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A contextual approach on sex-related biases in pain judgements: The moderator effects of evidence of pathology and patients' distress cues on nurses' judgements of chronic low-back pain

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Although women report feeling more pain than men, their pain is often underdiagnosed and undertreated. By proposing a gender-based theoretical conceptualisation, we argue that such sex-related biases may be enhanced or suppressed by contextual variables pertaining to the clinical situation, the perceiver or the patient. Consequently, we aimed to explore the moderator role of two clinically relevant variables in a chronic low-back pain (CLBP) scenario: diagnostic evidence of pathology (EP) and pain behaviours conveying distress. One-hundred and twenty-six female nurses ($M = 35.33$, $SD = 7.64$) participated in an experimental between-subjects design, 2 (patient's sex) \times 2 (EP: present vs. absent) \times 2 (pain behaviours: with vs. without distress). Independent variables were operationalised by vignettes depicting a patient with CLBP. Nurses judged the patient's pain on several dimensions: (1) credibility; (2) disability; (3) severity of the clinical situation; (4) psychological attributions and (5) willingness to offer support. Main findings showed that judgements of women's pain were influenced by EP, while judgements of men's pain were not. Moreover, nurses showed biases against men, but only in the presence of EP. The influence of distress cues was less consistent. Theoretical and practical implications are drawn.

Keywords: sex-related biases; pain judgements; gender; stereotypes; nursing

Introduction

Women feel more pain throughout their lives than men. Their pain experiences are more frequent, severe and enduring (e.g. LeResche, 2000; Robinson, Wise, Riley III, & Atchison, 1998; Unruh, 1996). In fact, most chronic pain conditions have a higher prevalence among females than among males (e.g. Berkley, Hoffman, Holdcroft, & Murphy, 2002; Berkley & Holdcroft, 1999; LeResche, 1999). Despite that, evidence shows that women's pain is often under diagnosed and undertreated as compared to men's pain (e.g. Ayanian & Epstein, 1991; Chang et al., 2007; Cleeland et al., 1994; Hoffman & Tarzian, 2001; Schulman et al., 1999). Because the presence of such sex-related biases among health professionals may have serious consequences in

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terms of health-care inequities, understanding such phenomenon seems of utmost importance.

The literature on such judgement biases has been predominantly descriptive, a-theoretical and revolving around a core question: 'Do sex-related biases in pain judgements exist?' The answer to such question, however, is far from being clear. In fact, although many studies have shown sex-related biases against women in pain judgements and treatments (e.g. Ayanian & Epstein, 1991; Chang et al., 2007; Cleeland et al., 1994; Loveman & Gale, 2000; Schulman et al., 1999), other studies have shown no such sex-related biases (e.g. Bell & Hudson, 2001; Criste, 2003; Turk & Okifuji, 1999; van Lennep et al., 1999), and still a few others have shown biases against men (e.g. Bergelson & Tommaso, 1995; Blum, Slade, Boden, Cabin, & Caulin-Glaser, 2004; Safdar et al., 2006). In a nutshell, the pattern of results seems inconclusive.

It is our contention that such an inconsistent pattern of results may point to the contextual nature of the phenomenon. More specifically, we argue that instead of being universal, the presence of sex-related biases in pain judgements may depend on the context of the pain experience. Therefore, we believe that conceptual and empirical efforts should aim at understanding, explaining and eventually predicting the phenomenon, instead of just trying to describe it.

This article reflects such endeavour. We will begin by briefly proposing a theoretical conceptualisation of the contextual nature of sex-related biases in pain judgements. Based on such a conceptualisation, we will discuss and explore the moderating role of two clinically relevant variables, namely, the presence/absence of 'objective' diagnostic evidence of pathology (EP) and of pain behaviours conveying distress.

Conceptualising sex-related biases in pain judgements

A first step to conceptualising sex-related biases in pain judgements is to clearly define and distinguish the concepts of sex and gender. As we have argued elsewhere (Bernardes, Keogh, & Lima, 2008), we define sex as a social category used to split human beings into males and females according to several biological markers (e.g. genitalia, hormones and chromosomes). It is a concept that only allows us to describe the similarities or differences between males and females. Gender, however, is a term that encompasses all the socially constructed representations of what it means to be and act as a man or a woman in a certain society. It is a concept that allows us to account for the social and relational nature of sex-related similarities or differences. Consequently, in order to explain the presence of sex-related biases in pain judgements and treatments, we need to resort to several gender-related concepts and theories.

In doing so, and drawing on the Gender-in-context Model (Deaux & LaFrance, 1998; Deaux & Major, 1987), our conceptualisation is based on two main theoretical assumptions. First, the perceiver, i.e. health-care professional, has an active role in the construction of the phenomenon by the use of his/her gender schemas. Gender schemas are cognitive structures that encompass socially learned knowledge regarding the meanings of being and acting as a man or woman (Bem, 1981; Spence, 1991). When such knowledge is activated in memory, it might be applied to the interpretation of life events, namely, other people's pain experiences.

Such schematic structures, however, do not colour our judgements all the time (Chaiken & Trope, 1999). Therefore, a second assumption is that the activation and application of such schematic structures is highly conditional. More specifically, certain context-related variables pertaining to the perceiver (e.g. being gender prejudiced), the person in pain (e.g. displaying gendered pain behaviours) or the (clinical) situation (e.g. suffering from a typically female pain condition) may trigger the activation and application of such schemas to pain judgements.

Based on such assumptions, we had reasons to expect sex-related biases in pain judgements to be a contextual phenomenon. As such, we aimed to contribute to the identification of clinically significant contextual variables that, by triggering the activation of gender schemas, could either enhance or suppress the presence of such biases.

