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On the intersection of phonetic detail and the organisation of interaction: clinical connections

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Abstract

The analysis of language use in real-world contexts poses particular methodological challenges. We codify responses to these challenges as a series of methodological imperatives. To demonstrate the relevance of these imperatives to clinical investigation, we present analyses of single episodes of interaction where one participant has a speech and/or language impairment: atypical prosody, echolalia and dysarthria. We demonstrate there is considerable heuristic and analytic value in taking this approach to analysing the organisation of interaction involving individuals with a speech and/or language impairment.

Keywords: conversation analysis, sequence, atypical prosody, echolalia, dysarthria

Introduction

The analysis of language use in real-world contexts — what might be broadly construed as “pragmatics” — poses particular methodological challenges. For instance, what would constitute an appropriate data-set (e.g. audio recordings, transcriptions, coding schemes, experimental results)? How do we decide on any particular occasion which levels of detail are involved in making meaning (e.g. lexis, grammar, phonetics, gesture, sequential organisation, sociolinguistic parameters)? Should we attend to participants’ own understanding of interaction, and if so how best do we do this (e.g. inductively, or through explicit questioning)? Should we attend to single instances or should we only deal with large numbers of instances? As part of work on the linguistic-phonetic resources participants marshal to make meaning in talk we have codified our responses to these challenges as a series of methodological imperatives for the study of the phonetic organisation and phonological structures of spontaneous speech. These imperatives have particular relevance to clinical study since the use of linguistic-phonetic resources to make meaning can be especially challenging for communicatively impaired individuals and their conversational partners. The imperatives are themselves extensions and developments of core aspects of Conversation Analysis (CA; Sidnell & Stivers, 2013), and reflect practices in certain studies of atypical speech and language behaviours (e.g. ; Wootton, 1990, 1999; Wells & Local, 1993; Goodwin, 1995, 2003; Radford & Tarplee, 2000; Beeke, Maxim, & Wilkinson, 2007; Wilkinson, 2007; Schegloff & Lerner, 2009). Since they provide the framework for the observations we make in this paper we reproduce them here in a concise form from Local and Walker (2005); throughout this article ‘I’ followed by a number is used to refer to a particular imperative.

(I1) *Only use data drawn from talk-in-interaction.* (‘Talk-in-interaction’ refers to talk produced such that some element of interaction between participants occurs and includes, for instance, business meetings, interviews, interactions in SLT clinics as well as everyday conversation.) This imperative arises not simply because of the ecological validity or naturalness of such data. Rather, the organization of talk-in-interaction allows us to use participants’ behaviour as the basis for the analytic categories proposed. Moreover, there may be practices available to participants in talk-in-interaction which might not arise from even the most careful introspection.

(I2) *Conduct linguistic and interactional analysis in parallel and not serially.* For instance, we do not see communicative function as a way of ‘explaining away’ audible properties of the speech signal. When dealing with data drawn from talk-in-interaction we take the view that linguistic features and interactional function are inextricably linked, and that one does not exist without the other. The way in which we conduct the analysis is intended to reflect that: we pursue a formal interactional analysis hand in hand with linguistic analysis (which we take to include analysis of phonetic design) and not simply as some optional extra.

(I3) *Demonstrate the orientation of participants to any categories posited or analytic claims made.* For instance, if we wish to make a claim that some linguistic feature is an important element in the structuring or treatment of a particular turn or sequence, the analysis is required to provide evidence that participants themselves treat it, or orient to it, as important. Placing reliance on participant orientation to warrant analytic claims ensures that the practices being described have some kind of reality for the participants and are part of their functional linguistic competences. A reliance on participant orientation also liberates us from analytic intuition and quasi-psychological speculation as to the motivating force behind the behaviour in question.

(14) *Ensure that any analytic account handles single cases as cogently as it does the aggregate.* There are two main reasons for this. First, setting the basis for statistical analysis of ‘interactional’ phenomena in a way which is informed and informative in terms of representing the behaviour of the participants is highly problematic; a particularly eloquent account of some of these problems can be found in Schegloff (1993). Second, no quantitative measure of frequency of occurrence alters the fact that an episode of interaction occurred in that way on that occasion for those speakers (Wootton, 1989): any singular occurrence is the result of a set of practices available to those participants for so conducting interaction.

(15) *Subject each fragment to repeated close inspection.* All claims should be based on what can be discerned in the audio/video recordings. Moreover, candidate findings in all domains should be referred back to the audio/video recordings for empirical verification and testing. As Firth remarked: ‘A theory derives its usefulness and validity from the aggregate of experience to which it must continuously refer in renewal of connection.’ (Firth, 1968, p. 168)

(16) *Treat all details at all levels as of potential relevance to the participants.* We simply do not know, from the outset, which details might be of relevance to the participants and might have a communicative function.

(17) *Be attentive to place in sequence and to place in structure.* In order to make claims about the functioning of linguistic features it is essential to establish robust comparability of instances. We need to understand, for instance, the precise syntagmatic relationships which turns and sequences of turns contract with each other. One important benefit which results from the approach we set out here is that it enables the analyst to establish functional structural sameness and to compare like with like.

