When prosodic distribution meets syntactic derivation: wh-questions in Italian

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1. Introduction. In several languages, successive-cyclic movement of a wh-phrase out of an embedded clause leaves a syntactic or morphological reflex in intermediate positions (see Abels 2012, Citko 2014). Phonological evidence for successive cyclic movement has been provided from tonal alternations in Kikuyu (Clements 1984, Haïk 1990) and in Asante Twi/Akan (Korsah & Murphy 2015). In this paper we argue that also prosody is sensitive to the derivational history of a wh-phrase: in an intonational language such as Italian, the assignment of the nuclear pitch accent (NPA) tracks the intermediate steps of wh-movement.

2. Nuclear pitch accent assignment in direct wh-questions. Ladd (1996) observed that in Italian direct wh-questions, the wh-element does not bear the nuclear pitch accent (NPA), even though it should qualify as focus. This observation was confirmed in the experimental studies by Marotta (2001, 2002): with bare wh-elements (with the exception of perché ‘why’), NPA is assigned to the lexical verb adjacent to the wh-element.

In order to investigate the placement of NPA in wh-questions, we carried out a production experiment in which 10 native speakers of Tuscan Italian read out 12 pairs of stimuli like (1a,b), featuring short- and long-distance wh-movement (along with 24 fillers).

(1) a. [CP A chi hai [SP detto t [CP che ti hanno [VP rubato la macchina]]]]
   to whom have.2SG said that you.DAT have.3PL stolen the car?
   ‘To whom did you tell that your car was stolen?’

   b. [CP A chi ti ha [SP detto [CP che hanno [VP rubato t la macchina]]]]
   to whom you.DAT have.3SG said that have.3PL stolen the car?
   ‘From whom did s/he tell you they stole the car?’

The stimuli were preceded by a short description of the context; to control for information structure, in each pair the description was identical for both stimuli. We collected, ToBI-transcribed, and analysed a total of 478 target sentences: 10 speakers x 12 items x 2 conditions (short/long movement) x 2 disfluency-free repetitions (when available). We transcribed as NPA the rightmost fully flagged PA, after which the pitch contour is extremely compressed or totally low and flat until the final boundary tone (optionally realized as L-H% in our data). Our intonational transcription is supported by the duration analysis: the σ of the lexical verb of the embedded clause is extra-long when associated with NPA.

The NPA distribution is reported in Fig.1. A mixed model revealed that NPA is significantly more likely (p<.001) to occur on the embedded verb in case of long-distance movement (1b) than in short-distance movement (1a). This evidence shows that the placement of NPA is sensitive to the derivational history of the wh-element: NPA can (optionally) be assigned to the embedded verb only if the wh-element has been extracted from the embedded clause.

3. Sensitivity to the base position? The next step is to determine which element(s) of the wh-chain are relevant for prosody. A first possible hypothesis is the following: assuming that the wh-phrase is inherently focal, NPA assignment should target the wh-phrase in the position where it is initially merged (indicated as t in (1a,b)); but since the wh-phrase has moved away,
NPA cannot be assigned to the trace (which must remain unpronounced), and it is ‘passed on’ to the adjacent element, i.e. the lexical verb. This line of analysis is problematic for two reasons: a) it violates the widespread assumption that traces are invisible at PF (see Nespor & Vogel 1986, a.o.); b) it cannot account for the possible assignment of NPA to the matrix verb in long wh-extraction (36% in our data). We carried out a second production experiment to rule out this hypothesis. The stimuli included 7 pairs of sentences like (2a-b), featuring two syntactic conditions: wh-movement of a noun complement (2a) and wh-movement of a verbal complement (2b). The two sentences in each pair were introduced by the same context description. 12 native speakers of Italian read out the stimuli.

(2) a. Di chi hai comprato [un romanzo t] nella nuova libreria? of who have.2sg bought a novel in-the new book shop
   ‘By whom did you buy a novel in the new book shop?’

   b. A chi hai comprato t [un romanzo] nella nuova libreria? to whom have.2sg bought a novel in-the new book shop
   ‘To whom did you buy a novel in the new book shop?’

We collected and analysed 336 target sentences (7 items x 2 conditions x 2 repetitions x 12 speakers). Our results show that in case of extraction of the noun complement (2a), NPA is never assigned to the N head, which is adjacent to the base position of the wh-PP. In both syntactic conditions, NPA falls on the lexical verb. This evidence leads us to discard the hypothesis that NPA is sensitive to the base position of the wh-phrase.

4. **Movement through phase edges.** Our account is based on two syntactic hypotheses: (i) assuming that phases (in the sense of Chomsky 2001) are cyclic domains, wh-movement must pass through the edge of every vP and CP phase in between the base (External Merge) position and the final landing site (see Abels 2012 for discussion); (ii) every time the wh-phrase lands in a phase edge, it shares the wh/focal feature with the local phase head (v° or C°). Crucially, this holds for *each intermediate landing site*, as manifested for vP by wh-agreement in Chamorro (Chung 1994, 1998) and by soft mutation in Welsh (Willis 2000), and for CP by Complementizer alternations in Irish (McCloskey 2001). At the prosodic level, we assume that (iii) NPA is assigned to an element bearing the wh/focal feature, and (iv) functional elements tend to resist NPA assignment (see Selkirk 1984, a.o.).

In case of short movement (1a), the wh-phrase moves through the edge of the matrix vP and lands in the edge of the matrix CP; by feature-sharing (ii), the wh/focal feature is also specified on the matrix v° and C°. By (iv), the prosodic computation looks for a lexical element bearing the wh/focal feature to assign NPA. The bare wh-phrase is a functional element; C°, after T-to-C raising, hosts the auxiliary, also a functional element; the only lexical element endowed with the relevant feature is the verb in the matrix v°, hence NPA targets this position. In case of long-distance extraction (1b), the wh/focal feature is present on the v° and C° heads both in the embedded and in the matrix clause. In the light of the above reasoning, NPA can be assigned to either the lexical verb in the matrix vP or the lexical verb in the embedded vP. This optionality can be captured by assuming that the wh/focal feature on intermediate landing sites may be disregarded by the prosodic computation. When the wh-phrase is a noun complement (2a), N°, though lexical, does not bear the wh/focal feature since it is not a phase head: by (iii) it is not eligible for NPA assignment. In both (2a) and (2b), the only element able to bear NPA is again v°, hosting the lexical verb.

Time permitting, we will also discuss the results of a third production experiment on lexically restricted wh-elements and perché (‘why’), and show how our proposal can be extended to account for their different behaviour with respect to NPA assignment.