On the contextual nature of sex-related biases in pain judgements

This study aims to explore the contextual nature of sex-related biases of nurses' judgements of chronic low-back pain (CLBP). We have chosen this specific pain syndrome for three main reasons. First, CLBP is one of the most pervasive and widespread pain conditions worldwide, often interfering severely in a person's life (Crombie, Croft, Linton, LeResche, & Von Korff, 1999). Second, it is also a pain condition that is equally prevalent among males and females (e.g. LeResche, 1999, 2000), allowing us to study sex-related biases in a 'gender-neutral' clinical scenario. Third, a large proportion of CLBP patients do not show 'objective' diagnostic EP (e.g. positive x-rays, CT scans; Dionne, 1999), which increases the uncertainty of the clinical judgements (Tait, Chibnall, & Kalauokalani, 2009). Because it is well established that our basic needs for control and understanding favour the activation and application of (gender) schematic knowledge to the interpretation of ambiguous (clinical) scenarios (e.g. Bodenhausen, Macrae, & Sherman, 1999; Kunda & Spencer, 2003), we believed that the EP could be an important moderator of sex-related biases in CLBP judgements.

The moderator role of diagnostic evidence of pathology

Although EP in CLBP patients is not highly correlated with pain intensity or pain-related disability (e.g. Hasenbring, Marienfeld, Kuhlendahl, & Soyka, 1994; Jensen et al., 1994), it has a large impact on how a person's pain is judged. Several experimental studies have shown that both laypeople and health-care professionals consistently undervalue CLBP in the absence of EP (Chibnall & Tait, 1995, 1999; Chibnall, Tait, & Ross, 1997; Tait & Chibnall, 1994, 1997). In these studies, written vignettes depicting a CLBP patient with or without unambiguous EP were presented to participants. Results consistently showed that in the absence of EP the patient's pain was perceived as less severe, disabling, credible, and when the reported pain was intense, underestimated. The patient without EP was also perceived as less distressed and with more negative personality traits.

The same pattern of results was found in clinical studies where medical records of CLBP patients attending occupational medicine clinics were analysed (Chibnall, Tait, & Merys, 2000; Tait & Chibnall, 2001); CLBP with specific and unambiguous aetiology (e.g. herniated disc) was perceived as more disabling, and associated with

more diagnostic tests and higher treatment costs than CLBP with unknown aetiology.

Although the studies mentioned above show a large effect of EP on judgements of CLBP, a similar pattern of results has been found with other chronic pain syndromes (e.g. migraines; Taylor, Skelton, & Butcher, 1984) or acute pain episodes (kidney stone; Gillmore & Hill, 1981), suggesting the robustness of these findings. Such a consistent pattern of results is the reflection of a prevailing dualistic way of thinking, where pain is considered to be organic or psychogenic depending on the presence or absence of EP (e.g. Gatchel, Peng, Peters, Fuchs, & Turk, 2007; Hansen, 1997). Consequently, pain in the absence of EP is commonly perceived as either illegitimate or attributed to psychological causes (e.g. Chibnall et al., 1997; Hansen, 1997). In other words, it might be perceived as a symptom of somatisation and, hence, undervalued.

Despite the robustness of the effect of EP on pain judgements, can we expect it to be the same for male and female pain patients? In the absence of EP, is a female's pain equally undervalued as compared to a male's pain? Although the aforementioned studies do not allow us to give an answer to such questions, we have reasons to believe that the effect of EP on pain judgements might depend on a patient's sex. Evidence suggests that peoples' cognitive representations of somatisation, by being clearly more associated with the female than the male stereotype (Bernstein & Kane, 1981; Martin & Lemos, 2002), are more often applied to the interpretation of a female's symptoms (e.g. chest pain; Chiamonte & Friend, 2006; Martin & Lemos, 2002). Also, mounting evidence on what Healy (1991) termed the 'Yentl syndrome' indirectly supports this contention. Several studies show that while in the absence of diagnostic evidence of cardiac pathology, a woman's chest pain is more often underdiagnosed and undertreated as compared to a man's chest pain, when EP is present no sex-related biases in pain treatment seem to persist (e.g. Chang et al., 2007; Johnson et al., 1996; Maynard, Bershansky, Griffith, & Selker, 1996; Schulman et al., 1999). In sum, these findings point to the moderator role of EP on sex-related biases in pain judgements. However, because most of these studies have focused exclusively on chest pain and have only presented indirect evidence of this effect, we aimed to directly test the moderating role of EP on sex-related biases in CLBP. Based on the reviewed literature, we expected:

- (H1) sex-related biases in CLBP judgements against women only in the absence of EP;
- (H2) only the judgements of women's pain to be dependent on the EP.

The moderator role of pain behaviours conveying distress

Apart from exploring the moderator role of a variable pertaining to the clinical situation – the presence/absence of EP – on sex-related biases in CLBP judgements, we aimed to analyse the moderator role of a patient-related variable, namely, whether his/her pain behaviours conveyed distress. This is also a clinically relevant dimension of pain experiences, considering the large prevalence of stress, anxiety and mood disorders among chronic pain patients (Asmundson, 2002; Asmundson & Katz, 2009) and also the different emotional tones with which pain experiences may be reported.

We have reasons to believe that common mechanisms may underlie the effects of pain behaviours conveying distress and EP on sex-related biases in pain judgements. Again, as a reflection of prevailing dualistic thinking, evidence supports the presence of an *implicit stress-disease rule*, where symptoms presented along with distress cues are typically attributed to psychological causes (Swartzman & McDermid, 1993). In fact, a recent review by Tait et al. (2009) highlighted several experimental and clinical studies supporting the association between distress cues, psychological attributions and pain underdiagnosing and undertreating. In other words, the presence of pain behaviours conveying distress may activate common sense models of somatisation. Because such models of somatisation (Martin & Lemos, 2002) and more specifically, pain behaviours conveying distress, are more intimately associated with the female stereotype (e.g. Adams et al., 2008; McCaffery & Ferrell, 1992), we have reasons to expect that the influence of the latter on pain judgements depends on the patient's sex.

Evidence that directly supports such a hypothesis is scarce and inconsistent. Some experimental studies with written vignettes depicting a patient with chest pain found that both laypeople and doctors showed sex-related biases against the woman only in the presence of distress cues (signs of anxiety or the presence of stressful life events). Also, only their judgements of the woman's pain depended on the presence or absence of such cues (Chiaromonte & Friend, 2006; Martin, Gordon & Lounsbury, 1998; Martin & Lemos, 2002). On the other hand, a study conducted by Bernstein and Kane (1981) that presented written scenarios of patients with low-back pain showed the opposite pattern of results. Doctors showed sex-related biases against the woman when stress cues were absent. Moreover, the judgements of the man's pain were more dependent on such stress cues (expressing a personal problem); his pain was more attributed to emotional factors and a psychosomatic diagnosis and they perceived a lower likelihood of finding EP.

