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Timing and Prosody of Lexical Repetition: How Repeated Instructions Assist Visually Impaired Athletes' Navigation in Sport Climbing

Terms of use:

'Sale sale sale sale': Instructive uses of repetition in auditorily guided sport climbing with visually impaired athletes

Abstract

This article investigates the functioning of auditory guidance implemented through lexical repetition in *paraclimbing* with visually impaired climbers. Based on systematic multimodal analysis of guide-climber interactions during indoor training sessions, the article shows how guides use lexical repetition to ensure online calibration of the direction and length of climbers' ongoing bodily movements as they aim at planned foot- and hand-holds. The analysis focuses on the emergent production of repetition in conjunction with the progressive unfolding of the climbers' embodied actions as well as with potentially critical tactile contacts occurring while they move toward the target-hold. The timing and the prosodic properties of repetition are shown to play a prominent role in providing the visually impaired climbers with relevant auditory sensory cues, enabling them to navigate the route as well as to correctly interpret haptic feedback concerning the affordances of the artificial rock face. Data are in Italian with English translation.

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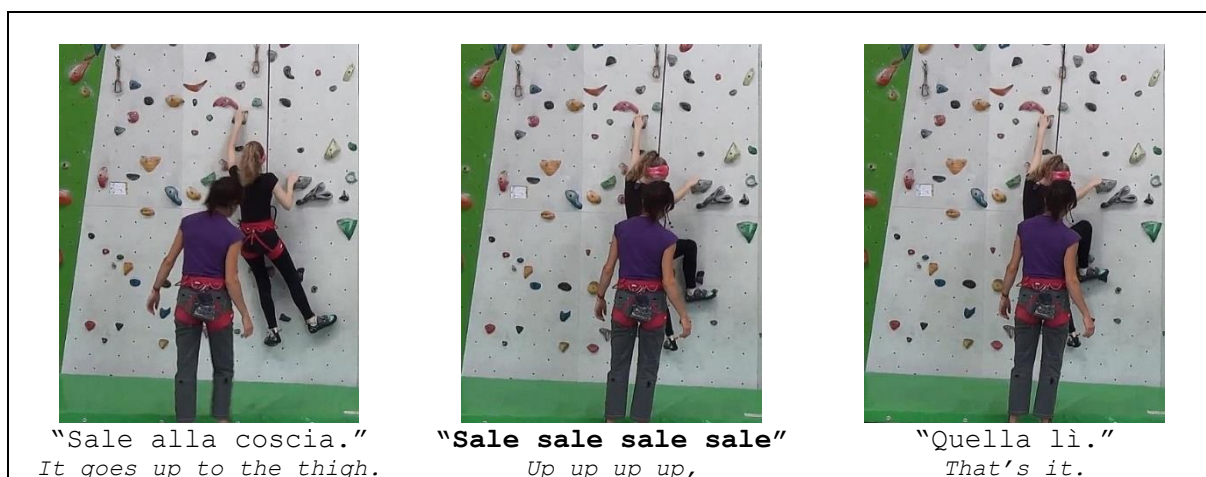
1. Introduction

Repetition is a pervasive and universal feature of language and a fundamental semiotic mechanism (Brown, 1999) extensively studied in linguistics and cognate disciplines. It has been proposed that "the whole of linguistics can be regarded as the study of repetition, in that language depends on repeated patterns" (Aitchinson, 1995:16). As such, repetition is also endemic in talk-in-interaction (Norrick, 1987), where it assumes a range of forms which can be summarized with a few basic criteria. Depending on whose talk is repeated, a major distinction can be drawn between same-speaker (or auto- or self-) and other-speaker (or etero-) repetition (also termed "monological" and "polyphonic" repetition in Bazzanella, 1999, 2011). *The present study deals with same-speaker repetition*. A further categorization concerns what Tannen (1989) terms the "scale of fixity", along which repetition can be categorised as exact or partial (the latter also termed "repetition with variation"*; see Aitchinson, 1995:19), depending on whether the repeated units appear in the same or in a changed form relative to their "first saying" (Wong, 2010)*. In this article, we are mainly concerned with cases of exact repetition*, although an instance of repetition with variation will be described (see § 4.1.). A third respect in which forms of repetition can be distinguished concerns the type of linguistic unit that is repeated. Prior literature has pointed out that repetition may affect both the segmental (morpho-syntactic) and the supra-segmental (phonetic) levels of linguistic production (Couper-Kuhlen, 1996; Curl, Local and Walker, 2006*). The present study deals with the repetition of single lexical items appearing in the same segmental form*. Also, the study identifies recurrent patterns in the prosodic formatting of series of

repeats appearing in immediate succession. In this regard, *the article concerns specifically instantiations of series of repeats forming part of the same turn constructional unit (TCU).*

To summarize, the object of investigation of this study is *same-speaker* repetition occurring in the form of *series of repeats* of the *same lexical item* uttered in *immediate succession within the same TCU*. Drawing on conversation analysis (Sidnell and Stivers, 2012), this article engages in the detailed analysis of repetition within instruction sequences in auditorily guided sport climbing sessions with visually impaired climbers, expanding on previous investigation of this setting (Anonymous & Anonymous, 2020).

Extract 1 illustrates the context in which the phenomenon is typically observed in the data.

Extract 1. The context of occurrence of repetition in auditorily guided climbing (see § 4.2, Extract 6 for transcript and analysis).

| "Sale alla coscia." | **"Sale sale sale sale"** | "Quella lì." |
| *It goes up to the thigh.* | *Up up up up,* | *That's it.* |

The analysis presented in the following sections of the article focuses on the design, timing, and sequential organization of repetition in relation to the climbers' embodied actions. Also, given the widely recognised importance of *auditory affordances* (Steenson and Rodger, 2015) in visually impaired navigation both in ordinary (Saerberg, 2010) and in sports settings (Powis, 2018), the study pays particular attention to the prosodic properties that give repetition its perceptual relevance for the visually impaired climbers.

The article is organized as follows. In Section 2, we provide a detailed description of the materials and methods of the study. In Section 3, we discuss prior CA research on self-repetition. Section 4 provides the results of the analysis. More specifically, in § 4.1, we illustrate the formats of series of repeats in the data; in § 4.2, we analyse the sequential and simultaneous organization of series of repeats relative to the climber's embodied action and its instructive significance; in § 4.3, we investigate the specific instructive function of series of repeats as a means to achieve continuance and calibrate the duration of the climber's embodied

4

action with a focus on timing and prosody; in § 4.4, we illustrate the use of series of repeats to implement correction. In Section 5 we discuss the main findings of the study and draw conclusions.

2. Materials and methods

2.1. Setting

Sport climbing involves ascending a rock face or artificial wall by using hands and feet to anchor the body and pull it upwards along a route by using holds for hands (*handholds*) and feet (*footholds*). Thanks to the increasing availability of facilities for climbing in urban environments, and to enhanced accessibility and safety of indoor climbing (compared with rock climbing), this sport is gaining in popularity also amongst disabled persons, as proved by the increased participation of athletes with sensory and motor impairments in paraclimbing, also at competition level. In this context, climbers with visual impairments are assisted by guides who *read* the route on their behalf and verbally convey the location of the holds available at each stage of the ascent.

The division of roles and responsibilities within the guide-climber dyad (to which a further participant responsible for belaying the climber's safety rope may be added) is reflected in the participants' spatial arrangement shown in Extract 1, constituting a control formation (*C-formation,* see Cekaite, 2010) whereby the guide, who stands facing the climbing wall, monitors both the climber and the route layout. Within this spatial configuration, the participants have asymmetrical access to the climbing space – the guide being the only participant who sees the route, while the climber experiences it through haptic and kinaesthetic sensation.

