

Factivity and prosody in Turkish attitude reports

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1. The ‘Prosodic Factivity Alternation’

- The prosodic structure of certain attitude reports correlates with the availability of the factive inference.

(1) Hey, what’s up?

a. Matrix Nuclear Pitch Accent (NPA) & Factive inference

Dilara [Aybike’nin sigara ictigini] BILİYOR
()_Φ ()_Φ ()_Φ

D. A. cigarette smoke.NMZ knows

Dilara knows that Aybike smokes.

↪ Aybike smokes.

b. Embedded NPA & No factive inference

Dilara [Aybike’nin SIGARA ictigini] biliyor
()_Φ ()_Φ ()_Φ

D. A. cigarette smoke.NMZ knows

Dilara believes¹ that Aybike smokes.

↯ Aybike smokes.

- The **nucleus** is (roughly) the ‘most prominent word’ in the sentence, and an informational center. In production, the nucleus is preceded by a high tone, and followed by a low and flat pitch (see Appendix).
- The prosodic structure of 1b looks like the language default for transitives: The NPA falls on the direct object. Matrix NPA is marked out of the blue.

(2) a. (Aybike)_Φ (SIGARA iciyor)_Φ

broad focus

A. cigarette smokes

Aybike smokes cigarettes.

b. # (Aybike)_Φ (sigara)_Φ (ICIYOR)_Φ

predicate focus or verum

A. cigarette smokes

Aybike smokes cigarettes.

- Contrasts like 1 raise at least two puzzles:

1. Puzzle #1 How does the factive inference arise?

Ordinarily presuppositions are ‘triggered,’ but there does not seem to be a trigger in 1a.
Logical options:

A The inference is encoded in the semantics of the attitude verb. [Hintikka, 1962, a.o.]

B The inference is encoded in the semantics of the embedded clause.

[Kiparsky and Kiparsky, 1970, a.o.]

C The inference arises in the syntactic/semantic composition.

[Schulz, 2003, Özyıldız, 2017]

¹Non-factive reports formed with *bil-* are strictly stronger than ones formed with *san-* (‘believe’) or *düşün-* (‘think’) in that they require the belief to be ‘justified.’

My proposal is a mix between B and C.

2. Puzzle #2 (How) does the availability of the factive inference affect prosodic structure?

– Kallulli [2006]:

If a proposition is presupposed, the clause denoting it can be treated as ‘discourse-given.’

If linguistic material is discourse-given, then it is deaccented.

(3) I didn’t believe it that John left. (#In fact he didn’t.)

(Emb. proposition presupposed & clause given.) [Kallulli, 2006, ex. 4, adapted]

– Wagner [2012], Rochemont [2016], Büring [2016]:

Presupposition and givenness are independent dimensions of meaning. In particular, presupposition does not (necessarily) give rise to deaccenting.

(4) I’m just glad you didn’t run out of GAS.

[Büring, 2016, ex. 7, p. 101]

(Emb. proposition presupposed & not deaccented, so not given.)

So we can not (systematically) make the step from presupposed to prosodic structure.

Among the factors that might affect prosodic structure, two are of interest:

– (As seen above:) Information structure: e.g., given vs. new info.

– Syntactic structure.

* The location of pitch accents is computed within certain syntactic domains.

* Syntactic constituents map onto prosodic constituents.

My story today is this. . .

– The sentences in 1 have different syntactic structures.

* The clause remains in situ in non-factives.

* It raises in factives.

– This feeds into the semantics and the prosody.

(5) a. Syntax: S [_{VP} CP V]

Semantics: *believe*(*p*)(*a*)

Regular prosody mapping: [S [_{VP} CP_{NPA} V]] (embedded NPA)

b. Syntax: S CP [_{VP} ___ V]

Semantics: *p* ∧ *believe*(*p*)(*a*)

Regular prosody mapping: [S [CP [_{VP} ___ V_{NPA}]]] (matrix verb NPA)

2. Background information

2.1. A typology

With respect to factivity alternations, Turkish attitude verbs fall into three classes.