To establish the relevance of these imperatives to the clinical investigation of phonetic detail we present analyses of single episodes of interaction where one participant has a speech and/or language impairment. For each individual this impairment can manifest itself in the atypical phonetic design of talk: atypical prosody used by a speech- and language-impaired child to signal the relevance of turn-transition (= a shift in speakership from current speaker to another participant); ‘unusual echoes’ of an interlocutor’s talk produced by an autistic child; and dysarthric speech produced by an adult with cerebral palsy. Rather than focussing on the factors which lead to the individual’s apparent pragmatic impairment, we focus on interactional consequences which are attributable to the joint actions of both participants. We demonstrate there is considerable heuristic and analytic value of taking this approach to analysing the organisation of interaction involving individuals with a speech and/or language impairment. While our discussion is selective, we hope to present sufficient detail to allow others to operationalize these imperatives in the study of pragmatic impairment. Where the analysis has resonance with particular imperatives, this is noted at the end of each section.

Study 1: Atypical prosody

At the age of 5;4 David was undergoing therapy on account of severe speech and language problems, one feature of which was a particular pitch characteristic at the end of his turns (Wells & Local, 1993). Fragment 1 is taken from a session in which David (D) and a student speech therapist (E) were looking at some pictures. The transcriptions reflect aspects of the

sequential organization of the talk and its lexico-syntactic make-up. Turns at talk run down the page with the speaker identified at the left-hand edge. Onset of overlapping talk is indicated by left-hand square brackets, '['. Silences are measured in seconds and enclosed in parentheses, for example (0.2); a period in parentheses indicates a silence of less than two tenths of a second. Events which occur in especially close temporal proximity to one another but which are transcribed on separate lines are linked with equals signs, '='. Audible breathing is indicated by 'h', with each 'h' indicating one tenth of a second; audible inbreathing is indicated by '.' preceding symbolisations for breathing. Phonetic transcriptions given in the text follow the conventions of the International Phonetic Association (1999).

(1) David: 5;4

1 E: what d'you think it is David
 2 (3.5)
 3 D: teddy bear
 4 (0.8)
 5 E: yes it could be a teddy bear who's that there coming up the
 6 path
 7 D: (* *)
 8 (1.5)
 9 D: postman
 10 (1.2)
 11 E: what's he going to do
 12 D: get out a letter
 13 (1.0)
 14 E: get out a letter
 15 D: yes
 16 E: and what's he going to do with the letter
 17 (1.0)
 18 D: put it in (1.7) put it through letter box
 19 (0.8)
 20 E: he's going to put it in the letter box=
 21 D: =yes
 22 (1.0)
 23 E: and who's this do you think
 24 (1.0)
 25 D: girl
 26 (1.0)
 27 E: is it a girl
 28 D: I already said that
 29 (0.8)
 30 E: she's already
 31 (0.5)
 32 D: I already said that (0.3) I did
 33 (5.0)
 34 E: should we see what's on the next page .h oh (0.6) who's this
 35 again
 36 D: postman

D's turns in fragment 1 follow the predominant prosodic pattern in his conversational talk: a main prominence (signalled by a rising pitch movement, along with slowing of tempo and increased loudness) is found on the final syllable of the final word in all of his utterances. Figure 1 presents F0 traces of part of D's talk in fragment 1. (Gaps in the F0 trace are due to changes from modal phonation.) The F0 traces are scaled to the speakers' baseline and topline pitches, established by inspection of hand corrected F0 traces of a representative

sample of that speaker's conversational talk. The relative darkness of the dots in the trace represents intensity, with higher intensity portions of the signal having darker dots. Word labels aligned with the F0 trace are presented at the top of each figure.

FIGURE 1 ABOUT HERE

D's final-syllable pitch accent occurs without regard to the normal pattern of lexical stress (e.g. at lines 9 and 36 we find postMAN, rather than POSTman, and at line 12 D produces leTTER rather than LETter) or information focus (e.g. the verb in line 28 [k=ɛt=] 'said', would normally be expected to be focussed where the speaker is refuting the suggestion that something has not been said, but that is not the case here – the rising pitch occurs on 'that'; see figure 1a). It seems reasonable to think that D's final rising pattern would have negative consequences for his ability to communicate effectively as it disrupts not only the normal patterns of lexical stress in di- and polysyllabic words but also the signalling of information focus. However, close inspection of the interactional organisation of this extract shows that his co-participant (E) is able to make sense of this pitch movement as an indicator of turn completion. The most straightforward evidence for this claim is found in the fact that after each such rising pitch movement (with the exception of the rise coincident with 'that' in line 32; see figure 1b and discussion below) D ceases to talk and his co-participant takes a turn. Moreover E does not attempt to begin a turn until such a pitch movement has been produced. So at line 18 D pauses for 1.7 seconds (s) after 'put it in' but E does not attempt to start a turn, although elsewhere she waits for a shorter time before starting to talk.

It might be argued that the gaps which occur between the end of D's turns and E's next turn are indicators that this prosodic pattern engenders understanding problems, or that E is using silence as a sole indicator of when to start her talk. However the actual design and timing of E's turns suggests that this is not the case. So, for instance, while there is a 0.8 s gap between D's turn at line 3 and E's response, there is no evidence that this is an indicator of trouble. E's turn at line 5 does not seek explicitly to treat his prior turn as problematic. She produces a positive response token and embeds D's production in her own turn before directing his attention to another part of the picture with 'who's that there coming up the path'. There is a gap of 1.2 s after D's turn at line 9 but again E's next turn treats this utterance as unproblematic and produces another question which anaphorically references 'postman' in D's prior turn. Note too that E starts her talk at line 16 immediately on the completion of D's production of 'yes' at line 15 which is produced with the characteristic prosodic pattern described here.

