Observations on F0 contours as a cue for turn-yielding in Bosnian multi-party conversations

Posmatranja o konturama fundamentalne frekvencije kao signala za naznačavanje završetka govora u razgovorima na bosanskom jeziku

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Apstrakt

Jezički signali za naznačavanje kraja govora na raznim jezicima već su bili tema više istraživanja. Većina prijašnjih studija na ovu temu se slaže da su varijacije fundamentalne frekvencije glasa (F0) relevantne za naznačavanje da trenutni govornik završava govor. U ovom prilogu se bavimo ovim pitanjem koristeći primjere iz stvarnog razgovora na bosanskom jeziku. Pri tome polazimo od već objavljenih rezultata o konturama fundamentalne frekvencije koje naznačavaju završetak govora i koristimo ih kao hipoteze pri analizi razgovornog materijala. Naša posmatranja potvrđuju regularnosti u varijacijama fundamentalne frekvencije na kraju završenih izjavnih rečenica. Također nalazimo da učesnici u konverzaciji upotrebljavaju fundamentalnu frekvenciju kao parametar za signaliziranje završetka govora.

Abstract

Cues for signalling turn end in conversation are well studied across several languages. Most previous work on this topic agrees that fundamental frequency (F0) variations are relevant for indicating whether a speaker is about to complete the turn. In this paper we investigate this question on examples from real conversations in Bosnian language. We use previously reported findings on turn final F0 contours as a starting point and try to identify these in our data. Our observations confirm that there are regularities in F0 movements at the boundaries of complete declarative utterances, and that participants in conversation use and orient to these as cues for turn delimitation.

Ključne riječi: prozodija, intonacija u konverzaciji, razmjena razgovornih sekvenci, projekcija završetka govora, fundamentalna frekvencija (F0)

Key words: prosody, intonation of talk-in-interaction, turn taking, turn end projection, fundamental frequency (F0)

Background

For the most part, turn exchange between speakers in conversations proceeds smoothly without long gaps between turns or speaker overlaps (Sacks et al. 1974). Smooth turn exchange between speakers in conversations implies that there exist resources of some kind that enable speakers to coordinate turn exchange in such manner that occurrence of gaps and overlaps is minimized. Previous work has established prosody as one important resource for coordination of turn exchange. A lot of studies in different languages have investigated different prosodic features as cues to turn end projection (Duncan 1972; Local et al. 1985; Cutler & Pearson 1986; Ford & Thompson 1996; Schegloff 1996; Wells & Peppé 1996; Koiso et al. 1998; Schegloff 1998; Selting 1998; Wells & Macfarlane 1998; Fox 2001; Caspers 2003; Wennerstrom & Siegel 2003; Walker 2004; Edlund & Heldner 2005; Ishi et al. 2006; Wesseling et al. 2006). Most of these studies find F0 excursions relevant for projection of turn ends. To add to this picture we analyse F0 contours at potential and real points of turn completion and make some initial observations on their relevance as turn finality cues. While these observations

remain preliminary, we discuss them in the context of previous work on prosody in this language as well as that of use of prosody as turn taking management resource.

Some predictions from previous work

Godjevac's (2006) work on transcribing intonation in Serbo-Croatian (SC) offers some predictions on what turn final pitch contours could look like. Using ToBI framework (Beckman et al. 2006) for describing pitch contours she identifies five different pitch shapes that occur at ends of intonational phrases and associates them with different utterance types (declaratives, imperatives, different types of questions). In this paper we limit our observations to declarative utterances.

Several previous studies on SC have characterized declaratives by final lowering of pitch (Lehiste & Ivić 1986; Inkelas & Zec 1988). In Godjevac's analysis the falling declarative pattern is characterized by L% boundary tone that "signals finality " and occurs at the last syllable of the intonational phrase.

Final lowering has attracted some attention with respect to its inter-relationship with lexical pitch accents of SC. While some studies assume that lexical pitch accent is neutralized by the final lowering in declaratives (Lehiste & Ivić 1986; Inkelas & Zec 1988), Godjevac states that the distinction between accents is still preserved, although they are modified by the L% boundary tone: the presence of L% tone further lowers falling accents leading to creaky voice, while it keeps rising accents level.

If this pitch contour is found to delimit intonational phrases in declarative statements as Godjevac reports, then it is potentially also used and oriented to by speakers in spontaneous conversations to mark and understand whether the ongoing turn is about to finish. Therefore we ask two questions:

1. Can falling F0 contour described by Godjevac be found in declaratives in spontaneous talk?
2. If so, is it used and oriented to by conversation participants as resources for turn exchange management?

We present F0 contours found in the turn final position in declarative utterances in our data and discuss them with respect to these questions.

Data

The data for this initial study comes from 40 min. of TV programme "Face to face". As the name says it is a face to face discussion involving three male speakers, the TV presenter and two guests. This programme seemed suitable for initial analysis because the data contains a variety of different conversational modes. The discussion starts with a recording of phone conversation between programme participants. It contains longer narrative sections by both participants, as well as free conversational exchange between participants without presenter's intervention. The data was downloaded from the internet and an audio file was created from the video. The conversation was then orthographically transcribed using the linguistic annotation tool ELAN[1].