- Alternating verbs: Factive or non factive

- (1) a. Dilara [Aybike'nin sigara ictigini] BILİYOR.
D. A. cigarette smoke.NMZ knows
Dilara knows that Aybike smokes. \rightsquigarrow Aybike smokes.
- b. Dilara [Aybike'nin SIGARA ictigini] biliyor.
D. A. cigarette smoke.NMZ knows
Dilara believes that Aybike smokes. $\not\rightsquigarrow$ Aybike smokes.

- Non-alternating verbs: Always **non-factive**.

These are produced out of the blue with **embedded NPA**.

- (6) a. Dilara [Aybike'nin SIGARA ictigini] dusunuyor.
D. A. cigarette smoke.NMZ thinks
Dilara thinks that Aybike smokes. $\not\rightsquigarrow$ Aybike smokes.
- b. # Dilara [Aybike'nin sigara ictigini] DUSUNUYOR.
D. A. cigarette smoke.NMZ thinks
Dilara thinks that Aybike smokes. $\not\rightsquigarrow$ Aybike smokes.

Givenness accommodation: Matrix NPA triggers an inference of the form “We have previously discussed whether Dilara thinks *p* or not.”

- Non-alternating verbs: Always **factive**.

These are produced out of the blue with **matrix NPA**.

- (7) a. Dilara [Aybike'nin sigara ictigini] UNUTTU.
D. A. cigarette smoke.NMZ forgot
Dilara forgot that Aybike smokes. \rightsquigarrow Aybike smokes.
- b. # Dilara [Aybike'nin SIGARA ictigini] unuttu.
D. A. cigarette smoke.NMZ forgot
Dilara forgot that Aybike smokes. \rightsquigarrow Aybike smokes.

- For completeness:

- Embedded NPA & Factive is possible with alternating verbs, e.g., *bil*—with narrow focus.
- Matrix NPA & Non-factive is complicated.

- The focus of this talk is alternating attitude reports out of the blue.

- **Upshot:** There are verbs that do not alternate (always factive or always non-factive). ARs with these verbs have the expected prosody: NFs : embedded NPA Fs : matrix V NPA

And if you deviate from the default you get discourse effects: narrow focus, or verum.

Prosodic structure is not a cause but an effect of the availability of the factive inference.

2.2. A factive and a non-factive semantic representation

Going back to 1, the claim that 1a is factive but that 1b is not should be grounded.

- (1) a. Dilara [Aybike'nin sigara ictigini] BILİYOR.
 D. A. cigarette smoke.NMZ knows
 Dilara knows that Aybike smokes. \rightsquigarrow Aybike smokes.
- b. Dilara [Aybike'nin SIGARA ictigini] biliyor.
 D. A. cigarette smoke.NMZ knows
 Dilara believes that Aybike smokes. $\not\rightsquigarrow$ Aybike smokes.

- Hypotheses:

H1 Both 1a and 1b have a non-factive semantic representation. That representation is compatible with situations where the belief proposition is true.²

H2 The sentence maps onto two distinct semantic representations: One factive and one non-factive.

- Arguments in favor of H2

1. Intuition:

Offline judgment and production tasks point to the availability of the inference in 1a and its absence in 1b.

2. Non-deniability of entailments:

- (8) a. # Dilara [Aybike'nin sigara ictigini] BILİYOR ama sigara ICmıyor.
 D. A. cigarette smoke.NMZ knows but cigarette smoke.NEG
 Dilara knows that Aybike smokes, #but she doesn't.
- b. ✓ Dilara [Aybike'nin SIGARA ictigini] biliyor ama sigara ICmıyor.
 D. A. cigarette smoke.NMZ knows but cigarette smoke.NEG
 Dilara believes that Aybike smokes, ✓ but she doesn't.

3. Anti-presupposition: Attitude reports with *bil-* are perfectly felicitous in contexts where the embedded proposition is true. Attitude reports with *düşün-* are somewhat odd.

- (9) Aybike sigara iciyor ve...
 Aybike smokes and...
 a. ✓ Dilara [Aybike'nin sigara ictigini] BILİYOR.
 Dilara knows that Aybike smokes.
- b. # Dilara [Aybike'nin sigara ictigini] DUSUNUYOR.
 # Dilara thinks that Aybike smokes.

