Aix Summer School on Prosody

EXPERIMENTAL STUDIES FOR PROSODY & MEANING

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Overview

Aim: **How to Investigate Prosody and Meaning through behavioral production and perception experimental tasks**

1. Introduction

2. General procedure

3. Example of a production experiment

4. Example of a perception experiment

5. Perception: another task

6. Exercice

Introduction

Two main ways: corpus studies & experimetal studies

Corpus studies: underdescribed language (cf. yesterday lecture)
unexplored variety (Corsican French)
discourse genre (video-game conversation)
phenomenon (back-channels)

Ex: systematic description of prosodic patterns associated to previously annotated speech acts or information structural patterns in a radio debate

=> Discovering new patterns, formulating new hypotheses

Today : focus on experimental studies
behavioral production and perception tasks
(tomorrow: More sophisticated methods = EEG/ERP or Eye-tracking)

Goal: understand the basic way of reasoning to design an experiment on prosody & meaning

General Procedure

Corpus investigations can be exploratory.
Experimental investigations need to define hypotheses.
Sources of hypotheses: **previous corpus exploration**
unresolved issue/controversy in the literature
the linguist (&/or native speaker)'s intuition

step 1
Define a general research question
step 2
Adapt it to the studied language (languages)
step 3
Read the relevant literature
Define the known constraints on the target phenomenon in the target language(s)
step 4
Define the working hypothesis/es
step 5
Define the experimental method
step 6
Design the statistical method, the stimuli and the fillers (if necessary)
step 7
Run the experiment and interpret the results
=> if they are convincing, publish a paper
=> If they are not convincing enough, try to understand why and run a complementary experiment…

Example: information structure meaning

step 1

Define a general research question

The prosody of association with focus in French

step 2

Adapt it to the studied language (languages)

The prosody of 'seulement' (only) and its associate in French

step 3

Read the relevant literature

Define the known constraints on the target phenomenon in the target language(s)

French is a boundary language in which the enhancement of both initial and final pitch movements are generally involved in focus marking

the constituent length also has an impact on the initial rise => to be controlled for

'seulement' (only) can occur at different syntactic surface locations related to its associate => to be controlled for

step 4

Define the working hypothesis/es

the associate of 'seulement' is generally phrased alone in its own prosodic constituent or can be phrased with 'seulement' when the adverb precedes it. The associate of 'seulement' is prosodically marked by an obligatory final rise at its right edge and an optional initial rise more frequent than in a non-focused constituent of the same kind

step 5

Define the experimental method

Production of sentences featuring 'seulement' in different locations relative to its associate

Production task: the Discourse Completion Task

Reference

Borràs-Comes, J. – Sichel-Bazin, R. – Prieto, P. (2015). "Vocative intonation preferences are sensitive to politeness factors". Language and Speech 58(1), pp. 68-83.

SOCIO-PRAGMATIC MEANING

Step 1: ?

Step 2: Where does the main research question and hypothesis come from?

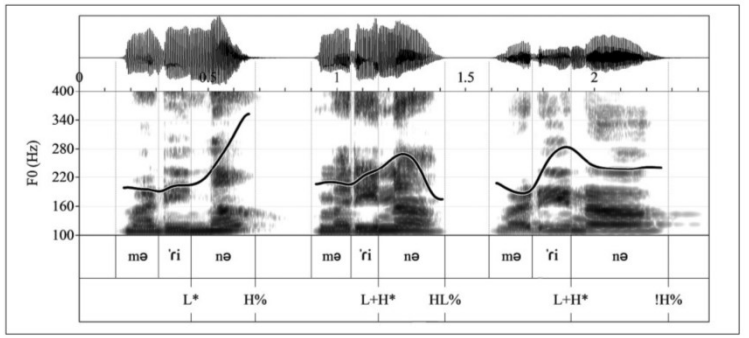
Pilar Prieto and her research group in Barcelona work on Prosody in Romance Languages (http://prosodia.upf.edu/home/en/recerca.php#pr2), especially on Catalan and found that different pitch contours are used with vocatives in this language (Prieto & Cabré, 2007–2012, Prieto et al. 2015)

=> what criteria make speakers choose one or the other?

