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Bridging the Gap between Pain and Gender Research: A Selective Literature Review

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Abstract

Evidence suggests that males and females differ with respect to the perception and experience of pain. Much of this work focuses on biological factors, yet it is also acknowledged that psychosocial issues are important. Within humans, socially and culturally constructed meanings of being and acting as a man or a woman should help us understand sex-related differences in pain. However, such an approach has not been widely adopted, partly because of problems conveying sex and gender concepts. We argue here for an assimilation of gender studies concepts into pain research as a means of developing our understanding of the psychosocial influences on pain in men and women. In order to bridge the gap between gender studies and pain, we draw on theoretical developments in such gender concepts, and illustrate their application to pain. We make use of Doise's (1982/1986) meta-theoretical model of levels of explanation in social psychology to show how gender may be conceptualized at an intra-individual, situational, positional and ideological level of analysis. We then selectively review existing gender and pain research using these different levels of explanation. In doing so we also highlight that by considering the gender conceptualizations underpinning such studies we are able to point to directions for future research. We conclude by arguing that this approach opens up a new avenue for pain researchers, which we hope will further our understanding of this interesting phenomena.

Key-words: Sex, Gender, Pain, Levels of explanation.

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Bridging the Gap between Pain and Gender Research: A Selective Literature Review

1. Introduction

Experimental, clinical and epidemiological studies have shown that women experience, or at least report experiencing, more pain than men (e.g., Berkeley et al., 2002; Holdcroft and Berkley, 2005; Le Resche, 2000). While such evidence continues to grow, a question still remains: How can we account for such sex-related differences in pain? Some have looked for an answer in biological factors e.g., body physiology, sex steroid hormones, whereas others focus on more psychological factors such as emotions, catastrophizing, perceived control or coping patterns, to help account for sex-related differences in pain (Berkeley et al., 2002; Robinson et al., 2000). More recently, interpersonal transactions have also been shown to impact on men and women's pain experiences (e.g., Jackson et al., 2005). Together this suggests that a biopsychosocial approach may be useful when considering sex-related differences in pain (Fillingim, 2000; Keogh, 2006).

2. Sex vs. Gender

One of the main contributions a social psychological approach could provide to the area of sex and gender in pain is to acknowledge the social and cultural roots of being a man or a woman. However, not only is the focus of much research placed on sex instead of gender, but ironically the distinction between the two has produced confusion, as the terms are often used interchangeably across the pain literature. Such conceptual and semantic blurring is not new, nor an idiosyncrasy of pain literature, as the distinction between sex and gender emerged, but not without controversy, within other domains such as sociology and social psychology (Oakley, 1972; Unger, 1979).

The early seventies saw gender emerging as a distinct concept apart from sex. Since

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then, within gender studies, sex has generally been seen as a biological marker, used to categorize human beings into males and females based on physical characteristics such as chromosomes, hormones, external genitalia and secondary characteristics (Deaux, 1985; Unger and Crawford, 1993). Such conceptualization of the term 'sex' has, in part, been proposed to avoid one of the major problems arising from research on sex-related differences, which is the use of the term sex as an explanatory variable rather than a descriptive one (Unger, 1979).

The assumption often made when using the term 'sex' is one of underlying biological causality, rather than broadly incorporating both biological and psychosocial factors. Indeed, even the assignment of a sex category can involve social processes (West and Zimmerman, 1987). For example, a human being is placed on a sex category – man or woman - based on socially agreed upon biological criteria e.g., genitalia at birth, chromosomal typing. However, such biological characteristics are often inferred by social characteristics, like how people dress or present themselves. The sex category a person is placed in does not necessarily correspond to their biological sex (e.g., transsexuals), and for some, chromosomes, hormones, internal sex structures, external genitalia and secondary characteristics do not match, as in the case of the so-called intersexes e.g., hermaphrodites. Thus, even at a biological level there is no absolute dimorphism (Fausto-Sterling, 1993). Also, the usage of 'sex' as a catch-all term to refer to complex interactions between biological, psychological and social factors is far from being heuristic. Indeed, it is difficult at times to acknowledge the specific role of these different biopsychosocial factors when accounting for sex-related differences. Such concerns have, in part, led some to argue that the term 'sex' should only be used as a marker instead of a causal statement (Deaux, 1993). Applying this view to pain means that although it is descriptively useful to refer to sex-related differences, this term falls short from giving an answer to how and why such differences exist.