Traditional accounts of this contrast rely on the existence of pairs of attitude reports s.t.

– both members have contextually equivalent assertions,

– one member of the pair is presuppositional. [Percus, 2006, a.o.]

Unless the explanation is rejected, we have to conclude that *bil-* can be presuppositional, *düşün-* cannot.

²This is the ideal belief verb, bleached of any pragmatic inference as to the uncertainty or the falsity of the belief proposition.

4. Projection:

- (10) Dilara [Aybike'nin sigara ictigini] bil-m-iyor.
 D. A. cigarette smoke.NMZ know-NEG-PRES
 Dilara doesn't know that Aybike smokes. \rightsquigarrow Aybike smokes.

Projection tells us we're dealing with psp, it creates additional questions wrt prosodic structure as non-veridical operators are known to shift it [Beaver and Clark, 2008]

• **Upshot:**

These attitude reports have two semantic representations, one factive and one non-factive.

3. Proposal I: Deriving a factive representation

Assumptions:

- (11) a. Attitude verbs like *bil-* have a non-factive Hintikkan semantics:
 $[[\text{bil-}]] = \lambda w_s. \lambda p_{st}. \lambda x_e. \forall w' [w' \in DOX_{x,w} \rightarrow p(w')]$
 All of the attitude holder x 's alternatives w' to the world w that he lives in are worlds where the proposition p is true.³
- b. Nominalized clauses denote regular propositions:
 $[[\text{Aybike'nin sigara ictigi}]] = \lambda w_s. \text{smoke}(w)(a)$
 The set of possible worlds w at which Aybike smokes.

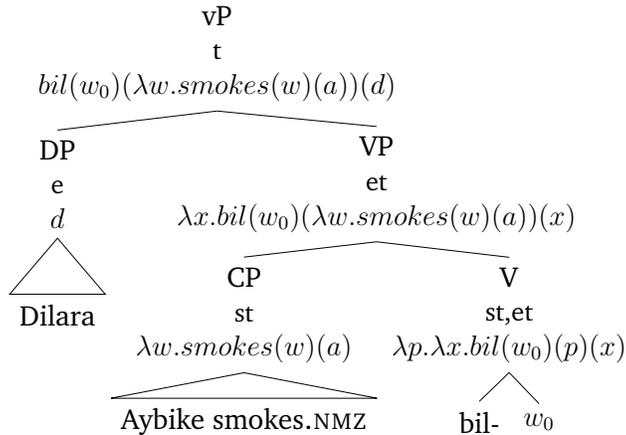
3.1. Capturing the non-factive reading

The example whose truth conditions we are deriving is repeated below:

- (1) b. Dilara [Aybike'nin SIGARA ictigini] biliyor.
 D. A. cigarette smoke.NMZ knows
 Dilara believes that Aybike smokes.

The truth conditions of the non-factive reading come 'out of the box':

- (12) LF for the non-factive attitude report 1b



$[[\text{vP}]] = 1$ iff
 Dilara believes Aybike smokes.

Because our definition of *bil-* is non-factive, the truth conditions for 1b do not entail the embedded proposition (non-factive).

³Compare this to the traditional lexical entries for 'know,' which have a *factive* semantics.

$[[\text{know}]] = \lambda w_s. \lambda p_{st}. \lambda x_e. \boxed{p(w)}. \forall w' [w' \in DOX_{x,w} \rightarrow p(w')]$ (semantic) presuppositional
 $[[\text{know}]] = \lambda w_s. \lambda p_{st}. \lambda x_e. \boxed{p(w) \wedge} \forall w' [w' \in DOX_{x,w} \rightarrow p(w')]$ veridical

3.2. Capturing the factive reading

The example whose truth conditions we are deriving is repeated below:

- (1) a. Dilara [Aybike'nin sigara ictigini] BILİYOR.
 D. A. cigarette smoke.NMZ knows
 Dilara knows that Aybike smokes.

I propose a head F.