The focus on different types of pain (chest vs. low-back pain) or the use of different operationalisations of stress cues may account for the inconsistency of such results. The scarcity and inconsistency of these findings and also the fact that most studies did not directly manipulate the patient's pain behaviours (but rather the presence of stressful life events) did not allow us to draw a firm hypothesis for the moderator effect of pain behaviours conveying distress on sex-related biases in pain judgements. Therefore, our goal was to merely explore the presence of such a moderator effect in a CLBP scenario.

Method

Participants

One-hundred and twenty-six female nurses, between 22 and 60 years of age ($M = 35.33$, $SD = 7.64$) participated in this study. They had 1–34 years of professional experience ($M = 11.82$, $SD = 7.12$) in several clinical specialties. About 50% of the nurses reported working or having worked in an emergency room and 70% reported having frequent professional contact with chronic pain patients ($M = 5.14$ out of 7; $SD = 1.06$). About 25% of the participants reported suffering ($n = 19$) or having suffered ($n = 13$) constant or intermittent pain for more than 3 months, mostly on a daily (37.5%) or weekly (40.6%) basis, located at their spines and with an average intensity of 5.84 out of 10 ($SD = 2.16$). Finally, outside their

professional contexts, 61% of the nurses were acquainted with other people suffering from chronic pain, most frequently family members.

Experimental design

This study consisted of an experimental between subjects design, 2 (patient's sex) \times 2 (EP: present vs. absent) \times 2 (pain behaviours: with vs. without distress). Participants were randomly assigned to one of the eight experimental conditions.

Independent variables

Independent variables were operationalised by written vignettes depicting a patient with CLBP. Below, a sample vignette is presented with the wording used to operationalise each variable and the information held constant across experimental conditions.

A 37-year-old man (woman) goes to an emergency room complaining of low-back pain irradiating to his (her) right lower limb, with which he (she) claims to have been living for 3 years.

In the waiting room, this man (woman) is agitated and anxious (calm and quiet). Besides a painful facial expression, this man (woman) is complaining and verbalising his/her pain frequently and spontaneously, (does not complain nor spontaneously verbalise his/her pain).

While in the waiting room, he (she) frequently tries to call for the attention of the health-care professionals who are passing by, in order to be seen more quickly (does not try to call for the attention of the health-care professionals who are passing by, waiting for his/her turn to be seen).

Finally, when called to the triage, he/she described the pain in the following way: 'I have been living with low-back pain for 3 years, which has recently gotten worse. My back and right leg hurt a lot and sometimes it is difficult for me to walk. I have even been having trouble sleeping. It is a fearful and cruel (sharp and cutting) pain'.

Recently, this man (woman) had X-ray, CAT scan and MRI of the lumbar spine that showed significant evidences of a herniated disc (did not show any evidence of significant anomalies).

The operationalisation of the patient's pain behaviours conveying distress was achieved by manipulating his/her anxiety manifestations, verbal pain behaviours and efforts to obtain social support. The choice of such dimensions of pain behaviour was based on some of our previous findings, suggesting their centrality on nurses' gender-role expectation of pain coping (e.g. Bernardes, Lima, & Paulino, 2010); nurses expect women to show, in public places, more pain behaviours conveying distress than men, like anxiety signs, verbal pain expressions and requests for support.

Anxiety manifestations were operationalised both by an explicit reference to the patient's emotional state and, as in Chiaramonte & Friend (2006), by the patient's pain descriptors. Based on a Portuguese version of the *McGill Pain Questionnaire* (Pimenta & Teixeira, 1996), two sensory (sharp and cutting) and two affective (fearful and cruel) descriptors were selected, the latter conveying more emotional distress than the former. The operationalisation of verbal pain behaviours and requests for support was based on nurses' discourses on gender-role expectations of pain coping we had previously gathered in a qualitative study (Bernardes et al., 2010). Finally, the operationalisation procedures for EP were similar to the ones

formerly used by other authors (e.g. Chibnall & Tait, 1999; Chibnall et al., 1997; Tait & Chibnall, 1997).

Several independent doctors and nurses checked for the scenarios' credibility and realism. Also, the vignettes were pre-tested with an independent sample of 23 nursing students, between 18 and 27 years old ($M = 20.2$; $SD = 2.42$; 78.3% women). Results showed that, compared to the patient without overt signs of distress, the patient with pain behaviours conveying distress was perceived as more anxious ($M = 5.54$; $SD = 0.88$ vs. $M = 2.50$; $SD = 0.97$), $t(21) = 7.86$, $p < 0.001$, expressing more openly his/her pain ($M = 4.23$; $SD = 1.3$ vs. $M = 2.70$; $SD = 0.95$), $t(21) = 3.13$, $p < 0.001$, and needing more support and attention ($M = 5.0$; $SD = 1.3$ vs. $M = 2.1$; $SD = 0.99$), $t(21) = 5.88$, $p < 0.001$. Moreover, all participants correctly recalled the information pertaining to EP.

Dependent variables

After reading one of the vignettes, nurses were asked to judge the patient's pain. Moreover, and in order to explore the presence of sex-related biases in potential therapeutic actions, nurses had also to express their willingness to offer support to the patient.

Based on past research on pain judgements (e.g. Chibnall et al., 1997; Chibnall & Tait, 1999; Lundquist, Higgins & Prkachin, 2002; Macleod, LaChapelle, Hadjistavropoulos, & Pfeiffer, 2001; McDonald & Bridge, 1991; Tait & Chibnall, 1997), we selected and adapted a pool of 18 items tapping dimensions often used as dependent variables (e.g. pain intensity, disability, credibility, clinical severity/urgency, causal attributions and willingness to offer support). Participants had to rate all the items, on an evaluative scale from 1 (not at all) to 7 (extremely), in which the rated dimension was adapted to the item's content (e.g. extremely credible, disabling or severe). The independent doctors and nurses had the perception that all of the items were measuring what they supposed to measure, supporting their face validity.