Where E's turns display a design that suggests she is having problems with D's talk (e.g. at lines 14, 20 and 30 where E initiates repair through full or partial repetition of D's prior talk) this would appear to have to do with atypical articulation rather than atypical prosody. D's productions exhibit a range of atypical features including nonstandard word-joins and non-canonical realisation of consonants. For example 'postman' (line 9) is produced as [p=ʌθm^wəp^h], the two versions of 'said' in 'I already said that' (lines 28 and 36) have two different places of articulation at their beginning – complete velar closure in the first ([k=ɛt=]) and complete alveolar closure in the second ([t=ɛt=]) rather than alveolar close approximation. The second version of the phrase ('I already said that (0.3) I did', line 32)

displays other atypical features including a voiceless velar plosive at the start of ‘did’ ([ɔ̣ɪlʲβɛtʰ=ɪtʰ=ɛtʰ=:aʰ] [ɔ̣ykʰ=rʰtʰ]). ‘Get out a letter’ (line 12) is produced as [kʰ=ɛtʰ=ɛkʰ=əʔ̣ʰ n̄ɛtʰʰah] with a velar rather than alveolar plosive at the end of ‘out’, atypical juncture between the indefinite article and ‘letter’ and a denasalised stop rather than lateral approximation at the beginning of ‘letter’. E’s redoing at line 14 of this latter turn both checks its lexical content (getting an affirmative response from D) and exposes for him normative junctures for ‘out a’ and ‘a letter’ which he produced as [ɛkʰ=əʔ̣ʰ n̄ɛtʰʰah].

There is one clear case where E explicitly displays a problem of understanding (line 30). Here again the problem arises not from issues of turn completion and turn taking but rather is sensitive to the content of what D has produced in his prior turn. At line 25, in answer to ‘and who’s this do you think’, D produces [kʰ=ɛ:ʰ], which E redoes as ‘girl’ (line 27). In response to this redoing D asserts that ‘I already said that’ (line 28). E’s turn at line 30, which is a partial redoing of D’s talk (though erroneous in respect of the pronoun) is characteristic of a particular kind of turn regularly found in naming/description sequences where adults and young children are looking through picture books (Tarplee, 1996; Wells & Corrin, 2004). Produced halfway up her pitch range with a very narrow rise over ‘already’ (1.8 semitones (ST)), it provides a candidate version of D’s turn up to the problematic part and invites him to redo his talk from that point. At line 32 D redoes a version of ‘I already said that’ with a wide (14.8 ST) rise on ‘that’: see figure 1b. When E does not come in D adds ‘I did’, with a wide (12.8 ST) rise on ‘did’ which can be seen as a second attempt to show that his turn is complete. Though E does not speak immediately, she none the less treats D’s talk as complete and as not projecting anything further: after a short gap she turns the page and, at line 34, proceeds to solicit more talk from him.

We should note that rising pitch is not the only phonetic resource systematically deployed by D to indicate that he is projecting turn-finality. We find absence of audible articulatory closure at the end of his turns along with rising pitch. So, for instance ‘girl’ at the end of line 25 is produced as a long vocoid and without any audible tongue closure. D’s production of ‘postman’ (line 9) is done as [pʰ=ɑ̣uθʰmʰ=ɑ̣pʰ] with a final audibly released and aspirated plosive. Similarly, the turn final plosives at line 28 (‘that’ [jʰaʰtʰ]), and line 32 (‘did’ [kʰ=rʰtʰ]) are both produced voiceless with audible aspiration while ‘letter’ at the end of line 12 is followed by an outbreath as is ‘box’ at line 18.

Attention to both the sequential organisation and the phonetic design (I2) reveals the way D is able to marshal linguistic-phonetic resources for turn-taking. As well as these utterances being designed by D as possibly complete, they are treated by his co-participant in that way (I3). Although D’s system for handling turn-taking is not identical to that of his local adult community (Wells & Macfarlane, 1998) it employs a subset of the same phonetic resources, and encompasses both prosodic and non-prosodic features (I6).

Study 2: Echolalia

Fragments 2 and 3 are drawn from a collection of audio and video recordings of Kevin, an

autistic boy. Kevin was 11;4 years old at the time of recording, living at home in the south of England with his parents and younger sister. He attended a school for children with special needs (Local & Wootton, 1995). One notable feature of Kevin's speech is the frequency of turns which repeat the immediately prior turn by his co-participant. Kevin's talk is massively echolalic, including both immediate 'pure' echoes of preceding talk (Prizant & Duchan, 1981) and delayed echolalia (speech which usually consists of recognizable reworkings of forms of talk that he had heard on some other occasion but which does not appear to be addressed to other people with specific communicative intent).

Not all of Kevin's immediate echoes are the same. Some are interactionally 'problematic' while others are not. The designation of repetitions in Kevin's talk as 'problematic' as opposed to 'unproblematic' can be determined not by stipulation but rather by carefully examining their sequential placement, their phonetic characteristics and the way in which they are treated by his co-participants. For example in fragment 2 Kevin (K) and his mother (M) are sitting side by side on the settee at home looking at a book. At lines 4 and 6 K's mother is soliciting a label for the picture they are looking at. At line 9 Kevin echoes the noun in his mother's prior turn [dʒæ:m]. At this place in the interactional sequence K's echo comes off as unproblematic repetition-as-confirmation of M's talk at line 8.

