

Reassessment of the frequency code: prosody of polite requests in Catalan

Iris Hübscher,¹ Joan Borràs-Comes,^{1,2} and Pilar Prieto^{1,3}

¹ *Department of Translation and Language Sciences, Universitat Pompeu Fabra (Spain)*

² *Universitat Autònoma de Barcelona (Spain)*

² *Institució Catalana de Recerca i Estudis Avançats (ICREA)*

The Frequency Code, first proposed by Ohala (1984) and later incorporated by Gussenhoven (2002, 2004) as the first of three biological codes, advocates the existence of universal tendencies in the interpretation of pitch variation across languages. Specifically, the Frequency Code is associated with politeness by establishing an association between high pitch and perceived subdominance. Experimental research, however, does not seem to support such claims about universal codification of F0. While some research suggests an association between an increase of pitch height and level of perceived friendliness (Chen et al., 2004 on Dutch and English; Ohara, 2001 on Japanese), other research shows that it is low pitch correlated with the usage of polite register (Winter & Grawunder, 2011, 2012; Brown, et al., 2014 on Korean). Moreover, it has been shown that high pitch can also be used to signal impoliteness (e.g. Stadler, 2007 on German and New Zealand English; Nadeu & Prieto, 2007 on Catalan). To our knowledge, little research has focused on how different languages encode politeness through F0 together with other prosodic qualities of speech. Winter and Grawunder (2012) found that Korean honorific (polite) speech register differs from non-honorific speech register by having slower speech rate, lower pitch, less jitter, shimmer and higher H1-H2 values. Furthermore, by replicating this study on German, Austrian German, Japanese and Russian, it has been shown that there are differing patterns observable (Brown et al., 2015). While Russian, German and Austrian German speakers manipulated formal speech in comparable ways to Korean speakers, Japanese displayed different pitch patterns. The methodology used in these two studies consisted of a discourse elicitation task by which different speech acts (such as making a request, an apology etc.), and a potential influence of speech act type cannot be discarded.

In this present study we would not only like to expand the scope of Brown et al.'s (2015) results by including a Romance language, Catalan, in the discussion, investigating its prosodic (phonetic) correlates of polite requests, but also we would like to focus on solely one type of speech act, and specifically requests, in order to control for potential confounds from the acoustic realizations of different speech acts. To do so, we collected data of 20 female Central Catalan native speakers through a discourse elicitation task. Participants had to imagine themselves in different scenarios and make spontaneous requests to two different kinds of interlocutors: (1) boss or professor at university and (2) to a friend in six contexts per condition (6 situations x 2 conditions x 20 speakers = 240 requests). We analysed the following prosodic components of speech within the same speech acts: intonation patterns in Cat_ToBI, mean syllable duration, mean F0, mean intensity (dB) and voice quality (jitter, shimmer and H1-H2).

Our analyses show that, overall, participants displayed clear differences when making requests in the formal and informal condition. In the formal condition, subjects used slower speech rate and lower mean pitch, less intensity and less jitter, shimmer and higher H1-H2 values. These parameters stand in contrast to previously claimed universals about polite speech and display not only that a social meaning such as politeness is clearly shaped by cultural parameters but also that this meaning is noticeably marked in acoustic correlates. Furthermore, investigation on Catalan along with the other languages that have been analysed thus far with a complete prosodic / acoustic analysis, highlights that instead of an increase in pitch height, slower speech rate, lower intensity and higher breathiness might be a more commonly shared pattern across languages to mark politeness.

Figure 1. Mean and standard deviation of prosodic measures (taken over all syllables produced in the recordings) applied to the informal and formal condition

Measure	Informal		Formal		t-test results	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i> (18907)	<i>p</i>
Duration	.1472	.0667	.1505	.0723	-3.226	.001
Mean f0 (st)	13.23	3.14	12.64	3.06	12.967	.000
Intensity (dB)	75.59	5.23	74.12	6.41	17.367	.000
Jitter	.0221	.0149	.0214	.0153	3.191	.001
Shimmer	.1552	.0506	.1499	.0540	6.952	.000
f1-f0 (Hz)	522.30	225.90	532.98	229.90	-3.170	.002

References:

- Brown, L., Winter, B., Idemaru, K., & Grawunder, S. (2014). Phonetics and politeness: Perceiving Korean honorific and non-honorific speech through phonetic cues. *Journal of Pragmatics*, 66, 45-60.
- Brown, L., Winter, B., Idemaru, K., & Grawunder, S. (2015). The Sound of Honorific Language: How Speech Indexes Social Meaning in Korean, Japanese, German and Russian. Paper presented at IPrA, Antwerp, Belgium, July 2015.
- Chen, A., Gussenhoven, C., & Rietveld, T. (2004). Language-specificity in the perception of paralinguistic intonational meaning. *Language and Speech*, 47(4), 311-349.
- Gussenhoven, C. (2002). Intonation and interpretation: phonetics and phonology. In B. Bel & I. Marlien (Eds.), *Proceedings of the Speech Prosody* (pp. 47 – 57). Aix-en Provence: Université de Provence.
- Gussenhoven, C. (2004). *The Phonology of Tone and Intonation*. Cambridge University Press, Cambridge.
- Nadeu, M., & Prieto, P. (2011). Pitch range, gestural information, and perceived politeness in Catalan. *Journal of Pragmatics*, 43(3), 841-854.
- Ohala, J. J. (1984). An ethological perspective on common cross-language utilization of F0 of voice. *Phonetica* 41, 1-16.
- Ohara, Y. (2001). Finding one's voice in Japanese: A study of the pitch levels of L2 users. In A. Pavlenko, A. Brackledge, I. Piller, & M. Teutsch-Dwye (Eds.), *Multilingualism, Second Language Learning, and Gender* (pp. 231-254). New York: Mouton de Gruyter.
- Stadler, S. 2007. *Multimodal (Im)politeness: The Verbal, Prosodic and Non-Verbal Realization of Disagreement in German and New Zealand English*. Hamburg: Verlag Dr. Kovac.
- Winter, B., & Grawunder, S. (2011). The polite voice in Korean: searching for acoustic correlates of contaymal and panmal. In H. Sohn, H. Cook, W. O'Grady, L. Serafim & S. Cheon (Eds.), *Japanese/Korean Linguistics* 19 (pp. 419-431). Stanford: CSLI.
- Winter, B., & Grawunder, S. (2012). The phonetic profile of Korean formal and informal speech registers. *Journal of Phonetics*, 40(6), 808-815.