Introduction

- Phonological transfer from one language to another is possible (Thomason & Kaufman 1988, Winford 2003).

- Most studies on phonological transfer: segmental changes.

Empirical studies on bilingualism and intonation:


- Bilinguals have different intonation systems than monolinguals

- Different explanations, e.g. borrowing, convergence, fusion.
Introduction

- Case study of the intonation of focus within the noun phrase in the Spanish of Quechua-Spanish bilinguals from Conchacalla (Peru).

- Contact between typologically different languages (Quechua and Spanish) that use different strategies to convey focus.

- Intonation of focus within the noun phrase: broad and contrastive focus.

- Data: dialogue game (semi-spontaneous speech):
  - Noun phrases describing an object (noun) modified by a color (adj)

- Insight in encoding of focus in Andean Spanish, language contact & contact-induced change.
Focus

- Focus: non-presupposed information; question-answer pairs
- Broad focus:
  1) a. ¿Qué pasó?
     ‘What happened?’
     b. [F El gato comió un ratón].
     ‘The cat ate a mouse.’

- Narrow focus:
  2) a. ¿Qué comió el gato?
     ‘What did the cat eat?’
     b. El gato comió [F un ratón].
     ‘The cat ate a mouse.’
Focus

Contrastive focus:

3) a. ¿El gato comió un canario?
   ‘Did the cat eat a canary?’

   b. No, el gato comió [F un RATÓN] (no un canario).
      ‘No, the cat ate a mouse (not a canary).’
Focus in Spanish

- In Spanish, focus is encoded in syntax and phonology.
- Syntax: changes in word order (e.g. focus fronting)
- Intonational differences between broad focus and contrastive focus (i.a. De la Mota 1997, Face 2001, 2002a, 2002b)
- Broad focus:
  - Non-final position: late peak alignment, i.e. the peak falls in the posttonic syllable
Focus in Spanish

- Contrastive focus:
  - Non-final position:
    - Early peak alignment, i.e. the peak is reached within the stressed syllable
    - Late alignment with higher peak
    - Postfocal pitch reduction
  - Final position:
    - Early peak alignment

- Additional prominence-lending features: higher F0 maximum, wider local range, longer duration of the stressed syllable and word (i.a. De la Mota 1997, Face 2001, 2002b, Face et al 2005).
Focus in Spanish

- Noun phrase:
  - Noun- Adj (Adj -Noun)

- Focus on final word in noun phrase:

4) El gato de botas ROJAS comió un ratón.
   ‘The cat with the red boots ate a mouse.’ (Zubizarreta 1999: 4230)

- Ambiguous: focus on rojas, botas rojas, or gato de botas rojas
Focus in Spanish

- Focus on other word:

5) El gato de BOTAS rojas se comió un ratón (y no el de pantuflas rojas)
   ‘The cat with the red boots ate a mouse (and not the one with the red slippers).’ (Zubizarreta 1999: 4230)

- Not ambiguous: focus on botas
Focus in Quechua

- In the Quechua sentence, focus can be expressed morphologically and syntactically.

- Morphological marker – *mi/n* is used to mark focus:

  6) Pidru wasi-ta-\(n\) ruwa-n. (SOV)
  
  Pedro house-AC-FOC make-3SG
  
  ‘It is a house that Pedro builds.’ (Muysken 1995).

- Within the noun phrase, focus is not encoded syntactically or morphologically.

- The word order is fixed (Adj-N).
Focus in Quechua

- The morphological marker \(-\text{mi}\) is constituent-external:

7) Allin runa-\(\text{n}\) chahay tayta-qa.
   Good man-FOC this man-TOP
   ‘This man is a good person.’

8) *Alin-\(\text{mi}\) runa chahay tayta-qa.
   Good-FOC man this man-TOP
   ‘This man is a good person.’ (Cusihuamán 2001)
Focus in Quechua

- Discontinuous noun phrases:
     Big-ACC-FOC field-ACC-TOP want-1PL (EXCL)
     ‘We want a bigger field’ (Cusihuaman 1976: 128).

- Rare constructions.
Focus in Quechua

  - No mention of specific intonation for topic/focus.

- Cole (1982):
  - Contrastive intonation contour in Imbabura Quechua: higher peak.