Auditorily guided climbs are accomplished stepwise, as the climber attains one new hold at a time once the guide has verbally conveyed its location. This gives the climb a distinctive sequential organization which is achieved through the alternation of verbal *instructions* and embodied *instructed actions* (Garfinkel, 2002) distributed between guide and climber, respectively (for a more detailed analysis of instruction sequences in guided climbing, see Anonymous and Anonymous, 2020).

2.2. Participants

Participants are three climbers, among which two have a severe vision impairment and one is blind, and a trainer in the role of guide (hereafter, 'guide'). At the time of the data collection, all participants had been

practicing sport climbing at competition level for several years. They were intensively training in view of the upcoming summer paraclimbing championships, focusing particularly on the guidance technique they would have employed during the competitions.

The participants took part in the study on a voluntary basis. They gave their consent to both the recording and treatment of data according to the law in force at the time of the data collection (Italian data protection law 2013/196, later replaced by UE GDPR 2016/679). To ensure that all participants had equal access to the recruitment process, all the documents concerning aims and procedures of the study and the privacy policy were provided both in hard copy and in accessible digital format. Recruitment of the participants, data collection and treatment were subjected to approval of the Ethics board of the University of Bologna.

2.3. Data collection

The empirical basis for this article comes from a corpus of 53 video-recorded climbs performed for training purposes on routes of varying grades of difficulty. The corpus was collected in 2016 by employing *in situ* ethnographic observation over a period of three months. Data were recorded by using a mobile camera and a wearable microphone on the guide.

2.4. Transcription and analytic procedures

The analysis proposed in the present article builds on a collection of 41 occurrences of series of repeats embedded in instruction sequences. Data were annotated by using PRAAT (Boersma and Weenink, 2009) and ELAN (Wittenburg *et al.,* 2006).

The extracts presented in the article were transcribed using the Jeffersonian system (Jefferson, 2004) and the conventions elaborated by Mondada (2019) for multimodal transcription. The description of the prosodic properties of repetition is a result of auditory analysis based on careful, repeated listening of the recordings (Walker, 2013).

3. Background

Within CA, the linguistic pattern of series of consecutive repeats has been investigated from a pragmatic perspective, focusing on the social action it implements in the context of its occurrence, both in conversation and embodied interaction.

In her seminal study, Stivers (2004) investigates the phenomenon (which she terms *multiple sayings*) in conversations occurring in diverse languages. She finds that multiple sayings like 'No no no' are recurrently produced in a responsive sequential position, often in overlap with the prior speaker's talk. Also, she observes that multiple sayings are systematically produced and understood as configuring a single TCU (rather than the same TCU being repeated multiple times) since they are uttered consecutively within a single *intonation contour* (du Bois *et al.* 1993). According to Stiver's analysis, speakers use multiple sayings to display that not only the prior turn, but the whole course of action has persisted unnecessarily and to bring it to a halt. Restricting the focus to the grammatical format of *syntactic reduplication,* Keevallik (2010) shows that such linguistic device is overwhelmingly used in response to the prior speaker's turn. In this sequential position, syntactic reduplication may implement a range of actions, among which insisting on previous requests/offers to prompt a response (i.e., imperative reduplication), prefacing a challenging reply to the prior speaker's turn, reinforcing an answer to yes/no question, and affirming the prior speaker's claim. Both the abovementioned studies (Keevallik, 2010; Stivers, 2004) converge on the point that series of repeats achieve their function based not primarily on grammar, but rather on their sequential position and prosodic design. However, both studies constrain the analysis of the phenomenon to verbal interaction.

As far as embodied interaction is concerned, series of consecutive repeats have been investigated mainly in studies on directives. For instance, the phenomenon is observed in data from driving lessons both by Depperman (2018) and Mondada (2017), both authors showing cases of imperative directives implemented through series of repeats. In their analysis, repetition is used to indicate that the requested action should start immediately. Mondada (2017) also analyses a different temporal trajectory of repeated imperatives, in which series of consecutive repeats are timed with the ongoing implementation of the requested action. In this latter case, she argues, repetition orients to the duration and completion of the recipient's ongoing action. More precisely, she uses the expression "online calibration of action" (2017:89) to indicate that repetition is used to manage *how* and *how long* the recipient should carry out current embodied action[1].

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[1] Further evidence in this direction is provided by Baldauf-Quilliatre (2015) and, more recently, Baldauf-Quilliatre & Colón de Carvajal (2019) drawing on data from multiplayer videogaming. In their data, participants uttered repeated "vague" directives (not addressing a specific action to be undertaken) to *encourage* the recipient to continue current game action.

The practice under investigation in this study has the same formal characteristics of the phenomenon previously investigated in CA under the rubric *multiple sayings* (Stivers, 2004). Yet, in the specific setting considered here, the practice assumes a rather opposite function than the one originally observed by Stivers. In fact, in the data, series of repeats are recurrently used to ensure the progression of ongoing climbing actions. This function is consistent with the one illustrated by Mondada (2017) but, differently from this latter study, our analysis illustrates cases in which linguistic categories other than imperative verbs are used. Indeed, as we will illustrate below, in the climbing data imperative verbs (and verbs altogether) are only one among the linguistic categories involved in repetition and used to implement the function of calibrating the recipient's ongoing embodied action.

4. Results

4.1. Formats of series of repeats in the data set

In the data, series of repeats may involve diverse linguistic units, the variety of which we shall describe based on Extract 2. This extract offers a glimpse of the overall sequential organization of guided climbing (see § 2.1; for detailed analysis, see Anonymous and Anonymous, 2020), capturing part of a vertical progression within which the guide (GUI) instructs the climber (cli) to reach a foothold (l. 1-5), a handhold (l. 6-11) and a new foothold (l. 12-18) stepwise and in succession.

Extract 2 [Grigia_Guido_kr]

```
1  GUI:  ↑sa:le    in linea il  piede sinis+tro.
          go up.3S in line  the foot  left
          the left foot goes up straight

2  cli:                                  +moves Lfoot upwards -->

3  GUI:  sa::le    sa:le      sale;+
          go up.3s  go up.3S   go up.3S
          u::p u:p up

4  cli:  > ----------------------+((anchors Lfoot to foothold))

5  GUI:  ↑lì
           there
           there it is

6  GUI:  e+  lu:nghi:::ssimo a   undici.
          and long.SUPL        at eleven
          and very stretched to eleven o'clock

7  GUI:  lu:ngo eh?
          long   eh
          stre:tched right?
```

```
   8        lungo     lungo     +lu:ngo.
            stretched stretched stretched
            stretched stretched stre:tched.

   9  cli:                      +stretches Larm to eleven o' clock -->

  10  GUI:  po:i a-  ↑DE+STRA=DESTRA=↑DESTRA=↑↑DESTRA=↑↑DES+TRA  Gui+do.
            then at-  right    right   right    right    right   Guido.
            then to- ↑RIGH=RIGHT=↑RIGHT=↑↑RIGHT=↑↑RIGHT Guido

  11  cli:           -->+grabs onto quickdraw-------------+moves to R+((anchors
            Lhand to handhold))

  12        (1.2)+(0.2)

  13  cli:      +lifts Rfoot up --> (l. 18)

  14  GUI:  sale     alle balle
            go up.3S at   balls
            (it) goes up to (your) balls

  15        (0.2)

  16  GUI:  sale     sale     sa::le,+
            go up.3S go up.3S go up.3S
            up up u:p

  17  cli:                       -->+((anchors Rfoot to foothold))

  18  GUI:  ↑lì
             there
             there it is
```

Extract 2 only includes instances of *same-speaker* repetition produced by the guide. This reflects a more general feature of the setting, that is, the distribution of verbal and embodied resources between guide and climber, respectively (see § 2.1)

We start by focusing on the instances of repetition highlighted in the grey boxes. In all the highlighted cases, the repeats consist in short lexical items (two-syllable length), which occur multiple times in the same segmental form and in immediate succession. The items include diverse lexical units, particularly motion verbs (l. 3 and 16: *sale*, literally 'it goes up'), adjectives (l. 8: *lungo,* 'stretched') and direction terms (l. 10: *destra,* 'right'). They all convey meanings related to motion path, direction, and extension, which is indicative of the importance given in this setting to assisting the climber's navigation.