Previous research + intuitions => politeness factors

Step 3

Prieto & Cabré, 2007–2012:
3 main *vocative* pitch contours
in Central Catalan
L* H%, L+H* HL%, and L+H* !H%



Prieto et al (2015): selection influenced by insistence and physical distance

Brown & Levinson (1987) politeness Theory:
2 factors impact the Speaker-Addressee face relationship =
- **social distance (or solidarity)**
- **power (or social status)**

Step 4
"to investigate the influence of social politeness factors (i.e., power and social distance) as well as two situational factors (the physical distance between participants and insistence) on vocative pitch contour selection and felicity." P. 69

How does the selection of L* H%, L+H* HL%, and L+H* !H% in vocative speech acts in Central Catalan is influenced by politeness and situational factors such as social distance, power, insistence and physical distance?

Note: here, no more specific hypotheses about which contour in which combinaison of factors. Could have been more specific.

Step 5

***Method* = two complementary experiments**

- a production experiment using = Discourse Completion Task (DCT)

- a perception experiment = acceptability judgment task (see part 4)

DCT

"In a DCT, the speakers are presented with specific discourse contexts that constrain their productions, so this enables the researcher to obtain semi-spontaneous productions while controlling for specific pragmatic factors." p. 71

=> Designing *contexts* is the mean to control for the social-pragmatic factors

Controlled factors (operationalization)

- Social Distance => two levels: at-work vs. at-home situations

- Power => two levels for each social distance value

- at work: calling a supervisor vs. a subordinate;

- at home: calling an aunt vs. a little sister

- Physical Distance => same room (close) vs. outside speaker's room (distant)

- Degree of Insistence => first call vs. second (insistent) call

=> 2 Power × 2 SocialDist × 2 PhysicalDist × 2 Insistence

= 16 target discourse contexts

Step 6 *Examples of DC*

(1) You're a project manager in a big company. The vice-president is Mrs Marina Smith. She holds a position of authority and you don't know her very well. You need her to sign some documents. She's in front of you. Call out her name so that she will come over.

[SocialDist: at work, Power: to superior, PhysicalDist: close, Insistence: first call]

(2) Your little sister Marina is very good at math and you want her to help you with your homework. You are the older sister and you have a lot of influence over her. She's now in the next room, so she may not hear you very well. You have already called her once. Call out to her again.

[SocialDist: at home, Power: to subordinate, PhysicalDist: far, Insistence: insistent call]

***Secondary factors controlled for*: Gender effect (same gender interactions); syntax (isolated vocative forms); cost of the request (same level = just ask for attention)**

What prosodic factor would you like to control for?

Step 7 ***What kind of results do you expect?***

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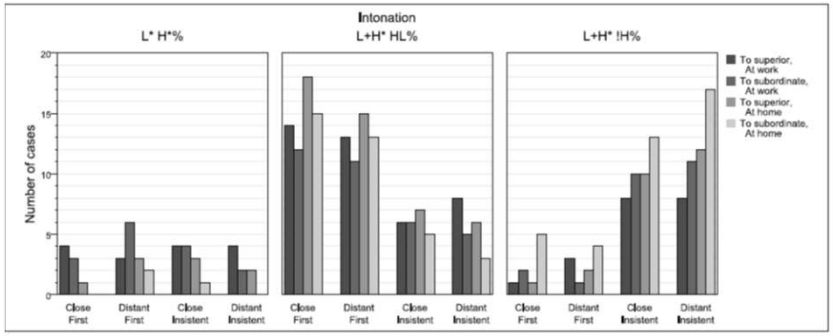
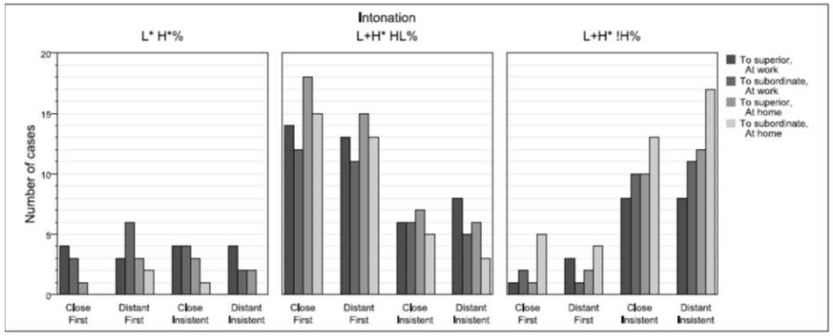
1. Distribution of *phonological* categories