- O’Rourke (2005):
  - Declarative sentences with SOV and neutral focus.
  - Focus is not encoded phonologically in Cusco Quechua.
  - Early peak alignment.
Focus in Andean Spanish

- O’Rourke (2005)
  - SVO order, broad and contrastive focus, monolinguals from Lima and monolinguals and bilinguals from Cusco

- Data: reading task

- Results:
  - Broad focus: earlier peak alignment in some bilinguals
  - Contrastive focus: fewer prominence-lending features in some bilinguals:
    - e.g. no difference peak alignment in broad vs. contrastive focus, wider range for broad focus than for contrastive focus
  - Possible influence from Quechua
Research questions

- Study on intonation within the noun phrase:
  - Noun modified by an adjective describing a color: *estrella verde*, ‘green star’.
  - Noun (non-final position)- Adjective (final position)
  - Broad focus, contrastive focus on the noun, contrastive focus on the adjective

- Research questions:
  i. Is intonation used to express focus in Andean Spanish noun phrases? If so, how?
  ii. Is Andean Spanish intonation affected by contact with Quechua? If so, how?
Methodology

- Setting:
  - Conchacalla, Peru.
  - Approx. 22 miles west of Cusco
  - Population: 480
  - Economic activities: agriculture & cattle breeding
  - Quechua/Spanish bilingualism

Source:
Methodology

- **Task:**
  - Dialogue game, adapted from Swerts, Krahmer and Avasani (2002).
  - Question-answer pairs
  - Broad focus, neutral focus and contrastive focus
  - Spanish and Quechua.

- **Subjects:**
  - 16 Quechua-Spanish bilinguals from Conchacalla:
    - Ages 23-47 (mean: 33.25)
    - 8 simultaneous bilinguals and 8 early sequential bilinguals (L1= Quechua)
    - 8 male and 8 female
    - 6 professionals, 7 non-professionals and 3 middle group
    - Spanish and Quechua are used on a daily basis
Methodology

- **Materials:**
  - Sociolinguistic background questionnaire:
    - age, place of birth, age of acquisition of Quechua/Spanish, frequency and domains of use of Quechua/Spanish, education, occupation, family.
  - Dialogue game:
    - Cards with drawings.
    - Words with voiced consonants.
    - Words with penultimate stress.
    - Words with 2-3 syllables.
    - Words with a Quechua equivalent.
Methodology

- **In total:**
  - 100 answer cards:
    - 20 objects and 5 colors
    - 5 focus types
  - 100 question cards (marked by question mark)
Subject A: ¿Qué tienes?
‘What do you have?’

Subject B: Tengo un toro verde.
‘I have a green bull.’
Contrastive focus on the Noun

12) ¿Tienes un sol verde?  
'Do you have a green sun?'

13) No, tengo un toro verde.  
'No, I have a green bull.'
Contrastive focus on the Adj

Subject A:

¿Tienes un toro naranja?
‘Do you have an orange bull?’

Subject B:

No, tengo un toro verde.
‘No, I have a green bull.’
Methodology

- Materials:
  - Questions with neutral focus on the noun and with neutral focus on the adjective.
  - 30 filler and distractor questions and answers.
  - Total: 2 x 130 = 260 cards per subject
  - Random order
  - Sheet with all the cards → cross off cards described by partner.
Methodology

- **Procedures:**
  - Instructions in Spanish
  - Participation voluntary and anonymous; permission to record
  - Recorded with Sony portable MiniDisc Recorder MZ-NH700 and Sony ECM-MS907 microphone with foam cap.
  - Spanish/Quechua
  - Practice sessions
  - The sessions lasted 45-90 minutes per language.
Methodology

- Data analysis:
  - The answers were coded according to type of focus and subject.
  - Analysis in Praat.

- Measurements for each noun (non-final position) and adjective (final position):
  - Peak alignment:
    - Location of peak (in ms): measured from end of stressed syllable.
      - Negative value = early peak alignment: peak within the stressed syllable.
      - Positive value = late peak alignment: peak in the posttonic syllable.
    - Male vs. female.
  - F0 maximum (in Hz):
    - Measured between onset of stressed syllable and first fall to a F0 minimum or valley.
    - Male vs. female.
Methodology

- Local range (in Hz):
  - Difference in Hz between the F0 maximum and the preceding F0 minimum or valley.
  - Male vs female.

