

# Empathy and Feedback in Conversations About Felt Experience

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## Abstract

When we talk about felt experiences, such as physical pains and pleasures, we normally expect our conversational partners to provide empathetic feedback of some kind. Some models of human interaction predict that this feedback should be similar in form to our original production; the gestures, expressions and other non-verbal signals we use to explain our experience should be mirrored in the empathic displays of our conversational partners. Here, we test this idea using data from a corpus of interactions in which people describe experiences that vary in their degree of unpleasantness. Speakers in this situation produce more gestures when describing more unpleasant experiences. In contrast to this, their listeners provide less non-verbal feedback and use more verbal feedback as the expressed experience becomes more negative. These findings suggest a socially strategic use of emphatic feedback that is not explained by the operation of an automatic perception-behaviour link.

**Index Terms:** empathetic feedback, motor mimicry, perception-behaviour link, imitation

## 1. Introduction

We have the capacity to empathise with each others experience, however the particular mechanisms behind empathy are still disputed and unclear [1]. Much of this debate concerns the in principle (im)possibility of knowing another's experience and how feedback behaviours could be used to demonstrate understanding of the experience of another in conversation. Here we are concerned with the empirical question of how people actually show understanding of another's experiences in conversation. We are particularly interested in the use of motor mimicry as a form of feedback to display understanding of felt experience. The performance of the expected expressive behaviour associated with an experience, translated into the perspective of another, as a way to communicate the message that 'I am like you'. [2]

Chartrand and Bargh (1999) propose that in conversation non-conscious non-verbal mimicry occurs by de-

fault. They draw from James' principle of ideomotor-action, which held that merely thinking about a behaviour increases the tendency to engage in that behaviour. Termed the perception-behaviour link, they proposed this phenomenon could provide a mechanism for non-conscious mimicry through an automatic connection between the perception and production of a behaviour. For example, if we see someone grimace we will also grimace and this helps to show that we understand what they are expressing. Chartrand and Bargh suggest that the imitation of postures, gestures and expressions are a continual source of information throughout a social interaction, communicating understanding and attention. They claim that individuals use behaviour mimicry as a communicative tool on a completely non-conscious level and that this overt behavioural mimicry underpins emotional convergence [3].

How well does this model characterise what people do in conversation when someone is describing a physical experience? These are situations in which a speaker can take advantage of their own embodiment to produce a non-verbal display of the experience they are describing. For example, wincing to describe a pain or holding their sides to describe a belly laugh. How do attentive, cooperative listeners normally respond to these displays?

To address this question we present a corpus of speech, video and body movement data in which participants describe to each other recalled experiences that invoke significant elements of embodied experience, for example a toothache or a yawn, that could provoke empathetic responses. Plant and Healey (2012) show that in this corpus speakers produce gestures more frequently and for longer durations for descriptions of more negative experiences. Here we focus on the character of the feedback responses to the expression of these experiences by the listeners. If the perception-behaviour link model of empathic communication is correct, listeners should tend to match speakers by producing forms of non-verbal feedback that are congruent with the forms chosen by speakers and that tend to match the increase in speaker's gestures for more negative experiences. The assump-

tion is that hearers should respond with stronger empathetic understanding by engaging in increasing levels of behaviour mimicry to more negative or unpleasant experiences. For example, the listener would mimic a reaction appropriate to the speakers described situation, like performing a wince at a description of pain in order to communicate an understanding of the felt experience of the speakers pain.

## 2. Feedback Mechanisms

The occurrence of listener feedback or back-channels is thought to facilitate the incremental process of a conversation as a joint activity. [5, 6, 7, 8, 9]. Research in the area of listener feedback has found that there difference functions can be distinguished for feedback. For the analysis below we distinguish between three broad categories of listener feedback: Contact and Perception, Comprehension and Attitudinal and Emotional.