As far as the temporal relation among the repeats is concerned, Extract 2 illustrates two distinct, yet connected, patterns, which can be categorized based on the distinction proposed by Bazzanella (1999:206-207) between *intra-* and *inter*-turn repetition. The series of repeats in the grey boxes configure cases of *intra*-turn repetition. Furthermore, in three out of four cases (namely, lines 3, 10, and 16) the items forming the series of repeats are *reused* from the guide's immediately preceding instruction, thus configuring instances

of *inter*-turn repetition. In the data, series of repeats may also be composed of *new* items (i.e., not reused from the preceding instruction), as in l. 10 (We will come back to the analysis of this line in § 4.4.).

In most cases, the reuse involves exact repetition of the item after its first saying. Less frequently, it takes the form of a reuse with variation. An instance of exact reuse is provided in Extract 3 which is drawn from Extract 2 and reported below for the reader's convenience.

Extract 3_Exact reuse (drawn from Extract 2, lines 1-5)

```
1  GUI:  ↑sa:le    in linea il  piede sinistro.
          go up.3S in line  the foot  left
          the left foot goes up straight

2         sa::le    sa:le     sale;
          go up.3s  go up.3S  go up.3S
          u::p u:p up
```

The series of consecutive repeats *sale sale sale,* 'up up up' (l. 2, literally: '(it) goes up') is built up with multiple exact repeats of the item already used in the preceding instruction (l. 1: 'the left foot **goes up** straight').

A case of reuse with variation is provided in Extract 4, also drawn from Extract 2.

Extract 4_Reuse with variation (drawn from Extract 2, l. 6-10)

```
1  GUI:  e   lu:nghi:::ssimo a  undici.
          and long.SUPL       at eleven
          and very stretched to eleven o'clock

2         lu:ngo eh?
          long   eh
          stre:tched right?

3         lungo lungo lu:ngo.
          stretched stretched stretched
          stretched stretched stre:tched.
```

In extract 4, the series of repeats (l. 3: *lungo lungo lu:ngo,* 'stretched stretched stretched') provides an unpacked version of the prior *lu:nghi:::ssimo* (l. 1: 'very stretched', pronounced with considerable syllable elongation). Both the elongated superlative form at l. 1 and the subsequent series of repeats at l. 3 configure *stretched* linguistic forms having an iconic significance of increased meaning (Ishikawa, 1991). Also, the series of repeats at l. 3 is built by reusing the item from the preceding tag question (l. 2: 'stretched right?'), evidently aimed at stressing the relevant aspect of the initial instruction (l. 1).

In both cases (exact reuse and reuse with modification), the series of repeats expand on prior instructions, providing for its "lingering relevance" (Deppermann, 2018:279), as well as for the unity and coherence of the whole sequence (on coherence achieved through repetition, see Tannen, 1989:48). Such coherence is maintained even when the series of repeats is not made with items reused from the prior turn, as in Extract 5.

Extract 5_Elaboration [Bianca_Ga_Sali_2]

```
1  GUI:  alto alle ginocchia.
          high at    knees
          high (up) by (your) knees.

2         sali       sa:li,
          go up. IMP go up.IMP
          up u:p
```

In this case, the reduplicated *sali sa:li,* 'up u:p' (l. 2) semantically elaborates on the prior *alto,* 'high (up)', used in the initial description of the location of the next foothold 'high (up) by (your) knees' (l. 1)[2].

In the examples analysed above (Extracts 3-5) it is worth noting the progressive simplification and ellipticity of grammatical construction of turns across the sequence. For instance, in Extracts 3 and 5, the verbs forming the series of repeats are bare, with no argument. These elliptical grammatical formats are indicative of the dependency (or responsiveness) of current turn upon the preceding one (Cf. Keevallik, 2010) as well as to the current contingencies of action. Progressive simplification of grammar is also traceable to the need to adjust to rapidly evolving situations, as already observed in previous studies on instructions in mobile activities. As an example, drawing on data from driving lessons, it has been observed that instructions exhibit an increasingly simpler grammatical construction the closer the moment is in which the instructed action is expected to take place (Deppermann, 2018; De Stefani and Gazin, 2014; Mondada, 2017). Furthermore, simplification of grammatical structure is observed in directives and requests uttered when the recipient is already committed to performing the mandated action (Zinken and Deppermann, 2017). All these aspects (sequential positioning *after* the prior instruction, pressing time conditions and the recipient's commitment to performing the mandated action) are observably connected to the elliptical formatting of

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[2] Note that in Extract 5 the guide verbally locates the next foothold with reference to the climber's body. Conversely, in Extract 4, she uses a clock position (l. 1: 'eleven') to verbally locate the next handhold. Both systems (reference to the recipient's body and clock positions) are meant to provide accessible directions that the visually impaired climbers can interpret based on proprioception (Cf., Anonymous and Anonymous, 2020).

instructions in guided climbing, particularly in the case of instructions made up of series of lexical repeats. Indeed, as we shall illustrate in more detail in the next section, in most cases such instructive turns are uttered while the climber is already accomplishing the previously instructed action.

4.2. Sequentiality, simultaneity and instructive significance of repetition

In the data, series of repeats achieve instructive significance not only by virtue of their coherence with the sequentially prior instruction, but, crucially, based on their timing with respect to the climber's current embodied action. More specifically, in the data, in 37 out of 41 cases, the guide utters series of repeats while the climber is already fulfilling the previous instruction by moving toward the planned hold. In these cases, the guide employs repetition to *calibrate* (Mondada, 2017) the duration of the climber's ongoing bodily movements and ensure that the climber reaches the planned hold, as we shall observe in the following Extracts 6 and 7.

The extracts are taken from two climbs on different routes, involving the same visually impaired climber (cli) and the guide (GUI). In both cases, the task consists of reaching the foothold whose location is described by the guide in the opening of the sequences.

Extract 6 [Grigia_Ga_Sale_4]

```
 1  GUI:  sa:le     alla coscia.
           go up.3S at   thigh
           up by (your) thigh.

 2         +sa:le    sale     sale      sale,+
            go up.3S go up.3S go up.3S go up.3S
            u:p up up up

 3  cli:  +lifts Rfoot up-----------------+((anchors Rfoot to foothold))

 4  GUI:  quella lì
           that   there
           that's it
```

Extract 7 (previously analysed as Extract 5)

```
 1  GUI:  alto a+lle ginocchia.
           high at    knees
           high (up) by (your) knees.

 2  cli:        +lifts Rfoot up -->

 3  GUI:  sali       sa:li,+
           go up. IMP go up.IMP
           up u:p
```

```
4  cli:              -->+((anchors Rfoot to foothold))
```

In Extract 6, the guide firstly formulates an instruction concerning the next foot movement (l. 1: 'up by (your) thigh'). Immediately afterwards, she utters the series of repeated *sa:le sale sale sale* 'u:p up up up' (l. 2), which is exactly timed with the climber's embodied implementation of the prior instruction (l. 3: the climber lifts her right foot). The guide's repetition and the climber's foot movement begin simultaneously and end in unison as soon as the climber reaches the foothold. Afterwards, the guide produces the validating *quella lì,* 'that's it' (l. 4), which configures a sequence-closing turn (Schegloff, 2007:118).

