Portuguese Phonetics and Phonology

Part 2. Phonology

Preliminaries

1. Phonemes and allophones

Each language has its own system of contrasting sounds (phonemes)
(Notation: phonemes are represented between / /.)

E.g. English contrasts:  
- sin /s/ and sing /ŋ/ 
- feet /f/ and fit /t/ 
- breed /d/ and breathe /ð/ 

Portuguese contrasts:  
- caro /c/ and carro /k/ or /t/ 
- avô /o/ and avô /ɔ/ 
- mina /n/ and minha /ɲ/ 

Allophones are the non-distinctive variants of phonemes, found in specific contexts:  
Notation: allophones, and phonetic representations in general, are presented between square brackets []

English /tʃ dʒ/ contrast with /t dʃ/: BP [tʃ] dʒ/ are allophones of /t d/, occurring before [i]

2. Applications

transcription:  
- broad transcription is essentially phonemic, indicating essential detail 
- narrow transcription is allophonic, including more phonetic detail 

pronunciation training:  
- perception of phonemic contrasts is prerequisite to distinguishing sounds 
- phonetic detail is necessary for fluency, convincing accent 

historical linguistics: pronunciation changes involve 
- loss of contrast (merger)  
  - OPtg /tʃ/ > /ʃ/ 
- creation of contrast (split)  
  - VL /a/ > Ptg /a ɐ/ 
- preservation of contrast in different form 
  - reanalysis  
    - Lat /i/ > Romance / i ɐ/ 
  - shift  
    - Lat /pp p/ > Romance /p b/

3. Generative phonology (phonology in generative grammar; 1970s onwards)

In a generative framework, the phonological module receives sentences in the form of a sequence of underlying forms (provided by the lexicon and the morphology) and converts them into surface forms (instructions to the vocal organs) by the application of an organised set of phonological rules. The rules incorporate what earlier theories would have separated into morphophonemics and phonemics. An underlying form is thus the form from which ALL surface forms or alternants can most convincingly be derived, and only in extreme circumstances will a morpheme have two separate underlying forms. Accordingly, underlying forms can differ radically from surface forms, and neither the underlying form nor the surface form will necessarily correspond to a phonemic representation: as generative phonology does not recognise phonemes or allophones, only underlying contrasts and surface contrasts. There is continual debate in phonological theory about the relation between rules and underlying forms, and on the form and organisation of rules. Lexical phonology is a variant of generative phonology in which phonological and morphological rules are integrated in a series of levels, and some underlying forms are underspecified for some feature values which are filled in later in the derivation.
4. Phonological structure (features and syllables)

**Features** are dimensions of sound which underly recurrent contrasts

- **[±nasal]** m n n vs b d j
- **[±voice]** b d g vs p t k
- **[labial]** p b m f v vs t d n s z

They are also used to write **rules** in generative phonology. **Phonological rules** determine the occurrence of sounds, and the alternation of different sounds in forms of the same unit.

- e.g. rules for alternation of /z/ at end of word or syllable
- rules for alternation of full vowels (tonic syllables) and reduced vowels (atonic syllables)
- rules for alternation of vowels in verb roots (metaphony)

**Portuguese phonology**

Two phonemic problems: /v/ and /ʁ/

What makes a phonological problem segment?
- limited distribution
- partial complementarity with other sounds
- apparent exception to general rules of the language

1. Strong [ʁ] vs weak [ɾ]
   - contrast in intervocalic position: caro - carro (but NB, no contrast following nasal vowels (genro, tenro) and almost no contrast following diphthongs: bairro but morro/moiro (OPtg)
   - complementary in other positions:
     - EP: /R/ syllable-initial rio, melro, abrogar
     - /ɾ/ elsewhere amor, porta, cabra, brava
     - BP: /ɾ/ in clusters brava, tripa and word-final intervocalic por ele
     - /R/ elsewhere rio, melro, amor, porta

   Solution: underlying contrast of /ʁʁ/ - /ɾ/ (predicted from possible syllable structures)
   - mapping of underlying length contrast onto surface quality contrast.

2. ‘closed a’ /v/: independent phoneme or product of phonological rules?

   a) different types of ‘closed a’ [v] [ʁ] [ø] [γ]
   b) phonemic contrasts (EP):
      - (i) falamos - falámos /v/ - /ã/
      - (ii) a casa - à casa (casa nova - casa azul, cadeira - caveira) /v/ - /ã/

   Contrasts result from the non-operation (blocking) of two otherwise allophonic rules
   /ɑ/ → [v], operating
   - (i) in nasal contexts,
   - (ii) in atonic contexts.

   Solutions:

   **Phonemic** (Barbosa 1965)- ‘once a phoneme, always a phoneme’, so /ɑ/ and /v/ must be distinct, and the /ɑ/ → [v] rule is NOT allophonic.

   **Generative Phonology** (e.g. Mateus & Andrade 2000) not really a problem. Only /a/ is found in underlying forms, all cases of [v] are derived by rule.

   The /ɑ/ → [v] rule is one manifestation of two sets of raising rules:
   a) Nasal Raising
Low vowels /ɛ o a/ become their non-low counterparts /e o v/ when in a nasal nucleus or when followed by a nasal consonant. (Given that nasal vowels are analysed as phonological VN, this is the same context.)
b) Atonic Raising
/ɛ e/ become [i], /ɔ o/ become [u], /a/ becomes [u]

- low
  + low
  - high
  + back
  - high
  + back
  - back
  + rd
  - rd

The apparent contrast of /u/-/a/ is analysed as the blocking of these rules (so that /a/ appears in contexts where you expect /u/).
The problem is: why are the raising rules blocked in these specific cases?

**hypothesis A**: the forms in question are simply irregular, and have a special feature [-raising] which blocks both rules

**hypothesis B: the forms are phonologically different in some hidden way**
(i): preterite represented by an abstract ‘morpheme’ (loosely identified with the final semivowel of falou, bateu, partiu) so in falámos the /a/ is not followed by /m/
(ii): atonic raising blocked in vowel sequences.

**Lexical Phonology** (Parkinson 1999)
a) there are two different phonetic [v] segments, defined by different features
tonic[ɛ] (+ATR=Advanced Tongue Root) and atonic [a] (-low).
b) underlying forms mainly contain an underspecified [A] which does not have a specific value for [ATR], except in the 1st conj preterite where the Theme vowel is specified as -ATR. The remaining surface contrasts of [a v a] are the product of the interaction of morphological and phonological rules which fill in missing feature values but do not change existing ones
(i) raising (+ATR) of pre-nasal vowels, a general rule overridden (or preempted) by several morphological rules including metaphor
   . prenasal /ɛ a/ are found in EP verbs (teme, come) but not chama esdrúxulas (fonémico, cómico) but not pânico
(ii) raising [-high - ATR] of atonic /a/, a rule with lexical exceptions (caveira) and phonological exceptions (diphthongs, long vowels, contractions) which could both be represented as complex nuclei e.g. caveira /kaaveira/

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The Phonology of Portuguese (OUP; 2000)

Fonética e fonologia do Português (1999)

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Etudes de phonologie portugaise (1st ed. 1965, 2nd ed 1983)

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Once a problem always a problem. the phonology of Portuguese closed a'.


X. Xove