italian bases in -enza, -tore.

Analysis (27b) would be preferred on economic grounds, as it reduces the number of allomorphic entities in the language (only the suffix -ate would have an allomorph, vs. the four suffixes -tore, -enza, -er and -or).

8. CONCLUSION

In this paper I have described the conditions that govern the appearance of /w/ and /j/ before certain derivational suffixes of Italian. The back glide /w/ can appear when the base conforms to a schema which is mainly phonologically defined (cf. (7) above). The same schema accounts well for the appearance of /w/ in both derivatives that have been part of the Italian lexicon for a long time and in the few neologisms that display this glide. In the case of derivatives with /j/, on the contrary, we have to separate the account given for the bulk of derivatives attested in the Italian lexicon from the account which is possible to give for the formation of neologisms. While two phonologically defined schemata a la Bybee (cf. (17) above) account well for the whole set of existing derivatives with /j/, the set of neologisms can be analyzed better by positing a readjustment rule that inserts /j/ between base and suffix in certain morphologically defined contexts (cf. (27) above). In Bybee's approach, in which rules are simply highly reinforced schemata, the conditions governing the appearance of /j/ in neologisms can still be considered schemata. Nevertheless, there is a strong contrast between these schemata and the schema which accounts for the appearance of /w/. The two sorts of schemata occupy the opposite ends of a continuum: the /w/ schema has low cue validity and is used only occasionally in the production of new derivatives, while the /j/ schema that account for neologisms have high cue validity and are productive; virtually all new derivatives whose base conforms to one of these schemata display /j/. These schemata, therefore, are nondistinct from rules.

The study of derivatives with /w/ and /j/ has shown that the devices available for the analysis of the attested lexicon can be different from those used in accounting only for productive processes. In other words, word formation rules are not the only devices available for word analysis. Schemata have proved themselves useful in the analysis of attested Italian derivatives with anteposfixal /w/ and /j/ which cannot be generated by rules.

NOTES

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with statistical analyses, Federica Casadei and Maria Grossmann for providing useful references, Barbara Weiden Boyd for checking my English, and, last but not least, Geert Booij and two anonymous referees for their helpful suggestions. Thanks also to Cippa, Paola, Alessandro, Minno, Enrico, Simone, Luigi, Miriam, Zipe and Felice for taking part in my test and for producing many occasional derivatives with /w/ from prototypic bases.

1 -are is used here as a convenient citation form (homophone with the infinitive ending) to identify a process of conversion of nouns into first conjugation verbs (distinguished by the thematic vowel -a-). By no means should it be implied, however, that I take the infinitive (inflectional) ending as having category-changing power. The actual process at work can be analyzed in two ways: either as the addition of a zero suffix -o-, which forms verbs from adjectives and nouns, and is associated with the first verbal conjugation (as proposed in Thornton 1990), or (along the lines of Aronoff 1994) as a case of lexeme formation rule whose overt correlates are the assignment to the -a- inflectional class (first conjugation) and sometimes the selection of a given base allomorph (cf. infra, § 5.3).

2 Representation is in the standard orthography of Italian. The boundary symbol ‘-’ is used here theoretically in (1), simply to show the result of a blind segmentation procedure. Based on the merging of Zingarelli (1983) and Garzanti (1987), two dictionaries of usage including around 100,000 words each (courtesy of Tullio De Mauro).


4 These data are based on a reverse dictionary of an abridged dictionary of Italian, containing about 45,000 lemmata (Ratti et al. 1989).

5 It is difficult to determine the number of denominal verbs in -are because, in a reverse dictionary they are not set apart from underived verbs in -are, which are the majority of Italian verbs. In BDVDB (Thornot, Iacobini and Burani 1994, 1997) denominal verbs in -are are 187 out of a total of 1007 verbs in -are, that is 18.6%. Projecting from this percentage, I have estimated the number of denominal zero-suffixed -are verbs in a 45,000 lemmata dictionary, which lists about 5000 verbs in -are, at about 900.

