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Psychoanalytical study of pitch changes in contrast to the mid frequency line in intonation. Application of PRAAT speech analyzer and the David Liberman Algorithm method.

José María Rembado

I. Introduction.

We explore those fragments of speech in which patients alter a pitch octave of their intonation in contrast to the mid frequency line. Tonal changes can happen: a) discontinuously, in a tonal jump or fall; b) continuously, in a rising or descending slide in intonation (*glissando*).

II. Application of PRAAT and DLA instruments.

1. We focused on two fragments of a session of an 18 year old patient with eating disorders and self aggressive behavior. The first fragment integrates the first minutes of the interview; the analyst remains in silence. The second segment is a part of a brief exchange between the analyst and the patient, after the analyst had referred to the patient's relationship with her father.
2. We applied PRAAT and obtained the image of three sounds as examples.
3. We took measurements of the changes of pitch in contrast to the mid frequency line.
4. We applied a temporary grid of the paraverbal level of the speech acts which establishes the consistency between some sound events of frequency with erotogenicity and defenses.
5. We applied the analysis of the verbal components of speech acts and the analysis of the narration.

Material.

Note: words analyzed by PRAAT are in bold

1.P: (2 minutes of silence) I'm in a bad mood because my dad is coming on Thursday... or Friday... **and I don't... I don't want him to come.** (Silence). He called me all weekend long and I didn't answer. **He's going to say... nothing.** No, I don't know I don't want to see him. My mum is going to Salta today.

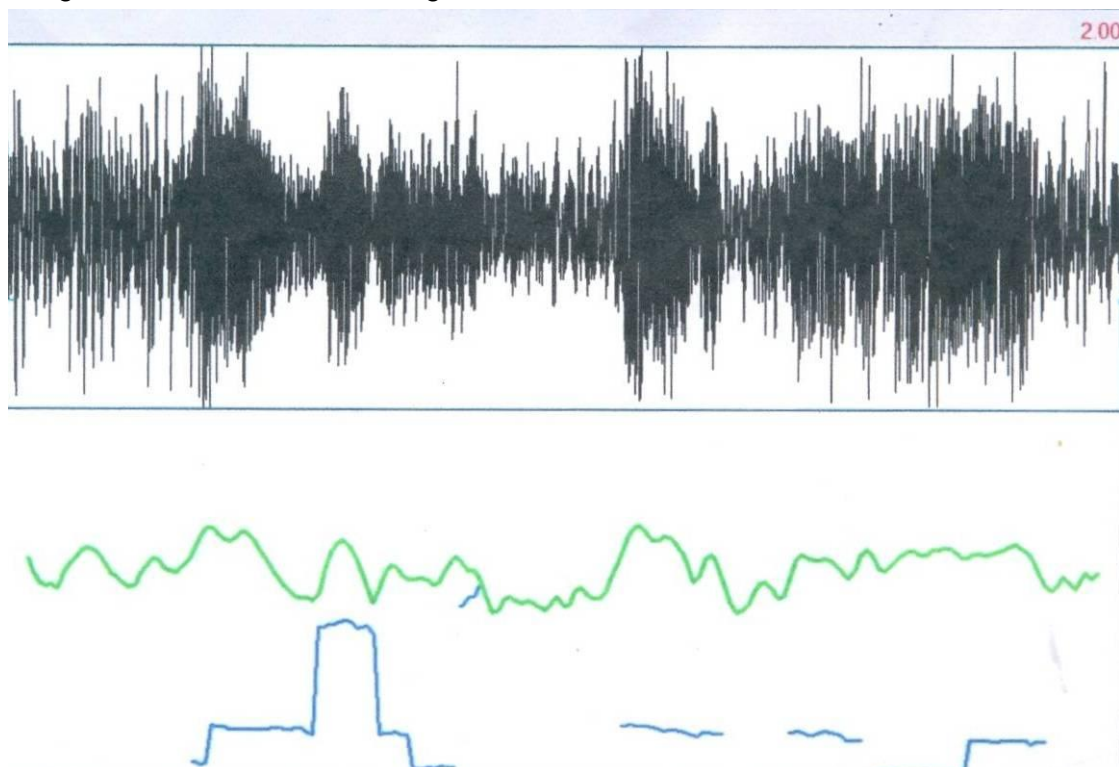
2."A: How does he screw it up?

