Implicit associations between pain and self-schema in patients with chronic pain

Dimitri M.L. Van Ryckeghem *, Jan De Houwer, Bram Van Bockstaele, Stefaan Van Damme, Maarten De Schryver, Geert Crombez

Department of Experimental Clinical and Health Psychology, Ghent University, Belgium

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ABSTRACT

Chronic pain often interferes with daily functioning, and may become a threat to an individual's sense of self. Despite the development of a recent theoretical account focussing upon the relationship between the presence of chronic pain and a person's self, research investigating this idea is limited. In the present study we aimed to (1) compare the strength of association between self- and pain schema in patients with chronic pain and healthy control subjects and (2) research whether the strength of association between self- and pain-schema is related to particular pain-related outcomes and individual differences of patients with chronic pain. Seventy-three patients with chronic pain ($M_{age} = 49.95$; SD = 9.76) and 53 healthy volunteers ($M_{age} = 48.53$; SD = 10.37) performed an Implicit Association Test (IAT) to assess the strength of association between pain- and self-schema. Patients with chronic pain also filled out self-report measures of pain severity, pain suffering, disability, depression, anxiety, acceptance, and helplessness. Results indicated that the pain- and self-schema were more strongly associated in patients with chronic pain than in healthy control subjects. Second, results indicated that, in patients with chronic pain, a stronger association between self- and pain-schema, as measured with the IAT, is related to a heightened level of pain severity, pain suffering, anxiety, and helplessness. Current findings give first support for the use of an IAT to investigate the strength of association between self- and pain-schema in patients with chronic pain and suggest that pain therapies may incorporate techniques that intervene on the level of self-pain enmeshment.

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1. Introduction

Chronic pain often interferes with daily life activities [17,24,45]. Lasting pain may also influence the individual's sense of self (i.e., an individual's self-schema) [5,24,33]. Indeed, the fact that pain persists and remains to interrupt and interfere with daily functioning may be damaging to one's sense of self, and result in suffering [23]. A theoretical account in this context is the schema enmeshment model of pain [33]. A central tenet of this model relates to strength of association between a person's pain- and self-schema (i.e., mental structures constructed through experience used to process incoming stimuli). It is assumed that the repeated and simultaneous activation of the content of the self- and pain-schema, as is the case in patients with chronic pain, results in a stronger association between a person's pain- and self-schema. Furthermore, it is proposed that such a strong association is

detrimental for pain outcomes (i.e., disability, pain suffering) [21,25,33] or related to chronic pain patient characteristics (e.g., depressive mood, anxiety, acceptance) [25,33,34,37,42]. Research investigating the above-mentioned topic is, however, still in its infancy [25].

As yet, the association between pain- and self-schema in patients with chronic pain has mainly been investigated by means of explicit (e.g., interview) and semi-explicit measures (e.g., Sentence Completion Test) [42,37,38]. Although these studies provide some evidence for the idea that chronic pain influences the individual's sense of self, there are limitations to the use of (semi-)explicit measures. Indeed, these measures tap only conscious cognitive processes, and explicit measures may be more vulnerable for response bias. Researchers have therefore developed so-called implicit measures that are less susceptible to bias and can reveal associations between schemata even when people are unwilling or unable to report those associations [11,30].

The main aim of the current research was to investigate the strength of association between pain- and self-schema in patients

* Corresponding author. Address: Ghent University, Belgium, Henri Dunantlaan 2, 9000 Ghent, Belgium. Tel.: +32 (0)9 2648611; fax: +32 (0)9 264648912.
E-mail address: Dimitri.vanryckeghem@ugent.be (D.M.L. Van Ryckeghem).

with chronic pain and healthy control subjects. To assess the strength between self- and pain-schema, we used the Implicit Association Test (IAT) [14]. The basic idea is that people are faster to categorize stimuli related to two associated concepts in the same way (e.g., by pushing the same button) than to categorize these stimuli in a different way (e.g., by pushing a different button) [14]. In this study, participants were required to categorize words related to the self - other dimension (e.g., <participant's first name> - <unfamiliar first name>), and words related to the pain - free of pain dimension (e.g., "excruciating" - "relieving").

We hypothesized that the association between pain- and self-schema, as measured by the IAT, is stronger in patients with chronic pain than in healthy control subjects. Furthermore, we also hypothesized that within the group of patients with chronic pain a stronger association between pain- and self-schema would be related to worse pain-related outcomes, in particular disability and suffering from pain. Finally, we tested whether IAT scores are related to depressive mood and level of anxiety and acceptance of the patients with chronic pain and so replicate previous research using (semi-)explicit measures to assess the overlap between pain- and self-schema in patients with chronic pain [25,42].

