

Information structure and intonation in Andean Spanish

Antje Muntendam
Radboud University Nijmegen

Introduction.¹ This study examines information structure and intonation in the Andean Spanish spoken by Quechua-Spanish bilinguals in the department of Cusco, Peru. Spanish and Quechua are typologically different languages that use different strategies to convey focus. In Spanish, focus is encoded syntactically (through word order) and intonationally. Several studies on Spanish have reported intonation differences between broad and contrastive focus (De la Mota, 1997; Face, 2001, 2002). For instance, prenuclear peaks are aligned late in broad focus, whereas they are aligned mostly early in contrastive focus. Furthermore, in different Spanish varieties contrastive focus is associated with an increased duration of the stressed syllable or word, a higher intensity, a higher F0 maximum, or a wider tonal range (De la Mota, 1997; Face, 2001, 2002; Hualde, 2005).

In Quechua, focus is encoded syntactically (through word order) and morphologically, through the focus particle *-mi/-n* (1). Focus is not encoded intonationally in Cusco Quechua (O'Rourke, 2005).

- (1) Pidru wasi-ta-*n* ruwa-n.
 Pedro house-AC-*FOC* make-3SG
 'It is a house that Pedro builds.' (Muysken, 1995: 380)

The differences between Spanish and Quechua in focus marking could affect the intonation patterns of bilinguals. O'Rourke's (2005) study, which was based on a reading task, revealed some differences between the Spanish intonation of Quechua-Spanish bilinguals and that of Spanish monolinguals. The present study aims to contribute to the research on Quechua-Spanish bilingualism and intonation. The research questions are: (a) Is intonation used to encode focus in Andean Spanish intonation? If so, how? and (b) Is Andean Spanish intonation affected by contact with Quechua?

Methodology. The data come from a picture-story task and an oral elicitation task consisting of question-answer pairs. The participants were 22 adult Quechua-Spanish bilinguals from the department of Cusco, who acquired both languages in their childhood and use them daily. The participants' ages ranged between 23 and 41 years (mean = 33.4). There were 11 male and 11 female participants. The task consisted of 30 pictures with 10 questions each: questions to elicit broad focus, questions to elicit neutral narrow focus on the subject, object and VP, questions to elicit contrastive narrow focus on the subject, object and VP (2-8), and distractor questions.

- (2) ¿Qué pasa?
 'What happens?'
(3) ¿Quién lleva al niño?
 'Who takes the child?'

¹ This research was supported by the Foundation Nijmegen University Fund (SNUF); Royal Netherlands Academy of Arts and Sciences (KNAW); and the ERC project 'Traces of Contact' (# 230310). I would like to thank Remy van Rijswijk for her help with the data collection and R. I would also like to thank the participants of this study.

- (4) ¿A quién lleva la madre?
'Who does the mother take?'
- (5) ¿Qué hace la madre?
'What does the mother do?'
- (6) ¿El padre lleva al niño?
'Does the father take the child?'
- (7) ¿La madre lleva a la niña?
'Does the mother take the girl?'
- (8) ¿La madre pega al niño?
'Does the mother hit the child?'

The target sentences were sentences with a subject, verb and object. The study was performed in both Spanish and Quechua. The sessions were recorded with a Sony MiniDisc Recorder MZ-NH700 and a Sony ECM-MS907 microphone with a foam cap.

The data were analyzed in *Praat* (Boersma & Weenink, 2010). The duration of the stressed syllable and word, intensity, F0 maximum and peak location were measured for the subject (non-final position) and the object (final position) in broad and contrastive focus. For this paper, the Spanish data from 8 participants (4 male and 4 female) were analyzed. Only sentences with SVO order and words with penultimate stress were included. For the statistical analysis, *R* (R Development Core Team, 2011) and the *R* packages *lme4* (Bates, Maechler & Bolker, 2011) and *languageR* (Baayen, 2011) were used. Linear mixed-effects models were used with Subject and Item as random effects (Baayen, Davidson & Bates, 2008) and Focus (broad, contrastive) as fixed effect. P-values were obtained using Markov chain Monte Carlo Sampling. A Bonferroni correction was used and the effects are reported at a .0167 level of significance.