Observations on turn final F0 shapes in spontaneous conversation

By turn final position, we mean a unit preceding the turn boundary where speaker change occurs. Next speaker can start either during the current speaker's speech in overlap or after the current speaker has completed his turn. We are concerned with smooth turn taking, i.e. with turns that start upon current speaker's completion and not in overlap.

[1] http://www.lat-mpi.eu/tools/elan/

The contour found at the end of most turn final declaratives in the data is the falling F0 contour where F0 falls to the bottom of the speaker's pitch range. It is exemplified in the pitch track in Figure 1.

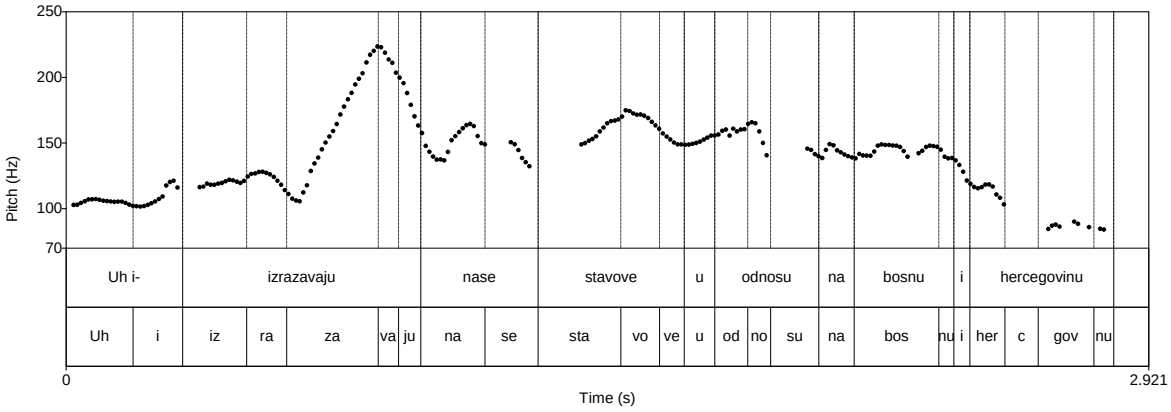

Figure 1: Turn final declarative contour

The pitch track in Figure 1 is the final part of the utterance given in Extract 1 that ends the extended turn of the speaker Bešlagić. The extended turn is followed by Presenter's turn addressing Pračer.

Extract 1: Final declarative of an extended turn

Bešlagić: Meni je drago što smo se danas evo prvi puta nakon eto šesnaest godina vidjeli

I'm glad that we are meeting today, for the first time after sixteen years

i čini mi se i moj stav i njegov stav Uh Su još uvijek, još uvijek ja bi reko jako aktuelni

and it seems to me that both my and his opinion Uh Are still still I would say very current

jer evo to su trenuci koji su

because these are the moments that

-> **uh i- izražavaju naše stavove u odnosu na Bosnu i Hercegovinu.**

-> ***uh i-, express our opinions related to Bosnia and Hercegovina.***

Presenter: Gospodine Pračeru zašto ste toliko navaljivali na autonomiju.

Mister Pračer why did you press so much for the autonomy

As the Figure shows, the F0 falls towards the end of the unit. More precisely, the fall starts on the final syllables of the penultimate phonological word (*bosnu i*) and reaches the low at the final syllable of the final phonological word in the phrase. Although it is not possible to present all turn final declaratives from our data, this falling F0 contour is prevailing in this position.

There is one instance, however, in which no such falling contour is found at the place where speaker change occurs. This is the highlighted utterance in Extract 2.

Extract 2: Preface to the narration

Pračer: Ako dozvolite (0.9) prvo jedan kontekst što se tiče granatiranja .hhh (0.4) Živinica.

If you allow (0.9) first a context regarding shelling .hhh (0.4) Živinice

-> **Tačno učestvovo sam u tome, ne želim da to izbegavam**

-> ***That's true, I took part in it, I don't want to deny that***

Presenter: Kako ste učestvovali u bombardovanju Živini[ca]

How did you take part in bombarding Živini[ce]

