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The multimodality and temporality of pain displays

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ABSTRACT

The present paper takes an interactional approach to the problem of communicating pain. We ask how a shared understanding of this subjective and internal experience is accomplished. The focus is on the multimodal features of pain displays and the way they emerge and progress at the micro level of turn construction and sequence organisation within health care interactions. The setting of the study is family doctor-patient primary care consultations. Using multimodal conversation analysis, we show the emergent, temporal unfolding nature of pain displays. Initially there is an embodied reflex-like action where an immediately prior cause can be attributed retrospectively. An interjection or non-lexical vocalization may follow. An expression of stance on the pain is routinely made as talk is resumed. The other party's understanding can be shown early in the pain display shaping its unfolding with empathetic vocalizations and/or comforting touch which results in a jointly produced change in the trajectory of action. The implications of the findings for theoretical understandings of sound objects, language and communication, and for clinical practice, are discussed.

1. Introduction

Communicating pain is not a straightforward matter. Linguistic studies have begun to explore the ways sensory experiences including pain are expressed and described within and across cultures (Lascaratou, 2007; Majid and Levinson, 2011). However, as a subjective and internal experience, the nature and intensity of pain can be difficult to convey to others in an adequate manner. For example, Scarry (1985) suggested that the interiority of physical pain resists its capture in language. She claimed that the cries and groans that are associated with pain are pre-language because they are the same ones that are used by animals and pre-verbal children. These kinds of vocalizations have not been considered a part of language, so they remain outside of the purview of linguistic semantics. Nevertheless, as Goffman (1978) observed, they are communicative in a very basic manner. Regarding the more encoded vocabulary in language, critical psychology also questions whether sensorial and emotional experiences are accessible through language and discourse (Cromby and Nightingale, 1999). Indeed, people with painful conditions report problems communicating about it with others in a broad variety of settings including peer support (Bullo, 2020), medical emergency encounters (Geisser et al., 1996), and primary care (Upshur et al., 2010). Interestingly,

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however, talk about pain has been shown to be easier when accompanied by gestures (Hydén and Peolsson, 2002; Rowbotham et al., 2015). In short, while the pain lexicon has been deemed largely inadequate, the more primordial sounds of pain – as well as their relationship with bodily displays - have largely gone below the radar of both linguistic and psychological research.

The present study examines pain displays in social interaction where there are less conventionalized but highly specific and recognizable non-lexical vocalizations. In contrast to neuro-cognitive communication models of pain (Hadjistavropoulos et al., 2011), we follow Goodwin (2018) who demonstrated the emergent nature of actions as they are jointly produced. Our question is how pain as a sensorial experience is produced in the here and now of an interaction via vocalizations, ordinary talk, and other embodied resources. We use this research to interrogate afresh how expressions of pain are at the limits of language to communicate about it and ask how that configures and calibrates the doctor's attention to the patient's pain. Using an ethnomethodological sensibility we show how intersubjectivity, or an adequate shared understanding of pain, for all practical purposes, is accomplished (Garfinkel, 1967). The setting of our research is clinical encounters in general practices, a perspicuous setting for investigating pain because it is a common reason for seeking medical help, and yet does not necessarily form a prime focus of the consultation compared to other settings such as emergency departments, pain clinics or cancer settings where pain discussion is expected at each encounter. Our contribution is to show that intersubjectivity about occasioned pain is accomplished via a temporal unfolding of talk, embodied resources, accompanying vocalizations, and a change in the trajectory of action that makes the pain focal. We remain agnostic, though, regarding the precise relationship of those displays to the subjective severity of pain, if any, as it is well known that sensitivity to pain varies across people, and vocal-bodily displays can of course be performed without the pain stimulus itself. We will instead show how a multimodal behaviour comes to be *treated as* a locally occasioned instance of pain.

2. Language and pain

As mentioned above, talking about pain can be difficult. The problem is part of a broader theoretical and empirical issue concerning the relationship between language and sensory experiences that has recently attracted attention, especially regarding smell and taste (Barwich, 2017; Mondada, 2020). A key matter is the issue of ineffability. That is, the extent to which perceptual phenomena including touch, smell, and pain, resist linguistic coding (Majid and Levinson, 2011). It has been well-established that languages differ in how they code senses such as colour, vision, and smell, with some evidence that the codability of the senses relates to the different kinds of perception (Levinson and Majid, 2014). It seems likely that the complexity of pain as a physiological, psychological, and socio-cultural phenomenon (Perl, 2007) may be related to its relative ineffability and the fact that the analysis has regularly started from a linguistic code rather than interacting bodies.

Regardless of whether there is something fundamental about pain as a subjective experience that reduces its precise codability, it sometimes needs to be communicated to others. A major area of research has focused on the development of standardised lexical descriptions of pain for the purposes of assessment, diagnosis, and treatment. A widely used tool for experimental and clinical studies of pain is the McGill Pain Questionnaire and its shortened form (Main, 2016). The descriptors (e.g. throbbing, piercing, sickening, tiring) originated from the words that patients of a pain clinic used. They have been validated as core terms for capturing the core sensory, affective and evaluative qualities of pain that patients report. However, they are typically not used by general practitioners who prefer much simpler assessment scales or listen for spontaneous descriptions instead (Johnson et al., 2013).

In a focus group study with participants suffering from chronic pain, Munday et al. (2019) found complex metaphorical descriptions dominated the discussions about pain. The authors concluded that the single-word descriptors used in standardised assessments are inadequate for communicating the complexity of pain experiences. Their conclusions supported those of Lascaratou (2007) who conducted a comprehensive linguistic study of how pain was talked about in Greek. Based on a sizeable corpus of discussions between doctors and patients she found the use of adjectives was relatively rare. Rather, pain was described using more grammatically complex utterances including personal avowals (e.g. I am hurting). Abstract descriptions were also common in that study and in others, with metaphors of pain as damage, a malign power, and an attack, being dominant.

The empirical studies of language and pain reviewed so far have asked about *how* pain is described in words. Chapman and Beach (2019) is a distinctive study for examining *where,* in terms of the overall structure of medical consultations, discussions about pain occur. The context of their research was oncology interviews where descriptions of pain are to be expected (unlike in general practice consultations) and were dramatic and vivid. However, they found that patients rarely initiated descriptions about pain and when they did these were minimally responded to by doctors. Instead, patients' talk about their pain was typically responsive to doctors' questions and received minimal uptake.