Results. Table 1 and Table 2 show the results for the duration of the stressed syllable and the word, respectively, for the subject and the object in broad and contrastive focus. No significant differences between broad and contrastive focus were found for stressed syllable duration, with $\beta = -0.0320$, $t = -0.38$, $p = .624$ for broad and contrastive focus on the subject and $\beta = -0.2151$, $t = -2.10$, $p = .042$ for broad and contrastive focus on the object. Unlike in some other Spanish varieties, stressed syllable duration is thus not used to distinguish broad and contrastive focus.

For overall word duration, a significant difference between broad and contrastive focus was found for the object (final position), with $\beta = -0.3121$, $t = -3.167$, $p = .006$. The object was significantly longer in contrastive focus (mean = 371.07 ms) than in broad focus (mean = 352.85 ms) (Table 2). This is in line with other Spanish varieties, in which contrastive focus is associated with an increased duration of the word. For the subject, no significant difference between the duration of the word in broad and contrastive focus was found, with $\beta = -0.1728$, $t = -1.614$, $p = .146$.

Table 1. Duration of the stressed syllable of the subject and object in broad and contrastive focus (in ms)

	Subject		Object	
	N	Mean	N	Mean
Broad	101	201.10	102	193.28
Contrastive	195	206.93	153	194.93

Table 2. Duration of the subject and object in broad and contrastive focus (in ms)

	Subject	Object
--	---------	--------

	N	Mean	N	Mean
Broad	99	351.05	100	352.85
Contrastive	196	370.67	153	371.07

Table 3 summarizes the results for intensity (in dB). No significant differences between broad and contrastive focus were found for intensity, with $\beta = -0.0199$, $t = -1.06$, $p = .334$ for broad and contrastive focus on the subject and $\beta = -0.0508$, $t = -1.68$, $p = .134$ for broad and contrastive focus on the object. Intensity is thus not used to distinguish contrastive from broad focus in Andean Spanish.

Table 3. Intensity of the subject and object in broad and contrastive focus (in dB)

	Subject		Object	
	N	Mean	N	Mean
Broad	101	79.02	98	75.23
Contrastive	197	78.73	153	75.37

The results for the F0 maximum (in ERB) on the subject and the object in broad and contrastive focus are given in Table 4. The F0 maximum did not differ significantly between broad and contrastive focus, with $\beta = -0.0285$, $t = -0.977$, $p = .418$ for broad and contrastive focus on the subject and $\beta = -0.0849$, $t = -1.337$, $p = .202$ for broad and contrastive focus on the object. This indicates that contrastive focus is not associated with a higher F0 maximum in Andean Spanish.

Table 4. F0 maximum of the subject and object in broad and contrastive focus (in ERB)

	Subject		Object	
	N	Mean	N	Mean
Broad	66	5.09	59	4.76
Contrastive	140	5.24	97	4.96

Finally, Table 5 gives the results for peak location (in milliseconds) for the subject and the object in broad and contrastive focus. No significant effects were found for peak location, with $\beta = 0.0638$, $t = 1.38$, $p = .134$ for broad and contrastive focus on the subject and with $\beta = 0.0214$, $t = 0.41$, $p = .710$ for broad and contrastive focus on the object. Table 5 shows negative values (i.e. early peak alignment) in all focus conditions and positions. Unlike in other Spanish varieties, in Andean Spanish prenuclear peaks in broad *and* contrastive focus are aligned early.

Table 5. Peak location for the subject and object in broad and contrastive focus (in ms).