### 2.1. Contact and Perception

Contact and perception feedback shows a continuation of contact and presence of the listener and the listeners perception that there is a message being put across. This is usually in the form of back-channels that do not interrupt or require acknowledgement from the speaker, although without them the speaker would question whether the listener was paying attention. For example, generic nodding or vocalisations such as 'yeah' or 'mmhmm'. Loredana Cerrato (2002) classifies feedback that functions as indicating contact and perception as a subtype back-channel feedback expressions, otherwise known as continuers as clear cases of such feedback are continuing the speaker's utterance, these share the following features:

- responds directly to the content of an utterance of the other
- are optional
- does not require acknowledgement by the other

This definition rules out post completion vocalisations, rules out feedback that occurs just after speaker's utterance, that could be from reflecting on some cogitation, rules out the answer to questions and listener questions. Back-channels do not take the floor or the turn but can sometimes seek continuation as a way of avoiding the floor. [9]

### 2.2. Comprehension

Another function of feedback is to acknowledges understanding of a message. Comprehension feedback is sometimes difficult to distinguish from contact and perception feedback. The clearest cases are when the feedback is in the form of a question relating to the content of

the speakers message, or a direct referent to their understanding, for example 'I see', 'Aaaah', 'Oh right'.

### 2.3. Attitudinal or Emotional

Another form of feedback is attitudinal or emotional, expressing a point of view or attitude towards the speaker's message. Schroder, Heylen and Poggi (2006) identified the subtype of listener responses displaying attitudinal or emotional feedback to speakers utterances called affect bursts. Affect bursts are very brief, discrete, nonverbal expressions of affect in both face and voice as triggered by clearly identifiable events. [10] Their experiments collecting recognition ratings of vocalisations of such phenomena indicated that affect bursts serve to display emotions that are gratifying for the speaker, or show empathy toward the speaker but generally never expressing a negative attitude or emotion toward the speaker. [11]

Similarly, Bavelas et al. (1987) classify empathetic listener responses as motor mimicry. Motor mimicry is defined as the mimicry of an expressive behaviour, or the performance of the expected expressive behaviour of an occurrence in the perspective of another. Conceptualised as primitive empathy, motor mimicry is described as an automatic reflex of conditioned cues based on ones own prior experience. Bavelas and her colleagues suggest that motor mimicry serves as an expression of the perceived emotion, an interpersonal act to put across, in their words, I feel as you do. [12]

Both affect bursts and motor mimicry contain emotional or attitudinal responses that occur simultaneously to the speaker's utterance. It would be expected that descriptions of sensory experience would provoke empathetic responses like motor mimicry, especially during descriptions of pain. Moreover, empathetic responses should be most likely to occur when the listener has a good understanding of the sensation.

## 3. Methods

A corpus of natural interactions between two participants describing experiences they have had to each other was captured on audio, video and motion capture equipment in the Performance Laboratory at QMUL. The aim was to elicit natural descriptions of people's recalled experiences in an open, unscripted interaction.

24 naive participants were recruited. Participants ages ranged from 18 to 60, consisting of 12 females and 12 males placed in 12 random sex pairs. They were told the study was investigating how people communicate common experiences and made no specific mention of gesture. Participants were given written instructions outlining the entire study procedure in which participants were asked to recall some experiences and talk about them to each other.

The experiences to be described were written on sets

of cards placed on a small table next to where the participants stood. Each participant was allotted a stack cards and asked to take turns selecting one card at a time. When it was their turn each participant described the details of a recalled instance of they had of the sensation written on the card to their partner for no longer than a two or three minutes. Emphasis was placed on describing the particular sensation they felt at the time of the experience. On each description the listening participant was encouraged to talk and ask questions at any time, the process was described in the instructions as an exchange. Video footage was taken of the each study, forming a full body face on view of each participant for the duration of the study.