All the above literature reflects a reliance for analysis on words and expressions, or sometimes gesture, leaving the less lexicalized vocalizations and the precise evolution of the bodily display without attention.

3. Pain displays

Pain obviously does get communicated in ways other than using words. Our research question is how occasioned pain displays, that reference pain occurring in the here and now of the interaction, are built and responded to in order to achieve joint understandings.

In an early study of pain expression in primary care doctor-patient consultations, Heath (1989) established that the revelation and expression of pain were largely confined to certain diagnostic activities. A pervasive sequential position that he identified was when the doctor was attempting to localise the area of pain through touch. Notably, in these sequences the doctor rarely apologised for inflicting the pain nor showed empathy towards the patient for the unpleasantness they had experienced. McArthur (2019) examined pain experiences in doctor-patient consultations that were not explicitly solicited. She found patients accounted for the expressions of pain to legitimate their problem and justify the doctor's visit. Both Heath and McArthur noted embodied aspects of pain expressions but did not investigate the systematic organisation of the multimodal features alongside the talk. This gap has been explored in work examining pain as sequentially organised in *embodied* talk (La, 2018; La and Weatherall, 2020). It seems that a joint understanding of pain is accomplished in part through the temporal organisation of embodied and verbal features of pain displays with respect to turn and sequence organisation. We build upon and further elaborate the temporal and multimodal features of pain displays.

Aside from medical settings, one of the few other domains where spontaneous pain displays in social interaction have been examined is in adult-child interactions. For example, Jenkins and Hepburn (2015) studied claims and expressions of pain at family dinner times. They found that claims of pain by the children (e.g. my tummy hurts) were made with elevated pitch, volume and aspiration, regularly with tremulous and elongated delivery. Children used such claims to draw attention to a trouble (e.g. not liking food or wanting to leave the table). Parents' responses used the pain claims and expressions to progress their own interactional agendas such as getting the child to eat or to sit still. Although family dinner times and doctor-patient interactions are quite distinct settings, a shared aspect of pain expressions across these contexts is that they were importantly shaped by the action being advanced by the participants.

One possible response to pain that would benefit from further investigation is the display of empathy or compassion. Empathetic responses can be made verbally (Hepburn and Potter, 2007) and they can also be done non-verbally (e,g, through gaze and facial expressions) and haptically. In a study of touch in response to pain Cekaite (2021) described the details of how caregivers responded to children who had hurt themselves. She showed the interactional organisation of skin-to-skin touch, talk and gaze. It was found that touch had functions which included examining and diagnosing trouble, soothing the pain and comforting distress. There is also evidence that non-verbal communication on the part of a clinician can have a therapeutic impact during a pain interaction (Ruben et al., 2017). As will be shown below, we have identified a qualitatively different way of enacting empathy – that of producing pain cries in response to someone else's pain - on behalf of someone else with a hurting body.

Developing further prior research on the interactional organisation of pain displays, this study examines how displays of pain are built through talk, vocalizations, and the body. It also considers where these displays occur in terms of local sequences of action, how they are responded to, and with what consequences for the ongoing progression of actions. We will show that despite the relative ineffability of pain in the lexicon, a shared understanding that someone has just experienced pain is possible through a variety of distinct embodied and vocal devices mobilised in patterned ways through time. We will argue that for pain that occurs in the here and now of an interaction, communication is not so much about words but rather, relies on multimodality and temporality. Without claiming anything about the truthfulness or even existence of actual pain, which neither we as analysts nor the addressee can assess directly, we lay out evidence of how a display of pain as (if) visceral and as (if) "flooding" the participant at unanticipated moments, is accomplished. It seems likely that these instances come closest to visceral expressions of pain, where the bodily sensation visibly and audibly interferes with whatever the participants were currently doing. We will thus analytically target the boundary between the social interaction and the individual body, the intentional and the unintentional. We will also begin to document the phonetic features of such displays, asking what is 'natural' and what is 'cultural' or conventionalized about them.

4. Method

4.1. Corpus

The pain displays included in the present study were drawn from the Applied Research on Communication in Health (ARCH) Corpus of Health Interactions held at Wellington School of Medicine, Otago University, New Zealand. At the time this study was conducted, the ARCH Corpus consisted of data from nine separate studies including a total of 478 health interactions involving 533 participants, all of whom provided their consent for their data to be used for future research and education. The corpus holds audio and video recordings of each interaction, a log that summarises key content and outcomes, glosses what is happening minute by minute and a base orthographic transcript that captures what was said and some temporal and paralinguistic features of the talk including sound cut-offs, silences, overlapping speech and aspects of prosody. The Corpus also includes related medical notes, field notes, interviews and other associated documents.

4.2. Sample

A search had previously been conducted as part of a related study on the base transcripts of 252 general practice consultations from three studies in the Corpus where the recordings were primarily between general practitioners and patients (the Interaction Study, the Tracking Study and the Diabetes Study). The search terms were 'pain' and 'sore'. This initial search yielded a high number of potentially relevant consultations (over 150) which were further filtered and classified via perusal of

the transcripts and video recordings. For the purposes of the present study, video recordings of 24 of those with the highest number of hits were watched carefully, in their entirety. From this, consultations were selected for even more detailed examination if they included a pain display, our target phenomenon. A pain display was defined as visible and audible behaviours that seemed to display pain experienced in the 'here and now' of the interaction. That is, they were locally occasioned or built as if they were spontaneous displays. *Talk* about pain was not enough to warrant inclusion as a case. Nine consultations (a total of 3 h of recorded interaction) with six different doctors had one or more instances of a pain display. Each of the nine consultations was viewed multiple times to understand the encounter in depth. Each excerpt identified as a potential case was also transcribed using the more detailed conversation analytic conventions originally developed by Jefferson (2004).

4.3. Collection

Around 30 sequences that included one or more pain displays were collected. All but three sequences included more than one pain display. In some sequences, pain displays occurred in a series and in quick succession so that they were not clearly distinct episodes, which is the reason for the number of cases being approximate. Each pain display sequence was transcribed to an even finer level of detail to capture the phonetic characteristics of sounds including breathiness. Embodied and multimodal aspects of bodily conduct were annotated following the principles outlined by Mondada (2018) where embodied actions are delimited for each speaker by identical symbols indicating their beginning and end.

