

## Impact of pain behaviors on evaluations of warmth and competence



Claire E. Ashton-James<sup>a,b,\*</sup>, Daniel C. Richardson<sup>c</sup>, Amanda C. de C. Williams<sup>d</sup>, Nadia Bianchi-Berthouze<sup>e</sup>, Peter H. Dekker<sup>a</sup>

<sup>a</sup> Department of Social and Organizational Psychology, VU University Amsterdam, The Netherlands

<sup>b</sup> Department of Oral and Maxillofacial Surgery/Oral Pathology, VU University Medical Center/Academic Centre for Dentistry Amsterdam (ACTA), Amsterdam, The Netherlands

<sup>c</sup> Department of Experimental Psychology, University College London, London, UK

<sup>d</sup> Research Department of Clinical, Educational & Health Psychology, University College London, London, UK

<sup>e</sup> UCL Interaction Center, University College London, London, UK

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### ABSTRACT

This study investigated the social judgments that are made about people who appear to be in pain. Fifty-six participants viewed 2 video clips of human figures exercising. The videos were created by a motion tracking system, and showed dots that had been placed at various points on the body, so that body motion was the only visible cue. One of the figures displayed pain behaviors (eg, rubbing, holding, hesitating), while the other did not. Without any other information about the person in each video, participants evaluated each person on a variety of attributes associated with interpersonal warmth, competence, mood, and physical fitness. As well as judging them to be in more pain, participants evaluated the person who displayed pain behavior as less warm and less competent than the person who did not display pain behavior. In addition, the person who displayed pain behavior was perceived to be in a more negative mood and to have poorer physical fitness than the person who did not, and these perceptions contributed to the impact of pain behaviors on evaluations of warmth and competence, respectively. The implications of these negative social evaluations for social relationships, well-being, and pain assessment in persons in chronic pain are discussed.

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## 1. Introduction

Difficulties with social relationships are a major problem in chronic pain [21,30,55]. Children, adolescents, and adults with chronic pain report feeling misunderstood, stigmatized, and excluded by others because of their pain [29,44,52]. Scientific explanations of this experience include social withdrawal due to embarrassment about pain [55,56], reduced ability to participate in work, school, and social activities [4,37], and reduced sociability because of pain-induced negative mood [16,25,36,43].

These explanations suggest that the source of relationship dysfunction is the person with pain. Empirically, the role of the interaction partner has received less attention. People with pain consistently report that others evaluate them negatively [39,40,45], and some studies of doctor–patient and family interactions support that view [11,13,36]. However, because

chronic pain is also associated with a negative social information processing bias [10,22], the extent of actual stigmatization remains unclear.

We aimed to clarify the impact of pain behavior<sup>1</sup> on interpersonal evaluations that are critical to social relationships—namely, evaluations of warmth (trustworthiness, friendliness, or sincerity) and competence (intellect, skill, or capability) [20]. These core interpersonal judgments are made spontaneously on the basis of very little information [61], and predict social motivations to approach or to avoid others [1,19,20,32,38,49,62]. Judgments of high warmth and high competence elicit uniformly positive, affiliative behaviors (eg, admiration, respect, helping, cooperation), whereas judgments of low warmth and low competence are associated with uniformly negative, disaffiliating social responses (eg, contempt, disgust, harm, neglect) [8,9]. Understanding the impact of pain behaviors on warmth and competence evaluations may

\* Corresponding author at: Department of Social and Organizational Psychology, VU University Amsterdam, van der Boechorststraat 1, 1081BT Amsterdam, The Netherlands. Tel.: +31 639781224.

E-mail address: c.e.ashton-james@vu.nl (C.E. Ashton-James).

<sup>1</sup> We make no distinction here between protective (such as guarding) or communicative (such as facial expression) pain behavior [57], since protective pain behavior is also communicative [7] and, from an evolutionary perspective, communicative pain behavior is also protective by eliciting help from others [59].

provide insight into the social relationship difficulties experienced by people with pain.

A person's warmth is often inferred from that individual's perceived mood. Positive mood is used as a cue for warmth, prompting a desire for social connection, whereas the perception or anticipation of another's negative mood motivates avoidance of social contact [8]. Pain is associated with the experience and expression of negative mood [3,16,23,24,42,53]. To the extent that people perceive pain behavior to be indicative of negative mood, therefore, we predict that pain behavior may cue judgments of lower warmth.

Competence is inferred from evolutionarily profitable traits such as cleverness, physical strength, and social status, whereas low competence is inferred from signs of physical, mental, social, or psychological vulnerability [9,46,47]. Because pain behaviors can signal physical vulnerability [41], we predict that pain behaviors will elicit less favorable judgments of competence than pain-free behavior, and that this relationship will be mediated by perceptions of physical fitness.

