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I see how you feel: Recipients obtain additional information from speakers' gestures about pain

Samantha J. Rowbotham[a,b,c,*], Judith Holler[d], Alison Wearden[a], Donna M. Lloyd[e]

[a] School of Psychological Sciences, University of Manchester, Manchester, UK
[b] Menzies Centre for Health Policy, School of Public Health, University of Sydney, Sydney, Australia
[c] The Australian Prevention Partnership Centre, Sax Institute, Sydney, Australia
[d] Max Planck Institute for Psycholinguistics, Nijmegen, Netherlands
[e] School of Psychology, University of Leeds, Leeds, UK

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ABSTRACT

Objective: Despite the need for effective pain communication, pain is difficult to verbalise. Co-speech gestures frequently add information about pain that is not contained in the accompanying speech. We explored whether recipients can obtain additional information from gestures about the pain that is being described.
Methods: Participants ($n = 135$) viewed clips of pain descriptions under one of four conditions: 1) Speech Only; 2) Speech and Gesture; 3) Speech, Gesture and Face; and 4) Speech, Gesture and Face plus Instruction (short presentation explaining the pain information that gestures can depict). Participants provided free-text descriptions of the pain that had been described. Responses were scored for the amount of information obtained from the original clips.
Findings: Participants in the Instruction condition obtained the most information, while those in the Speech Only condition obtained the least (all comparisons $p < 0.001$).
Conclusions: Gestures produced during pain descriptions provide additional information about pain that recipients are able to pick up without detriment to their uptake of spoken information.
Practice implications: Healthcare professionals may benefit from instruction in gestures to enhance uptake of information about patients' pain experiences.

1. Introduction

Recent research has revealed that when describing pain, co-speech gestures (spontaneous movements of the hands, arms and other body parts that are closely synchronised with speech [1–5]) contain additional information over and above that contained in speech [6–8], potentially making an important contribution to the communication of this experience. In the present study we use experimental methods to explore whether recipients are able to pick up the additional information from the gestures that accompany another person's pain description.

1.1. Pain communication

Pain is a frequent feature of medical consultations and healthcare professionals need to understand the presence and nature of pain to provide appropriate management and support. However, pain is a private, internal experience, directly accessible only to the sufferer, making it vital that sufferers *communicate* their pain effectively to others. Despite this, pain is notoriously difficult to verbalise in a way that truly captures the experience [9–14]. Even when we find the words to describe pain, these may have different meanings to different people and even to the same person across time, leading to potential miscommunication (see [15] for a more detailed discussion of these issues).

The problems of verbal pain communication have led researchers to consider additional channels through which sufferers may communicate their pain experience to others. These include facial expression [16–18], rating scales and questionnaires [19,20], and drawings and photographs [9,10,21–23]. More recently, research has considered the role of *co-speech gestures* as a means of sharing the private pain experience with others.

* Corresponding author at: Charles Perkins Centre, University of Sydney, NSW 2006, Australia.
E-mail addresses: samantha.rowbotham@sydney.edu.au (S.J. Rowbotham), Judith.Holler@mpi.nl (J. Holler), alison.wearden@manchester.ac.uk (A. Wearden), D.M.Lloyd@leeds.ac.uk (D.M. Lloyd).

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1.2. Gestures and pain communication

The gestures that are the focus of this article are those which represent (or depict) semantic information directly related to the topic of speech (known as *representational* [24], or *topic gestures* [25,26]). For example, a gesture in which a circular movement is made while saying "she ran all the way around the block" is related to the topic of speech and depicts the path that the runner has taken. It has been well established through basic gesture research that such gestures not only contain semantic information related to the verbal message, but often *add* a substantial amount of information that is not contained in the accompanying speech [5,27–29], and that recipients glean meaningful information from gestures over and above that obtained from speech (see [30] for a *meta*-analysis). Taken together this indicates that gestures make an important contribution to communication, providing recipients with a more complete message than would be obtained from speech alone. Moreover, instructing participants to attend to gestures while watching videos of children explaining solutions to math problems increased the accuracy and amount of information obtained about the strategies used to solve the problems [31]. This provides preliminary evidence that it is possible to increase the uptake of information from gestures through instruction, with specific instruction about the types of information that gestures can convey providing the most benefit [31].