Step 7 *What kind of results do you expect?*

1. Distribution of *phonological* categories



2. *Phonetic variations* within categories

- **Duration**
- **Pitch range**
- **What else?**

Table 3. Means and standard deviations of syllabic durations and tonic movements (ms or st) in each of the levels of SOCIALDIST and PHYSICALDIST, for the two most frequent contours.

Measure	Intonation	SOCIALDIST		PHYSICALDIST	
		At work	At home	Close	Distant
TonicDur	L+H* HL%	124.67 (15.91)	128.07 (15.47)	123.93 (15.95)	129.31 (15.05)
	L+H* !H%	130.06 (16.37)	133.97 (20.56)	128.38 (18.52)	135.82 (18.74)
PosttonicDur	L+H* HL%	307.27 (81.29)	355.80 (120.66)	309.12 (91.32)	358.97 (115.84)
	L+H* !H%	307.75 (98.39)	388.94 (131.05)	309.66 (96.59)	394.32 (133.35)
TonicRise	L+H* HL%	2.95 (1.97)	2.53 (2.19)	1.85 (1.41)	3.70 (2.28)
	L+H* !H%	5.25 (2.52)	5.53 (2.37)	4.57 (1.85)	6.12 (2.63)
PosttonicFall	L+H* HL%	3.89 (3.72)	4.50 (4.33)	3.94 (4.20)	4.56 (3.88)
	L+H* !H%	3.02 (1.43)	3.47 (1.74)	3.32 (1.74)	3.25 (1.54)

4. Perception task: Acceptability Judgement

Reference: same paper

Why a second experiment?

"Due to the production task constraints, each participant could only produce one contour for a given communicative context, meaning that this methodology does not allow us to adequately assess how felicitous other possibilities would be in that specific context" p. 74

***Instructions*: "listeners were asked to rate the perceived degree of adequacy between a given prosodic rendition of a vocative (i.e., uttered with a particular intonational contour) and its preceding discourse context." P. 75**

About acceptability judgement tasks: Bard, E. G., Robertson, D., & Sorace, A. (1996). Magnitude estimation of linguistic acceptability. *Language*, 32-68.

Material selection

4 speakers of the previous DCT x 3 contours = 12 vocative sentences

Assigned randomly to the 16 discourse contexts

<u>Selection criteria</u>

- the same speaker should have produced all three contours

- the utterances only included the proper noun Marina, without any preceding personal term of address (like senyora 'Mrs', senyoreta 'Miss' or tieta 'Aunty')

Why?