In Extract 7 as well, the guide initiates the sequence with an instruction (l. 1: 'high (up) by (your) knees'). Then, as soon as the climber begins to move her foot upwards (l. 2), the guide utters the reduplicated *sali sa:li,* 'up up' (l. 3). Similarly to the previous extract, the repeats are exactly timed with the progression and completion of the climber's action, ending once the climber reaches the foothold. Yet, in contrast to the previous extract, in this case the guide does not provide a validation of the climber's achievement once she reaches the target-foothold. This is important insofar as climbers with vision impairments cannot check visually whether the hold just reached belongs to the planned route, therefore depending upon the guide's feedback to be sure that they attain the correct hold. In the absence of overt validation, in Extract 7, the climber treats the end of the guide's turn as an indication that the hold she is currently feeling with her foot is the target, thus anchoring her foot to it (l. 4).

The two extracts analysed above are characterised by a similar sequential structure, which is schematically represented in Table 1.

Table 1. Sequential environment of repetition

1. Instruction	GUI verbally instructs cli about the location of next hold
2. Implementation	cli physically moves toward the next hold / GUI uses repetition to calibrate the duration of cli's bodily movement
3. Sequence closing	As cli reaches the target-hold, GUI validates the achievement (Extract 6). Alternatively, the sequence is tacitly closed (Extract 7)

Within such a sequential organization, the series of repeats configures an *expansion* (Schegloff, 2007) of the sequence-initiating instruction, securing its persistent relevance and successful implementation, while the guide uses repetition to calibrate the duration and completion of the climber's movement according to the location of the target-hold. Crucially, within this sequential organization, the climber's embodied

response to the repeated instruction is not implemented as a successive interactional move, but is rather achieved simultaneously, as the climber continues moving toward the target as long as the guide utters the series of repeats. Thus, the climber's action is consequential to the guide's repetition, which in turn adjusts to the progression of the climber's bodily movement, in a relationship of reciprocal calibration (Cf. Stukenbrock, 2014). As previously observed by Mondada (2017), in this context, the relation of consequentiality is achieved within "sequentially ordered simultaneities", as the two actions unfold simultaneously "closely responding to one another in an emergent and reflexive way, beat by beat" (*ibid.*:91).

4.3. Making continuation relevant through timing and prosody

In the previous section, we have shown that the functioning of repetition as a device aimed at guiding the climber toward the planned hold rests crucially on its "precision timing and time embeddedness" (Mondada, 2017) within the course of the climber's embodied action.

We now expand on the analysis of instructive repetition by also considering the prosodic aspects of its delivery to which both guide and climber orient as relevant. In the setting under investigation, the auditory characteristics of repetition deserve special analytical attention insofar as they might provide relevant sensory cues to the visually impaired recipients. More specifically, the prosody of repetition appears to have an iconic significance of continuance and duration, both aspects made sequentially relevant in the climber's embodied response. We shall explore this issue by drawing on the following extracts, which are taken from two guided climbs performed by the same blind athlete. As in the cases analysed in the previous section, in both Extracts 8 and 9 the instructed move consists of lifting one foot up to the next foothold. In both cases, the onset of the guide's repetition occurs when maintaining the current direction of movement becomes relevant for the climber to reach the target-hold.

Extract 8 [Marrone_Ma_Sali_3]

```
1  GUI:  hai     un  ↑pie:de alle ↓co+sce.
         have.2S one  foot   at    thighs
         you have a foothold by your thighs

2  cli:                              +swaps feet -->

3       (0.5)

4  GUI:  qu- eh alle balle praticamen-
         al- eh at  balls practicall-
         al(most)- eh by (your) balls basically-
```

```
5          ci+  porti    il  ↑destro=
           PTCL bring.2S the right
           there (you) bring your right (foot)

6  cli:  ->+lifts Rfoot up -->

7  GUI:  =sali  sali  sa:li,+
           go up go up go up
           up up up,

8  cli:                    -->+((anchors Rfoot to foothold))

9  GUI:  que:llo,
           that
           that one
```

Extract 9 [Verde_Ma_Alto_4]

```
1  cli:  >> moves Rfoot -->

2  GUI   e:::h sali=
          erm   go up.IMP
          e:::rm go up

3  cli:  > lifts Rfoot up -->

4  GUI:  a:lto=alto=alto=al+to=
          high  high high high
          high (up)=high (up)=high (up)=high (up)=

5  cli:  >----------------+((leans Rfoot on a hold))
```

In Extract 8, the climber's action is already prepared while the guide articulates the instructions concerning the next move: he accomplishes a technique called *foot swap* by lifting the right foot off the foothold and replacing it with the left one (l. 2). After providing an initial description of the location of the next foothold (l. 1: 'you have a foothold by your thighs'), followed by a pause (0.5) which orients to the progression of the climber's ongoing action, the guide initiates a new description (l. 4. 'al(most)-). She then produces a self-initiated repair by reformulating the prior description (l. 4: eh by your balls basically'), and an instruction (l. 5: there you bring (your) right (foot)').

Only after the climber completes the foot swap and begins to lift his right foot upwards does the guide produce the repeated *sali sali sali* 'up up up' (l. 7), latched with the prior TCU. In this context, the series of repeats is clearly mobilized to calibrate the climber's target-reaching movement. The verb *sali* (literally, 'go up') elaborates on prior 'there you bring (your) right (foot)' (l. 5), providing a more granular indication of the movement to be performed. At the same time, it refers indexically to the current path of the climber's lifting movement, already initiated at l. 6. The prosody of the series of repeats conveys the relevance that current action is carried out smoothly and continually, as if to say, "what you are presently doing, continue

doing". The series of repeats are indeed uttered within a continued vocal stream, with no gaps, and minimized pitch movements, as shown in Praat plot 1.
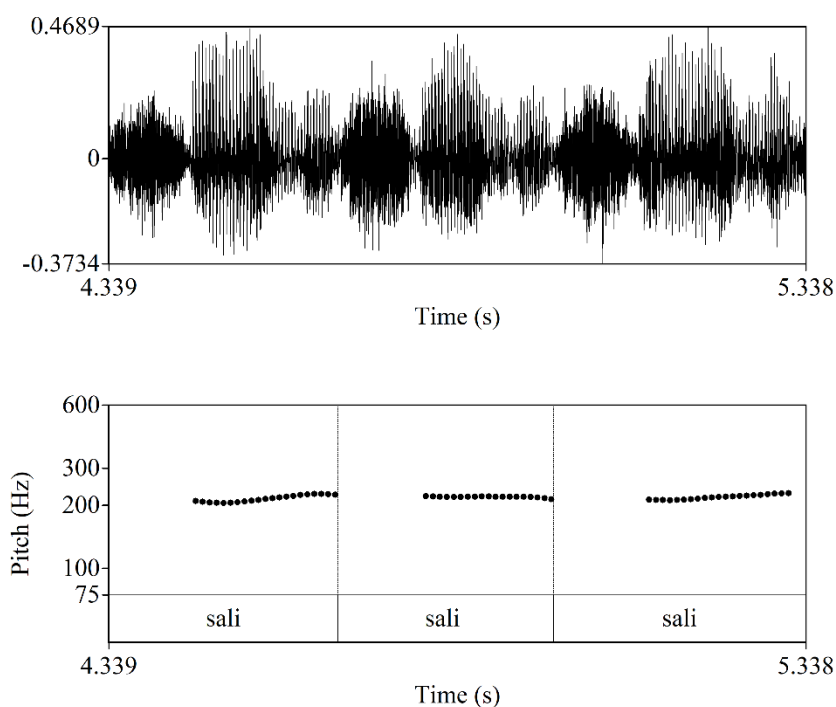
Praat plot 1. Waveform and pitch track of Extract 8 l. 7.