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In light of problems associated with the concept of sex, the notion of gender emerged, to account for the socially and culturally constructed meanings of being and acting as a man or a woman, in a certain society, within a certain time frame (e.g., Deaux, 1985, 1993; Unger and Crawford, 1993; West and Zimmerman, 1987). Thus, gender refers to mental, social or cultural representations about sex categories, which can account for the social and relational nature of sex-related differences. However, the notion of gender is not without its complexities. For example, the gender concept has been approached in very different ways over the last 30 years (Korabik, 1999). Indeed, gender representations are often described in terms such as masculinity and femininity. However, such terms have been viewed as stable personality traits, as context-specific behaviours, as synonym of social status, or as shared socio-cultural processes ordering human practices, discourses and social structures. In another words, gender has been viewed as what people are, what people do, social status or an institutionalized ideology. This can be confusing for those working outside the immediate area and what is required is for researchers to be more explicit about the position they are adopting, in order to facilitate understanding, and thus improve the explanatory power of a psychosocial approach to sex-related differences in pain.

The goal of the current paper is to focus on conceptualizations of gender, provide a framework from which to consider gender and pain, and in doing so consider how psychosocial factors may specifically contribute to differences between men and women in pain. Although we are almost exclusively focusing on psychosocial factors here, we do acknowledge that biological factors are important. Indeed, we agree with Holdcroft and Berkley (2005) when they point out that biological, psychological and social factors interact, and are likely to do so in different ways, depending on the stage of life one considers. We share the view that explanations for differences in pain experiences between men and women are likely to be best conceived using a biopsychosocial model. Such an approach is still in its

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infancy, however, and we still have not yet identified all the various mechanisms that may be involved within each domain. This is particularly the case for psychosocial influences, which is relatively underdeveloped, and to date has not been considered in as much detail. We hope that by providing a gender framework, the psychosocial factors that may be important in sex-related differences in pain will emerge, and so we will be in a better position to start considering potential interactions between biological, psychological and social factors.

3. Overview of the current review

Although the concept of gender has grown immensely, it has not crossed over from gender-studies to other areas of research, including pain. We will argue here that those interested in understanding sex-related differences in pain may gain from assimilating a deeper knowledge of the social construction of gender. One of our aims will, therefore, be to bridge the gap between pain research and gender-studies, by addressing the problem of a lack of integration between different theoretical explanations of gender and pain. We will draw on the work of Doise (1982/1986), who proposed that one way of unifying different conceptual approaches (in social psychology) was to consider different levels of theoretical explanation. This approach has been usefully applied to health psychology (Murray, 2000), although to date it has yet to emerge within the area of gender and pain. We will, therefore, selectively review research on gender and pain, but do so using the different levels of analysis proposed by Doise (1982/1986). We believe that by adopting such a structure, we can also illustrate some of the different psychosocial factors that may be important when considering sex-related differences in pain.

We shall start by outlining Doise's (1982/1986) meta-theoretical framework of explanation, which proposes four levels of analysis. These levels are:

1. Intra-personal: this level is exclusively concerned with how individuals process and

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structure their emotions, perceptions and appraisals of the social world as well as their behaviours within the environment, regardless of individual-environment interactions.

2. Situational: this level is concerned with inter-personal or intra-group interaction processes. There is a focus on the dynamics of relations established between different individuals as they occur in a given context. Individuals' social positions outside this context are not considered and so, individuals are perceived as interchangeable.
3. Positional: this level is concerned with the role played by social status on the relations that individuals establish in certain contexts or situations. It considers differences in the position individuals occupy in the larger social structure (e.g., being a member of a minority group), which exist prior to inter-individual or intra-group interactions.
4. Ideological: this level focuses on society's ideologies, that is, culturally shared systems of beliefs, norms, values and representations that exist in order to validate and perpetuate an established social order.