Pračer: [Uh] sedio sam u avionu i pokazao objekat koji treba da se granatira

[Uh] I was sitting in the airplane and showed the object to be shelled

Presenter: Bili ste u avionu i bombardovali

You were in the airplane and bomarded

Pračer: raketirali

Rocketed

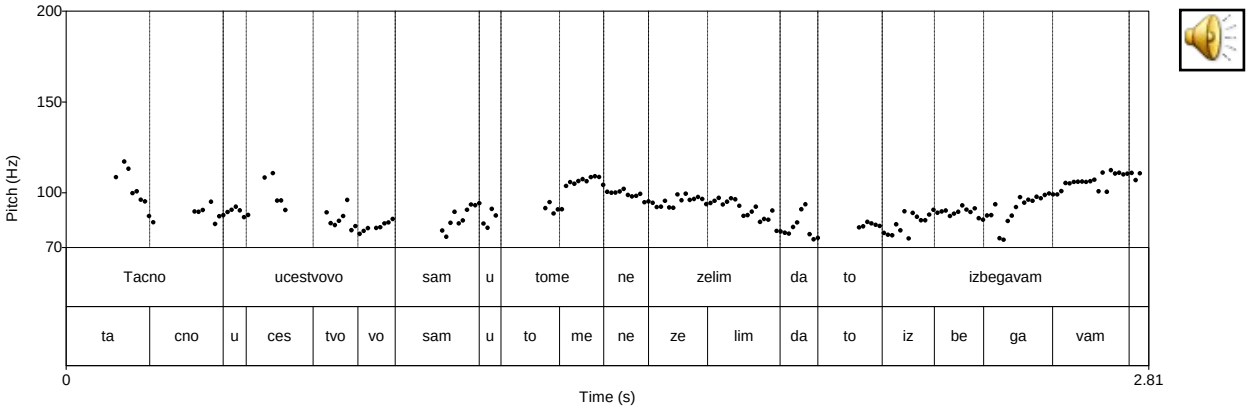

Figure 2: Rising F0 in a turn final declarative

The F0 contour of the highlighted utterance from Extract 2 is given in Figure 2. F0 contour of this utterance differs from the falling contours in turn final declaratives above. Both the potential completion point (*Tačno učestvovo sam u tome*) and the actual one (*ne želim da to izbegavam*) are characterized by rising F0 on the last phonological words (*tome* and *izbegavam*). In both words the rise starts on the post-stressed syllable. In *tome,* however, the rise starts reaches its peak on the same post-stressed syllable while in *izbegavam* the peak is reached on the final syllable of the word (syllable after post-stressed one). The range of F0 rise for *izbegavam* is from 78.65 to 110.43 Hz while that of *tome* is from 91.54 to 107.02 Hz. The pitch range of this speaker is 70-200Hz.

The shapes of these contours most resemble the rising H% tone postulated by Godjevac. This rising tone aligns with the last syllable of the last word in the intonational phrase. According to Godjevac's prediction H% would be found in prosodic questions[2] or at places where turn continuation is projected. There is no evidence that this utterance is treated as question, so this could be a continuation rise. However, if this was a continuation, wouldn't Presenter's incoming be treated as problematic as it is placed exactly at the point where more to come is projected?

[2] Godjevac defines prosodic questions as utterances with the semantic force of a question, but syntax of a declarative statement.

There is no evidence in the conversation sequence that Pračer treats this Presenter's incoming as problematic. He answers Presenter's question, thus orienting to Presenter's incoming as a legitimate incoming, not as a threat to his turn. This situation may seem puzzling. Although F0 contour signals that Pračer will continue, there is speaker change without problems at the same place. Consideration of pragmatic context clarifies this observation.

Pragmatically, Pračer's utterance is embedded in a preface to narration. Although the utterance could be a pragmatically complete unit in another context, it is not so in this case. Pračer has been accused of taking part in shelling by Bešlagić and although the presenter asks him a question unrelated to this event, he is insisting on clarifying it. Therefore, Pračer's announcement that he wants to explain a context in which shelling has occurred indicates that he will give more background than only admitting that he took part in it which projects an extended turn to follow. In this way he pragmatically projects more to come and accompanies this by intonational projection of continuation by rising F0. In this way he reserves the right to the turn for a long narration.

Having reserved the turn both pragmatically and prosodically, Pračer can make space for others to interfere without treating their incomings as a threat. In the further sequence not shown here, he indeed not only responds to presenter's questions but also allows the other participant to come in for a short turn. However, he then claims his turn back for completing this narration, which is explicitly accepted by both other participants.

This example suggests that rising F0 contour at the end of declaratives is used if speakers want to signal that turn will be continued. If intonational continuation projection is accompanied by continuation projection on other linguistic levels, in this case pragmatics, a speaker can delay his turn completion without loosing the right to the turn.

Conclusion

Our observations show that F0 shapes in turn final intonational phrases of declarative statements conform to the pattern predicted by Godjevac (2006). Declaratives in spontaneous conversation are characterized by a final fall of F0 to the bottom of the speaker's range. The fall starts on the penultimate phonological word and reaches the bottom of the speaker's range on the last syllable. This contour is exactly what Godjevac calls L% boundary tone.

Our next question was whether conversation participants treat this contour as a signal for turn end. Analysis of the declarative where no such contour is found turn finally suggests that this is the case. If there is more talk to come, the speaker would mark this by rising F0, regardless of whether the continuation is immediate or not.

These initial observations suggest that conversation participants use F0 movements at the boundaries of declarative utterances for turn exchange management. These findings are in line with findings of other studies on other languages. However, it is important to note that although F0 excursions are relevant as turn end cues, they are not the only resources for signalling ends of turns. Further investigation of more data is needed in order to establish to what extent observed F0 contours are used for this purpose, as well as to show how they interact with other linguistic modalities of spoken discourse (syntax, semantics, pragmatics) and non-linguistic conversational modes (gaze, gesture, etc.).

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