4.4. Ethics

This study operated under the overall umbrella of ethical approvals granted to the original researchers as part of previous projects to archive these data in the ARCH Corpus. It was granted specific approval by the University of Otago Human Ethics Committee –Health (REF: Stubbe HE18/004) as an extension of a related ARCH Group study of conversations about chronic pain in GP consultations (REF: Thompson HE16/131). Data from the ARCH Corpus can be shared with other researchers under strict conditions. Gaining permission to use the data involves signing a memorandum of understanding and agreeing to follow the protocols required to ensure the privacy and confidentiality of participants. Due to the sensitive nature of the material, all transcriptions and recordings are stored securely and confidentially. In accordance with ethical requirements, all identifying information is removed from data extracts used in presentations and publications. Where participants gave permission for de-identified video stills to be used, they are included in the transcripts.

4.5. Analytic process

Following a conversation analytic methodology (Hoey and Kendrick, 2017; Schegloff, 1996) each pain sequence was examined multiple times with detailed observations made about how the pain was displayed in each case, exactly where in the turn of talk and sequence of action it occurred and what happened previously and subsequently. Attention was paid to the talk and what was happening in other modalities. Comparisons were made between cases to identify aspects of each pain display that were idiosyncratic and those in common across cases.

The findings are shown through a close analysis of six extracts selected for their brevity and clarity, but also with a view to representing the diversity in the collection of cases including the doctors involved and the different sequential locations where the pain displays occurred.

5. Analysis

From the intensive analytic process described above a generic sequential pattern was identified. Each pain display began with some kind of embodied reflex (e.g. recoil, facial grimace, a hearable closing of the glottis, sharp intake of breath), then in some, but not all, cases a vocalization that may or may not resemble a lexicalized response cry (e.g., *uw, ouch*, *qaah, oh*) that was followed by a resumption of engaged interaction, routinely an expression of stance (e.g. *it is sore, that is painful*). In addition, gaze shifts regularly occurred in close proximity to pain displays, for example the patient's gaze shifting to the doctor's face and vice versa. Furthermore, the onset of the pain display co-occurred with a change in the trajectory of turn, sequence or action, except when it was part of a pain elicitation sequence. The pain display and the shift in the turn trajectory could be attributed to an immediately prior event.

The analysis begins by presenting instances where the sequential unfolding of the expression of pain and responses to it are most elaborate drawing on the largest range of resources. These are also cases where there are examples of empathetic response cries which share a resemblance to "return gestures", as impressionistically described by deFornel (1992), but with a vocal form that does not necessarily mimic the exact vocal qualities. The production of the joint understanding is co-operatively established with an abrupt change in the trajectory of talk and action. Subsequent cases show pain disrupting an ongoing action in a less dramatic way. Lastly, we present a case where the pain is explicitly elicited, a sequential position previously documented in the literature where understanding is fitted to the temporal unfolding of the talk (Heath, 1989).

In sum, we show that a joint understanding of pain and its relative intensity is observably accomplished through its temporal emergence within a course of activity.

5.1. Pain and abrupt shifts in action

The following cases show sequences where a joint understanding of pain is built sequentially by a substantive change in the trajectory of action from a previous course of action to a discussion of pain. In Extracts 1 and 2 the three unfolding elements, reflex, vocalization, and resumption, are clearly distinctive. In the first case there is a verbal response from the doctor in the form of an apology, in the second there is a non-lexical empathetic response cry.

In Extract 1, the patient has a problem with his foot. He has a history of gout and has recently started a manual job that involves a lot of physical activity. The doctor asks about the location of the pain (not shown) and the extract begins as the patient is responding. Fig. 1 shows the parties are sitting opposite one another and engaged in talk, with the patient's gaze on the doctor. It represents the moment when the patient is punctuating his answer to the lack of reason for the pain *that's the weird thing-'* with a hand gesture that is halted as the doctor squeezes the patient's foot which occasions the pain display

Extract 1 TS-GP09-05 that's the weird thing[1]

```
01  PT:     =um .hh (0.4) ah yeah it's kinda in- it's in the:re
02          somewhere
03  GP:     right in the midfoot (0.4) but it came on .hhh
04          |(with that) (0.2) well I mean you've obviously been
            |lifting PT's foot onto lap-->
05          doing a bit more stuff| but but you [haven't]
                                  -->|
06  PT:                                          [ yeah  ]
07          (0.4)
08  GP:     |sprained it or twisted it# [or anything| else  =
            |holding PT's foot
09  PT:                                  [.hh* that's^ the weird=
                                             *palm up hand gesture-->
    gp                                             ^squeezes
    fig                                  #fig 1
```

fig #1

```
10  GP:     =as far as ^you co-]
11  PT:     =  thin:G*-|0.3/q::]°↓o:h°

    gp      foot-------^
12  GP:     |sorry=
    pt      |smiles
13  PT:     =uh[m  H]h hih [  h i h    .  h  h  h ]
14  GP:        [(oh)]      [is that sore just from] gra:bbing it
15          down there I [suppose]
16  PT:                  [ . h h ] I th- yeah
```

At lines 01–02, the patient provides a vague verbal description of the location of the pain while indicating the whereabouts with his hand. The doctor verbally formulates the place in anatomical terms as *in the midfoot* (line 03) while he lifts the patient's foot into his lap. As the doctor takes hold of the foot, he engages in some history taking by asking a declaratively formatted question about how the pain came about (lines 05 and 08). The negative form of the question *but you haven't sprained it or twisted it or anything else,* shows what the doctor has gleaned so far in the consultation, while still deferring to the patient's primary rights to know about their experiences (Heritage, 2012). In overlap with the end of the doctor's utterance (lines 08–11), the patient confirms there is no obvious explanation by stating *that's the weird thing.* During this ut-

[1] The extract label follows the conventions required when publishing ARCH corpus data. The first two letters indicate the study the extract comes from (IS – Interaction Study; TS – Tracking Study; DS – Diabetes Study. The second two letters (GP) shows it is an interaction involving a GP, and following it the unique GP identification number. The final number is a patient identifier.

terance he gazes at the doctor and gestures towards him, even though the doctor is looking down at the foot (see Fig. 1). On the words *the weird*, the doctor squeezes the foot. Then the word *thing* in line 11 is brought to completion, but abruptly, with a closure of the glottis which could have been a velar nasal [ŋ] but instead seems to be a hold of breath. The hold is accompanied by the mouth gradually opening broader. It lasts for 0.3 s after which the patient produces an *oh*, which has the characteristics of a lexicalized marker of surprise (Wilkinson and Kitzinger, 2006). Here it is uttered very low in the speaker's pitch range with a falling contour and very soft, while the rounded back vowel [u] is considerably lengthened. It thus constitutes a specific kind of communicative device that has some prosodic similarities to the 'disappointment' *oh* regarding its softness (Couper-Kuhlen, 2009) but is different in its sequential placement and related action import. Towards the end of *oh* the patient's face transforms into a smile. Thus, the *oh* can be heard as the patient's comment on his momentary loss of composure and is an example of what Goffman (1978) described as response cries - a means of publicly displaying a return to normal senses and being again available for interactional engagement. The stance of having been momentarily disengaged or 'flooded' out from interaction is further shown by his subsequent laughter in line 13. This constructs it retrospectively as a laughable matter, thereby also displaying troubles resistance - 'coping with fortitude' - in the face of the pain elicited by the doctor (relatively gently) squeezing his foot.