Two sessions were excluded from the data where the participants didn't follow the instructions as requested and two further sessions were excluded because of incomplete data. For the coding process, each description of an experience was separated into separate items. All listener feedback was annotated, firstly the feedback was separated by modality, either verbal or non-verbal. Then every instance of feedback was coded according to function:

- CP- indicating listener contact and perception of message.
- C- indicating listener comprehension or understanding of message
- A/E- indicating an attitudinal or emotional response which could have been as simple as agreeing with the speaker to showing shock to the speaker message.

#### 4. Results

We report data for 9 pairs of participants and for four target items: Toothache, Backache, Yawn and Laugh. For analysis we ranked them on an intuitive basis as follows: 1 Laugh, 2 Yawn, 3 Backache, 4 Toothache to provide a scale from positive to negative experience. Figure 1 and 2 show mean occurrence of feedback type per item over valence of experience, ranging from most pleasant to most unpleasant, as denoted above.

The frequency of occurrence of verbal empathic responses by the Non-Card Holder were analysed using Generalised Estimating Equations (GEE) with a Tweedie Distribution and an Identify link. Participants were entered as a subject variable, Valence (1-4), Annotation Type (Attitudinal/Emotional / Comprehension / Contact and Perception) and Valence by Annotation Type as an interaction. As figure 2 suggests, there is an overall main effect of Valence (Wald Chi-Square(3) = 15.5,  $p = 0.00$ ) no overall main effect of Annotation Type (Wald Chi-Square(2) = 0.7,  $p = 0.70$ ) and no interaction (Wald Chi-Square(6) = 11.7,  $p = 0.07$ ). Linear trend contrasts for

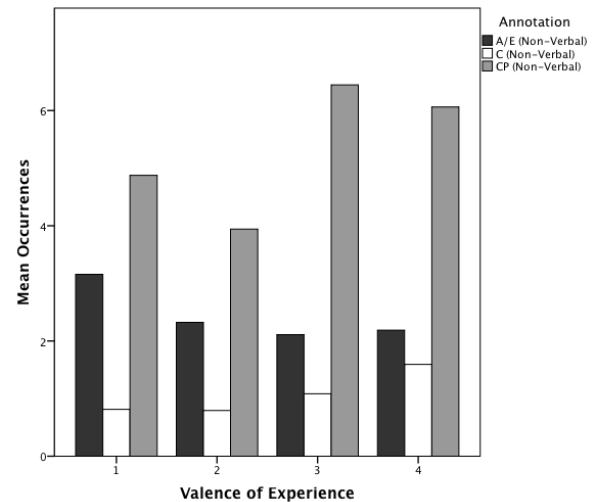


Figure 1: Pattern of Non-Verbal Responses by Non-Card Holder

Valence show that there is a consistent increase in verbal empathic responses as the unpleasantness of the described experience increases (Wald Chi-Square = 11.8,  $p = 0.00$ ). The marginal means for average occurrences at levels 1-4 are: 1.8, 1.9, 2.5, 2.8 respectively.

The parallel analysis for the non-verbal empathic responses (GEE, Tweedie Distribution, Identity link with Valence (1-4), Annotation Type (Attitudinal/Emotional / Comprehension / Contact and Perception) for Valence by Annotation Type as an interaction) shows a more complex pattern. There is a main effect of non-verbal response type (Annotation). Main effect of Valence (Wald Chi-Square(3) = 9.4,  $p = 0.02$ , main effect of annotation (Wald Chi-Square(2) = 38.8,  $p = 0.00$ ) and a reliable Annotation by Valence interaction (Wald Chi-Square(6) = 14.9,  $p = 0.02$ ).

As the marginal means in Table 1 show, the main effect of Annotation is that non-verbal contact and perception signals are more common, across all strengths of expressed experience than either attitudinal/emotional responses or responses showing comprehension. Table 2 breaks down the interaction between Annotation Type and Valence. The highest level of attitudinal/emotional feedback occurs with the least unpleasant experience. Feedback showing comprehension and contact and perception by contrast tend to increase as the unpleasantness of the experience increases.