We will use Doise's (1982/1986) framework to show how gender may be conceptualized at different levels of explanation, as well as show how it has been conceptualized within the pain literature. This review will be divided into four sections, one for each level of analysis. Within each, we will briefly present examples of gender theories, and then draw from existing research to exemplify how such theories can be applied to pain. Table 1 shows a graphic representation of the gender concept for each level of analysis, along with brief definitions and examples of some findings on gender and pain relations.

Using Medline, Psychinfo and Proquest Social Sciences Plus databases we have searched for articles published between 1980 and June 2007 that contained the keywords gender, masculinity, femininity and pain in the title or abstract. Papers using the word gender as synonym of sex were not considered, except when a person's sex was used as a stimulus variable influencing pain judgements or as synonym of social status. Subsequently, main

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thematic lines of research were identified for each level of analysis. Considering space constraints, when a large amount of studies within the same line of research were found only illustrative examples were provided. In such cases, studies showing more robust methodologies were selected e.g., longitudinal vs. cross sectional, experimental vs. correlational. As will become apparent, most research is situated within the intra-personal and ideological levels of explanation, with level three studies almost non-existent. Finally, we will draw some conclusions on the research conducted to date, and point to future directions.

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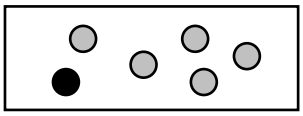
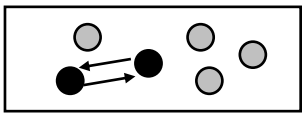
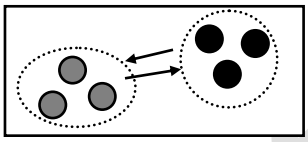
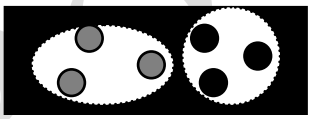
Table 1 – The gender concept at different levels of analysis: iconic representations, definitions and examples of findings in gender and pain research.

Level of Analysis	Iconic Representation	Gender Definition	Examples
Intra-individual		"*Gender as what people are*"; an intrinsic and relatively stable characteristic of an individual.	More feminine individuals (those who endorse more expressiveness-related personality traits) show lower pain tolerance.
Situational		"*Gender as what people do*"; an act or display dependent on contextual factors	Displaying pain in a more masculine or feminine way influences how other people judge women's pain.
Positional		"*Gender as synonym of social status*"; sex-groups as occupying asymmetrical social positions in a certain society's hierarchy of prestige and status.	Women and black people seem more comfortable reporting their pain to other disadvantaged group members as compared to members of higher status groups (e.g., men or white people).
Ideological		"*Gender as an ideology*"; largely shared sets of beliefs, norms, values and representations of the meanings of being a man or a woman, which are imbued on pervasive patterns of social practices and discourses, and maintain a social order.	The dominant representation of masculinity is reflected on peoples' practices and discourses on pain e.g., overt pain expressions are devalued but more accepted in women than in men, especially by other men.

Note: small circles = individuals; big circles = sex groups; arrows = interpersonal or inter-group relations

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4. Intra-individual level of analysis

4. 1 Gender theories and concepts

Bem's (1974, 1975) Theory of Psychological Androgyny is a good example of how gender may be conceptualised within an intra-individual perspective. This theory introduced the notion of androgyny, by suggesting that an androgynous individual has both masculine and feminine personality traits, and acts on them according to the circumstances, adjusting him/herself to context requirements. This view brought profound changes in prevailing gender conceptualizations, in that it challenged the view that masculinity and femininity were opposite poles of a single dimension. It also questioned some views that men had to be masculine and women feminine in order to be perceived as healthy and functional individuals.

The Bem Sex Role Inventory (BSRI; Bem, 1974) was devised to operationalise sex-typing by measuring masculinity and femininity as two orthogonal dimensions, providing two sets of gender-linked and socially desirable personality traits. Instrumentality traits, or so-called masculinity, comprised of a tendency to focus on the self and an orientation towards active performances like problem solving and getting tasks done (e.g., independent, active, competitive, assertive, dominant, self-reliant). Expressiveness traits, or so-called femininity, comprised of a selflessness tendency to focus on others needs, a desire to establish emotionally-significant connections with others (e.g., gentle, affectionate, compassionate, helpful, tender, kind). Four types of people could be distinguished (Bem, 1977): 1. Masculine (high instrumentality, low expressiveness); 2. Feminine (High expressiveness, low instrumentality); 3. Androgynous (high instrumentality, high expressiveness); and 4. Undifferentiated (low instrumentality, low expressiveness). In sum, masculinity and femininity were predominantly conceptualised as two independent personality orientations

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that could co-occur within the same individual regardless of his/her sex.