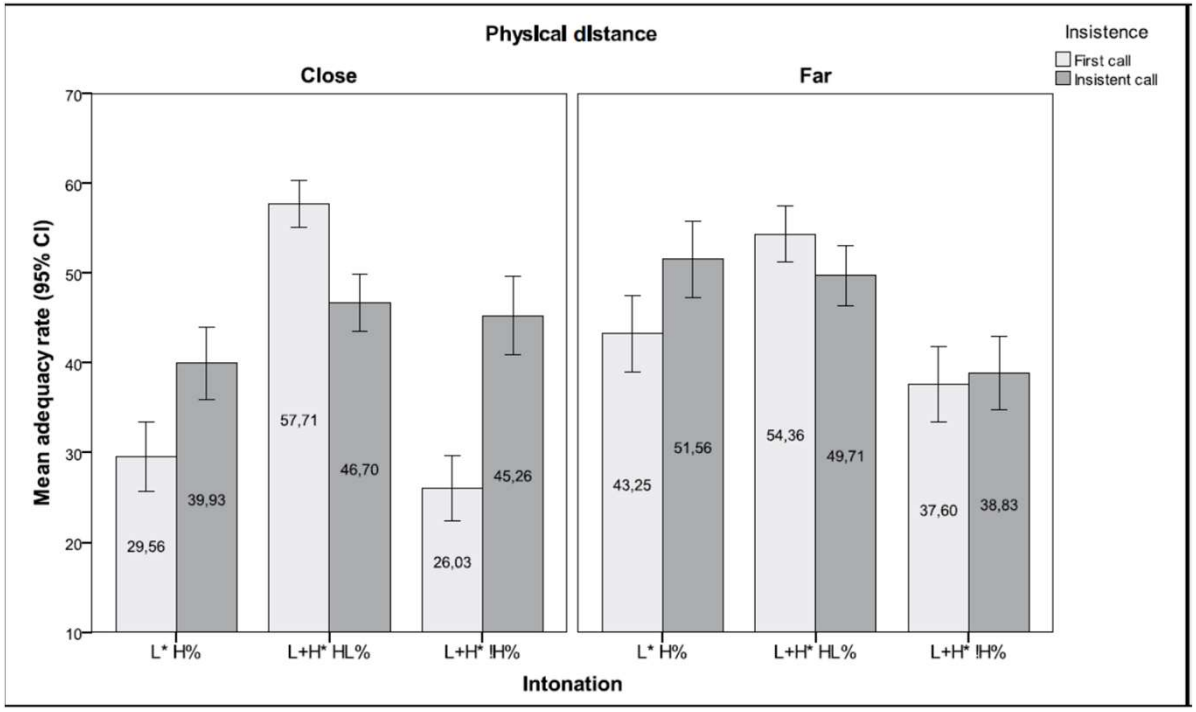
"The three authors of the study plus three more members of the research group in Barcelona checked that the 12 utterances were representative of the target intonational contours, showing similar acoustic properties of duration and pitch range across speakers."

Why?

What kind of results do you expect?

What kind of results do you expect?

Mean acceptability rates



5. Another perception (interpretation) task

Reference

Portes, C.; Beyssade, C.; Michelas, A.; Marandin, J.-M.; Champagne-Lavau, M. (2014). The Dialogical Dimension of Intonational Meaning: Evidence from French. Journal of Pragmatics, vol. 74. 2014, p. 15-29.

COMMITMENT MEANING

Motivation: **very detailed hypotheses about intonational tunes meaning**
very indirect task

General hypothesis

Intonational meaning is dialogical and signals speaker commitment and how the speaker anticipates the reaction of the addressee to his utterance by attributing attitudes to him and calling for his next move

Task

participants hear an utterance with a specific tune among 4 and have to choose the appropriate dialogical reaction they would have as an addressee among 4 proposed ones.

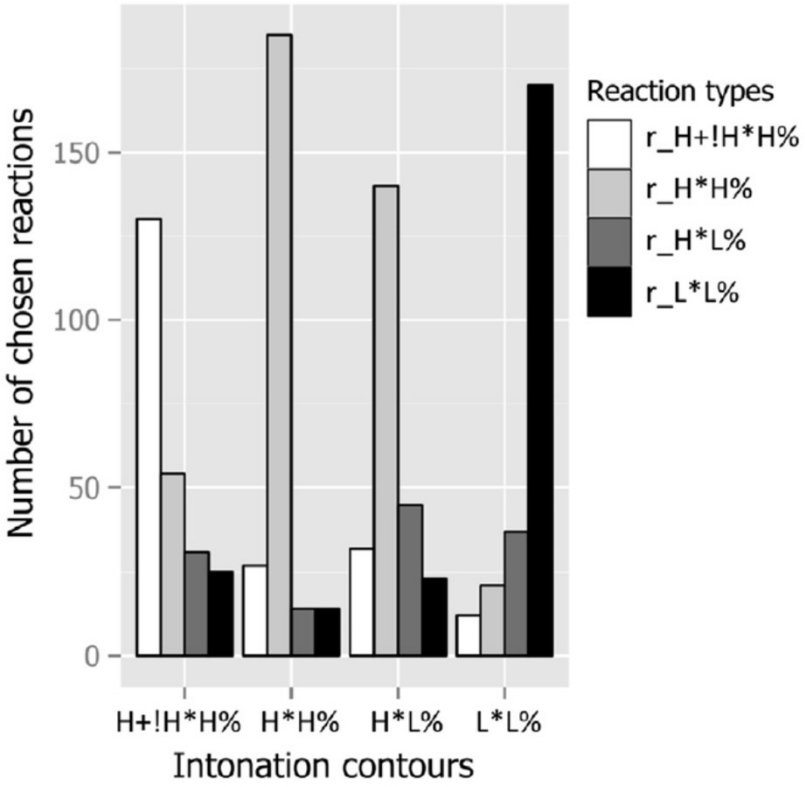
Detailed hypotheses => more specific task