(2) Kevin: cake

1 M: what is it
 2 (0.4)
 3 K: cake
 4 M: a cake with
 5 (1.2)
 6 M: what's this
 7 (1.2)
 8 M: it's ja:::m=
 9 K: =jam
 10 (1.3)
 11 M: so there's jam in the cake

His mother's talk at line 11 treats K's repetition as unproblematic by building it into her turn which closes the discussion of the jam and the cake and the conversation moves on. Phonetically the two productions of 'jam' are noticeably different: see figure 2. Although both pitch contours rise then fall, his mother's version of 'jam' exhibits a marked fall in frequency (16.5 ST) towards the end while K's version has only a narrow fall (2 ST) and ends higher than its starting frequency. The initial rising parts of the contours show a difference in pitch excursion. K's version reaches its frequency peak proportionately later than his mother's version and shows proportionately less difference in frequency between its starting point and peak: 4.5 ST for K and 8 ST for his mother. The duration of the two versions also differs. His mother's is some 408 ms while K's is approximately 350 ms. The loudness characteristics of K's echo also distinguish it from M's version. The relationship between loudness and pitch of M's version bring it off as a distinct rising-falling contour whereas those of K's turn bring it off as a falling contour.

FIGURE 2 ABOUT HERE

Compare this with K's echo of his mother's talk at line 7 in fragment 3. K and his mother are playing a board game. As this sequence begins his mother is holding the dice and its container in her hand and K is looking away, towards the camera:

(3) Kevin: turn

- 1 M: whose turn is it
 ((then M adjusts cards on the table between them, and K looks at the table))
 2 (1.5)
 3 M: whose turn is it
 4 (1.5) ((near end of gap K looks away))
 5 M: whose turn is it
 ((K begins to reach for dice container M is holding))
 6 (.)
 7 K: turn is it ((looking at M's face))
 8 M: whose turn is it ((withdrawing her hand that holds the container))
 9 K: Kevin's turn ((his hand now flat on the table, not reaching for container, now looking at table))
 10 (0.6)
 11 M: go on then

At lines 3 and 5, M makes successive attempts to solicit a response from K to her question first asked at line 1. This is not unusual. Typically when co-participants ask K questions he does not give an immediate vocal response. Often this leads to extended sequences, as here, where a co-participant will repeatedly redo the question. At line 7 K eventually produces a vocal response by echoing part of his mother's question – 'turn is it'. M's treatment of K's turn at line 7 is different from her treatment of his redoing of 'jam' in fragment 2. In fragment 2 M treats K's turn at line 9 as an appropriate interactional contribution at that point in the sequence and builds it into her immediately next turn. However, in fragment 3, by redoing her previous question in its entirety she treats K's productions as an action not fitted to her prior talk – she treats it as inappropriate and persists with her question (line 8). This renders K's talk as problematic – whatever function it may have it is not treated as counting as a fitted response to the question 'whose turn is it'. It is only when K produces 'Kevin's turn' at line 9 that M treats his response as appropriately addressing her question and gives him permission to take the dice shaker and to take his turn.

The phonetic characteristics of the echo at line 7 [tʰɜːnɪzɪtʰ] with respect to the talk that it redoes is strikingly different from that in fragment 2. Here, K's version closely models the articulatory and pitch characteristics of his mother's turn: see Figure 3.

FIGURE 3 ABOUT HERE

In addition it has a particular rhythmic relationship to M's prior talk which is different from that manifest in fragment 2. In articulatory terms, the vowels of K's production [ɪzɪtʰ] have the qualities of M's third production [hɜːtʰɜːnɪzɪtʰ] which has noticeably closer qualities than her first two versions. In addition, the consonants of 'is' [zɪ] and 'it' [tʰ] of K's production have the same resonance as M's immediately prior version and the final

consonant has the same apical alveolar closure and release and aspiration as M's immediately preceding version. These features are striking not least because they are noticeably different from M's first two versions [hʊz̥^ht̚^hɜ̃:nɪz̥^vɛ̃^vɪ̃^vp̚^v], [hʊz̥^ht̚^hɜ̃:nɛz̥^vɛ̃^vɪ̃^vp̚^v] where the consonant of 'is' is produced with velarized resonance [z^v], and the final consonants are both inaudibly released voiceless plosives without aspiration (the first of which has bilabial closure [p̚^v], the second an alveolar closure [t̚^v]).

K's version also closely models the pitch characteristics of his mother's third version. Her third version, like her previous two, has a main pitch accent on 'turn' which falls to the end of her utterance. It begins slightly above mid in her pitch range (her second version is noticeably higher) and falls to a little above her baseline (and lower than her first two versions). The largest excursion of the fall occurs with 'is it'. In similar fashion K's version has a main pitch accent on 'turn' which falls to the end of his utterance and the main part of the fall is accomplished on 'is it'. Though K's version is slightly lower at its onset than M's (3 ST), it closely follows M's version in contour shape and time course (see figure 3) and comes off as pitch mimicked (we therefore present the pitch trace of K's utterance in figure 3b scaled to M's baseline rather than his own) and functionally opaque (on pitch mimicry see Couper-Kuhlen, 1996).