Despite this ability of gestures to communicate *semantic* content related to the topic of speech, within the clinical communication literature gestures have typically been grouped with 'nonverbal behaviours' (e.g. posture, gaze, facial expression and touch) involved in relational and emotional expression (e.g. communicating feelings, desires, personality, and attitudes) [32–34]. Such a view overlooks the semiotic contribution of gestures, and the present study is part of a growing body of work which recognises the value of gestures in conveying detailed information within a clinical context [35–39].

Recent research exploring the role of gestures in pain communication has revealed that gestures are frequently used to depict information about pain, including sensation, location, size, and cause [6–8,37,39]. Heath [37] reported that when describing a tension headache, one patient said, "it's like a band," while using a gesture to depict the feeling of a band tightening around the head. Gestures contribute a substantial amount of information about pain that is not contained in the accompanying speech [6–8], for example using the words, "quite sharp, it felt quite sharp," while producing a gesture in which the fingers of both hands tensed and squeezed inwards towards the palms in a single slow clenching motion [8]. Here, the gesture contains additional information about the nature of the sensation (i.e. that it was clenching or squeezing) that was not contained in the speech.

Taken together, this research demonstrates that co-speech gestures contain information about the subjective, perceptual experience of pain. Given the difficulties inherent in the verbal communication of pain, the information contained in gestures may contribute to a fuller understanding of the pain experience. Preliminary evidence that recipients pick up the information contained in speakers' gestures during pain communication comes from Heath [37] who provides an example and qualitative analysis of a GP repeating a patient's gesture back to her to establish understanding in a consultation. However, experimental, quantitative studies of whether recipients benefit from the information contained in the gestures that accompany pain descriptions do not exist.

1.3. The present study

As the first study to explore whether gestures can contribute to recipients' understanding of another person's pain experience, we used experimental methods adapted from basic gesture research. First we examined whether recipients are able to glean the additional information contained in the gestures that accompany spoken pain descriptions, and, second, whether brief instruction about gestures leads to further increases in the information obtained.

2. Method

2.1. Participants

Participants ($N = 135$) were University staff and students. All were female, native English speakers and had normal or corrected to normal vision, and none suffered from any language or hearing impairments. The mean age was 20 years ($SD = 4$ years; *Range* = 18–53 years), and 84% were right handed.[1] The study was granted approval by the University Research Ethics Committee and all participants provided written informed consent prior to participation.

2.2. Design

A between-participants design was used in which participants were randomly allocated to one of four clip presentation conditions:

1) Speech Only (SO; video stilled with gesture and facial information obscured) ($n = 33$).
2) Speech and Gesture (SG; facial information obscured) ($n = 34$).
3) Speech, Gesture, and Face (SGF) ($n = 34$).
4) Speech, Gesture, and Face plus Instruction (SGF-Instruction) ($n = 33$).

The SG condition was included to control for the possibility that differences between the SO and SGF conditions may be due to presence of facial (rather than gestural) information. The dependent variable was the amount of information contained in participants' responses that was directly traceable to the gestures contained in the clips (see Analysis section for more information).

2.3. Stimulus development

Video clips were created from interviews with 21 female participants (21 right handed; *M age* = 23 years; $SD = 8$ years) who took part in a previous study in which they were filmed while describing a recently experienced physical pain [40]. The types of pain included back/neck/shoulder pain, headache, stomach pain, and leg/hip/foot pain, and there was a mixture of chronic and acute pain with pain durations ranging from less than 1 month to over 10 years.

To establish whether recipients could glean *additional* information from gestures, it was necessary to produce clips in which gesture(s) *added* pain information that was not contained in speech. Thus, for the 21 videos, we first identified all representational gestures (i.e. those containing semantic information) that occurred during participants' pain descriptions. We then used a 'redundancy analysis' [7,27,41,42], which involves considering the information contained in each gesture with respect to the information contained in the accompanying speech and assessing

[1] Comparisons revealed no significant differences in the amount of information obtained by left and right-handed participants in any of the conditions (all $p > .05$), and one-way ANOVAs conducted separately for left and right-handed participants revealed the same pattern of results for both groups. Therefore, the data for both left and right-handed participants is reported together.

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