(Long silence) I don't know, I feel that talking about him is bullshit. I don't know. I don't want to

waste time on him, I don't know. (Brief silence) **I don't know what I'm going to do when he**

comes".

Image A of the chosen audio fragment



And nooo... *I don't want him to come.*

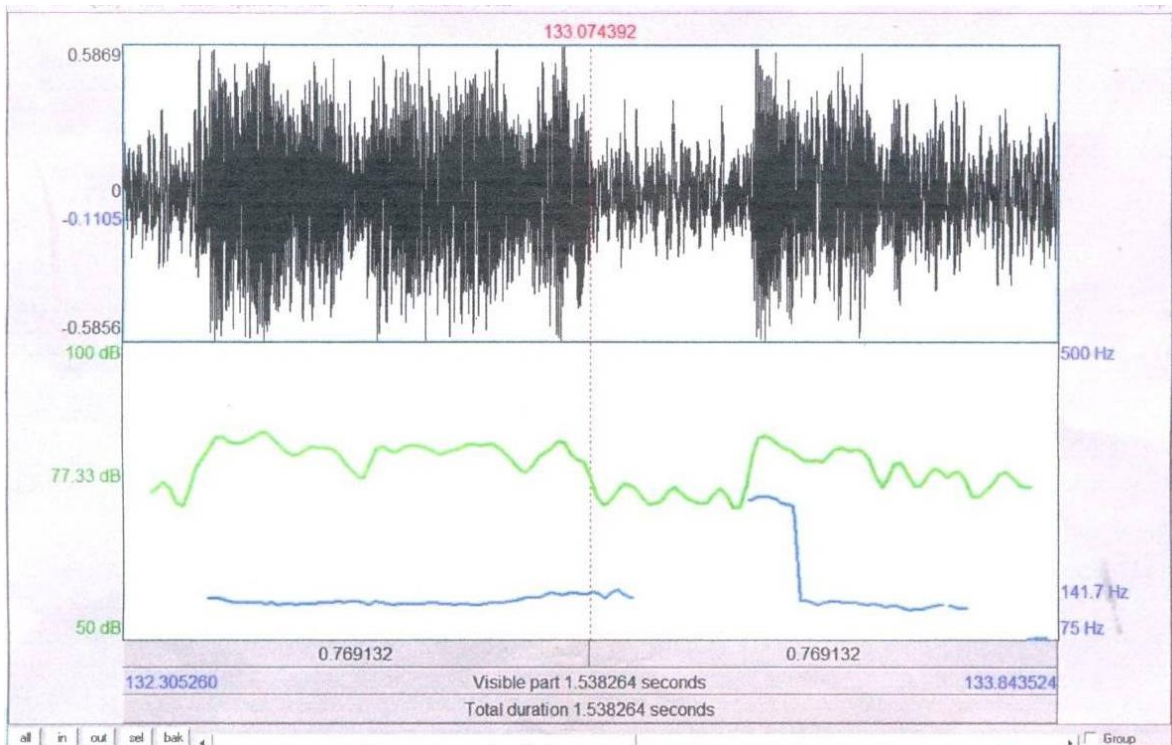
- Notes: 1) words in **bold** are the pitch changes and words in *italics* are the mid frequency line.
2) The blue line corresponds to pitch frequency and the green one corresponds to insensitive frequency.

Measurements of the changes of pitch in contrast to the mid frequency line.