As the patient's glottis closes at the end of *thing* the doctor stops squeezing the foot and abandons his turn of talk mid word *as far as you co-* (line 10). The engagement with history-taking is abandoned at this disruption. Immediately after the patient's *oh*, the doctor apologizes (*sorry*, line 12) indicating that the squeeze had not been to elicit pain which is further evident in his immediately following request for confirmation that the foot is *sore just by grabbing it* (line 14). The doctor's apology is different from what was reported by Heath (1989) in British medical consultations where diagnostically relevant pain cries, even when not elicited were not responded to with sympathy or apologies.

The doctor's *sorry* demonstrates his orientation to the patient's breath hold and *oh* as a pain display and that it was a result of his palpitation of the foot, which he stops. The exact timing between the doctor's squeeze of the foot, the interruption of the patient's turn of talk and the doctor's apology are crucial to how an intersubjective understanding of the patient's pain as a visceral experience is accomplished and how its genuineness is displayed. The interactional consequence is that the history taking activity is modified and the doctor seeks verbal confirmation that the pain display was due to the foot being sore. In contrast to other research on pain displays in medical consultations where it is fitted to a pain elicitation sequence (Heath, 1989), Extract 1 is a case where it interrupts the progression of the turn and sequence.

In sum, Extract 1 shows three distinct temporally ordered elements; the glottis closing is an initial reflexive action, a response cry which in this case is perhaps a version of the interjection *oh*, followed by a further stance marker (troubles resistant laughter) on the momentary loss of composure resulting in an apparent inability to finalize the turn. It is an example of how a halt in the progressivity of a turn of talk within a conversational sequence can be precisely timed with a diagnostic touch and can also disrupt the other party's talk as they orient to the person being temporarily unavailable to interact because they are experiencing pain. All these features together, and the precise timing of them, show an interactional accomplishment of an intersubjective understanding that pain had been experienced.

Excerpt 2 is a second clear case that shows the patterned unfolding of a pain display and responses to it in social interaction. The patient has pain and swelling in her right foot. The configuration of the parties cannot be shown with a figure in this case because of a lack of patient consent to do so. The pain display (lines 10–11) occasions a empathetic response cry, an acknowledgement of the pain experienced and an abrupt change in the action trajectory, instead of moving towards examining the patient the talk continues with a question about pain relief. The patients' movement from sitting to standing to walking towards the examination table are captured in the transcripts by descriptions in bold italics with bars indicating exactly where key movements (e.g. the moment of collapse) occur with respect to the talk.

Extract 2 TS-GP08-10 it is sore

```
01  PT:      .hh [s o :] >and I certainly while I was on the=
02  GP:          [oka:y]
03  PT:      =(seraquel) I never had any side effects [°from it°]=
04  GP:                                               [ °right° ]
05  PT:      =[at all]
06  GP:       [  > o ]kay .HH ↑can I get you to lie up here
07            [+(julia) and we'll h]ave a wee lo[o k  at  your=
08  PT:       [+ s  (h)  u   r  e  ]            [I need to take my=
               +. . .RH on Rthigh . . .standing up . . LL step. . .>
```

```
09  GP:     =le:gs]
10  PT:     =panty]hose  o f f-|*    >  qAAAH    %( H )
            full weight on RL  |torso collapses...straightens
                               *- - - grimacing- - - >
    gp                                          %gp gazes to foot-->

11  PT:     †you   s [ee†  it's  jus::t    (↑hh) as* =
            . . . RL step. . . LL step torso bends...

12  GP:              [↓aw† :  h   it   ↑is  sore: =
                        †RH on patients back
                     |...stands up...>

13  PT:     = soon as I  put ] %pressure on it you kno:w? >it's:=
            . . .walks to examination table...>>

14  GP:     = isn't  i t(h)? ]
            . . .follows patient. . .>>

15  PT:     =(0.4) it's- (.) >yea:h
16          (0.4)
17  GP:     >are you taking any pain relief for it?<
```

The beginning of the excerpt (lines 01–05) shows the conclusion of some history taking where the patient is describing medication that had worked well for her in the past. The doctor's turns at line 02 (*okay*) and line 04 (*right*) show a readiness to transition into a new activity (Beach, 1993) which is then launched in an *okay*-prefaced turn (line 06) where she asks the patient to get up and lie on the examination table. The patient verbally indicates compliance with *sure* (line 08) and enacts it by beginning to rise, in overlap with the doctor's continuation of her turn, where she goes on to describe the purpose of her request: *and we'll have a wee look at your legs* (lines 07 and 09). Again in overlap, the patient explains a preparatory action for the examination *I need to take my pantyhose off* (lines 08–10). As the patient says *off* she places her full weight onto the right foot that has the problem and simultaneously her upper body collapses forward, and she accelerates the step of her left leg to take the weight off her right foot.

The pain display begins with a sound cut-off on the word *off* (line 10) which suggests a sudden intense onset, as a voiced gasp which is produced with a wide-open mouth but constrained glottal area, resulting in something like *qaaah* (line 10). After the glottal closure is released the voice is breathy, the mouth wide open, and the sound therefore resembles [ɑ]. Then the voicing stops and the vocalization ends in an outbreath. Coinciding with that pain cry is a facial grimace. The sound of exhalation goes slightly beyond the moment when the weight has been shifted off the sore right leg. All the sounds are performed out loud and are not suppressed to seem minor or inappropriate.