A similar pattern is observable in Extract 9. In this case, the climber begins to lift his right foot up (l.3) before the guide can articulate a full instruction. By doing so, he exhibits his readiness to move toward the next foothold, whose location he presumably remembers from an earlier climb on the same route. Again, the guide evidently monitors the progression of the climber's ongoing movement, as we can see from her initial hesitation (l. 2: *e:::h*, 'e:::rm') followed by the start of a TCU (l. 2: *sali* 'go up') which is then abandoned to produce the repeated *alto=alto=alto=alto* 'high (up)=high (up)=high (up)=high (up)' (l. 4) once the climber's moving foot is found to proceed towards the target-foothold already. Thus, analogously to the previous extract, the series of repeats emerges as soon as the climber's movement takes an upward path (l. 3: he lifts his right foot upwards) and is mobilized to ensure that such path is maintained.

Like in the previous extract, the series of repeats (l. 4) are heard as a continuous vocal stream, with no silent gaps and minimised pitch movements on the stressed syllables, apart from a slight rise at the onset (see Praat plot 2).
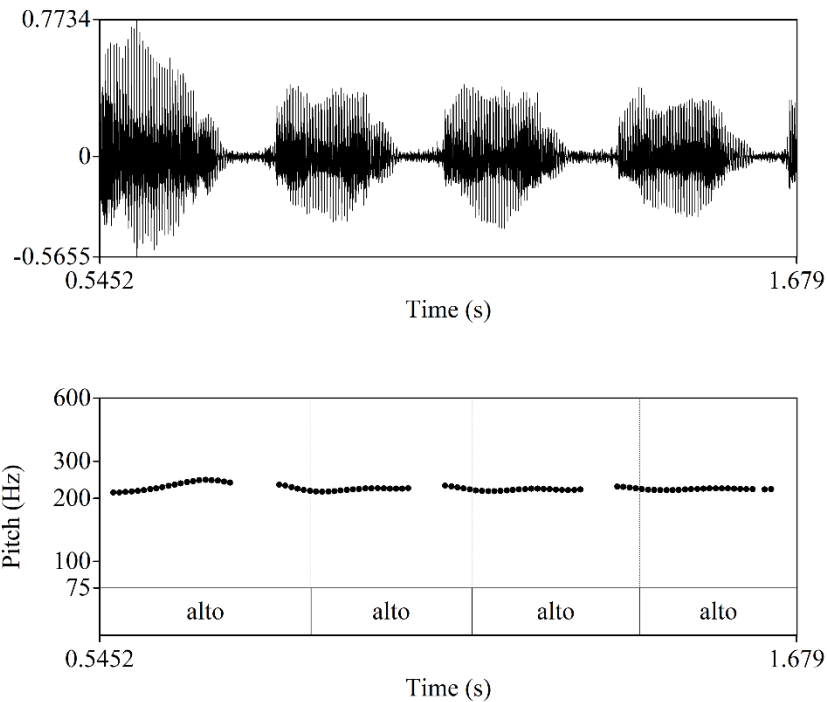
Praat plot 2. Waveform and pitch track of Extract 9 l. 4.

The analysis of Extracts 8 and 9 demonstrates that, in addition to timing, the guide also uses prosody as a resource to calibrate the duration, completion and path of the climber's ongoing bodily movements. More specifically, the analysis demonstrates that repetition is produced and understood as an instruction to continue by virtue of its being heard as a continuous and relatively homogeneous vocal stream.

The participants' orientation to the auditory affordances of repetition as an instruction to continue is particularly observable in the following Extract 10, which is drawn from the very beginning of a climb.

Extract 10 [Marrone_Guido_Lungox5]

```
 1  GUI:  lu:::ngo a   undici (.) lungo eh?
           long    at eleven     long  eh?
           stre:::tched to eleven [o' clock] (.) stretched right?

(lines 2-16 omitted)

17          (0.2)+(0.5)

19  cli:       +opens Larm to eleven o'clock and stretches -->

20  GUI:  lun+go=lungo=+lungo=lungo+=lungo:+
```

```
           long    long    long   long    long
           stretched=stretched=stretched=stretched=stretched

21  cli:      +#stretches-+#touches hold+moves up+#((anchors to handhold))

    Fig.      #1            #2                    #3
```


Fig.1   Fig.2   Fig.3

Following the initial instruction (l. 1), the activity is momentarily suspended (lines 2- 16 omitted)[3]. After its resumption, the climber starts performing the previously instructed action by opening his left arm to eleven o' clock and then stretching out vertically (l. 17). As soon as the climber stretches vertically, aiming to the target-hold, the guide utters the series of repeated *lungo=lungo=lungo=lungo=lungo* 'stretched=stretched=stretched=stretched=stretched' (l. 20). Meanwhile, the climber's hand approaches a hold located right below the target (Fig. 1) and touches it shortly thereafter (Fig. 2, l. 21). Although the location of the non-target hold is consistent with prior instruction 'to eleven (o' clock)' (l. 1) (recall that the climber cannot see where the planned hold is located), the climber does not anchor his hand to it, but rather continues reaching out vertically as long as the guide continues uttering the series of repeats, until he finally reaches the planned handhold (Fig. 3).

As in the instances analysed previously (Extracts 8 and 9), the series of repeats (l. 20) conveys the sense that current movement should be carried out continually by virtue of both its timing and its prosodic properties, since it is uttered with continuous vocal emission and constant intonation (see Praat plot 3).

---

[3] The climb is suspended since the guide goes to the gym staff and asks them to turn down the music as the volume is too loud to communicate with the climber.
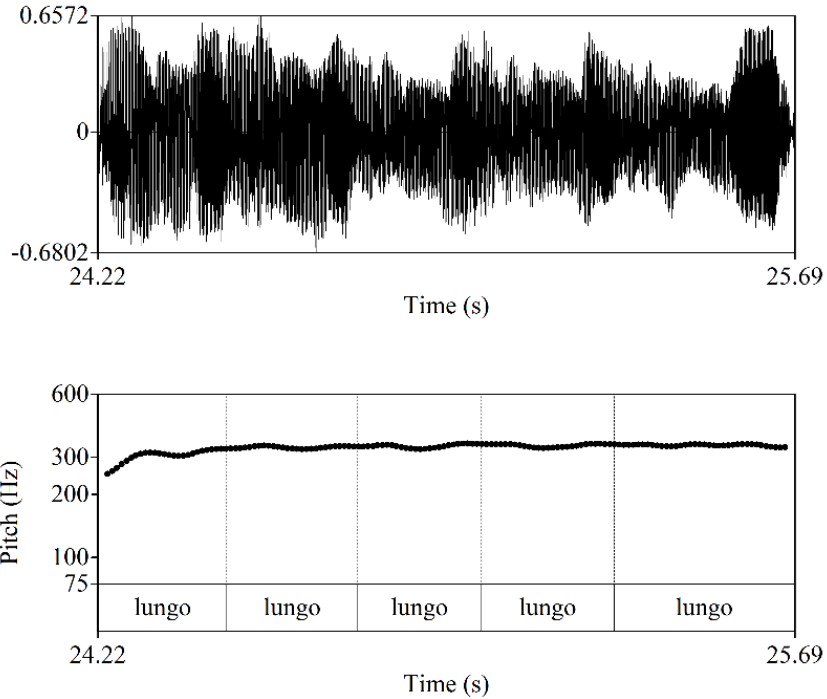
Praat plot 3. Waveform and pitch track of Extract 10 l. 20.