#### 5. Discussion

From this analysis we can determine that the level verbal feedback (of all types) increases as the level of unpleasantness of the described experience increases, with the highest occurrence of verbal attitudinal or emotional

**Estimates**

Valence	Annotation (Non-Verbal)	Mean	Std. Error	95% Wald Confidence Interval	
				Lower	Upper
1	Attitudinal/Emotional	3.16	.457	2.26	4.05
	Comprehension	.81	.246	.33	1.29
	Contact and Perception	4.87	1.296	2.33	7.42
2	Attitudinal/Emotional	2.32	.308	1.72	2.93
	Comprehension	.79	.226	.35	1.24
	Contact and Perception	3.94	.555	2.85	5.03
3	Attitudinal/Emotional	2.11	.492	1.15	3.07
	Comprehension	1.08	.209	.67	1.49
	Contact and Perception	6.44	1.131	4.23	8.66
4	Attitudinal/Emotional	2.19	.316	1.57	2.81
	Comprehension	1.59	.405	.80	2.39
	Contact and Perception	6.06	1.070	3.97	8.16

Table 1

**Estimates**

Annotation (Non-Verbal)	Mean	Std. Error	95% Wald Confidence Interval	
			Lower	Upper
Attitudinal/Emotional	2.44	.206	2.04	2.85
Comprehension	1.07	.202	.68	1.47
Contact and Perception	5.33	.681	4.00	6.67

Table 2

feedback in response to the most unpleasant experience. Showing the predicted higher level of engagement and understanding communicated the more unpleasant the described experience. Analysis of the non-verbal feedback shows a different pattern. Similar to the verbal feedback pattern, contact/perception and comprehension feedback types increase as the unpleasantness of the described experience increased. However the attitudinal and emotional feedback, which would include all non-verbal empathetic feedback, decreases. This is contrary to expected, where we predicted that the more unpleasant the described experience would provoke more non-verbal empathetic responses such as motor mimicry to communicate understanding and mutual recognition of the speakers experience. This is incompatible with an explanation of empathic communication based on the automatic production of non-verbal feedback of the kind described by Chartrand and Bargh.

Our findings suggest that descriptions of unpleasant experiences do elicit higher levels of engagement through verbal feedback and generic non-verbal feedback but do not increase the tendency to engage in the embodied behaviour associated with the experience to communicate understanding. This suggests that listeners are sensitive

to the character of the experience described by a speaker, but they dynamically adapt the feedback they produce. We speculate that this adaptation is related to strategic social goals such as politeness and to a preference for using non-verbal communication to address the manifest concrete particulars of a described event rather than the speaker's embodied experience.

## 6. Acknowledgements

This research is support by an EPSRC digital economies grant.

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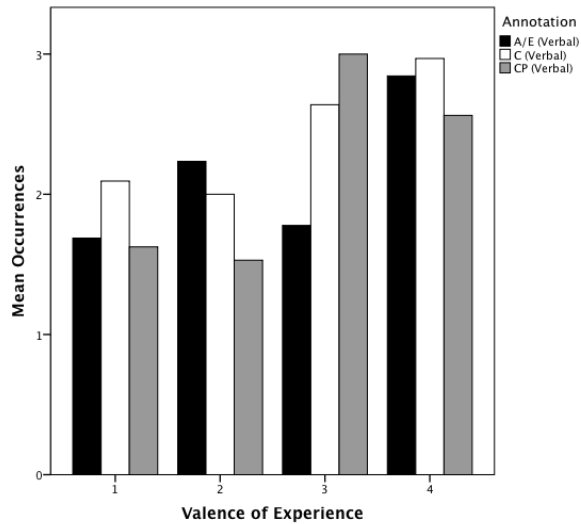


Figure 2: *Pattern of Verbal Responses by Non-Card Holder*

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