Androgyny was re-conceptualised when Bem (1981) developed her Gender Schema Theory, which argued that individuals learned how to evoke a net of gender-linked cognitive associations in order to interpret events. Such gender schemas often determined how information was interpreted, coded, stored and accessed, and individual differences could be found in gender-schematic processing. The so-called sex-typed individuals, who strongly identified with cultural definitions of masculinity and femininity, would have a greater readiness to engage in gender schematic processing than non sex-typed individuals e.g., the androgynous. Therefore, masculinity and femininity were conceptualised as personality orientations linked to gender-schematic processing of information. More recently, gender schemas are seen as multidimensional, with some arguing that masculinity and femininity are more complex than the instrumentality and expressiveness personality orientations, in that they should include attitudes, preferences and orientations (Signorella, 1999; Spence and Helmreich, 1980).

What unites the theories of androgyny and gender schemas is that both approach gender from an intra-individual level of analysis, i.e., gender is perceived as an inner and stable characteristic of an individual (Table 1). Next we will show how this level of analysis has been applied to research into gender and pain.

4. 2 Research into gender and pain

When reviewing the existing research into gender and pain, there are mainly two general types of empirical investigation that can be found at the intra-individual level. One set looks for a relationship between general gender-related personality orientations and pain, whereas the other focuses on more specific pain-related components of gender schemas, like gender-role expectations of pain. Both will be considered below.

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4.2.1 The influence of gender-related personality traits on pain experiences

Many of the studies that examine gender from a personality perspective use self-report measures such as the BSRI or the Personal Attributes Questionnaire (PAQ; Spence et al., 1974). The goal is to look for relationships between gender-related personality types, such as instrumentality and expressiveness (or agency and communion as measured by the PAQ), and experimental or clinical pain. Experimental studies have examined whether gender-related personality types account for sex-related differences in induced pain (e.g., Otto and Dougher, 1985; Myers et al., 2001, 2006; Sanford et al., 2002). Such studies reveal that participants' who reported more masculine than feminine traits have higher pain tolerance (Otto and Dougher, 1985; Myers et al., 2001, 2006). When examined separately, only femininity-related traits are negatively associated with pain tolerance, accounting for the sex-pain relation (Sanford et al., 2002; Thorn et al., 2004). Sex by gender interactions on pain thresholds have also been found (Otto and Dougher, 1985), with men who reported being more masculine than feminine exhibiting higher pain thresholds than men who reported being more feminine than masculine. No such effect was found within women. No support was found for a mediating role of gender-related personality traits on the sex-pain threshold relationship.

These findings could be taken to suggest that gender personality traits have a larger influence on pain tolerance, whereas such traits have a sex-specific effect on pain thresholds. On the other hand, pain tolerance may be in part accounted for learned dispositions like instrumentality or expressiveness, while pain thresholds may be less influenced by such social factors as compared to biological ones.

Gender-related personality traits have also been examined in clinical pain, although results are not as consistent. For example, masculinity has been found to predict less physical disability, pain, distress and greater life satisfaction in patients with rheumatoid arthritis

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(Trudeau et al., 2003). However, others have found inconsistent results, with masculinity predicting more severe pain (Helgeson, 1991; Trudeau et al., 2003) or showing no relationship (Ku et al., 2002). Differences in outcome measures and patient groups may partially account for such inconsistencies.

Interestingly, studies into the role of femininity traits in clinical pain are more consistent. The general pattern is that feminine traits are associated with greater pain (e.g., Fillingim et al., 1999). Also, a prospective study by Applegate et al. (2005) found that higher femininity scores taken at college entry predicted a higher number of chronic pain conditions 30 years later in men, but not women. In a separate study, more negative femininity traits (e.g., spineless, servile, gullible, subordinate) were found to predict higher distress, lower life satisfaction and greater disability in chronic pain patients (Trudeau et al., 2003). These studies suggest a clearer relationship between femininity and clinical pain.