The rhythmic relation of K's echo to M's version is also rather different from that in fragment 2. Though K's echo of 'jam' in fragment 2 is relatively close in temporal terms to his mother's version, his echo of 'jam' coincides with the rhythmical beat set up by M's prior turn. In M's first two turns in fragment 3 syllable stress and rhythmic beat coincide. In her third turn the rhythmic beat falls in the same place and further reinforces the regular rhythmic pattern established by her first two turns. The stressed syllable 'turn' in K's next utterance, however, is not aligned with this established rhythmic pattern but comes in early. The place where the expected beat would fall coincides with the unstressed syllable 'is'. This creates a noticeable anisochronous relationship of K's production with that of his mother's preceding turn and contributes to its 'unusual' status. By contrast K's production of 'Kevin's turn' at line 9 is rhythmically fitted to M's prior talk, coincides with the beat set up by that turn and is treated by M as unproblematic. Taken together the articulatory, pitch and rhythmic features give K's 'turn is it' echo, and others like it in his speech, both a parasitic and automatic feel. It is produced in a sequential position where K is being required to produce a next turn, but it appears to be occupying that turn slot simply by repeating what the adult has said rather than being a fitted, action-relevant response.

In this analysis we have motivated a distinction between fitted, unproblematic echoes and not fitted, problematic echoes by explicit reference to the way in which K's co-participant treats his talk (I3). This distinction arises when we are sensitive to place in sequence and structure to understand action in talk, rather than treating repetition as a unitary phenomenon (I7; see also Curl, Local, & Walker, 2006). This sensitivity is especially valuable given that pragmatic impairment is not necessarily found in all utterances at every place in interactional structure: not all repetitive utterances produced by an echolalic speaker are 'impaired'.

Study 3: dysarthria

This section focusses on two excerpts from a broadcast telephone call made by Steve (S), an adult male with cerebral palsy, to the *Nightowls* radio phone-in programme broadcast from Newcastle, England. There are moments in this interaction from which a sense of S being a ‘passive’ communicator might emerge. Following talk about S not having been allowed into a local pub because of his wheelchair (S’s initial reason for calling), in fragment 4 the show’s host (AR) begins talk about repairs to S’s computer.

(4) NO.1.01.shop, 1:16

1 AR: .pthhh d’- was your computer [s]orted
 2 S: [(°eh°)]
 3 AR: today:[:
 4 S: [hhh
 5 (0.5)
 6 S: .hhhh hhh (.) .hhh eh (0.4) .hh (0.2) it is but I need a new
 7 .mhhh monitor
 8 (0.4)
 9 AR: ah:: did he[:
 10 S: [.hhh[h
 11 AR: [that’s exce[l]lent]
 12 S: [hh]
 13 (0.2)
 14 S: .mhhh
 15 AR: w’l I’m glad something’s moving (.) at least there
 16 for y[ou D]ave
 17 S: [°hh°]
 18 (S:) °.hhhh°
 19 AR: anything else mate

In response to AR’s enquiry about S’s computer (lines 1-3), S reports only partial success: he will need a new monitor (lines 6-7). As is characteristic of S’s speech generally, this turn is delivered with slow pace, frequent and atypical use of glottal closures (e.g. at the end of ‘need’), incomplete supraglottal closures (e.g. for the medial nasal in ‘monitor’), and with several spates of audible breathing with a greater degree of glottal constriction than is usually associated with audible breathing in interaction. AR’s response (lines 9-11) is not well-fitted to S’s report. First, his newsmark (Maynard, 1997) ‘ah:: did he’ contains a pronoun which connects to a referent which is not to be found in S’s turn (Fox, 1987). Second, while AR’s follow-up assessment ‘that’s excellent’ is fitted to the S’s good news (that the computer is ‘sorted’) the bad news (that S needs a new monitor) is left unaddressed. It would appear from AR’s responsive talk that his understanding of S’s turn at lines 6-7 is flawed, this flawed understanding perhaps arising from the additional perceptual challenge for AR of S’s dysarthria especially given that the communication is taking place by telephone (Drager, Hustad, & Gable, 2004). The orthographic transcription downplays the extent of the perceptual work AR needs to do to make sense of what has been said. Whatever its basis, notice that this displayed flawed understanding is left unaddressed by S: he does not initiate repair following AR’s apparent error of interpretation (cf. Jefferson, 1987 on correction in unimpaired interaction).

These remarks about aspects of fragment 4 notwithstanding, close analysis of the

interaction between S and AR also reveals collaboratively achieved sequential complexity in which S plays a full and active role (Goodwin, 2003). Fragment 5 contains a case which demonstrates S's competencies in producing talk with a phonetic design which is precisely fitted to the sequence in which it occurs and the pragmatic function it performs. S has asked for help in raising money for a new wheelchair; AR has explained that the radio station forbids requests for donations of money on the show. The turn of particular interest here is S's, beginning at line 15, in which he revisits his reason for making the call: he has not been allowed into his local pub because he uses a wheelchair, and wants advice.

(5) NO.1.01.shop, 2:12

1 AR: will none of the organisations that deal with cerebral palsy
 2 help [you get] one
 3 St: [eh:]
 4 (0.9)
 5 St: yeah
 6 (0.3)
 7 AR: well they they might do I would suggest that you contact them
 8 Steve .hhh but--=
 9 St: =yeah
 10 AR: but good luck to you:
 11 AR: I[hope it happe]ns=if anybody's got a second hand
 12 St: [w:::]
 13 AR: electric wheelchair .hhhh that they're trying to move on
 14 obviously we'll put a shout out for you=
 15 St: =ɛ̃ʔ̃ɛ̃œ̃ə̃(0.2) what do I do hh about my (.) .hhh situation (0.3)
 16 .hhhh I .hh tried to get in .nhh to my local .hnhhhh (0.3) pub
 17 (0.5) but (.) they .mhhhhh told me (.) .hhh (0.2) I wasn't
 18 allowed in
 19 (0.3)
 20 St: .thhhh(.) I don't know what (.) .hh (.) I (.) can do about it
 21 (0.8)
 22 St: °.hhh°
 23 AR: right well if anybod[y's] got any idea they could give [me a]
 24 St: [°.hh°] [°.mh°]
 25 AR: call