We tested these predictions in a within-subjects experiment in which participants evaluated a person who displayed pain behavior and another who displayed none. Participants' evaluations were based on body motion alone, avoiding the potential confounds inherent in social interaction and controlling for perceptual cues such as facial expressions, gender, and appearance.

## 2. Methods

### 2.1. Participants and design

A total of 56 university students (44 female) participated in a within-subjects experiment for university course credit or payment. Participants watched 2 video clips of an unidentifiable actor performing a series of exercises. In 1 of the 2 video clips, the person showed pain behaviors (eg, rubbing, guarding, hesitating) while completing the exercises, and in the other the exercises were performed normally. The order of presentation was counterbalanced.

### 2.2. Procedure

Participants were recruited on a university campus by flyers advertising the opportunity to participate in research. After signing a consent form to participate in a study of "person judgments," they were led to private cubicles to complete a computer-based study. Their first task was to watch two 2-minute videos of human figures performing a series of exercises (eg, side stretch, leaning forward, sitting down, standing up). Immediately after watching each video, participants were asked to evaluate the person in the video on a variety of different attributes related to warmth, competence, mood, and physical condition. The task instructions explained to participants, "We are interested in the impressions that people form of others based only on their bodily movements. For example, when you meet someone for the very first time, you often make a quick evaluation of their personality as you see them walking towards you." After watching each video and completing each set of evaluative judgments, participants reported their perception of the level of pain experienced by the person in each video and reported their age and gender. Before participants were compensated and debriefed, they completed a variety of additional surveys as part of an ongoing research.

### 2.3. Materials and measures

#### 2.3.1. Video stimuli

Each video portrayed a human figure executing 5 simple exercises (3 times each) at a slow, steady pace: (right and left) leg lifts,

a forward bend (right and left) side bends, a back bend, and sitting. Reflective markers were placed on the joints and limbs of the actor and they were filmed by 6 high-speed infrared cameras. The locations of the markers in 3D space were reconstructed by the Vicon Nexus motion tracking system (see Appendix for video stills). The marker positions were then displayed as dots onscreen, and the recordings were edited to produce short video clips of the actor. Hence, the figures that participants viewed were composed only of point-light displays [34], with no facial features or expression visible, nor other individuating features that may influence social evaluations such as skin tone or clothing.

The pain and no-pain videos were designed to be as similar as possible. The same actor performed the same actions in the same order, with indistinguishable levels of expressiveness or animation. Hence, the only observable difference between the figures in each video was the presence or absence of pain behaviors. Specifically, the pain behaviors were as follows: hesitation on all movements, and consequently the figure in the pain video took longer to perform the movements, but the difference was small; the actor performed a variety of guarding actions, for instance, when moving to sit, stand, and bend; using support when sitting from standing, and bracing of the back when standing from sitting, and in general, movements were performed more stiffly. The actor, who had experienced chronic pain herself in the past, was trained in pain behavior by a physiotherapist experienced in treating pain for maximum realism in both conditions.<sup>2</sup>

#### 2.3.2. Evaluative judgments

After watching each video, participants were given the following instructions: "Please give your impressions of the person that you saw in the video using the scales provided. We understand that you have very little information about this person, but we are interested in how much you can pick up based only on the information you received." Participants then used a 7-point scale (1 = strongly disagree, 7 = strongly agree), to indicate their impression of the person in the video on a variety of attributes related to warmth (warm, friendly, cooperative, good natured, trustworthy, sincere, tolerant, honest, easy going, carefree; reverse-score items: mean, irritable, impatient), competence (confident, skillful, intelligent, competent, capable, prestigious, ambitious, lazy [reversed], economically successful, well educated, hardworking, persistent), mood (happy, depressed [reversed], relaxed, anxious [reversed]), and physical fitness (healthy, unfit [reversed], energetic, athletic). The order in which these attributes were presented was randomized to control for potential question order effects. The traits that together captured impressions of warmth and competence were selected based on their demonstrated validity and reliability in previous research (reviewed by Cuddy et al. [9]). Finally, participants reported how much pain they thought that the person in each video was experiencing (pain intensity) on an 11-point scale (0 = no pain at all, 10 = worst pain imaginable).

### 2.4. Data reduction and analytic approach

Mean evaluations of warmth, competence, mood, and physical fitness were computed for evaluations of the person displaying pain behavior and the person showing no pain behavior. Reliabilities were high with 1 exception: warmth: pain behavior  $\alpha = 0.82$ , no pain behavior  $\alpha = 0.80$ ; competence: pain behavior  $\alpha = 0.83$ , no pain behavior  $\alpha = 0.88$ ; mood: pain behavior  $\alpha = 0.80$ , no pain behavior  $\alpha = 0.64$ ; physical fitness: pain behavior  $\alpha = 0.86$ , no pain behavior  $\alpha = 0.89$ . We expect that there is greater heterogeneity in

<sup>2</sup> The video materials developed for this study are available upon request from the first author.

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