(13) Definition of F

$$\llbracket F \rrbracket = \lambda w_s. \lambda p_{st}. \lambda Q_{st,t}. p(w) \wedge Q(p)$$

F composes with a proposition and a predicate of propositions, asserts the proposition and feeds it into the predicate.

F will turn a non-factive report of the form 'S believes p' into the factive report 'p and S believes p.'

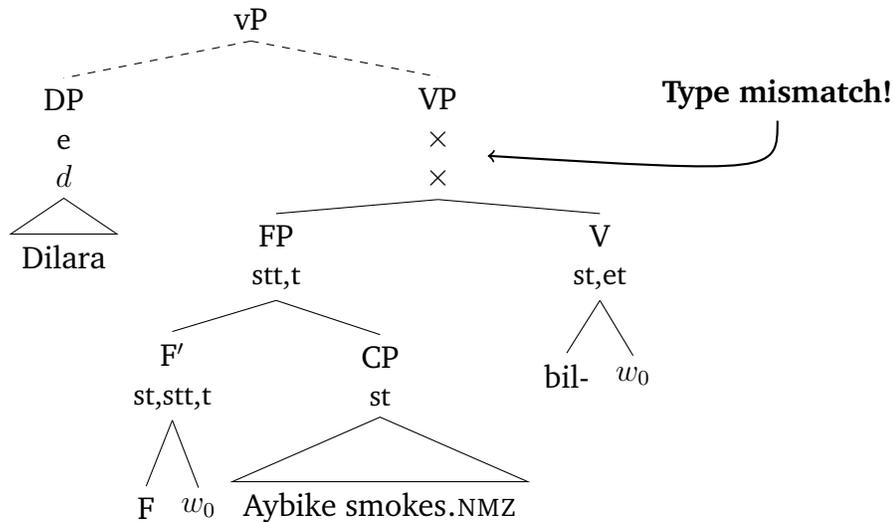
F merges with the embedded clause:

The resulting object is of type st,t (a function from predicates of propositions to truth values).

The attitude verb is looking for a proposition of type st .

This creates a type mismatch and the derivation cannot proceed.