In order to check the factor structure underlying the selected pool of items in our sample, we conducted a principal axis factor analysis with an oblique rotation. Items with high cross-loadings (< 0.20) were progressively eliminated from the factor structure.

Five factors were extracted with *eigenvalues* over 1, accounting for 83.25% of the total variance: (1) willingness to offer support (5 items; e.g. *To what extent would you be willing to help this patient ambulate?*); (2) pain disability (4 items; e.g. *To what extent do you believe this pain interferes with this man's professional life?*); (3) psychological attributions to pain (3 items; e.g. *To what extent do you believe this patient's pain is caused by psychological factors?*); (4) pain credibility (3 items; e.g. *To what extent do you feel the pain reported by this patient is credible?*) and (5) severity of the clinical situation (2 items; e.g. *How would you rate the severity of this patient's clinical situation?*). All factors showed excellent internal reliability (all $\alpha > 0.83$).

Except for the low negative correlation between psychological attributions and credibility judgements ($r = -0.24$, $p < 0.05$), all the remaining factors presented low to moderate positive correlations ($0.25 > r > 0.50$, $p < 0.05$).

Procedure

As in Chiaramonte & Friend (2006), nurses' were invited to collaborate on a study supposedly aimed at understanding: (1) to what extent the ability to recall clinical information was influenced by its presentation format (videotaped, audio-taped or written) and (2) the influence of information recall on health-care professionals' attitudes towards a patient or clinical situation. Although participants' were told that they had been randomly assigned to the written condition, in reality, all scenarios were presented in a written format.

After their consent to collaborate, participants' were given a maximum of 2 min to carefully read one of the eight scenarios and to form an impression of the pain patient. After that time was over, without referring back to the written information, they were asked to recall several details of the clinical scenario (e.g. patient's symptoms, sex, age, emotional state and pain behaviours, evidence of pathology) in order to check the manipulations of the independent variables. Then, they were asked to judge the patient's pain and express their willingness to offer him/her support. Finally, participants' socio-demographic information and personal and vicarious experiences with chronic pain were collected.

Questionnaires were administered in small groups, taking an average of 20 min to complete. Afterwards, all participants were debriefed.

Results

Manipulation checks

Once again, results showed that, compared to the patient without overt signs of distress, the patient with pain behaviours conveying distress was perceived as more anxious ($M = 5.32$; $SD = 1.07$ vs. $M = 2.30$; $SD = 1.39$), $t(125) = 13.71$, $p < 0.001$, expressing more overtly his/her pain ($M = 5.16$; $SD = 1.07$ vs. $M = 2.88$; $SD = 1.52$), $t(125) = 9.74$, $p < 0.001$, and needing more support and attention ($M = 5.5$; $SD = 1.1$ vs. $M = 1.92$; $SD = 1.42$), $t(125) = 15.81$, $p < 0.001$. About 92% of the participants correctly recalled all the information presented in the vignettes. However, 10 nurses failed to recall at least one piece of information (e.g. patient's age, sex and evidence of pathology). Such participants were equally distributed across the experimental conditions and were not significantly different from the remaining sample in terms of their socio-demographic characteristics or personal and vicarious experiences with chronic pain. Consequently, they were not included in the following analyses.

Mean differences in pain judgements

Preliminary analyses showed that none of the variables pertaining to the participants' socio-demographic characteristics or their personal, professional and vicarious experience with chronic pain showed significant relations with any of the dependent variables. Consequently, such variables were excluded from the analyses presented below.

Considering the factor inter-correlation indexes, first, we conducted a 2 (patient's sex) by 2 (pain behaviours) by 2 (EP) analysis of variance over the psychological attributions to pain. Finally, a multivariate analysis of variance was undertaken over the remaining four factors.

Psychological attributions to pain

Results showed significant main effects of pain behaviours, $F(1, 109) = 65.16$, $p < 0.001$, $\eta^2 = 0.37$, and EP (Table 1). Nurses made more psychological attributions to pain when the patient presented pain behaviours conveying distress ($M = 4.93$; $SD = 0.66$) or when EP was absent as compared to when he/she behaved with no overt signs of distress ($M = 3.51$; $SD = 1.04$) or presented significant EP, respectively.

The main effect of EP should, however, be interpreted with caution considering the borderline interaction effect of the patient's sex by EP. Despite being of borderline significance, we believe this effect should be highlighted due to its relevance to our hypotheses (Table 1). In fact, planned comparisons showed that only the woman's pain was significantly more attributed to psychological causes in the absence of EP, $F(1, 109) = 16.52$, $p < 0.001$.

Judgements of pain credibility, disability, severity of the clinical situation and willingness to offer support

Multivariate tests showed a significant main effect of EP, $F(4, 101) = 6.18$, $p < 0.001$, $\eta^2 = 0.20$. Univariate tests showed that in the absence of EP, the patient's pain was perceived as less credible, disabling and his/her clinical situation as less severe than when he/she presented evidence of a herniated disc (Table 1).

Again, EP main effects should be read with caution, given that multivariate tests also showed an interaction effect of EP by the patient's sex, $F(4, 101) = 2.78$, $p = 0.03$, $\eta^2 = 0.10$, which univariate tests showed to be significant on pain credibility and disability (Table 1). Planned comparisons again showed that only the judgements of the woman's pain depended on the EP; in the absence of EP, the woman's pain was perceived as less credible, $F(1, 104) = 15.25$, $p < 0.001$, and disabling, $F(1, 104) = 15.76$, $p < 0.001$, than when she showed evidence of a herniated disc. Also, in the presence of EP, the male's pain was perceived as less credible, $F(1, 104) = 3.89$, $p = 0.05$, and disabling, $F(1, 104) = 7.26$, $p = 0.008$, than the female's pain.

Univariate tests also showed that the effect of EP on clinical severity judgements was moderated by the patient's pain behaviours, $F(1, 104) = 4.52$, $p = 0.036$, $\eta^2 = 0.04$. Planned comparisons showed that the clinical situation was perceived as less severe in the absence than in the presence of EP, but only for the patients that displayed overt signs of distress ($M = 3.82$; $SD = 0.77$ vs. $M = 4.72$; $SD = 0.72$), $F(1, 104) = 20.56$, $p < 0.001$.