The pain cry of the patient draws the doctor's gaze down to the patient's leg. Then, in overlap with the patient's turn that explains the pain just displayed, the doctor produces a sound (line 12) that expresses rapid empathy in the form of a pain cry. It is a kind of vocal equivalent to the return gesture (deFornel, 1992) that is produced in a contextual dependent relationship with the initial pain cry. In this case the empathetic response cry is produced with a creaky voice lengthened high rounded back vowel *u*. Creaky voice has, for example, been shown to correlate with talk about chronic pain (Torres et al., 2020). The sound accompanies the patient's forward momentum which the doctor pairs with a comforting touch of the kind documented when adults soothe children (Cekaite, 2021). In this case, the doctor places her hand on the small of the patient's back and shifts her gaze downward towards the patient's feet. The doctor's empathetic indications are made explicit in a declarative statement about the pain experience *it is sore* (line 12) which is an object-side assessment that constructs the reality of the event (Edwards and Potter, 2017). It is also the kind of pain description by the patient that Lascaratou (2007) found was common in her Greek study. The stress on the copula further underscores the facticity of the displayed pain.

In contrast to Extract 1 and to the following extracts where the pain is *responsive* to something the doctor initiates, here it is brought about by the patient herself as she is getting up to move towards the examination table. The patient rises relatively slowly and moves her hand which has been holding her lower back to brace the front of her thigh, possibly in anticipation of a movement that has caused pain in the past. The progression of her bodily movement toward the examination table is further disrupted as she places weight on the leg and grimaces. Furthermore, the trajectory of the talk shifts after the pain display from commentary about preparing herself for examination to being about the pain itself. The patient comments on the pain just experienced to provide relevant information for the doctor *you see its just as soon as I put pressure on it* (lines 10 and 13). According to McArthur (2018), comments like these, are a practice that manages the relevance of unsolicited pain displays in primary care examinations. Further evidence of the patient orienting to the diagnostic implication of the pain just displayed is that on the word *pressure*, she turns her head slightly back towards the doctor, thus recreating a participation framework for mutual engagement.

The temporally ordered elements of the pain display that were distinctive in Extract 1 are also clear in Extract 2. First, the pain display begins with a disruption of the smooth progression of the talk in progress by a constriction in the vocal tract resulting phonetically in a glottal stop and a breath hold. The display continues with a lexical and partially conventionalized pain sound which is then followed by a stance on the pain which here points to its diagnostic relevance. The doctor's display

of understanding of the pain is also precisely co-ordinated and emergent alongside the patient's pain display. Through the cry of empathy, the comforting touch and her linguistic construction of the pain it is treated as factual. The pain is made visible in the disruption in the flow of the talk and in the embodied actions of the patient. Furthermore, it is seen in the doctor's embodied response and ensuing change of talk where she engages in comforting touch and moves to ask about pain relief.

In the next extract there is also an abrupt change in the trajectory of action. However, the elements of the pain display are fewer without a clearly distinct pain cry. The patient has a sore arm, which ultimately gets diagnosed as tennis elbow. As the excerpt begins, the doctor and the patient are sitting facing each other. The patient's arm is outstretched, and the doctor is holding her hand in his (see Fig. 2). The doctor is instructing the patient to push against his hand to twist the elbow (lines 01–03). With two question-answer sequences in series (lines 06–07; lines 08–12) it is established that the elbow is more sore pushing one way than the other. The responses (lines 07 and lines 10, 12) make a claim of experiencing pain but do not demonstrate a pain experience. The doctor launches a new *so*-prefaced diagnostic question (line 13) which marks it as being generated through inference (Bolden, 2006) and at the same time he moves his other hand to the patients elbow and palpitates it (see Fig. 2). His turn assumes a no pain response, which turns out to be wrong because the patient displays pain (lines 14–17), which is the focus of our analysis.

Extract 3 TS-GP03-17 Tennis Elbow That is very painful

```
01  GP:       okay .hh >what I might do< is just ho:ld (0.4)
02            um (0.2) just twist against my hand that wa:y (0.4)
03            u[   h   :   ] that wa:y
04  PT:        [(like that)]
05            (0.4)
06  GP:       is that okay?
07  PT:       no it's so:re
08  GP:       (>what about<) going the other way?
09            (1.0)
10  PT:       not as sore
11  GP:       ↑not as sore
12  PT:        [ n  o ]
13  GP:       *[↑oka:y] |oh that's interesting↑|# .hh so you're
                        |LH moves to PT's elbow|
              *gaze at downward at elbow-->
    fig                                          #fig2
```

Fig #2

```
14  GP:       |probably  △okay  *ov!er  th[e:re ]|!
              |palpates elbow                    |
                                 *gaze to patient-->>
    pt                      △lifts gaze to gp-->
                                    !recoils#      !
    fig                                  #fig 3
15  PT:                                  [°.hh°] [that  is] very=
16  GP:                                          [( u::w )]
```

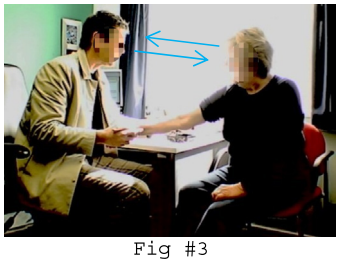

Fig #3

```
17  PT:       =[ painful]
18  GP:        [↑it is v]ery tender is i[t?↑ ]
19  PT:                                  [it's] very tender
20  GP:       [right]
21  PT:       [yeah ] (0.2) it's  very  tender
```

Extract 3 highlights how the combination of precise timing, sequential unfolding and intersecting elements, (rather than distinct individual aspects) of a pain display create an interactional ecology for intersubjective understanding. As the doctor's fingers palpate around the elbow (line 14), the patient shifts her gaze to the doctor who then lifts his gaze to meet the patient's eyes, anticipating a no problem response by saying *probably okay*. However, at the beginning of the next bit of the turn *over there* the patient's upper torso makes a small recoiling movement backward during which she takes a sharp inbreath (line 15; Fig. 3). Immediately after the patient's inbreath the doctor starts vocalizing a sound - a high rounded back vowel (*u*) transforming into an approximant (*w*). It is response like the one made by the doctor in Extract 2 that performs a pain cry as a way of showing empathy. It is timed precisely, immediately following the onset of the patient's pain display which is a voiceless gasp after the embodied jerk. The patient expresses her stance by assessing the sensation as *very painful* (lines 15,17). With that assessment she changes the projected trajectory of talk which was progressing as a diagnostic manipulation to talk about the pain experienced.