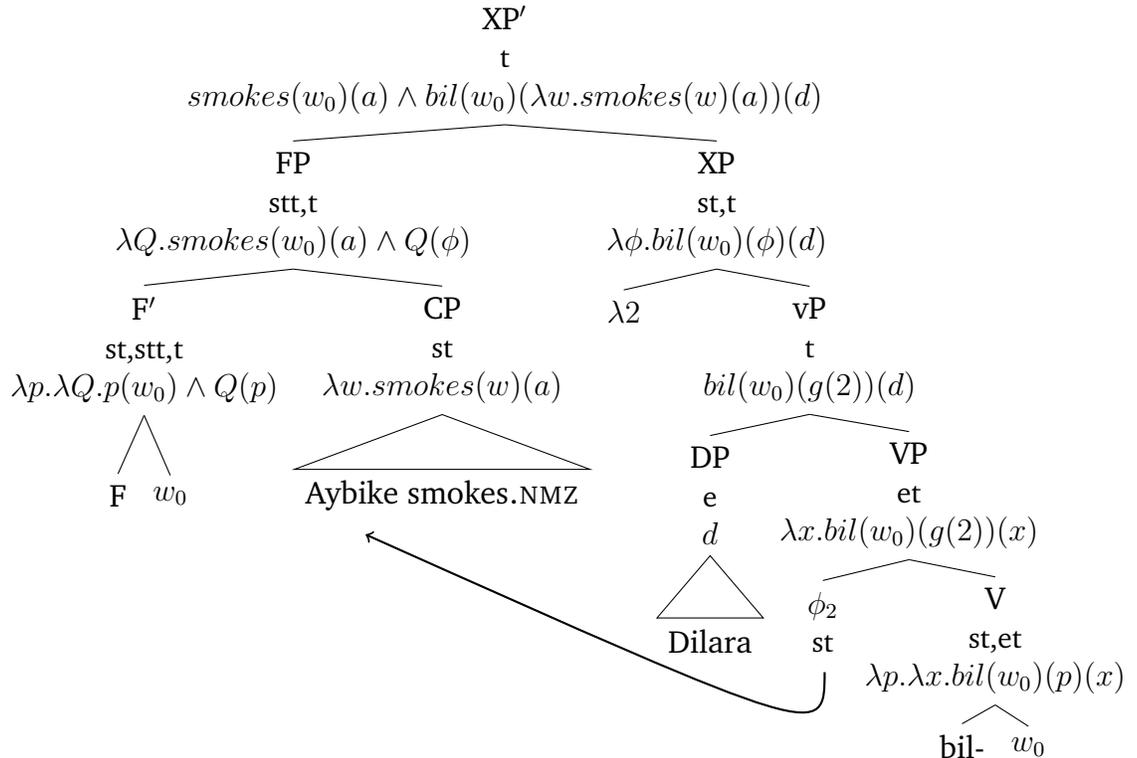
(14) The FP cannot compose in situ



The type mismatch is fixed by raising the FP.
 In raising, the FP leaves a trace that is a variable over propositions (type st). The attitude verb can compose with this object.

(15) LF for the factive attitude report in 1a

a. Structure



b. Truth conditions

$\llbracket \text{XP}' \rrbracket = 1$ iff Aybike smokes and Dilara believes that Aybike smokes.

Because the head F asserts the proposition it composes with, the truth conditions of 1a entail the truth of the embedded proposition (are factive).

Note: Officially, I treat F as a quantifier. The raising mechanism described here is a form of Quantifier Raising.⁴

4. Proposal II: The interface with prosody

- **Background:**

Syntactic structure determines prosodic structure (in part).

- E.g., Kahnemuyipour [2009]: The highest item in v's spell out domain (read, "some specific syntactic domain") is the nucleus.⁵

⁴An official definiton of F might look like:

$$\llbracket \text{F} \rrbracket = \lambda w_s. \lambda p_{st}. \lambda Q_{st,t}. \left[\exists s [s \leq w \wedge p(s)] \right] \wedge Q(p)$$

I believe that this formulation is equivalent to the one in 13 if it assumed that natural language propositions are 'persistent' [Kratzer, 1989]. I thank Simon Charlow for much help with this point.

⁵This assumes that we have an adequate representation about what items remain within that domain,

(16) What's up?

- a. Ali $[_{VP} v$ AYŞE'Yİ öptü] Nuclear stress domain
 Ali Ayşe.ACC kissed
 Ali kissed Ayşe.
- b. Ali $[_{VP} v$ İÇTİ]
 Ali drank

– Pre-nuclear constituents are mapped onto prosodic constituents. [Kamali, 2011, İpek, 2015, Güneş, 2015]

(17) ((Ali) $_{\Phi}$ (AYŞE'Yİ öptü) $_{\Phi}$) $_I$
 Ali kissed Ayşe

Further research: Does the prosodic constituency of the nucleus and post-nuclear material respect syntactic constituency?

• **The prosodic structure of non-factives:**

The nominalization remains within the stress domain. It gets accented.

(18) Dilara $[_{VP}$ [Aybike'nin $[_{VP}$ SIGARA ictigini]] biliyor]
 Dilara [Aybike'nin SIGARA ictigini] biliyor
 () $_{\Phi}$ () $_{\Phi}$ () $_{\Phi}$
 D. A. cigarette smoke.NMZ knows
 Dilara believes that Aybike smokes cigarettes.

• **The prosodic structure of factives:**

The nominalization merges with the head F. It raises and vacates the stress domain.

(19) Dilara $[_{FP} F$ [Aybike'nin sigara ictigini]] $[_{VP}$ __ BİLİYOR]
↑
 Dilara [Aybike'nin sigara ictigini] BİLİYOR
 () $_{\Phi}$ () $_{\Phi}$ () $_{\Phi}$
 D. A. cigarette smoke.NMZ knows
 Dilara knows that Aybike smokes.

The verb is the only phonologically overt item within the domain, and gets accented.

• **Note:** If we assume the Y model of grammar, for this system to work, nominalized clauses must raise in the syntax.

This raises a question about whether movement can be motivated by a type mismatch.