Table 1
Hypothesized contour-reaction pairing tested in the forced-choice interpretation task.

Contour	Prototypical meaning features	Reaction
L*L%	S commits him/herself to the truth of p S signals that he/she anticipates no disagreement from A (about p) S proposes to A to update CG with p	**J'en prends note** ***I get it*** A acknowledges that S has no disagreement about p and that p can be added to the CG
H*H%	S signals that he/she doesn't commit to p S signals that he/she attributes a belief about p to A (that p or not p) S proposes to A to commit to p or to commit to not p	**J'en sais rien** ***I've no idea*** Contradicts S's attribution to A
H*L%	S commits him/herself to p S signals that he/she anticipates a disagreement from A:S signals that he/she attributes to A the belief that not p. S proposes to A to update CG with p	**Tu dois avoir raison** ***I guess you're right*** Acknowledgment of S's commitment Remaining potential disagreement of A
H+!H*H%	S signals that he/she does not commit to p S signals that he/she anticipates a disagreement from A:S signals that he/she attributes to A the belief that p S proposes to A either to commit to p or to commit to not p	**Si, si, je t'assure** ***No, really, it's true*** Comments both on S's disagreement and on the confirmed commitment of A

What kind of results?

Distribution again => confirm or contradict your hypotheses



Exercice

Read the following paper:

Michelas, A., Portes, C. & Champagne-Lavau M. (2015). When pitch accents encode speaker commitment: evidence from French intonation. Language and Speech, published online before print June 3, 2015. DOI: 10.1177/0023830915587337.

Define the 6 first steps of the general procedure as actualized in this paper as precisely as possible.

Concerning the 7th step, what do you think would be relevant as a follow up experiment? Explain why?

Solution

Step 1

General research question **= see the title of the paper = intonation encodes commitment**

We were working on the 'commitment' meanings of French intonational contours within a project on Prosody and ToM (MINDPROGEST).

Background on the general question

Grice & Savino papers on Bari Italian (Grice & Savino, 1997; Savino & Grice, 2007): L+H*= neutral position of the speaker towards the content; L+H* with higher peak (difference in scaling)= negative bias (the speaker doesn't believe in the content of the utterance); H*+L = slight positive biais; H+L* = questions about given information, very strong positive bias (the speaker is strongly committed to the content of the utterance)

Vanrell et al. (2013) on Majorcan Catalan: !H+L* = information seeking Q (the speaker is neutral); H+L* = confirmation-seeking Q (the speaker is positively biased); difference in scaling of the H leading tone

Armstrong (2010) in Puerto Rican Spanish: !H* = no commitment vs. H+L* = positive bias

=> Languages use pitch accent *type* (Bari Italian, Spanish) and pitch accent *scaling* (Bari Italian, Majorcan Catalan) to incode differences in commitment in questions

Solution

Step 2

Specified research question = What about French? How do French speakers prosodically encode the difference between unbiased questions (information seeking Q) and biased questions (confirmation Q)?