The sudden sharp intake of breath is not a pain cry, as formulated by Goffman (1978) with its conventionalized forms. Nevertheless, the doctor in Extract 3 displays his understanding that the patient has experienced pain in the here and now of the interaction by producing a response cry that builds and retrospectively produces it as showing pain. Experimental research has shown an increase in inspiratory volume in response to a pain impulse (Jafari et al., 2017). However, in other settings the audible in-take of breath might be understood in other ways such as getting a fright if occasioned by a loud noise. A crucial temporal aspect that supports the intersubjective understanding of this bodily-verbal configuration as a display of pain, is the immediacy of the patient's response to the doctor's palpation. The doctor's immediate recognition of the patient's experience is afforded by his access to the embodied reaction through touch as well as hearing and seeing it. The joint understanding of pain occurs with a empathetic response cry by the doctor and also with a change in the trajectory of action from an assumption that a diagnostic moment won't be painful to an understanding that it is.

The doctor's vocalization emerges as an empathetic receipt by producing a pain cry himself. It is produced very high in his pitch range and it is timed precisely after the first two elements of the pain display, which as it happens is co-ordinated with the end of his turn of talk and the palpation of the elbow (end of line 14). It has the same high rounded back vowel quality as a conventionalized pain cry and it is part of the emergent, joint accomplishment of the pain display.

The analysis so far has shown three examples where the unfolding and collaboratively produced pain display resulted in an abrupt change in the action, sometimes first involving an apology by the doctor. In Excerpt 1 the doctor cut off his turn of talk, the progression of the physical exam was modified, and the pain just displayed became focal in the talk. In excerpt 2 the difference was dramatic with the patient displaying difficulty in weight bearing as she got up to walk to the examination table. In excerpt 3 the doctor was projecting that a diagnostic movement would not be a problem with pain, and it was. In each case the temporal unfolding of the pain display was similar in so far as there was a sudden reflex-like response to a retrospectively understood pain trigger that interrupted the smooth procession of action and then a re-engagement in the interaction where the pain just displayed became focal.

5.2. Pain disrupting progressivity

In this section, we present two cases where the changes in the action trajectory are less abrupt than in the previous ones. So, the joint understanding of the pain is produced with smaller disruptions to the interaction. Empathetic responses to the pain are also less evident.

In Extract 4, there are hitches to the patient's turn at the onset of the pain display. However, rather than there being a complete change in topic as in the previous extracts, in this case the resumption of talk is grammatically fitted to where it left off. The consultation is about a sore shoulder and the doctor is examining it. At the beginning of the physical examination the doctor asked the patient to take his shirt off and stand up. There was a dramatic pain display while complying with the request, but because the doctor was attending to the computer, she initially made no acknowledgement of having seen it. Prior to the beginning of the extract the doctor has also asked the patient to indicate where the pain was and conducted some physical palpations in those areas, with sequential pain displays from the patient and responses from the doctor.

The excerpt begins as she asks a follow-up question about the location where it is most painful, requesting the patient to *put one finger on the most sore bit* (lines 01–03). Nishizaka (2007) documented touch being used as a referential practice for a pregnant recipient where the speaker was a midwife. This is a different but related case because it is being done for the benefit of the speaker. As the patient obliges with the request, there is a disrupting of the progression of the turn of talk. The figure shows the onset of the pain display where a sharp inbreath occurs simultaneously as the patient's face changes into a grimace with eyes closed.

Extract 4 IS-GP07-06 one finger

```
01  GP:       so if you could put one finger [on the]=
02  PT:                                      [ .hh  ]
03  GP:       =most sore bit, where would it be?
04            (0.6)
05  PT:       |>right here
              |touches front of shoulder-->
06  GP:       ri:ght|
    pt              | reaches for back of shoulder-->
07  PT:       an(h)d (0.2)#+>.hh< (0.8)|+ round the back
    pt                                 |touches shoulder
                          +  grimaces  +
    fig                  #fig 4
```

Fig #4

```
08  GP:       mm::
09  PT:       (°there°)
```

The patient responds to the doctor's question about the sorest bit by the indexical expression *right here* which is accompanied by a pointing gesture (line 05). The doctor receipts that response with *right*, which marks a progression of understanding (Gardner, 2007). The patient then misaligns with the terms of the question, which was designed for an indication of a single place, by continuing his answer with an indication of another location. To indicate the second place the patient reaches around the back of the shoulder.

The *and*-prefaced extension of the response is interpolated with a breathiness particle (line 07), which suggests the movement is effortful, and the silence that follows, disrupting the turn, is an alert to trouble. The onset of a grimace followed by a sharp intake of breath are the initial unfolding elements of the pain display. The patient's experience of pain is further displayed by temporary disengagement from the interaction (the 0.8 pause, line 07). His resumption of talk *round the back* is perfectly grammatically fitted to the point in which it was disrupted. So, despite the sharp onset of a pain display and its suspending the patient's engagement from interaction for a moment, the turn of talk parses perfectly.

In the next extract the pain also causes hitches to the patient's turn of talk. However, in contrast to the previous case where the post-pain display talk was grammatically fitted to where it was disrupted, this is a case where the unfolding turn is adjusted to respond to the doctor's touch.

The patient's problem is an inflamed foot that was hit by a cricket ball. The patient is standing up with his back to the camera; the GP is sitting on a chair, leaning over and looking down at the ankle, as shown in Fig. 5. The patient has confirmed for the GP which foot is sore (lines 02–03). The action that is occurring during the silence at line 04 is off camera but it seems reasonable that the *ohr* at line 05 is a response cry that shows a visual recognition of the trauma site. The two parties are engaged in concurrent actions. The patient is further describing the problem with his foot, while the doctor has begun the physical examination of it. The first indication that the physical examination is causing trouble is at line 06 when there is a hitch in the patient's talk.