- Duration of the stressed syllable and word (in ms)
Methodology

- Exclusion of data:
  - Only words with stress on the penultimate syllable were included.
  - Background noises.

- Statistics:
  - A (Friedman’s) ANOVA was used for all measurements.
  - Post-hoc procedures
Peak location: Noun (non-final)

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N Mean</td>
<td>N Mean</td>
</tr>
<tr>
<td>Broad focus</td>
<td>113 -20.23</td>
<td>130 -37.86</td>
</tr>
<tr>
<td>Contr focus N</td>
<td>122 -15.93</td>
<td>125 -41.94</td>
</tr>
<tr>
<td>Contr focus Adj</td>
<td>113 -34.10</td>
<td>121 -15.52</td>
</tr>
</tbody>
</table>

Male & female: early peak alignment in the three focus conditions.
Male: no significant differences between the three focus conditions.
Female: significantly earlier peak alignment in broad focus and contrastive focus N than in contrastive focus Adj.

Peak alignment is not used to distinguish between broad focus, contr focus N and contr focus Adj ≠ other varieties of Spanish.
Early peak alignment for the noun in (a) broad focus and (b) contrastive focus on the noun.
### Peak location: Adjective (final)

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
</tr>
<tr>
<td>Broad focus</td>
<td>82</td>
<td>-104.29</td>
</tr>
<tr>
<td>Contr focus N</td>
<td>70</td>
<td>-99.21</td>
</tr>
<tr>
<td>Contr focus Adj</td>
<td>82</td>
<td>-109.66</td>
</tr>
</tbody>
</table>

Male & female: early peak alignment in the three focus conditions.
Male & female: no significant differences between the three focus conditions.
Male & female: the F0 max is significantly higher in broad focus than in both contrastive focus conditions ≠ other varieties of Spanish
<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
</tr>
<tr>
<td>Broad focus</td>
<td>126</td>
<td>129.03</td>
</tr>
<tr>
<td>Contr focus N</td>
<td>124</td>
<td>125.49</td>
</tr>
<tr>
<td>Contr focus Adj</td>
<td>128</td>
<td>123.54</td>
</tr>
</tbody>
</table>

Male: significantly higher F0 max on the adjective in broad focus than in both contrastive focus conditions. There is no significant difference between the two contrastive focus conditions.  
Female: significantly higher F0 max on the adjective in broad focus and contr focus Adj than in contr focus N. The F0 max on the adjective is not significantly higher in contr focus Adj than in broad focus.  

Lower F0 maximum in contr focus N: postfocal pitch reduction (≈ other varieties of Spanish) (i.a. Face 2001, 2002b, Face et al 2007)
F0 maximum: male group

![Bar chart showing F0 maximum for different conditions: Broad focus, Contr focus N, and Contr focus Adj. The chart compares F0 max N and F0 max Adj.](image-url)
F0 maximum: female group
Post-focal pitch reduction

Contr focus N: postfocal pitch reduction
Local range: Noun (non-final)

<table>
<thead>
<tr>
<th></th>
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<th>Female</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N Mean</td>
<td>N Mean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broad focus</td>
<td>135 16.45</td>
<td>140 24.92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contr focus N</td>
<td>137 14.98</td>
<td>136 24.29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contr focus Adj</td>
<td>135 14.24</td>
<td>133 21.45</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Male: significantly narrower range in contr focus Adj than in broad focus (≈ other varieties of Spanish).
Female: no significant differences between the three focus conditions.

Local range of the noun in the contr focus N condition is not significantly different from the local range in the other conditions ≠ other varieties of Spanish.
### Local range: Adjective (final)

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th></th>
<th>Female</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean</td>
<td>N</td>
<td>Mean</td>
</tr>
<tr>
<td>Broad focus</td>
<td>122</td>
<td>13.79</td>
<td>117</td>
<td>17.42</td>
</tr>
<tr>
<td>Contr focus N</td>
<td>116</td>
<td>11.30</td>
<td>121</td>
<td>17.28</td>
</tr>
<tr>
<td>Contr focus Adj</td>
<td>124</td>
<td><strong>12.21</strong></td>
<td>117</td>
<td>20.67</td>
</tr>
</tbody>
</table>

Male: local range is significantly wider in contr focus Adj than in contr focus N (≈ other varieties of Spanish); but no significant difference between contr focus Adj and broad focus (≠ other varieties of Spanish).