Step 3

Fonagy & Bréard, 1973: a rise-fall from the penultimate peak convey uncertainty in questions while rising and falling contours do not

Beyssade and Marandin (2007) in both affirmations and questions, rising contours convey a stronger commitment of the speaker than contours that fall from a penultimate peak

Portes & Beyssade (to appear): H+!H* (H+L* in their coding) and H*+L both convey disagreement but with H+!H* disagreement is stronger. An H+!H*H% combination conveys an incredulous confirmation question (combining the strong disagreement of the pitch accent and the fact that "the responsibility for the truth of the content is delegated to the hearer" conveyed by the H% boundary tone)

=> used in declarative questions, H+!H*H% conveys a negative bias while H*H% (the AM coding for the simple rise) conveys neutrality towards the utterance content

Solution

Step 4

Working hypothesis

Does the contrast between the two pitch accents H* and H+!H* in French encode a difference in commitment (neutral vs negative respectively)?

Step 5

Define the experimental method

Since we also wanted to verify some hypotheses about the phonetic realization of the H+!H*H% contour we chose a *production* experiment

We had quite clear ideas about the kind of contexts in which a positively biased information seeking question and an incredulous confirmation seeking question could be felicitous

We also added a sentence following the sentence to be produced designed to strengthen the elicitation of the right meaning

Solution

Step 6

Appendix. Target sentences and additional sentences for unbiased and negative-biased contexts.

Target sentence	Additional sentence		Unbiased context	Negatively biased context
	Unbiased context	Negatively biased context		
Yves a revendu le guéridon	*Faut-il qu'on le remette en vente*	*Mais je viens de le voir dans le garage*	*Votre amie et votre frère, Yves, viennent juste de rentrer d'un vide grenier auquel ils participaient. Vous interrogez votre amie sur ce que votre frère a réussi à vendre :*	*Votre amie prétend que votre frère, Yves, a vendu à un vide grenier le guéridon Louis XVI qu'il a hérité. Vous soupçonnez votre amie de se tromper car vous venez d'apercevoir ce meuble dans le garage. Vous mettez en cause ses propos :*
Yves resold the table	Do we need to place it on sale again	But I have seen it in the garage	Your friend and your brother Yves are back from local auctions. You are asking your friend about what Yves has sold :	Your friend is pretending that your brother Yves resold at auctions the Louis XVI table he inherited. Since you have just seen the table in the garage, you are sure that your friend is making an error. You call in to question what your friend has just said :
Jules a engagé un adjudant	*Est-ce que je continue les entretiens*	*Je croyais que les embauches étaient gelées pour l'année*	*Le colonel vous a chargé, votre collègue Jules et vous, d'engager un nouvel adjudant. Après quelques jours de congés, vous interrogez votre secrétaire pour savoir si Jules a trouvé quelqu'un ou si vous devez continuer les entretiens :*	*Vous êtes en train de discuter avec votre collègue de travail. Celui-ci vous confie qu'il a rencontré le nouvel adjudant que Jules, le colonel, vient d'embaucher. Vous êtes très surpris car Jules vous a affirmé qu'il n'y aurait aucune nouvelle embauche cette année. Vous mettez en doute ce que vous affirme votre collègue :*
Jules hired an adjutant	Do I continue the interviews	I thought hires were frozen for the year	The Colonel asked your colleague Jules and you to hire a new adjutant. After a few days off, you ask your secretary to find out if Jules found someone or if you need to continue the interviews :	You are talking to your colleague. He tells you that he met the new adjutant that the Colonel Jules has just hired. You are surprised because Jules told you that there would be no new hires this year. You call into question what your colleague has just said :

Solution

Step 7

The results described in this paper show that both H* and H+!H* are used by participants in negatively biased questions. So a first following research question is to try to find out how the two contours H*H% and H+!H*H% could be more precisely distinguished pragmatically.

A second result is that not only the contour H+!H*H% but also the contour H+!H*L% is used in negatively biased contexts. So a second following research question is to determine whether these two contours are simply allomorphic, being two possible realizations for the same pragmatic function, or if they are actually two phonologically different contours. In the latter case, it should be possible to find a type of context where H+!H*L% would be felicitous while H+!H*H% would not be.

For both follow up research questions, both production or perception experiments can be used depending on the focus of interest. Especially, a production experiment would be more interesting if the study means to explore the variability of the realization of the contours. On the other hand, if only the interpretation conditions are at stake, a perception study would generally be chosen.

THANK YOU VERY MUCH FOR YOUR ATTENTION!