One option: Generate many syntactic structures. Filter out uninterpretable ones.

[S [FP V]] → Type mismatch: Can't interpret, discard.

[S [FP [__ V]]] → Can interpret, keep.

Something to think about: QR must be overt in this system (see also Demirok [2017]).

and what items vacate it. A second question is whether we should allow nuclear stress to be carried out of a phase if an element that it gets assigned moves out.

5. Independent supporting evidence

- **Prediction of the present proposal:**

Some movement operations have an effect on prosodic structure, despite string vacuity.

- The data in 20 support this prediction:

Observation: Not all direct objects host the NPA. Some quantifier phrases do not.

An all-new, broad focus utterance of example 20a, where the direct object is a distributive universal quantifier phrase, has the NPA on the matrix verb.

(20) **Context:**

A: Partide neler oldu?
at the party what all happened?
What all happened at the party?

B: Can MUZİK açtı. Pıtır ŞARAP içti.
Can music played Peter wine drank
Can played music. Peter drank wine.

Target sentences:

- a. Alara HER davetliyi ÖPTÜ. #Alara her DAVETLİYİ öptü.
Alara every guest kissed
Alara kissed every guest. [SMALL CAPS: Secondary locus of prominence]
- b. Alara bi DAVETLİYİ öptü. #Alara bi davetliyi ÖPTÜ.
Alara a guest kissed
Alara kissed a guest.
- c. Alara AYŞE'Yİ öptü. #Alara Ayşe'yi ÖPTÜ.
Alara Ayşe kissed
Alara kissed Ayşe.

- If it is assumed that the QP 'every guest,' undergoes overt QR, this exceptional-looking stress pattern can be explained:

(21) Structure for 20a
[Alara [every guest [_{VP} KISSED]]]

On the other hand, names and indefinites do not need to QR.

(22) Structures for 20b and 20c
a. [Alara [_{VP} A GUEST kissed]]
b. [Alara [_{VP} AYŞE kissed]]

- **Upshot:** The effects of the mechanism that derives factivity and its interaction with prosodic structure are found elsewhere in the language.

6. Remaining issues

- This talk has focused on capturing the interpretation and prosodic structure of attitude reports where the availability of the factive inference alternates.

To capture the facts with non-alternating attitude reports, additional assumptions are required.

This is a general drawback associated with approaches that export the factive inference into the semantics of embedded clauses.

- Turkish has a second clause embedding strategy: Tensed clauses introduced by the morpheme *diye*.

(23) Dilara [Aybike SİGARA içiyor diye] biliyor.
D. A. cigarette smoke DIYE know
Dilara believes that Aybike smokes.

Infelicitous after “Dilara smokes and...” ⇒ no factive reading

- Attitude reports where the embedded clause is a *diye*-clause are always non-factive.
- The stress pattern is the one expected for non-factives.
- This suggests that the head F is ‘picky’—it only composes with nominalizations.

7. Concluding remarks

- In Turkish, all new, broad focus utterances of non-factive attitude reports have embedded NPA, those of factive attitude reports have matrix verb NPA.
- This can be derived if it is assumed that factives have a structure different from non-factives.
- This structural difference accounts for the availability of the factive inference in the composition, and is able to interface with prosodic structure.

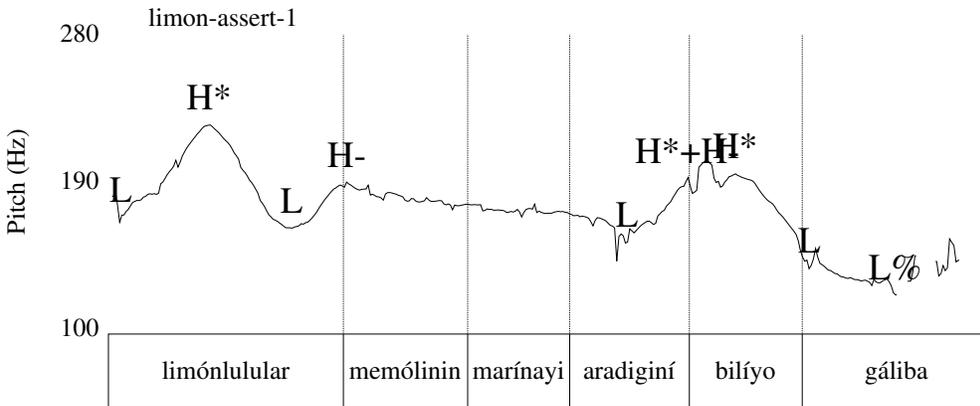
Appendix

Speaker DE, F, 25, Ankara. Data collected March 2017.