A further illustration of the efficacy of both the timing and prosody of repetition as an instruction to continue is provided in the following Extract 11.

Extract 11 [Viola_Go_Salex4]

```
1  GUI:   sale      +all'anca?
           go up.3S  at  hip
           up by your hip?

2  CLI:           +lifts Lfoot up -->

3  GUI:   sale      +>sale     sale    <+sa:le:+
           go up.3S   go up.3S go up.3S   go up.3S
           up >up up< ↑u:p

4  CLI:           -->+#feels hold---------+moves on+#((anchors foot to foothold))

   Fig.           #4                            #5
```

Fig.4

Fig.5

In Extract 11, the onset of the guide's repeated *sale >sale sale< sale*, 'up >up up< up (l. 3) slightly anticipates the climber's contact with a non-target hold, which the climber subsequently touches with his left foot (l. 4: cli feels the hold), while aiming to the next foothold. The guide modulates the ensuing series of repeats in such a way as to convey that the climber should continue moving in the indicated direction without further delay. More specifically, the delivery of the second and third repeats is slightly accelerated as the climber feels the hold with his left foot (l. 4). Such acceleration conveys a sense of urgency (Mondada, 2017:87) to which the climber evidently orients as he lifts his foot off the hold and moves on, reaching the foothold shortly thereafter. In contrast with the accelerated delivery of the second and third repeats, the last repeat is indeed elongated and uttered with raising intonation, orienting to the achievement of the expected response.
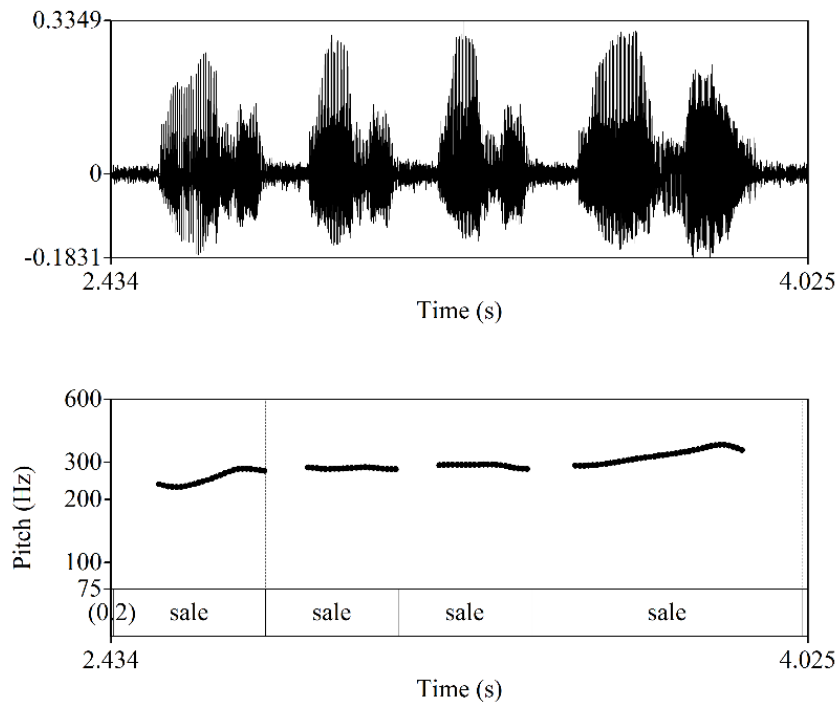
Praat plot 4. Waveform and pitch track of Extract 11, l. 3.

In this section, we analysed the functioning of repetition as an instruction to continue. More specifically, we showed that, by modulating the timing and prosody of repetition, the guide calibrates both the duration and completion of the climber's bodily movement and its path, conveying that current direction should be maintained in the ensuing action. Moreover, in extracts 10 and 11, the onset of repetition occurs in advance of the climber's projectably imminent contacts with non-target holds, as if *alerting* the climber that what he is about to touch is not the planned hold. In this respect, by using repetition in the way just analysed, in addition to making the climber's haptic experience of the wall interactionally relevant, the guide helps the climbers to correctly interpret haptic feedback concerning the affordances of the artificial rock face and to distinguish between target and non-target holds.

4.4. Series of repeats as corrective instructions

In the previous section, we showed examples of the use of repetition to prevent possibly problematic outcomes of the climber's embodied actions, such as anchoring to unplanned holds. As we have seen, in such cases, repetition also accomplishes a slightly corrective function, securing that the climber "stays on track"

and continues current movement until reaching the planned hold. We now consider some examples in which instead the corrective function is evidently put on the record, that is, is made relevant through a distinctive use of prosody, as well as of other resources, such as lexicon and timing.

We start by considering an extract in which the guide mobilizes repetition *after* the climber fails to comply with the prior instruction, prompting the climber to redirect his movement appropriately.

Extract 12 [Verde_Go_Undici_3]

```
1   GUI:   +e  lu:::ngo  a  undici+=
           and stretched at eleven
           and stretched to eleven (o' clock)

2   cli:   +extends Rarm to one o'clock+

3   GUI:   =u+ndici=undici=UNdici+
             eleven=eleven=eleven
4   cli:    #+moves to eleven o'clock+#

    Fig.   #6                        #7
```


Fig.6   Fig.7

```
5   GUI:   è    quella ↑lassù
           be.3S that    up there
           it's the one up there
```

In Extract 12, the climber stretches out his right arm vertically before the guide articulates completely the instruction concerning the next move (l. 1: *e lu:::ngo a undici* 'and stre:::tched to eleven (o' clock)'). As a result, he eventually finds himself in an inconsistent position compared to the one indicated by the guide as his hand points to one o'clock (Fig. 6) rather than eleven. Thus, immediately following the prior TCU (see the latching between l. 1 and 3), the guide produces the repeated *undici=undici=UNdici* 'eleven=eleven=eleven' (l. 3) with increased pitch on the first (stressed) syllable of each repeat (see Praat plot 5). The climber promptly moves his right hand toward eleven o'clock (l. 4, fig. 7) almost simultaneously with the onset of the repetition and continues reaching in the same direction as long as the series of repeats is uttered by the guide. Once the climber's hand reaches the handhold, the guide produces an elaborate

sequence-closing turn (l. 5: 'it's the one up there'), orienting to the climber's exhibited difficulty in reaching the hold (Fig. 7: in the white circle, the climber cannot reach the handhold).
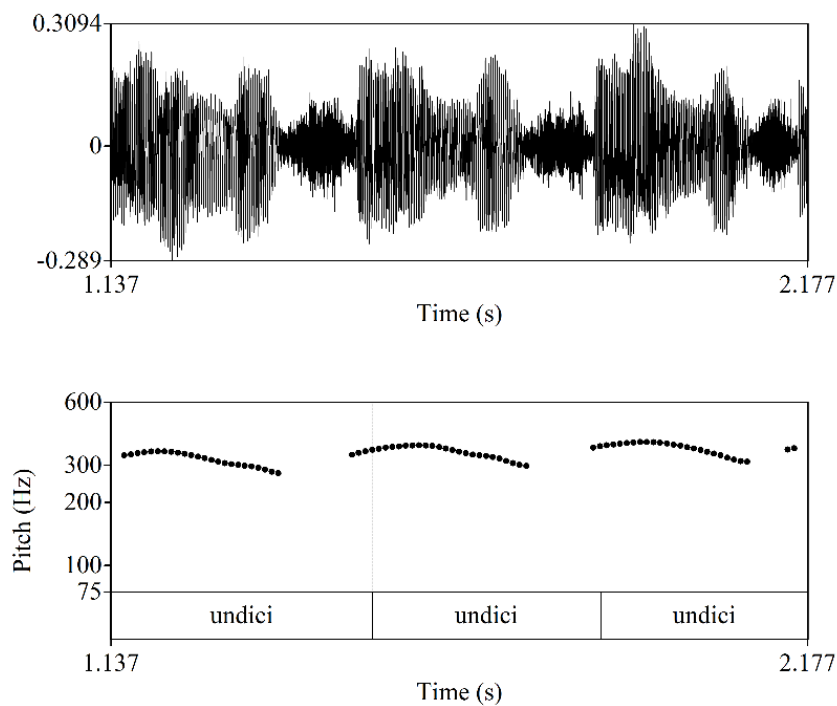
Praat plot 5. Waveform and pitch track of Extract 12, l. 3.