6 Derivatives with /w/ are also discussed by Rainer (1998, to appear).

7 In what follows, I will call 'root' that part of a word which remains when the word is stripped of its inflectional ending. In many cases, this entity is not monomorphic; therefore, some linguists object to calling it a 'root', and prefer to call it a 'stem'. In the framework of Italian morphology, however, this terminology could be misleading. It has been argued (by Dessler and Thornton 1991) that Italian verbal morphology must be described by positing, for each verb, two base allomorphs, called 'base radicale' and 'base tematica', each of which is used in a number of inflectional, derivational and compounding processes. The 'base radicale' is the verb's root, while the 'base tematica' (or simply 'tema') is the verb's root followed by a thematic vowel, which is different for each conjugation (e.g., for the three verbs parlare, vedere, sentire 'to speak/talk, to see, to hear/feel', the roots are par, ved, sen, and the 'temi' are parla, vede-, senti-). A common and traditional English translation for 'tema' is 'stem'. So the word 'stem', in the framework of Italian morphology, implies the presence of a thematic vowel in the entry referred to. I believe that there is a basic asymmetry between verbal and nominal morphology in Italian, because in nominal (and denominal) morphology there is no need to posit entities such as 'temi' or stems provided with a thematic vowel (contra Scalise 1993: 190; cfr. infra, § 4). There are, of course, entities which correspond to the definition of 'root' given
above, but are polymorphic, both among nouns and among verbs. Dressler & Thornton (1991: 7) propose to call these entities 'derived roots', and define a derived root as a root derived from another one by means of a WFR. For example, the verb *gareggia* 'to compete' is formed from the noun *gara* 'competition' by addition of the derivational suffix *-da/-dy*, which forms verbs of the first conjugation; thus, the verb's stem (or 'tema', or 'base tematica') is *gareggia* (which appears in the infinitive *gareggia* or in the imperfect indicative *gareggia*, etc.), while its root -- a derived root -- is *gareda*/*garedy*, which appears in some present indicative and subjunctive forms, such as *gareggio, gareggi*. A parallel example from nominal morphology is the noun *sentimento* 'feeling'; it is derived from the verb *sentire* 'to feel', which appears in its stem (or 'tema', or 'base tematica') *senti-*, by addition of the derivational suffix *meni-*, which forms nouns that belong to the inflec-
tional class that has the ending -o in the singular and -i in the plural. Thus *sentimento* is a derived nominal root, which in its turn appears in derivatives such as *sentimentale*. In this paper, both monomorphic and derived nominal roots will be referred to simply as 'roots'.

9 Only the roots of the following bases do not end in a coronal segment:

Base Derivatives
--bow arcuate, arcuare
ancient antiquario
less connected to logo laco
rip+river bank ripuario (rare)

The three words whose roots end in /k/ are reflexes of words that belonged to the Latin fourth declension. *Ripa* is included only for the sake of completeness; in fact, its only derivative with /w/, *rifacimento*, is rare and not in contemporary usage (while *ripario* is more usual, at least in the name of the river *Dora Riparia*), and *ripa* itself is not used in contemporary standard Italian, where it has been replaced by *rivta*. It seems, then, that in contemporary usage only nouns ending in a coronal can acquire a root allomorph ending in /w/ (cf. the data in 4); words that have such an allomorph even if their root does not end in a coronal are all inherited from Latin.

10 A base differs from the prototype by one feature if C₂ is either [+Continuant], [+Sonoran], [+Voice], non Coronal or [-Anterior], or if it is preceded by a V rather than by a C.

The existence of a hierarchy among the features defining the prototype of a class had already been discovered by Bybee and colleagues. Bybee (1988: 135) observes that in schemata 'some features [are] more strongly represented than others'. Bybee and Moder (1983) report experimental evidence that the features defining a class of English irregular monosyllabic verbs are ranked, in that the final consonant is the most important defining feature, followed by the initial consonant cluster, while the vowel counts very little in defining a nonce-form as part of the class.

12 No new derivatives with /w/ have appeared from feminine bases: *voluttuario* 'voluptuary', *voluettua* 'voluptuous', from fem. *voluità* 'pleasure, voluptuousness', and *manuale* 'manual' from fem. *mano* 'hand' are inherited from Latin.

13 This is reminiscent of a negative morphological restriction in the sense of Aronoff (1976: 53).

14 However, there are psycholinguistic data that point to the fact that the citation form of nominal lexical items has a privileged status in the Italian mental lexicon (cf. Burani 1992 and references therein). Therefore, a less economical but psychologically more plausible model of Italian lexical entries might include the citation form along with one or more root allomorphs.

15 Geert Booij suggests that this could be interpreted as paradigmatically determined allomorphy.

16 The autosegmental representation of the affricate /ts/ (19a) is not entirely correct from a technical point of view. It is adopted here for purposes of clarity. No violation of the OCP is implied.

17 Consider also the pair of synonyms *restorale*/*estoriale*, from *restore* 'head of a University' (Sgrič 1997).

18 In the case of *derivatismo*, the glide is predictably absent because of the restriction involving the suffix -menso observed in (12).

19 There is also an occasional extension of /i/ to a non prototypic base (Bardot → bardotia).

20 This word seems to be an Italian creation: *teenerager* does not exist in English, as Mark Aronoff has observed in Mytilene.

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Kluwer, 207-244.

*Università Degli Studi - L'Aquila*
*Dipartimento Di Culture Comparatorate*
*Via Camponeschi 2*
*67100 L'Aquila*