Extract 5 TS-GP14-04 Cricket Whack

```
01  PT:    it's not it's not terribly so:[re  ]
02  GP:                                  [it's] this one?
03  PT:    yeah
04         (0.6)
05  GP:    [(ohr)]
06  PT:    [it's ] not terribly sore but it i- is now=
07  GP:    =M[mm ]
08  PT:      [wen] y'put it around there* ↑yea- h#*th¤ere#=
                                        *bkfwdjerk*
    gp                                              ¤looks at pt-->
   fig                                        #fig5   #fig6
09           =.HHf[S ]¤
                   -->¤
10  GP:           [it]s quite (0.8)
```

Fig #5

Fig #6

```
11  PT:    mhmh
12         (0.4)
13  PT:    an my my partner thought it might be a bit inflamed.
14  GP:    mm it is inflamed
15  PT:    mm
```

The account of the foot as not hurting much (lines 01 and 06) shows an orientation to the 'doctorability' of the problem, a concept that refers to how the patient manages the issue of legitimacy for seeking medical help (Heritage and Robinson, 2006). The utterance at line 06 has the format of a disclaimer *not terribly sore but* which projects another reason for coming to the doctor. The delivery of the projected explanation is interrupted with a sound cut off *it i-* ending in a glottal closure and then immediately resumed with *is now*. The hitch occurs presumably as a response to the doctor's touch of his foot which is out of the camera frame. The result is a reformatted turn adjusting to the contingency of the pain.

The *but* at line 06 pivots the action of the utterance in progress away from an account of the reason for the visit, into a report of pain in the here and now of the interaction. The doctor gives a prosodically marked minimal response to the pain report with *Mmm* (line 07) that is in overlap with the patient's talk; the latter continues with an increment to his turn that further specifies the location of the pain in relation to the doctor's examination of his foot: *when you put it around there*.

At the end of that utterance at line 08, the smooth progressivity of the talk is again interrupted with a responsive pain display. There is an onset of a clearly observable jerk of the patient's body which disrupts the talk. The high-pitched *yeah* is cut off but then resumed to confirm the location of the pain, presumably with respect to the doctor's touch. A sharp, loud, in-breath produced through closed teeth punctuates the end of the patient's turn, further cementing the framing of his experience as painful.

The pitch shift in the patient's turn and the physical jerk is followed by the doctor's gaze shifting briefly to the patient's face (Fig. 6). The doctor begins to speak as the patient's pain display comes to completion to assess the injury *it's quite*. His turn is not completed, but the patient minimally receipts it, nevertheless (line 11). Then, in an *and*-prefaced turn, the patient completes the explanation of what prompted the doctor's visit. He takes a stance on his pain and its doctorability by invoking a third party i.e. his partner – *who thought it might be a bit inflamed*. At line 14 the doctor confirms the partner's reported assessment of the injury with a modified repeat, giving stress to the copula *it is inflamed*, thus acknowledging one possible origin of the patient's pain.

In this section, we have seen examples of how pain displays can interfere with progressivity of talk in relatively subtle ways, still collaboratively brought about through the doctor's touch, gaze, and formulation of its origins.

6. Pain display organised within the diagnostic activity

In contrast to the examples shown so far where pain displays have disrupted the course of action, we show a final case where the patient's expressions of pain are fitted to explicit verbal and embodied solicitations. It is a clear example of the interactional organisation of pain that was originally documented by Heath (1989) where a pain display functions as a response to a question about it.

The consultation is for a patient recently diagnosed with diabetes. However, the patient raises a different matter, a problem with her foot. Just prior to the start of Extract 6, the patient initiates a major activity shift by beginning to remove her sock, in response to which the doctor removes his stethoscope from his neck, scoots the chair away from his desk and the computer to get nearer to the patient, and starts looking more closely at the now raised foot as the patient says *look. I can't touch it I can't bend it and it hurts like ma:d .hh*, at which point the doctor asks his first question about the whereabouts of the pain in line 01.

Extract 6 DS-GP29-01 It hurts like mad. You've pain in this area.

```
01  GP:   which ah |which a|rea you |have a pain?
    pt             |.......|  point |--->
02  PT:   |there| (.) |across |there|*.hfF=   |*
          |point         --->|,,,,,|* recoil|*
    gp                |pincer grip  |   press|
03  PT:   =[ * q h a a   *  ]
             *eyes closed*
04  GP:    [#you've p]ain in] *|this* |[area] |
           |        gazes on patient          |
           |   hold            |press |release|
    pt                         *nods*
    fig     #fig 7
```

Fig #7

```
05 PT:                                    [ mm ]

06         |yeap (0.4)|yeap
   gp      |press     |release
07         |(0.8)|
   gp      |press x3|
08 GP:     |oka:y|
   gp      |press x3|
09         | (0.4) |
   gp      |press moves toe-ward|
10 PT:     .hH (.) yep
11 GP:     |['bout how-|how often] do you have this?
   gp      |  presses  |back of hand on foot--->
12 PT:      [  qoO        qaHH  ]
13 PT:     HH (0.6) for about a week and a half(hh)|
   gp                                          --->|
14 GP    oh for a week and a [half]
```

The patient anticipates the doctor's inquiry by beginning to point to the source of the pain close to its launching (line 01). The beginning of her verbal response is delivered with no gap or overlap to the doctor's question (line 02). The doctor positions his fingers in a pincer like grip around the area indicated by the patient, in overlap with her pointing and verbal response. As the patient retracts her pointing gesture the doctor presses on the relevant location. At that same moment the

patient gasps and the body visibly tenses and recoils slightly backward. The sharp inbreath and the reflex-like response initiate the pain display and occur almost simultaneously with the doctor's manipulation (see Fig. 7). Immediately following is a vocalization *qhaa* [qxɑ] produced on the outbreath, beginning in a closed glottis, then developing into a fricative and an open vowel, albeit breathy. The pain cry in this case is unlike others in our data that show a recovery because the patient here intensely blinks for a moment, an enacting that ostensibly displays intensity of the sensation that precludes an entry back into the social world.

It is the initial phase of the patient's pain display that draws the doctor's gaze to the patient. As he looks at the patient, he requests confirmation of the whereabouts of the pain (line 04). This request can be understood as a final phase of the unfolding pain display where there is a full re-engagement with the interaction on the topic of pain. The doctor makes a further palpation during that request as he utters the indexical term *this*. The patient nods and then verbally confirms rather than displays the doctor's successful determination of the location of the pain, even though the two *yeap* particles are squeezed through the teeth, thus also suggestive of pain (line 06). However, a further pain display is simultaneously produced in lines 10–12 as the doctor shifts where he is palpating. It is a case of a pain display fitted into the action. Nevertheless, it follows the same pattern as in the previous examples: an immediate reflex-like reaction of a sharp inbreath (line 10) followed by a more conventionalized cry (line 12). In this case, the patient also gives a verbal confirmation *yep* that the doctor has pressed on the painful area between the inbreath and the pain cry. The patient's verbal and embodied responses to the doctor's question and palpation show that the parties are concurrently engaged in the activities of determining the location of the pain and its frequency.