Univariate results also showed an interaction effect of the patient's sex by the patient's behaviours on pain disability judgements, $F(1, 104) = 4.60$, $p = 0.034$, $\eta^2 = 0.04$. Planned comparisons showed that nurses perceived the male's pain as more disabling when he displayed overt signs of distress ($M = 5.35$; $SD = 0.81$) than when he did not do so ($M = 4.81$; $SD = 0.67$), $F(1, 104) = 7.17$, $p = 0.008$. Also, in the absence of pain behaviours conveying distress, nurses perceived the man's pain as less disabling ($M = 4.81$; $SD = 0.67$) than the woman's pain ($M = 5.25$; $SD = 0.95$), $F(1, 104) = 4.64$, $p = 0.03$.

Finally, it should be noted that no significant effects were found involving the nurses' willingness to offer support to the patient.

Table 1. Univariate main effects of EP and interaction effects of EP by patient's sex on pain judgements.

| Pain judgements | M (SD) | | | | F | η^2 | M (SD) | | | | F | η^2 |
|--------------------------------|-------------|-------------|-------------|-------------|---------|----------|-------------|-------------|-------------|-------------|---------|----------|
| | Present | | Absent | | | | Present | | Absent | | | |
| | Man | Woman | Man | Woman | | | Man | Woman | Man | Woman | | |
| Psychological attributions | 3.88 (1.19) | 4.58 (1.20) | 4.00 (1.17) | 3.75 (1.22) | 16.80** | 0.13 | 4.41 (1.20) | 4.74 (1.20) | 4.41 (1.20) | 4.74 (1.20) | 2.78*** | — |
| Pain credibility | 5.14 (0.84) | 4.56 (0.85) | 4.93 (0.74) | 5.38 (0.91) | 13.56** | 0.12 | 4.65 (0.81) | 4.47 (0.89) | 4.65 (0.81) | 4.47 (0.89) | 3.78* | 0.04 |
| Pain disability | 5.34 (0.81) | 4.93 (0.80) | 5.08 (0.74) | 5.63 (0.82) | 8.09** | 0.07 | 5.08 (0.80) | 4.79 (0.78) | 5.08 (0.80) | 4.79 (0.78) | 8.25** | 0.07 |
| Severity of clinical situation | 4.54 (0.75) | 3.94 (0.71) | — | — | 18.97** | 0.15 | — | — | — | — | — | — |

Note: * $p \leq 0.05$, ** $p \leq 0.01$, *** $p = 0.09$.

Discussion

We have argued that sex-related biases in pain judgements may be a contextual phenomenon, enhanced or suppressed by variables pertaining to the clinical situation, the perceiver or the patient. In order to explore this contention, we aimed to test the moderator effects of two clinically relevant variables on sex-related biases in nurses' CLBP judgements: EP and pain behaviours conveying distress.

The effects of evidence of pathology on sex-related biases in pain judgements

In line with former findings (e.g. Chibnall & Tait, 1995, 1999; Chibnall et al., 1997, 2000; Tait & Chibnall, 1994, 1997, 2001), EP showed large main effects on nurses' CLBP judgements. In the absence of EP, the patient's pain was more attributed to psychological causes, perceived as less credible, disabling and his/her clinical situation as less severe. However, and consistently supporting our hypothesis (H2), the effects of EP on psychological attributions and judgements of pain credibility and disability were only significant for female but not male patients. These results suggest that the representations of somatisation, while activated by the absence of EP, are more readily applied to the interpretation of women's pain experiences (e.g. Martin & Lemos, 2002).

Our results also showed that EP moderates the presence of sex-related biases in pain judgements (H1), but not in the expected direction. In fact, if in the absence of EP nurses showed a non-significant tendency to undervalue the woman's pain, it was in the presence of EP that they perceived the female's pain as more credible and disabling than the male's pain.

How can we account for such results? First, our hypothesis (H1) was mainly drawn from studies on judgements of acute chest pain, while our results focused on CLBP. From a purely cognitive perspective, we could argue that the degree to which representations of somatisation are associated with gender representations may depend on the pain condition, namely, its chronicity. In fact, we have found evidence suggesting that pain chronicity changes nurses' representations of men and women (Bernardes & Lima, 2010); in terms of typical masculinity and femininity-related traits, nurses' representations of men and women with CLBP were more similar to each other than their representations of the typical man and woman. Consequently, if in an acute pain scenario the representation of somatisation may be more associated with the typical female than the typical male, in a CLBP scenario it may be equally associated with both female and male representations. This would account for the suppression of sex-related biases in pain judgements in the absence of EP.

As for sex-related biases favouring women in the presence of EP, they may be reflecting a motivational in-group favouring bias (e.g. Fiske, 1998, 2004): female nurses protecting female patients when they present herniated discs. Such biases may also reflect a compensation effort for initial low expectations of the woman's pain that, in the end, turned out to be supported by EP. Finally, we could argue that such biases may be the mere epiphenomenon of the stronger contextual nature of the judgements of the woman's pain.

A final effect of EP on pain judgements should be stressed, despite not being directly related with our hypotheses. Nurses' perceived the clinical situation as less severe in the absence of EP only for the patients who displayed pain behaviours

conveying distress. These results suggest that overt signs of distress additively reinforce the effects of EP on nurses' judgements of the clinical situation.

The effects of distressed pain behaviours on sex-related biases in pain judgements

The effects of distressed pain behaviours on sex-related biases in pain judgements were not as salient or consistent as the effects of EP. This may suggest that for nurses, the overt display of distress may not be as relevant as the EP to judge CLBP scenarios.

Despite the apparent secondary role played by distressed pain behaviours on nurses' CLBP judgements, our results showed that a patient's pain was clearly more attributed to psychological causes when he/she displayed overt signs of distress. This result directly supports the presence of a strong stress-disease rule, where symptoms accompanied by distress are typically attributed to psychological causes (Swartzman & McDermid, 1993), hence, activating representations of somatisation (Martin & Lemos, 2002). It should also be stressed that, if former evidence on judgements of acute chest pain may suggest that such a rule is more often applied to the interpretation of females' pain (e.g. Chiaramonte & Friend, 2006; Martin et al., 1998; Martin & Lemos, 2002), in the present CLBP context, such a rule seems to be equally applied to the interpretation of males' and females' pain experiences. As already argued, the fact that a CLBP scenario suppresses the differences between nurses' representations of males and females (Bernardes & Lima, 2010) may account for this result.