The frequency line starts with "And" ("Y" in Spanish) measuring 86 to 129 Hz. When vocalizing "NOOO" an abrupt tonal change is made, with a continuous and rising slide of an octave, 122 to 245 Hz. It briefly keeps the pitch reached at 247 Hz, to later descend in a continuous manner in an octave, 247 a 122 Hz. This reduction is deepened in a staggered descent of 122 to 80 Hz, after which it bounces with a tonal jump at 280 Hz, where the intonation of the vocal "O" of "NOOO" concludes. So far, the beginning of the mid frequency line descends in the amount of vibrations. The abrupt change of pitch is, first, continuous in a rising and then descending manner and, later, a tonal jump, all of which corresponds to the vocalization of "And nooo". Next, the frequency line is extended in a low vibration frequency, near to 126 Hz, when vocalizing "I don't want him to come".

The mid frequency dominant line is near 130 Hz

Image B of the chosen audio fragment



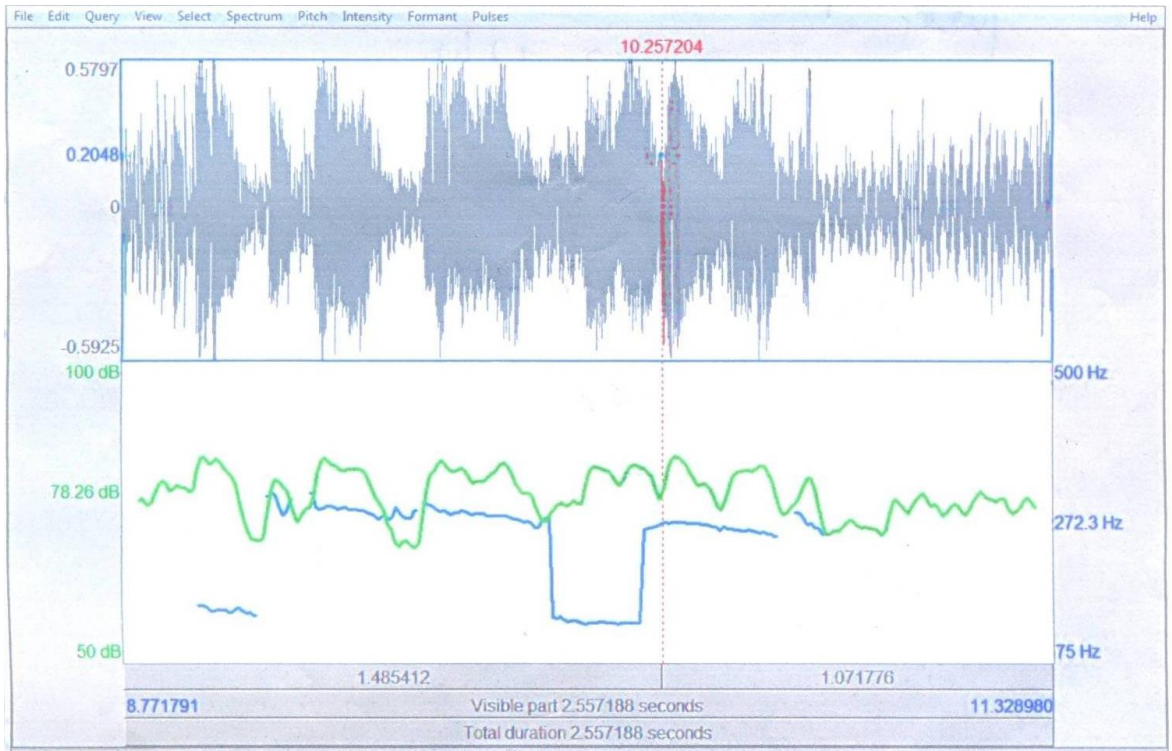
1. *He is going to tell me...* **nothing**
 "Me va a decir... nada"

Note: words in bold are the pitch changes and words in *italics* are the mid frequency line

Descending glissando: She utters the fragment "he is going to tell me" keeping a tonal axis that measures near 138 Hz. She utters the phoneme "N", corresponding to the syllable "NO", forming a small plateau that measures near 270 Hz, to carry out then, over the vocal "o" of «**nothing**» a reduction of the height in a glissando of **266-131 Hz**, while the vocal strings go from being stretched to being swell during the height change mentioned. She completes the utterance of "nothing" intoning the syllable "thing" in 131hz to start descending slightly to 120 Hz.