In the early part of fragment 5, the call is heading towards possible closing (Schegloff & Sacks, 1973). Having discussed a variety of topics, AR has outlined a course of action for S ('I would suggest that you contact them Steve', lines 7-8) followed by a solicitude ('good luck to you', line 10). S evidently recognises this move to possible closing, and launches a first (unsuccessful) attempt at resisting this move to close with his talk at line 12. Without a break in his talk, AR goes on to solicit help from listeners (lines 11-14) which includes a figurative expression 'put a shout out' (on figurative expressions and topic closing see Drew & Holt, 1998). S does not produce the appreciation or closing AR's talk up to the end of line 14 has made interactionally relevant. S makes a successive attempt, latched to the end of AR's turn, at producing talk in which he revisits (or 'back references': Button, 1987) the earlier matter of not being allowed into a pub on account of his wheelchair (lines 15-18). He eventually makes a claim that his problem has not been dealt with (line 20).

In addition to the propositional content of S's turn (line 15 on) connecting back to previously discussed matters, it is phonetically packaged to display that at this point he is

beginning a new sequence rather than following the closing implicative direction of AR's talk. S manages this through the pitch of the early part of his turn. S's talk at the start of line 15 is produced relatively high in his speaking range, and higher than the beginning of other turns. For instance, it is audibly higher in pitch than his most recent talk produced out of overlap ('yeah', line 9). This percept is borne out by acoustic measures of frequency. Figure 4 contains F0 traces of relevant parts of S's talk. Figure 4a shows an F0 trace for the beginning of S's talk in line 15; comparators are provided in figure 4b and 4c (his preceding talk produced in the clear at line 9, and the start of his next utterance in line 20 respectively).

FIGURE 4 ABOUT HERE

The mean F0 for the early part of S's turn which begins in line 15 is 252 Hz, 10.9 ST above his baseline measure. The mean F0 for his preceding talk produced out of overlap (and therefore where an accurate measure can be obtained), 'yeah' (line 9) has a mean F0 of 202 Hz, 7.1 ST above his baseline. On occasions S's phonation is disturbed, with the result that there is considerable variation in his F0 measures (see especially figure 4a around 151.2 s and 152.8 s). Since these values are not always equal in terms of their perceptual salience, we report here on F0 values taken at the intensity maximum in the relevant syllables on the basis that the point of maximum intensity in a syllable will be a point of particular perceptual prominence. The mean of the F0 measures at peak intensities for his 'what do I do' (line 15/figure 4a) is 242 Hz, 10.2 ST above his baseline. This is much higher than his preceding 'yeah' (line 9/figure 4b), which has an F0 at peak intensity of 212 Hz, 7.9 ST above his baseline.

The significance of the relatively high pitch from the beginning of line 15 is that one way interactants can prosodically mark talk as beginning a new sequence (rather than following on from the immediately prior talk) is to produce an utterance with high pitch from its very first syllable (Couper-Kuhlen, 2004). As well as having higher pitch than his talk in line 9, the beginning of this turn is also higher in overall pitch than his utterance starting in line 20, which continues the sequence. Figure 4c shows an F0 trace for the chunk of speech from the start of line 20 up to his first spate of audible breathing: 'I don't know what'. The mean of the F0 measures at peak intensities for these syllables is 230 Hz, 9.4 ST above his baseline.

It is through close sequential analysis that we reach a more complete understanding of how S's talk, in terms of its lexico-grammatical construction and its phonetic design, is fitted to the moment-to-moment development of the interaction. The tasks which S has been shown to be able to handle in fragment 5 — in particular the marking out of talk not as cohering with the immediately prior talk, but as dealing with some other matter — are the sorts of tasks which are only observable in naturally occurring talk-in-interaction (I1). Attentiveness to the place in conversational structure in which the talk is produced has helped first to highlight, and then to account for, different pitch features on different turns (I7), and to relate those features to findings made concerning the speech of individuals without a speech or language impairment.

5 Discussion and implications

We began by stating a set of methodological imperatives for the study of naturally occurring talk-in-interaction. Using these imperatives as a starting point, we have analysed short strips of interaction between impaired and unimpaired participants. These analyses have provided an insight into the organisation of those interactions, and indications of both competency and deficit. For example, David (a child in speech therapy) produces turns which have in certain respects atypical phonetic characteristics, but he is still able to signal turn-endings appropriately; Kevin (an autistic child) presents with repetition as his principal form of participation in interaction but not all of his redosings of prior talk are designed or treated in the same way; Steve (an adult with dysarthria) produces talk which creates significant perceptual challenges for his co-participant, but despite problems of production he is able to marshal prosodic resources to mark syntagmatic relationships between turns at talk.