Female: no significant differences between the three focus conditions.
Local range: male group

- Local range N
- Local range Adj

* Broad focus
* Contr focus N
* Contr focus A
Local range: female group

![Bar chart showing local range for female group.](chart.png)
## Duration stressed syllable: Noun (non-final)

<table>
<thead>
<tr>
<th>Context</th>
<th>N</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broad focus</td>
<td>312</td>
<td>190.02</td>
</tr>
<tr>
<td>Contr focus N</td>
<td>314</td>
<td>192.32</td>
</tr>
<tr>
<td>Contr focus Adj</td>
<td>308</td>
<td>190.03</td>
</tr>
</tbody>
</table>

No significant difference between the three contexts ≠ other varieties of Spanish.
Duration stressed syllable: Adj (final)

<table>
<thead>
<tr>
<th>Condition</th>
<th>N</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broad focus</td>
<td>318</td>
<td>204.22</td>
</tr>
<tr>
<td>Contr focus N</td>
<td>316</td>
<td>203.57</td>
</tr>
<tr>
<td>Contr focus Adj</td>
<td>316</td>
<td>215.90</td>
</tr>
</tbody>
</table>

Duration of the stressed syllable is significantly longer in contr focus Adj than in other conditions (≈ other varieties of Spanish).
Duration stressed syllable

![Bar chart showing duration stressed syllable for different focus conditions and word types (N, Adj). The chart includes bars for broad focus, contrast focus on N, and contrast focus on Adj. Significant differences are indicated with asterisks (*) between conditions.]
Duration stressed syllable: Adj

Adj: Longer duration for the stressed syllable in contrastive focus on the adjective than in broad focus.
Duration word: Noun (non-final)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broad focus</td>
<td>295</td>
<td>395.92</td>
</tr>
<tr>
<td>Contr focus N</td>
<td>295</td>
<td>387.00</td>
</tr>
<tr>
<td>Contr focus Adj</td>
<td>295</td>
<td>396.77</td>
</tr>
</tbody>
</table>

No significant differences (≠ other varieties of Spanish).
## Duration word: Adjective (final)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broad focus</td>
<td>318</td>
<td>475.99</td>
</tr>
<tr>
<td>Contr focus N</td>
<td>315</td>
<td>468.31</td>
</tr>
<tr>
<td>Contr focus Adj</td>
<td>316</td>
<td>494.20</td>
</tr>
</tbody>
</table>

Duration of the word is significantly higher in contr focus Adj than in other conditions (≈ other varieties of Spanish).
Duration word

- **N**
  - Broad focus
  - Contr focus N
  - Contr focus Adj

- **Adj**
  - Broad focus
  - Contr focus N
  - Contr focus Adj

Note: Bars indicate duration values.
Adj: Longer duration of the word on contr focus Adj than in broad focis.
Discussion and conclusions

For all focus conditions:
- prenuclear F0 max > nuclear max
- Local range on noun > local range on adj

Broad focus:
- Peak alignment: early
- F0 max on the noun: higher in broad focus than in both contrastive conditions
  - ≠ other varieties of Spanish
- Local range on the noun:
  - similar in broad focus and in contr focus N
  - wider in broad focus than in contr focus Adj
  - ≠ other varieties of Spanish.
  - ≈ O’Rourke (2005)
Discussion and conclusions

- Contrastive focus on the noun:
  - Postfocal pitch reduction
    - ≈ other varieties of Spanish
  - Duration: no differences between three conditions.
    - ≠ other varieties of Spanish
    - ≈ O’Rourke (2005)

- Contrastive focus on the adjective:
  - Wider local range.
  - Increased duration of the stressed syllable and word.
  - More prominence-lending features in contr focus than in broad focus (≈ other varieties of Spanish)
Discussion and conclusions

- Early peak alignment in all contexts
  - ≠ other varieties of Spanish
  - ≈ O’Rourke (2005)

- Influence from Quechua or bilingualism?

- Limitations:
  - Quechua monolingual group, Spanish monolingual control group.
  - Other features
  - Neutral focus
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- www,midisegni.it
- www.schoolplaten.com
- www.hetkleineloo.nl
Thank you

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