The mid frequency dominant line is near 130 Hz

Image C of the chosen audio fragment



*I don't know what I'm going to do **when** he comes*
 "No sé que voy a hacer **cuando** venga"

Note: words in bold are the pitch changes and words in *italics* are the mid frequency line

Concave circumflex glissando: She intones the doubt with two segments, she starts near 152 Hz jumping to 311 Hz in «I don't know» («No sé» in Spanish); regarding the cause of the doubt "what I'm going to do now", she intones in a segment that measures near 300 Hz; as regarding what originates the doubt, "when he comes", it produces a concave circumflex glissando (the first descends and then rises) while locating "when" (taking the syllable "cuan" in Spanish). She descends from 280 to 138 Hz and ascends from 131 to 263 Hz. *In the last word "comes", she utters in the beginning in a linear segment that measures near 260 Hz, and in the last part jumps to 286 Hz and descends to 258 Hz.*

The mid frequency dominant line is near 280 Hz

A brief comment about the mid-frequencies lines: The three images are representative of two lines of different dominant frequencies appearing at different times during the same session. Images A and B have the same dominant mid frequencies line, nearly 130 Hz. Image C has a dominant mid-frequency line nearly 280 Hz.

The first two lines of frequencies belong to the first minutes of the interview, when the analyst remained in silence. The third line of frequency is subsequent to a brief exchange between the analyst and the patient, when the last one complained about his father.

In this paper the differences between the mid-frequencies will not be developed. Because been a different issue from the one about tonal changes it requires a different view of the sample as well as a different hypothesis which would help us understand the found differences.

Coordination of pitch changes in contrast to the mid frequency line with erotogenicity, defenses and their status.

First moment. Image A

Events of frequency	Description	Erotogenicity	Defense	State	Function
From 122 to 245 Hz. Continuous and rising slide of an octave of intonation.	Increase of vibrations in a voice which suddenly turns high pitched, expressing a state of anxiety derived from failure of an evasive defense	UPH	Repression + secondary disavowal and identification with a deceitful character	Failed	Complementary
Brief constant pitch at 247 Hz. Pitch maintained briefly.		UPH	Repression + secondary disavowal and identification with a deceitful character	Successful	Complementary
From 247 to 122 Hz. Continuous and descending slide of an octave of intonation, which is deepened in a staggered descent of 122 to 80 Hz.	Loss of vibration in a voice which suddenly turns deep, expressing a state of uncontrollable bitterness	O2	Disavowal	Failed	Main
Rebound with a tonal jump at 280 Hz	High pitched sound indicating the interlocutor to move away, expressing a state of anxiety derived from failure of an evasive defense	UPH	Repression + secondary disavowal and identification with a deceitful character	Failed	Complementary
Continuous frequency line in a low frequency of vibrations,	State of sadness partially stable	O2	Disavowal	Successful/failed	Main

near 126 Hz					
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First moment. Image B

Events of frequency	Description	Erotogenicity	Defense	State	Function
She utters the fragment “he is going to tell me” keeping a tonal axis that measures near 138 Hz.	Continuous frequency line in a low frequency of vibrations	O2	Disavowal	Successful/failed	Complementary
A tonal jump at 270 Hz keeping the measure	Suddenly change tonal keeping the measure. Expressing a state of anxiety	UPH	Repression + secondary disavowal and identification with a deceitful character	Successful/failed	Complementary
Over the vocal “o” of «nothing» a reduction of the height in a glisando of 266-131 Hz	While the vocal strings go from being stretched to being swell during the height change mentioned.	O2	Disavowal	Failed	Main
She completes the utterance of “nothing” intoning the syllable “thing” in 131hz to start descending slightly to 120 Hz.	Continuous frequency line in a low frequency of vibrations	O2	Disavowal	Successful/failed	Main