2. Method

2.1. Participants

Patients with chronic pain were recruited via an invitation letter sent to the members of the Flemish Pain League. Five-hundred and eighteen members responded to the letter, of which 315 agreed to be contacted by phone. In the period February-March 2011, 267 persons were actually contacted by telephone. Inclusion criteria for patients with chronic pain were: (1) aged between 18 and 65 years; (2) sufficient knowledge of the Dutch language; and (3) suffering from pain that lasted for at least 6 months. Individuals were excluded when headache was the most important pain (cfr. [12]), when they were unable to use both index fingers, or when their eyesight was not normal or corrected-to-normal (e.g., by glasses) [46]. Eighty-one patients with chronic pain who fulfilled the criteria agreed to participate. Because participants needed to travel to the university campus to participate in this study, transportation problems were mentioned as the most frequent reason for non-participation. However, later on, a further 7 patients decided not to participate because of health problems, and 1 participant could not execute the IAT because of insufficient time to complete the task during the experiment session. The final chronic pain sample consisted of 73 individuals. A control group matched for age and gender (on group level) was recruited via advertisement in a local newspaper and via flyers. A total of 86 individuals contacted the researcher to participate in the study. Inclusion and exclusion criteria were similar to those in the chronic pain group, except for (1) age range which was between 21 and 65 years (because of matching with patients with chronic pain) and (2) participants should not report current pain problems. A total of 54 participants were eligible to participate in the study. The main reasons for exclusion were age range (n = 13) and presence of a current pain problem (n = 12). The final healthy control sample consisted of 53 individuals.

Both groups were recruited as part of the Ghent Pain and Disability Study I (GPD-I-study). A flowchart and more details of the recruitment and procedure of the GPD-I-study are available at http://hdl.handle.net/1854/LU-3050986. The study design was approved by the ethics committee of the Faculty of Psychology and Educational Sciences of Ghent University, and written informed consent was obtained from all participants. All participants received a monetary reward for participation.

2.2. Questionnaires

Disability was assessed by means of the Dutch version of the Pain Disability Index (PDI; [35]). In this questionnaire, participants are asked to indicate the extent of disability experienced in 7 areas of everyday life (e.g., family/home responsibilities and social activity) using 0–10 Likert scales (0 = no disability and 10 = total disability). Scores range from 0 to 70. The reliability and validity of the PDI have been well established [43]. In the present study, Cronbach's alpha of the PDI was 0.81.

Depressive and anxious mood were measured using the Hospital Anxiety and Depression Scale (HADS; [48,49]). The HADS is a self-report scale that screens for the presence of depression and anxiety during the past week. The HADS was especially designed to measure depression and anxiety among patients with "medical conditions" [48]. The HADS-D (depression subscale) consists of 7 items that are rated on a 4-point Likert scale (e.g., I feel cheerful). Scores vary between 0 and 21. Also the HADS-A (anxiety subscale) consists of 7 items that are rated on a 4-point Likert scale (e.g., I feel tense or wound up). Again scores vary between 0 and 21. The HADS was found to perform well in assessing the symptom severity of depression and anxiety in somatic and primary care patients [3]. Cronbach's alpha of the HADS-D and HADS-A in the present study were 0.82 and 0.80 respectively.

Participants' level of anxiety was further assessed via the Dutch version of the State-Trait Anxiety Inventory (STAI; [40,47]) because the STAI measures anxiety in a more elaborated way than the HADS-A. The STAI measures State anxiety as well as Trait anxiety. The STAI-trait (STAI-T) subscale measures the disposition toward anxiety as a personality trait, which is defined as the relatively stable individual difference in anxiety proneness. The STAI-state (STAI-S) subscale measures the intensity of anxiety as a current emotional state consisting of subjective feelings of tension, nervousness, apprehension, and worry, and activation or arousal of the autonomic nervous system. The STAI consists of 40 items in which people are asked to report their feelings in general (e.g., I feel happy) and at present (e.g., I feel upset) using a 4-point Likert scale. Scores for the state and the trait version vary between 20 and 80. This questionnaire consistently demonstrated adequate psychometric properties and is among the most commonly used measures of anxiety [2,9,26,27,41]. In the present study, Cronbach's alpha of the STAI-S (STAI state version) and STAI-T (STAI trait version) were 0.94 and 0.94 respectively.

Pain severity and Pain suffering were assessed using the Multidimensional Pain Inventory (MPI; [18,19]). Part I of the MPI consists of 5 subscales assessing the impact of pain (i.e., pain severity, pain interference, social support, perceived life control, and affective distress). Pain severity was assessed by means of 2 items (i.e., "Rate the level of your pain at the present moment" and "On average, how severe has your pain been during the last week."). We opted to use only 2 items of the MPI severity subscale because the third item (i.e., How much suffering do you experience because of your pain?) relates to suffering rather than pain severity (see [32]). This item was coded and reported as pain suffering. The reliability and validity of the MPI have been well established [36]. In the present study Cronbach's alpha of the MPI pain severity subscale was 0.95.

Helplessness (i.e., the tendency to focus on the adverse aspects of the disease/pain and to generalize them to daily functioning) and Acceptance (i.e., the tendency to recognize the need to adapt to a chronic disease/pain while perceiving the ability to tolerate and manage its aversive consequences) were assessed using the 6-item Helplessness subscale and the 6-item Acceptance subscale of the of the Illness Cognitions Questionnaire (ICQ; [10]) respectively. The ICQ showed a good reliability and validity [20]. In the