In this case, the series of repeats (l. 3) accomplishes a twofold function. It prompts a correction (a direction change) and contributes to its ensuing implementation. The corrective function is achieved through the increasingly heavier stress the guide puts on each repeat of "eleven". At the same time, as already observed in previous analysis, a guiding function is achieved, as the series of repeats also calibrates the duration and completion of the climber's action.

In contrast with Extract 12, in which the corrective series of repeats is uttered once the climber has completed the faulty movement, in Extract 13, repetition is mobilised early with respect to the climber's faulty action.

Extract 13 [Drawn from Extract 2, lines 10-12]

```
1  cli:  >>stretches Larm toward next handhold -->

2  GUI:  po:i a-  ↑DE+STRA=DESTRA=↑DESTRA=↑↑DESTRA=↑↑DES+TRA ↓Gui+do.
         then at-  right    right    right     right     right    Guido.
         then to-  ↑RIGH=RIGHT=↑RIGHT=↑↑RIGHT=↑↑RIGHT ↓Guido
```
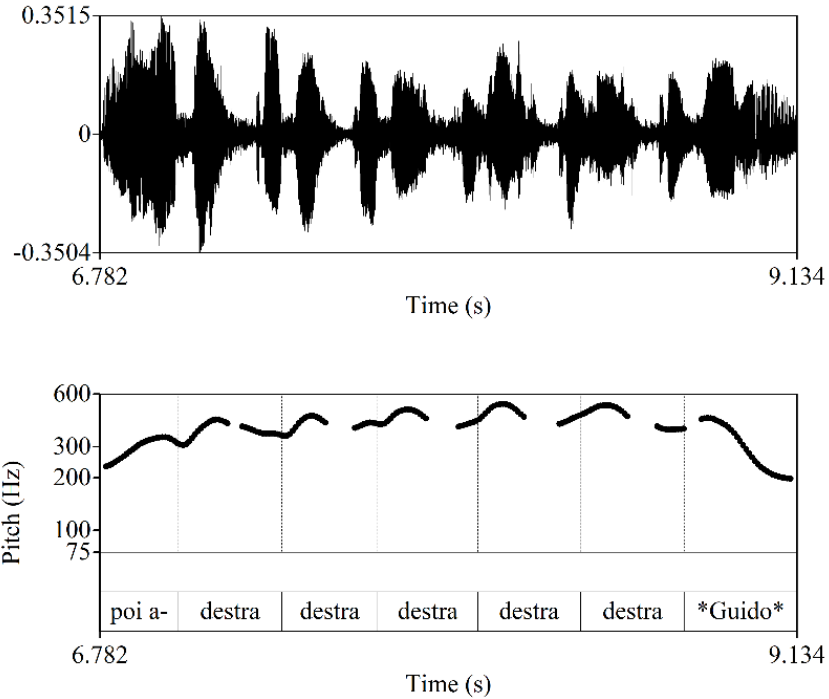
```
3  cli:              -->+#grabs onto quickdraw-------------+moves to R+
   Fig.              #8
```


Fig.8

At the beginning of Extract 13, the climber is reaching out to the next handhold by stretching his left arm. While he is approaching the handhold (l. 1), the guide presumably initiates a new instruction (l. 2: *po:i a-,* 'then to-'), which she immediately cuts off as soon as the climber visibly directs his hand toward a quickdraw (which he grabs soon after, see Fig.8). Immediately following the abandoned instruction, the guide produces the repeated ↑DESTRA=DESTRA=↑DESTRA=↑↑DESTRA=↑↑DESTRA, *RIGH=RIGHT=↑RIGHT=↑↑RIGHT=↑↑RIGHT* (l. 2) as the climber grabs onto the quickdraw (l. 4), arguably in an attempt to maintain balance and not to detach from the wall.

The series of repeated directions seen in Extract 13 forms part of a *corrective instruction* (Deppermann, 2015) which is produced as soon as the climber's projectably faulty action emerges as he ostensibly directs his hand toward the quickdraw. The corrective instruction formulates the direction to be undertaken next (*right*), but the item is repeated multiple times until the climber releases the quickdraw and *begins* to move in the required direction (l. 3). Hence, the series of repeats displays the guide's stance that the climber's incorrect action (anchoring to the quickdraw) should be halted (Cf. Stivers, 2004), while at the same time urging the climber's compliance with the requested direction-change. The imperativeness of executing the mandated action is immediately embodied in the delivery of the repetition, which is uttered with a loud voice and raised pitch on the initial syllable of each repeat (see Praat plot 6) (Cf. Mondada, 2017; Depperman 2018). Lastly, the recipient's address term (first name) in turn-final position (l. 2, 'Guido'), occurring immediately after the climber releases his grip on the quickdraw, conveys a sense of concern due to the prior failure.

0.3515

0

-0.3504

6.782   9.134

Time (s)

600

300
200

Pitch (IIz)

100
75

| poi a- | destra | destra | destra | destra | destra | *Guido* |

6.782   9.134

Time (s)

Praat plot 6. Waveform and pitch track of Extract 13, l. 2.

A similar case is observable in Extract 14. Before getting into detailed analysis, it is worth noting that this extract is taken from the climber's third consecutive attempt to climb the same section of the route. At this stage, the climber is indeed expected to follow the guide's instructions smoothly and accurately.

Extract 14 [Verde2_Go_Giù_6]

```
 1  GUI:    al ginocchio destro?
             at knee       right
             by your right knee

 2          (1.5) + (0.7)

 3  CLI:         +lifts Rfoot up -->

 4  GUI:    a ↑de:+stra-
             at right
             to the ↑right-

 5  CLI:         +moves Rfoot to R -->

 6  GUI:    #GIÙ   GIÙ+=GIÙ= GIÙ= GIÙ= GIÙ=  ↓Gui+do
             down down down down down down   Guido
             DOWN DOWN=DOWN=DOWN=DOWN=DOWN ↓Guido

 7  CLI:         -->+lowers Rfoot-------------+((anchors foot to foothold))

    Fig.  #9
```

```
8   GUI:   ↑quello.
              that
              that one.
```


Fig.9

At the beginning of the sequence, the guide instructs the climber about the location of the next foothold (l. 1: 'to (your) right knee'). The climber's response is immediate as he promptly begins to lift his right foot up (l. 3). At line 4, the guide produces a further instruction (l. 4: 'to the right'), which projects a correction, prompting a direction change. The climber immediately directs his foot to the right (l. 5). However, he heads too high and fails to reach the target foothold, which is placed in a lower position. (Fig. 9, the target foothold is in the white circle). The guide orients to the climber's failure to reach the target by producing the series of repeats *GIÙ GIÙ=GIÙ=GIÙ=GIÙ=GIÙ* 'DOWN DOWN=DOWN=DOWN=DOWN=DOWN' (l. 6), promptly followed by the climber who lowers his foot until reaching the foothold (l. 7).