Although pain behaviours conveying distress did not moderate the influence of a patient's sex on psychological attributions, they did moderate nurses' sex-related biases in pain disability judgements. As in the study conducted by Bernstein and Kane (1981) with low-back pain scenarios, it was only in the absence of stress cues that sex-related biases in pain judgements were significant. Also, only the judgements of the male's pain depended on such cues. However, if in Bernstein & Kane's study such biases were against the woman in pain, in our study the biases were against the man. In fact, while in the former study the male's pain was undervalued in the presence of stress cues, in this study it was undervalued in the absence of such cues. Methodological differences pertaining to the sample and operationalisation techniques may account for such inconsistencies. However, in our study, the sex-related biases may be accounted for by previously held gender-role expectations. In fact, a qualitative study recently conducted by the authors (Bernardes et al., 2010) showed that nurses expected a disabling chronic pain condition to be more threatening to men than to women, consequently, leading men to express more distressed pain behaviours under such circumstances. Considering such expectations, the nurses in our study might have easily interpreted the absence of distressed pain behaviours as the absence of severe disability.

Finally, we stress the fact that no significant effects on the nurses' willingness to help the patient were found, which may be accounted for by a ceiling effect on nurses' answers. The fact that biases were found on pain judgements but not on intentions to offer support may have two interpretations. First, nurses' are trained to be equally committed to helping every patient regardless of their subjective impressions of the patient or his/her pain. This being true, we would expect no sex-related biases in pain treatments, which does not seem to be empirically

supported (e.g. McDonald & Bridge, 1991). A second more likely interpretation is that the expression of intentions to offer a patient support may be more influenced by social desirability than pain judgements.

Limitations and future avenues for research

Some methodological limitations of our study should be considered when interpreting the reported findings. First, despite written vignettes being useful tools to explore causal relationships by increasing the internal validity of a design, they raise concerns in terms of its ecological and construct validity. As regards to external validity, vignettes will always be a partial and simplified representation of natural clinical scenarios, making it difficult to predict whether the same pattern of results would be replicated in a natural setting. Despite that, some dimensions of a clinical encounter may be more realistically represented in a vignette than others. For instance, we believe that while pain behaviours are particularly difficult to depict due to their richness and complexity, the EP and the patient's sex are much more easily represented in an ecologically valid manner. The degree to which certain variables accurately represent their respective theoretical constructs is also related to this matter. If there are not many ways of operationalising a patient's sex, there are countless ways of operationalising pain behaviours conveying distress and, to a lesser extent, the presence or absence of EP. Consequently, these later variables, but especially the one related to pain behaviours conveying distress, most likely are underrepresenting their respective underlying constructs. Therefore, if our findings should generally be interpreted with parsimony due to external and construct validity issues, these are especially important when considering the effects of pain behaviours conveying distress.

A second shortcoming pertains to the inability of our study to reveal the conscious and unconscious cognitive and/or motivational processes underlying the self-reported pain judgements. Although we raise several hypotheses on the processes that may account for the contextual nature of sex-related biases in pain judgements, these remain to be directly tested. Therefore, uncovering the cognitive and/or motivational mechanisms underlying such contextuality seems to be an interesting avenue for future research.

Finally, the fact that we have conducted our study with a sample of nurses, and also the ceiling effect found on the willingness to offer support dimension, do not allow us to draw any conclusions regarding pain treatments. It would be interesting to conduct a similar study with doctors in order to explore sex-related biases not only in pain judgements but also in pain treatments.

Despite these limitations, we would like to stress some theoretical and practical contributions of this study. At a theoretical level, this study stressed the need to change paradigms when studying sex-related biases in pain judgements and treatments. Our data clearly support the contextual nature of the phenomenon. Therefore, instead of just trying to answer the question of whether such biases exist or not, researchers should be focusing on identifying the circumstances that enhance/suppress their presence and the processes that account for them.

At a practical level, our findings could be integrated in training programs, like the ones recently developed to facilitate the incorporation of a sex/gender analysis in health practice (e.g. Johnson, Greaves, & Repta, 2009), in order to teach health-care

providers to: (1) be aware of their pain-related gender schemas, (2) learn to recognise their influence on clinical judgements and (3) be aware of the circumstances that enhance or suppress the probability of sex-related biases. We are well aware that provision of information and awareness-based trainings are seldom enough to influence health-care practices and should be complemented by training focused on increasing technicians' motivation to consider gender issues related to health-care and/or conceiving and implementing on a regular basis strategies to counteract the influence of stereotypes on pain judgements and treatments. However, and although gender awareness may not be enough to counteract the influence of gender schemas on pain judgements and treatments, it may well be a first step to prevent the presence of a phenomenon that may contribute to pervasive disparities in health-care access.