(24) Memoli looked for the marina. (Assert)

- a. ((limónlulular)_ϕ (memólinin marínayi aradiginí)_ϕ (bilíyor galiba)_ϕ)₁
 Limonlu.DEM Memoli marina look for know ADV
 The people of Limonlu know that Memoli is looking for the marina, I think.

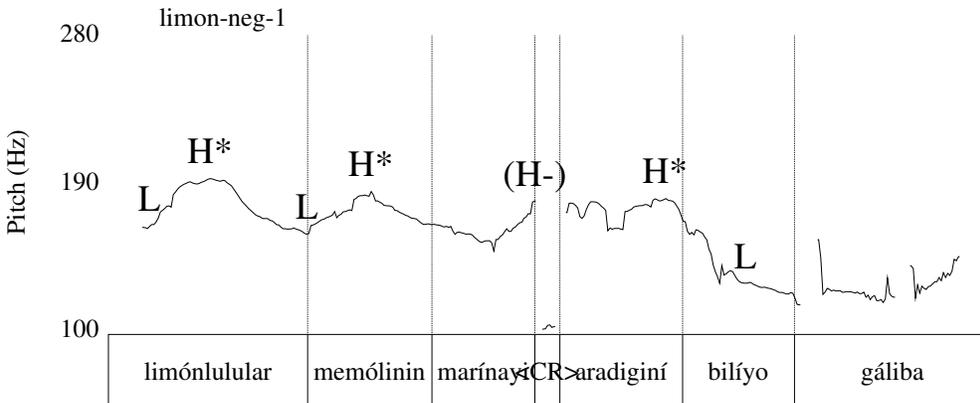
b. Pitch track for 24a



(25) Memoli hasn't looked for the marina. (Deny)

- a. ((limónlulular memólinin marínayi)_ϕ (aradiginí bilíyor galiba)_ϕ)₁
 The people of Limonlu know that Memoli is looking for the marina, I think.

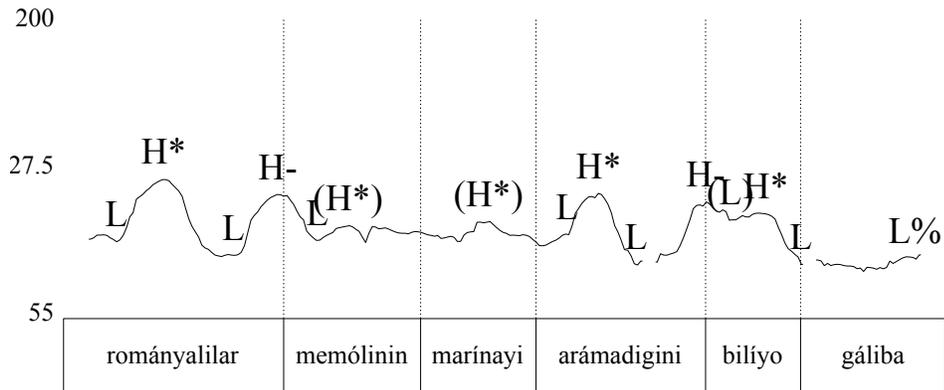
b. Pitch track for 25a



Speaker DÖ, M, 27, Ankara. Data collected November 2017.

- (26) a. ((rományalılar)_ϕ (memólinin marínayi ará-ma-digini)_ϕ (bilíyo gáliba)_ϕ)₁
 Romanians Memoli marina look.for-NEG-NMZ know ADV
 The Romanians know that Memoli isn't looking for the marina, I think.

b. Pitch track for 26a



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