	Subject		Object	
	N	Mean	N	Mean
Broad	64	-90.19	52	-83.42
Contrastive	129	-77.78	76	-94.07

Discussion and conclusion. This study examined the intonation of focus in Andean Spanish. The results revealed that in Andean Spanish stressed syllable duration, intensity, F0 maximum and peak alignment are not used to distinguish broad and contrastive focus, unlike in some other Spanish varieties. The results for overall word duration revealed that the object was significantly longer in contrastive focus than in broad focus. That is, word duration is used to distinguish

broad from contrastive focus in final position. This is in line with what has been reported for some other Spanish varieties (De la Mota, 1997), but not with O'Rourke's (2005) findings for Andean Spanish. More research is needed to further examine variation within Andean Spanish.

The results for peak location revealed early peak alignment in both focus conditions and positions. These results do not correspond to other Spanish varieties, in which a non-final word in broad focus involves late peak alignment. O'Rourke (2005), however, did not find a difference in peak alignment for broad and contrastive focus in Andean Spanish either. Given that in Quechua peak alignment is mostly early, the predominance of early peak alignment in Andean Spanish could be due to contact with Quechua. An analysis of the Quechua data will provide a better understanding of a possible Quechua influence in Andean Spanish intonation.

To conclude, this study revealed some differences between Andean Spanish and other varieties of Spanish. It contributes to research on Spanish intonation, bilingualism and language contact. More specifically, it lends support to recent empirical studies on intonation and bilingualism (Bullock, 2009; Colantoni & Gurlekian, 2004; O'Rourke, 2005; Simonet 2008), which suggest that bilinguals have different intonation patterns from monolinguals. Control groups of Spanish and Quechua monolinguals will give more information on the precise nature of the differences between bilingual and monolingual speech and a possible Quechua influence.

References

- Baayen, R. (2011). *LanguageR: Data sets and functions with 'Analyzing linguistic data: A practical introduction to statistics.'* R package version 1.4. <http://CRAN.R-project.org/package=languageR>.
- Baayen, R., Davidson, D., & Bates, D. (2008). Mixed-effects modeling with crossed random effects for subjects and items. *Journal of Memory and Language*, 59, 390-412.
- Boersma, P., & Weenink, D. (2010). *Praat: doing phonetics by computer*. Version 5.1.44. <http://www.praat.org/>.
- Bullock, B. (2009). Prosody in contact in French: a case from a heritage variety in the USA. *International Journal of Bilingualism*, 13(2), 165-194.
- Colantoni, L. & Gurlekian, J. (2004). Convergence and intonation: historical evidence from Buenos Aires Spanish. *Bilingualism: Language and Cognition*, 7(2), 107-119.
- De la Mota, C. (1997). Prosody of sentences with contrastive new information in Spanish. In A. Botinis, G. Kouroupetroglou & G. Carayiannis (Eds.), *Intonation: Theory, models and applications. Proceedings of an ESCA workshop*, (pp.75-78).
- Face, T. (2001). Focus and early peak alignment in Spanish intonation. *Probus*, 13, 223-246.
- Face, T. (2002). Local intonational marking of Spanish contrastive focus. *Probus*, 14(1), 71-92.
- Hualde, J. (2005). *The sounds of Spanish*. Cambridge: Cambridge University Press.
- Muysken, P. (1995). Focus in Quechua. In K. Kiss (Ed.), *Discourse configurational languages* (pp. 375-393). New York, NY, Oxford, UK: Oxford University Press.
- O'Rourke, E. (2005). *Intonation and language contact: a case study of two varieties of Peruvian Spanish*. Ph.D. dissertation, University of Illinois at Urbana-Champaign.
- R Development Core Team (2011). *R: A language and environment for statistical computing*. R foundation for statistical computing, Vienna, Austria. ISBN 3-900051-07-0. <http://www.R-project.org/>.
- Simonet, M. (2008). *Language contact in Majorca: An experimental sociophonetic approach*. Ph.D. dissertation, University of Illinois at Urbana-Champaign.