As in Extract 13, also in this case the guide formulates a new direction and repeats it multiple times in immediate succession (l. 6) with comparably louder voice, high intonation and a rapid pace (see Praat plot 7), all aspects which help convey a sense of urgency. Moreover, as in Extract 13, the series of repeats is followed by the address term in final position (l. 6: 'Guido'), which reinforces its corrective character. However, in contrast with Extract 13, in this case the guide does not stop uttering the series of repeats once the climber's complying action is initiated, but rather she keeps repeating until the climber reaches the planned foothold. Hence, similarly to Extract 12 (l. 3: 'eleven=eleven=eleven'), in this case as well the practice accomplishes a twofold function, that is (a) prompting a direction change and (b) calibrating the duration of the climber's ensuing movement to ensure that he attains the target-hold.
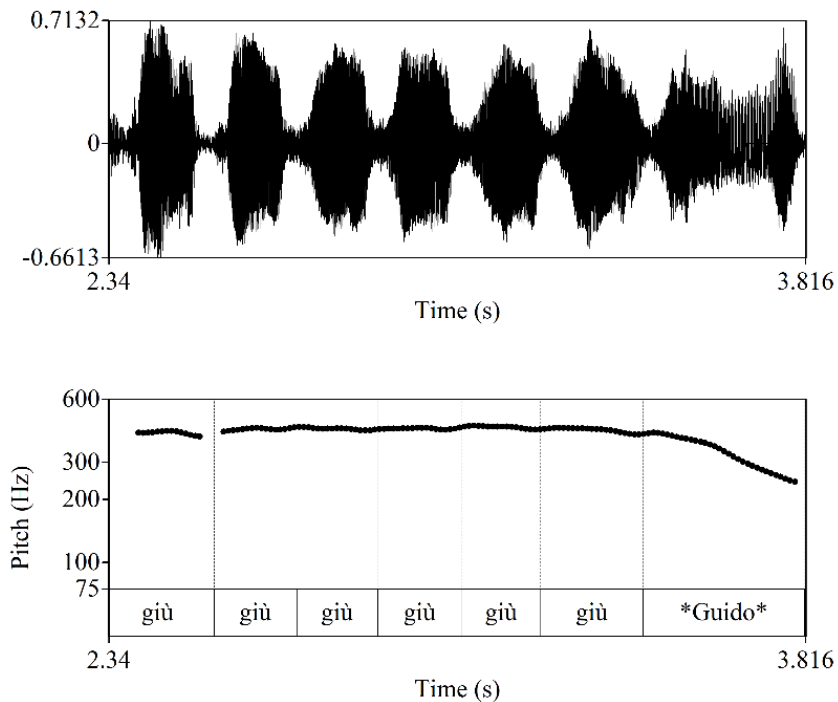
Praat plot 7. Waveform and pitch track of Extract 14, l. 6.

5. Discussion

Drawing on data from paraclimbing training sessions, the study explores the formats and functioning of same-speaker lexical repetition as an instructive practice specifically designed to provide auditory guidance and enable the visually impaired climbers to navigate the route. The practice takes the form of series of repeats of lexical items conveying motion path, uttered in immediate succession within a single intonation contour, hence forming a single TCU. Unlike previous studies that explored the use of a similar practice in instructed activities, but considering only the case of series of imperatives (Mondada 2017), our analysis addresses a range of linguistic categories, including verbs in declarative form (i.e., *sale,* lit. '(it) goes up'), adjectives (i.e., *lungo,* 'stretched' and *alto,* 'high up') and direction terms (i.e., *destra,* 'right' and *giù,* 'down'). Hence, the instructive (directive) function of series of repeats is evidently more the result of their indexical relation to the embodied and material ecology of the ongoing activity, than the result of their grammatical category.

The instructive significance of series of repeats is achieved both sequentially and simultaneously. Multiple repeats are indeed sequentially bounded to prior instructional turns, either because they reuse lexical material or because they semantically elaborate on the preceding instruction. The instructive function of

multiple repeats is also achieved based on their indexical relation to the current development of the climber's body movement, whose direction and duration are simultaneously made relevant and calibrated.

Timing and prosody of multiple repeats also play a relevant role. As far as timing is concerned, in most of the occurrences of the practice, the temporal trajectory of the series of repeats is perfectly timed to end in unison with the completion of the addressed climbing movement. This precision timing gives the impression that the purpose of repetition is that of vocally conveying the expected duration of the climber's ongoing bodily movement, making the guide's commitment to ensuring the successful outcome of climber's performance specifically observable.

As far as prosody is concerned, intonation, loudness and tempo result to be crucial in implementing (and differentiating between) the two functions of a) instructing the climber to continue moving in the current way, and b) correcting the climber's current movement. By delivering the series of repeats with a continuous, relatively "flat" prosodic contour, the guide makes sure that the climber continues moving as he/she is already doing, that is, maintaining current motion path. In this case, "sameness" in the segmental as well as suprasegmental shape of the repetition conveys that the *same* motion flow is to be maintained. Conversely, by delivering the series of repeats with increased loudness, pressing tempo and heavier pitch movements on each repeat, the guide conveys the sense that something in the current movement (i.e., its direction), is to be changed.

The efficacy of repetition in providing auditory guidance is confirmed by the observation that the climber routinely follows the instruction to continue moving in the current direction, even in the case he/she 'accidentally' touches a hold that could be confused with the target hold. In these cases, the climber is observably relying more on the auditory information provided by the guide, than on the haptic information he/she directly receives from the contact with the holds. This is a demonstration that the auditory guidance strongly contributes to enhance the climber's sensory experience, enabling the climber to correctly interpret the haptic affordances of the route. Thus, the auditory dimension of language interacts with the haptic dimension of climbing, filling the gap between the trainer's visual and the climber's haptic sensory experiences.

To conclude, the analysis encourages greater attention to the embodied aspects of language, by which we mean not only the aspects pertaining the articulation of speech, but also those relating to its auditory perception. While it is widely demonstrated that some linguistic practices can locally contribute to orienting the participants' perception towards specific aspects in the material world (as is the case for deictics), we still

know little about how language itself can constitute a sensory resource, thanks to the auditory properties of speech.

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Declaration of interest

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Appendix: Transcription conventions

Original talk is in Italian. Each transcribed turn is accompanied by a word-by-word translation in the following line, as well as by an idiomatic translation (in italics, in the third line).

Conventions used for transcribing talk (adapted from Jefferson, 2004):

`(1.0)`	pause in tenth of a second
`(.)`	short gap of less than 0.2 seconds
`.`	falling intonation
`?`	rising intonation
`;`	slightly falling intonation
`,`	slightly rising intonation
`:`	elongation of the immediately prior sound
`:::`	the more the colons, the longer the sound
`↑↓`	marked rise/fall in pitch
`=`	latching utterances
`word`	speaker's emphasis
`word-`	abrupt cut-off
`WORD`	sound markedly louder than surrounding talk

Symbols used for transcribing embodied conduct (adapted from Mondada, 2019):

+ +   delimit the description of the climber's embodied actions, which are synchronized with the

           preceding talk

-->   the action continues across subsequent lines

-->>   the action continues beyond the extract

-->+   indicates when an action continuing from previous lines ends

>>   the action has started before the beginning of the extract

indicates the exact timing of a snapshot