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References

- Adams, A., Buckingham, C.D., Lindenmeyer, A., McKinlay, J.B., Link, C., Marceau, L., & Arber, S. (2008). The influence of patient and doctor gender on diagnosing coronary heart disease. *Sociology of Health & Illness*, *30*(1), 1–18.
- Asmundson, G. (2002). Anxiety and related factors in chronic pain. *Pain research Management*, *1*, 7–8.
- Asmundson, G., & Katz, J. (2009). Understanding the co-occurrence of anxiety disorders and chronic pain: State-of-the-art. *Depression and Anxiety*, *26*, 888–901.
- Ayanian, J.Z., & Epstein, A.M. (1991). Differences in the use of procedures between women and men hospitalized for coronary heart disease. *New England Journal of Medicine*, *325*, 221–225.
- Bell, P.D., & Hudson, S. (2001). Equity in the diagnosis of chest pain: Race and gender. *American Journal of Health Behaviour*, *25*, 60–71.
- Bem, S.L. (1981). Gender schema theory: A cognitive account of sex-typing. *Psychological Review*, *88*, 354–364.
- Bergelson, B.A., & Tommaso, C.L. (1995). Gender differences in clinical evaluation and triage in coronary heart disease. *Chest*, *108*, 1510–1513.
- Berkley, K.J., Hoffman, G.E., Holdcroft, A., & Murphy, A.Z. (2002). Pain: Sex/gender differences. In D. Pfaff, A.P. Arnold, A.M. Etgen, S.E. Fahrback, & R.T. Rubin (Eds.), *Hormones, brain and behaviour* (Vol. 5, pp. 409–442). San Diego, CA: Academic Press.
- Berkley, K.J., & Holdcroft, A. (1999). Sex and gender differences in pain. In P.D. Wall & R. Melzack (Eds.), *Textbook of pain* (4th ed., pp. 951–965). London: Churchill Livingstone.
- Bernardes, S.F., Keogh, E., & Lima, M.L. (2008). Bridging the gap between pain and gender research: A selective literature review. *European Journal of Pain*, *12*, 427–440.
- Bernardes, S.F., & Lima, M.L. (2010). Being less of a man or less of a woman: Perceptions of chronic pain patients' gender identities. *European Journal of Pain*, *14*, 194–199.
- Bernardes, S.F., Lima, M.L., & Paulino, P. (2010). Do estoicismo face à dor: Uma teoria enraizada sobre as expectativas de papel de género de leigo/as e enfermeiro/as.

- In M.N. Strey, C. Nogueira, & M.R. Azambuja (Orgs.) (Eds.), *Género e saúde: diálogos Ibero-Brasileiros* (pp. 79–113). Porto Alegre: EDIPUCRS.
- Bernstein, B., & Kane, R. (1981). Physicians' attitudes toward female patients. *Medical Care*, *21*, 600–608.
- Blum, M., Slade, M., Boden, D., Cabin, H., & Caulin-Glaser, T. (2004). Examination of gender bias in the evaluation and treatment of angina pectoris by cardiologists. *The American Journal of Cardiology*, *93*, 765–767.
- Bodenhausen, G., Macrae, C.N., & Sherman, J. (1999). On the dialectics of discrimination: Dual processes in social stereotyping. In S. Chaiken & Y. Trope (Eds.), *Dual-process theories in social psychology* (pp. 271–290). New York: The Guilford Press.
- Chaiken, S., & Trope, Y. (Eds.). (1999). *Dual-process theories in social psychology*. New York: The Guilford Press.
- Chang, A.M., Mumma, B., Sease, K.L., Robey, J.L., Shofer, F.S., & Hollander, J.E. (2007). Gender bias in cardiovascular testing persists after adjustment for presenting characteristics and cardiac risk. *Academic Emergency Medicine*, *14*, 599–605.
- Chiaromonte, G.R., & Friend, R. (2006). Medical students' and residents' gender bias in the diagnosis, treatment, and interpretation of coronary heart disease symptoms. *Health Psychology*, *25*, 255–266.
- Chibnall, J.T., & Tait, R.C. (1995). Observer perceptions of low back pain: Effects of pain report and other contextual factors. *Journal of Applied Social Psychology*, *25*, 418–439.
- Chibnall, J.T., & Tait, R.C. (1999). Social and medical influences on attributions and evaluations of chronic pain. *Psychology & Health*, *14*, 719–729.
- Chibnall, J.T., Tait, R.C., & Merys, S.C. (2000). Disability management of low back injuries by employer-retained physicians: Ratings and costs. *American Journal of Industrial Medicine*, *38*, 529–538.
- Chibnall, J.T., Tait, R.C., & Ross, L.R. (1997). The effects of medical evidence and pain intensity on medical student judgments of chronic pain patients. *Journal of Behavioral Medicine*, *20*, 257–271.
- Cleeland, C.S., Gonin, R., Hatfield, A.K., Edmonson, J.H., Blum, R.H., Stewart, J.A., & Pandya, K.J. (1994). Pain and its treatment in outpatients with metastatic cancer. *The New England Journal of Medicine*, *330*, 592–596.
- Criste, A. (2003). Do nurse anaesthetists demonstrate gender bias in treating pain? A national survey using a standardized pain model. *AANA Journal*, *71*, 206–209.
- Crombie, I.K., Croft, P.R., Linton, S.J., LeResche, L., & Von Korff, M. (Eds.). (1999). *Epidemiology of pain*. Seattle, WA: IASP Press.
- Deaux, K., & LaFrance, M. (1998). Gender. In D. Gilbert, S. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (4th ed., pp. 788–827). New York: McGraw Hill.
- Deaux, K., & Major, B. (1987). Putting gender into context: An interactive model of gender-related behavior. *Psychological Review*, *94*, 369–389.
- Dionne, C. (1999). Low-back pain. In I.K. Crombie (Ed.), *Epidemiology of pain* (pp. 283–297). Seattle, WA: IASP press.
- Fiske, S. (1998). Stereotyping, prejudice and discrimination. In D. Gilbert, S. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (4th ed., pp. 357–411). New York: McGraw Hill.
- Fiske, S. (2004). *Social beings: A core motives approach to social psychology* (pp. 397–457). Hoboken: John Wiley & Sons.
- Gatchel, R.J., Peng, Y.B., Peters, M.L., Fuchs, P.N., & Turk, D.C. (2007). The biopsychosocial approach to chronic pain: Scientific advances and future directions. *Psychological Bulletin*, *133*, 581–624.
- Gillmore, M.R., & Hill, C.T. (1981). Reactions to patients who complaint of pain: Effects of ambiguous diagnosis. *Journal of Applied Social Psychology*, *11*, 14–22.
- Hansen, J. (1997). Chronic pain's challenge to western medicine: Towards understanding those who suffer. *Contexts: Chronic Pain*, *5*, 1–8.