While recognising that in each case one participant has a speech or language impairment, we have set aside assumptions about canonical behaviour which may be associated with those particular impairments. In focussing on the organisation of the interaction we aim to avoid stereotyping of impairments. Instead we seek to account for the moment-to-moment production and understanding of talk by all participants. So, for instance, in study 3 we are not trying to characterise dysarthric impairment, but rather we are trying to understand the nature of the interaction in which an individual with dysarthria is participating. This approach makes it possible to gain greater insight into the organisation and the nature of pragmatic impairments (Goodwin, 2003; Perkins, 2007; Wilkinson, 2007). Grounded in the observable details of ecologically valid behaviours, these insights may help refine received characterisations of pragmatic impairment and how those impairments may shape interaction. The application of these imperatives would allow us to develop characterisations of particular populations of interactants through observing the behaviour of individual members rather than imposing *a priori* characterisations of impairments. These interactant- and interaction-driven characterisations have the potential to provide greater explanatory power in understanding individuals with communication impairments. This parallels I4 above: the relevance of careful analysis of individuals' day-to-day communication to characterising the population is equivalent to the relevance of understanding strips of interaction in order to establish the characteristics of an aggregate data-set. Whatever the eventual outcome, the method we have described and applied allows for the identification of details and competencies which may be overlooked in large-scale experimental studies, or by theoretical models which take utterances out of their real-world, real-time contexts of occurrence.

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Declaration of interest

The authors report no declarations of interest.

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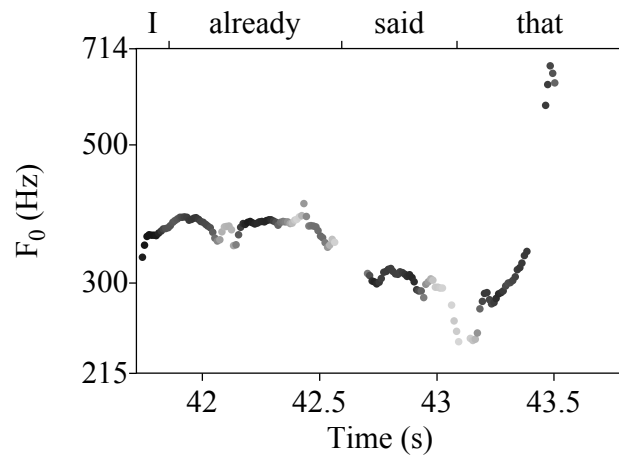
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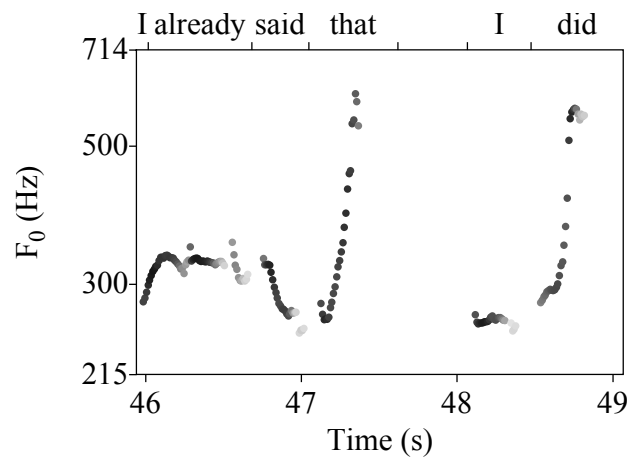
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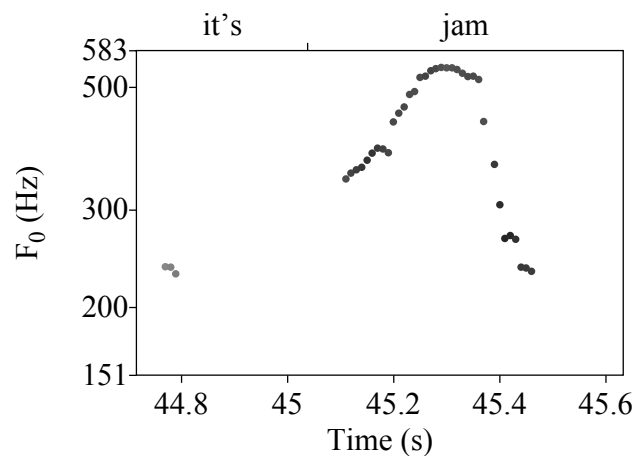