7. Discussion

Pain is a regular concern in primary care settings and is often the reason for the visit. Targeting locally occasioned displays of pain, we have documented that they can occur with a range of apparent spontaneity, and in a range of places in the encounter, including but not limited to, physical examinations where displays of pain can be elicited through diagnostic manipulations. We found them also happening during transitions between the activities, thus not in positions where they were part of a sequentially organized action such as a pain solicitation.

In contrast to other conversation analytic studies that have importantly demonstrated the way pain displays can be organised within and fitted to ongoing sequences of action, the current paper highlights that they can also interfere with the progressivity of action. Hardly controllable behaviours, such as sudden in-breaths and bodily recoil, but also breath holds, happen in positions where they seem to be unanticipated, such as during medical history taking, standing up for an examination, or in the middle of a word in a turn. We have demonstrated how these displays can change the trajectory of talk: a patient may, for example, produce a self-repair or reformulation immediately after the pain display, and the doctors regularly switch the topic of talk to the location, severity, or frequency of pain. Pain displays thereby constitute moments when the embodied concerns disrupt the smooth progression of the ongoing social interaction, insofar as they can change trajectories of action and topics of talk. We have underscored that a fundamental feature of a pain display is the exact temporal positioning of the embodied reflex-like action to some just prior event that can be retrospectively attributed as the cause.

One of the main contributions of the analysis is that it extends prior work on the detailed examination of multimodal features and their temporal relationships that together build a pain display. We dissect the fine details of pain displays, however minimal they may have been, and show how they constitute and are organised with respect to a perceived pain stimulus. Either self-inflicted, for example, by putting weight on a painful leg or triggered by the doctor's palpation, a pain display was shown to crucially involve an immediate embodied reflex, such as a sharp inbreath, a bodily recoil, or a glottal stop (breath hold) while speaking – bodily leakage that can be unintentional (but can of course also be performed). For example, Jafari et al. (2017: 997) show that the increase in inspiratory flow in response to acute cutaneous painful stimulation seems to occur involuntarily because it is instantaneous and occurs under general anaesthesia. These rather subtle initial responses to a real or assumed pain stimulus have hitherto not been analysed regarding their communicative import and relevance for the diagnoses or the medical outcome of the visit. We showed a joint orientation to those by both the patient and the doctor, thereby revealing how a joint understanding of something like pain which can be considered ineffable (Lascaratou, 2007; Majid and Levinson, 2011; Scarry, 1985) is accomplished in the temporal moment by moment progression of action in social interaction. The study furthermore contributes to the ongoing conceptualisation of pain vocalisations and the recognition of the complex aetiology of those vocalisations to both voluntary and involuntary attribution (Helmer et al., 2020).

In contrast to linguistic and psychological studies that have generated significant insights into pain assessment measures and the lexicon of pain (Levinson and Majid, 2014; Main, 2016), we found both patients and doctors produced a range of more or less conventionalized vocalizations (*uw*, *oh*, *qa:h*) in the immediate aftermath of the initial reflex-like displays. Rather than simplifying the variation to match one or another interjection in the English language, we can see them as accompanying the precise bodily experience, possibly formed by a coincidental mouth shape, and reflecting the intensity and length of the body trouble, whether performed or visceral. Recent analyses of non-lexical vocalizations have revealed their capacity to communicate beyond words (Keevallik and Ogden, 2020). Following the argumentation by (Goffman, 1978), these may simultaneously mark the gradual regaining of composure by the speaker and a stance display towards the fleeting moment when full control of the pain experience could not be maintained. The vocalizations are furthermore characterized by glottal closure and constriction, perhaps related to the tensing body, which results in the utterances beginning in glottal closures and

being breathy or creaky. Further recovery of talk or embodied action accompanied by a stance marker (laughter, relieved outbreath) were documented. Crucially, we also showed that in marked contrast to early work by Heath (1989), doctors produced empathetic pain cries (*uw*) almost simultaneously to the patients' displays of pain as if it was themselves that experienced the sensation. Thus, we demonstrated how a pain display emerges as something that is publicly and jointly oriented to as such, to the extent that the doctors provide the vocal sound to accompany a patient's ostensibly suffering body, which amounts to a collaborative accomplishment of a single pain display. Rather than merely claiming understanding, the doctors are demonstrating being involved in the pain experience. In parallel to how participants can jointly produce an assessment of the taste of food semi-simultaneously (Goodwin and Goodwin, 2004) we have been able to document how something internal and subjective, such as a pain, can be empathically constructed as such across several participants. Our findings further support the work of Goodwin (2018) who proposed a temporally unfolding substrate of talk that provides both a basis and a resource for a listener/next speaker to analyse in order to creatively transform the emergent action into one that is co-operatively produced.

These findings have value not just to linguistics and social science but can form an important addition to the current debates about pain assessment in clinical practice (Manias et al., 2002). Acknowledging the complexity and joint production of the pain utterance can have implications for the whole of the clinical consultation journey and in particular for its impact on negotiation of any subsequent treatment and management plan. While there is some literature on the impact of pain discussion on treatment plans (Rogers and Todd 2010) there are no studies which appear to consider the impact of non-verbal utterances on that phase of the consultation. This is of potential importance in areas of clinical practice such prescribing for chronic pain where understanding of the importance of pain utterances might lead to more appropriate prescribing of, for example opioid medication. A further potential clinical impact of our work is recognition that the alignment of expressions of pain may relate to empathetic compatibility between practitioner and patient in negotiating adherence to treatment regimes (Squier 1990).

Although not a focus of the present study, a central question for future work is whether there is a relationship between pain displays and subsequent treatment plans. For example, does a pain display make pain relief medication relevant? Extract 2 suggests that it can at least potentially be the case because after a pain display the doctor asked about pain relief. Given the issue of addiction to prescribed pain medication such as opioids, better understanding of how drug seeking is accomplished in clinical encounters may inform health policy and doctor training.

To conclude, we have provided evidence that the way pain is communicated may not simply rest on the lexicon used to describe it, but that rather a joint understanding is built multimodally and over time and is discoverable through the palpable reactions of the body as well as through vision and hearing. Lexical classifications or verbal descriptions of pain experiences risk over-mentalizing and individuating the sensation, thus marginalising the importance of the body and action in social interaction in communication about sensed experiences.

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