- Hasenbring, M., Marienfeld, G., Kuhlendahl, D., & Soyka, D. (1994). Risk factors of chronicity in lumbar disc patients. A prospective investigation of biologic, psychological and social predictors of therapy outcome. *Spine*, *19*, 2759–2765.
- Healy, B. (1991). The Yentl syndrome. *The New England Journal of Medicine*, *325*, 274–275.
- Hoffman, D., & Tarzian, A. (2001). The girl who cried pain: A bias against women in the treatment of pain. *Journal of Law, Medicine and Ethics*, *29*, 13–27.
- Jensen, M.C., Brant-Zawadzki, M.N., Obuchowski, N., Modic, M.T., Malkasian, D., & Ross, J.S. (1994). Magnetic resonance imaging of the lumbar spine in people without back pain. *New England Journal of Medicine*, *331*, 69–73.
- Johnson, P.A., Goldman, L., Orav, E.J., Zhou, L., Garcia, T., Pearson, S., & Lee, T.H. (1996). Gender differences in the management of acute chest pain: Support for the “Yentl syndrome”. *Journal of General Internal Medicine*, *11*, 209–217.
- Johnson, J., Greaves, L., & Repta, R. (2009). Better science with sex and gender: Facilitating the use of a sex and gender-based analysis in health research. *International Journal for Equity in Health*, *6*, 8–14.
- Kunda, Z., & Spencer, S.J. (2003). When do stereotypes come to mind and when do they color judgment? A goal based theoretical framework for stereotype activation and application. *Psychological Bulletin*, *129*, 522–544.
- LeResche, L. (1999). Gender considerations in the epidemiology of chronic pain. In I.K. Crombie, P.R. Croft, S.J. Linton, L. LeResche, & M. Von Korff (Eds.), *Epidemiology of pain* (pp. 43–52). Seattle, WA: IASP Press.
- LeResche, L. (2000). Epidemiologic perspectives on sex differences in pain. In R.B. Fillingim (Ed.), *Sex, gender and pain* (pp. 233–249). Seattle, WA: IASP Press.
- Loveman, E., & Gale, A. (2000). Factors influencing nurses’ inferences about patient pain. *British Journal of Nursing*, *9*, 334–337.
- Lundquist, L.M., Higgins, N.C., & Prkachin, K.M. (2002). Accurate pain detection is not enough: Contextual and attributional style as biasing factors in patient evaluations and treatment choice. *Journal of Applied Behavioural Research*, *7*, 114–132.
- Macleod, F.K., LaChapelle, D.L., Hadjistavropoulos, T., & Pfeiffer, J.E. (2001). The effect of disability claimants’ coping styles on judgments of pain, disability and compensation: A vignette study. *Rehabilitation Psychology*, *46*, 417–435.
- Martin, R., Gordon, E.E., & Lounsbury, P. (1998). Gender disparities in the attribution of cardiac-related symptoms: Contribution of common sense models of illness. *Health Psychology*, *17*, 346–357.
- Martin, R., & Lemos, K. (2002). From heart attacks to melanoma: Do common sense models of somatisation influence symptom interpretation for female victims? *Health Psychology*, *21*, 25–32.
- Maynard, C., Bershansky, J.R., Griffith, J.L., & Selker, H.P. (1996). Influence of sex on the use of cardiac procedures in patients presenting to the emergency department: A prospective multicenter study. *Circulation*, *94*, II93–II98.
- McCaffery, M., & Ferrell, B. (1992). Does the gender gap affect your pain control. *Nursing*, *22*, 48–51.
- McDonald, D.D., & Bridge, G. (1991). Gender stereotyping and nursing care. *Research in Nursing & Health*, *14*, 373–378.
- Pimenta, C., & Teixeira, M. (1996). Questionário de dor McGill: Proposta de adaptação para a língua portuguesa. *Revista da Escola de Enfermagem da USP*, *30*, 473–483.
- Robinson, M.E., Wise, E.A., Riley III, J.L., & Atchison, J.W. (1998). Sex differences in clinical pain: A multi-sample study. *Journal of Clinical Psychology in Medical Settings*, *5*, 413–423.
- Safdar, B., Choiniere, M., Crandall, C., Ducharme, J., Fosnocht, D.E., Homel, P., . . . , Todd, K.H. (2006). Impact of patient gender on pain management practices in the emergency department: A multi-center study. *Annals of Emergency Medicine*, *48*, s121.

- Schulman, K.A., Berlin, J.A., Harless, W., Kerner, J.F., Sistrunk, S., Gersh, B.J., . . . , Escarce, J.J. (1999). The effect of race and sex on physicians' recommendations for cardiac catheterization. *New England Journal of Medicine*, *340*, 618–626.
- Spence, J.T. (1991). Gender-related traits and gender ideology: Evidence for a multifactorial theory. *Journal of Personality and Social Psychology*, *64*, 624–635.
- Swartzman, L.C., & McDermid, A.J. (1993). The impact of contextual cues on the interpretation of and response to physical symptoms: A vignette approach. *Journal of Behavioral Medicine*, *16*, 183–198.
- Tait, R.C., & Chibnall, J.T. (1994). Observer perceptions of chronic low back pain. *Journal of Applied Social Psychology*, *24*, 415–431.
- Tait, R.C., & Chibnall, J.T. (1997). Physician judgments of chronic pain patients. *Social Science & Medicine*, *24*, 415–431.
- Tait, R.C., & Chibnall, J.T. (2001). Work injury management of refractory low back pain: Relations with ethnicity, legal representation and diagnosis. *Pain*, *91*, 47–56.
- Tait, R.C., Chibnall, J.T., & Kalauokalani, D. (2009). Provider judgments of patients in pain: Seeking symptom certainty. *Pain Medicine*, *10*, 11–34.
- Taylor, A.G., Skelton, J.A., & Butcher, J. (1984). Duration of pain condition as determinants of nurses' assessments of patients in pain. *Nursing Research*, *33*, 4–8.
- Turk, D.C., & Okifuji, A. (1999). Does sex make a difference in the prescription of treatments and the adaptation to chronic pain by cancer and non-cancer patients? *Pain*, *82*, 139–148.
- Unruh, A. (1996). Gender variations in clinical pain experience. *Pain*, *65*, 123–167.
- Van Lennep, J.E., Zwinderman, A.H., van Lennep, H.W., Westerveld, H.E., Plokker, H.W., Voors, A.A., . . . , van der Wall, E.E. (1999). Gender differences in diagnosis and treatment of coronary artery disease from 1981 to 1997. *European Heart Journal*, *21*, 911–918.