(a) David, line 28

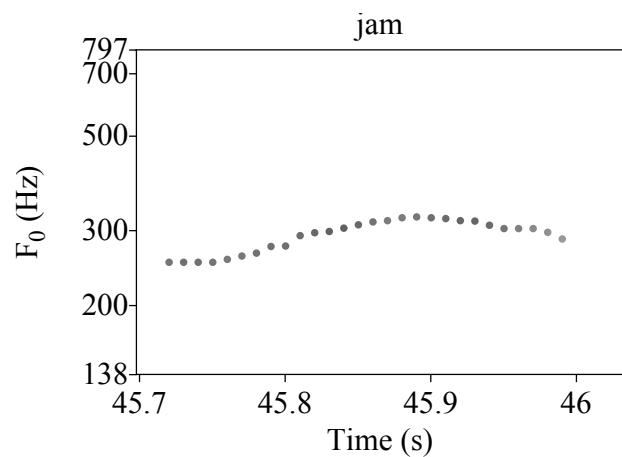


(b) David, line 32

Figure 1: Pitch traces for parts of fragment 1

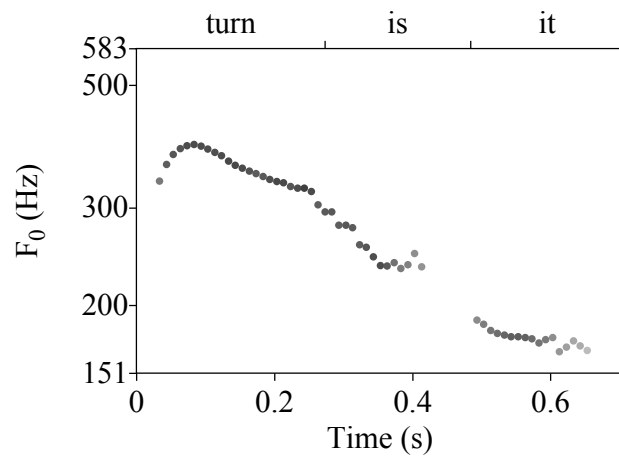


(a) Kevin's mother, line 8

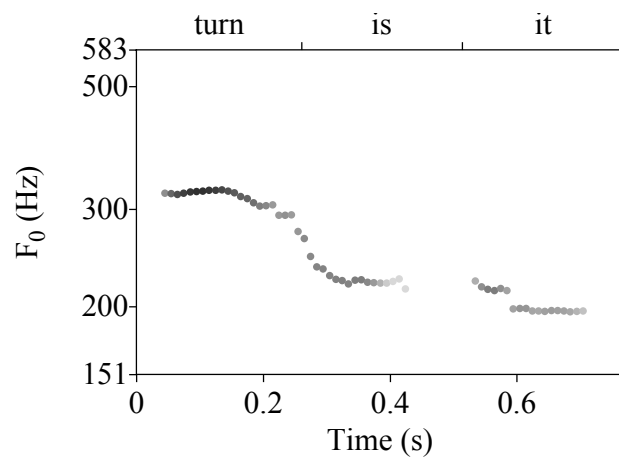


(b) Kevin, line 9

Figure 2: Pitch traces for parts of fragment 2

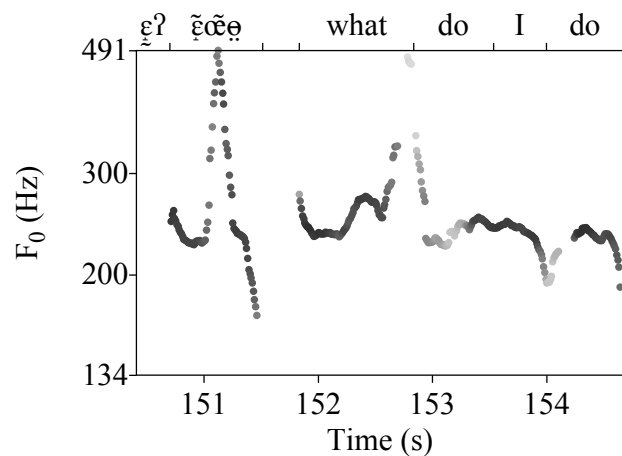


(a) line 5

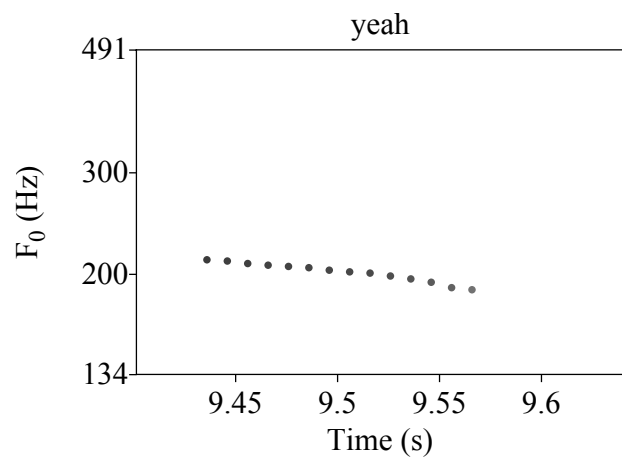


(b) line 7

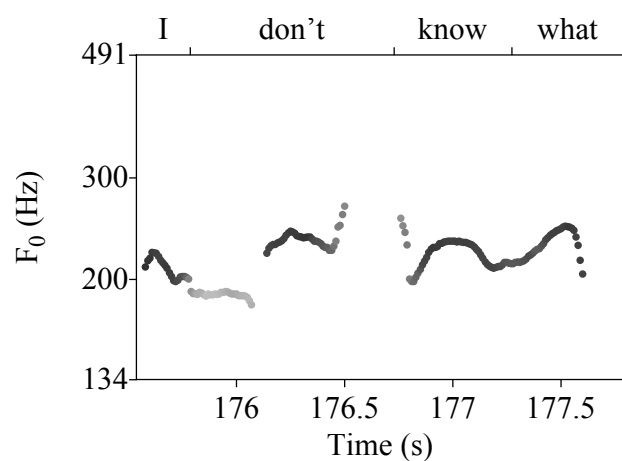
Figure 3: Pitch traces for parts of fragment 3



(a) Steve, line 15



(b) Steve, line 9



(c) Steve, line 20

Figure 4: Pitch traces for parts of fragment 5

Figure captions

Figure 1: Pitch traces for parts of fragment 1

(a) David, line 28

(b) David, line 32

Figure 2: Pitch traces for parts of fragment 2

(a) Kevin's mother, line 8

(b) Kevin, line 9

Figure 3: Pitch traces for parts of fragment 3

(a) line 5

(b) line 7

Figure 4: Pitch traces for parts of fragment 5

(a) Steve, line 15

(b) Steve, line 9

(c) Steve, line 20