Second moment. Image C

Events of frequency	Description	Erotogenicity	Defense	State	Function
She intones the doubt with two segments she starts near 152 Hz	Continuous frequency line in a low frequency	O2	Disavowal	Successful/failed	Complementary

	of vibrations				
A tonal jump at 311 Hz keeping the measure	Suddenly change tonal keeping the measure. Expressing a state of anxiety	UPH	Repression + secondary disavowal and identification with a deceitful character	Successful/failed	Complementary
She descends from 280 to 138 Hz	The vocal strings relax State of sadness partially stable	O2	Disavowal	Failed	Complementary
and ascends from 131 to 263 Hz keeping the measure	High pitched sound indicating the interlocutor to move away, expressing a state of anxiety	UPH	Repression + secondary disavowal and identification with a deceitful character	Successful/failed	Complementary
and in the last part jumps to 286 Hz and descends to 258 Hz.	The vocal strings stretch. High pitched sound expressing a state of anxiety	UPH	Repression + secondary disavowal and identification with a deceitful character	Failed	Main

Speech acts.

First moment

1

Speech acts	Erotogenicity	Defense	State	Function
He called me all weekend long and I didn't answer.	UPH	Repression + secondary disavowal and identification with a deceitful character	Successful	Complementary
He's going to say... nothing.	UPH	Repression + secondary disavowal and identification with a deceitful character	Successful	Main

2

(Long silence) I'm in a bad mood because my dad is coming on Thursday... or Friday...	O2	Disavowal	Failed/successful	Complementary
and I don't... I don't	GPH	Repression +	Successful	Main

want him to come		<i>secondary disavowal and identification with a deceitful character</i>		
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Second moment

3

I don't want to waste time on him, I don't know. (Brief silence)	IL	foreclosure of the affection	Successful	Complementary
I don't know what I'm going to do when he comes".	UPH	Repression + secondary disavowal and identification with a deceitful character	Failed	Main

Comment: During the beginning of the session the patients shaws herself evasive as regards dealing with the relationship with her father, she keeps her stand expressing a negative wish (I don't want to see him). Further on the analyst keeps the interest in the subject, the patient substitutes her negative wish by a speculative attitude finally she shaws herself confused by the imminent arrival of the father.

Analysis of the narration.

- 1) We selected three episodes related to the patient's father, a) when he was living in another place, b) when he was with her; c) when she noticed that he'll travel to visit her.
- 2) We arranged a set of narrative sequences in which the elements are related according to two criterions: a) isotopy, b) temporal causal relationship.

1

Flor depends on the money of her paternal grandmother.
When her father travels to visit her, he underestimates her.

IL foreclosure of the affection successful/failed
O2 disavowal failed

2

The father called her and she did not answer.
She does not want to waste time on him.

UPH Repression + secondary disavowal and identification with a deceitful character successful
IL foreclosure of the affection successful

3

She's father is coming son and she doesn't know what she's going to do.
She's in a bad mood

UPH Repression + secondary disavowal and identification with a deceitful character failed
O2 disavowal successful/failed

Results:

- a) Context A: As she was successful in avoiding contact with her father, she speculates with obtaining benefits
- b) Context B: As she failed to avoid her father, she is exposed to his underestimation.

III. Results of the three levels of analysis:

Levels of analysis	IL	O1	O2	A1	A2	UPH	GPH	Dominant
Speech acts. Paraverbal c. <i>First moment</i>			X			X		Dysphoric O2
Speech acts Paraverval c. Second moment			X			X		Dysphoric UPH
Speech acts. Verbal c. First moment						X	X	Euphoric UPH
Speech acts. Verbal c. Second moment	X					X		Dysphoric UPH
Narration: context A	X					X		Euphoric IL
Narration: context B	X		X					Dysphoric O2