4.2.2 The influence of gender role expectations of pain on pain experiences

The second approach to the intra-individual level of analysis focuses on specific pain-related gender-schemas. Gender-role expectations have mostly been explored using the Gender-Role Expectations of Pain questionnaire (GREP; Robinson et al., 2001), which explores sex-related stereotypic expectations of pain sensitivity, tolerance and willingness to report pain. Personal gender role expectations (self compared to the typical man and woman) and stereotypical gender role expectations (typical man compared to typical women and vice-versa) are measured.

For personal gender role expectations of pain, Robinson et al. (2001) found that young adult women perceived themselves as more willing to report pain than the typical man and woman, although they also perceived themselves as equally sensitive and tolerant to pain. Young men, however, were found to perceive themselves as more tolerant to pain than the

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typical man and woman. Subsequently, both men and women perceived themselves as feeling less intense pain associated with common pain events than the typical woman. However, when compared to the typical man, women rated their pain intensity as higher and men as the same (Robinson et al., 2004a). Personal gender-role expectations of pain have also been shown to influence peoples' own pain experiences (e.g., Wise et al., 2002; Robinson et al., 2004b). For example, Wise et al. (2002) found that those who perceived themselves as more willing to report pain than the typical man had lower pain thresholds, lower pain tolerance and reported more pain unpleasantness to a thermal pain stimulus.

For stereotypical gender role expectations, similar, but not identical, patterns are found, in that the typical man is perceived to be less willing to report pain than the typical woman (McCaffery and Ferrell, 1992; Robinson et al., 2001). Whereas McCaffery and Ferrell (1992) found nurses believed that women tolerate more pain, are less sensitive to pain and feel less distress when in pain than men, Robinson et al. (2001) reported that males believed that the typical man is more tolerant to pain than the typical woman. Such inconsistencies may be due to methodological and sample differences between the studies, however. Gender stereotypes to common painful events suggest that injury is the worst pain sensation imaginable for the typical man, whereas it is childbirth and menstrual pain for the typical woman (e.g., Robinson et al., 2004a). Finally, stereotypical gender role expectations also seem to impact on how pain and pain-related emotions are perceived in others. Robinson and Wise (2003) found that female participants rated observed pain intensity (to an experimental pain) in others as higher than male participants. Moreover, gender stereotypic expectations of pain tolerance (the typical man as compared to the typical woman) predicted observed pain intensity scores, totally accounting for such sex-related differences.

Generally speaking, stereotypic gender role expectations, as measured by the GREP, can be seen as descriptive norms of behaviour (e.g., Cialdini and Goldstein, 2004), i.e., shared

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social expectations on what a member of a sex group does (when in pain). However, there are also injunctive norms (Cialdini and Goldstein, 2004), which are shared expectations on what an ideal member of a sex group should do. Pool et al. (2007) have recently examined such injunctive norms within the context of pain. They found that young men and women believed that the ideal man should tolerate more pain than the ideal woman. However, such gender norms only predicted pain tolerance in the extent to which participants' identified with their sex group, i.e., valued being similar to the ideal man/woman, respectively. Hence, sex-related differences in pain tolerance were only found among participants' who reported a high identification with their respective sex group.

4. 3 Summary

Numerous studies look at the influence of gender on pain experiences from an intra-individual level of analysis. Gender is mostly conceptualised as either a general personality orientation (e.g., instrumentality vs. expressiveness) or as more pain-specific schemas (mostly gender-role expectations or descriptive gender norms). The advantages of examining gender role expectations of pain are that beliefs are specific to pain, which may be more suitable when trying to understand pain behaviours, as well as allowing a more multidimensional approach (e.g., self vs. others). However, the Pool et al. (2007) study suggests that gender injunctive norms may have more of an effect amongst individuals' who have a strong identification with social images of men or women. This finding clearly brings social identity issues into the realm of pain, along with numerous and unexplored directions for research. The impact of gender-related beliefs and norms could be explored in other pain-related behaviours, such as coping strategies, as well as within clinical settings.

5. Situational Level of Analysis

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5. 1 Gender Theories and Concepts

The role of context is the subject of the second level of explanation, and an example of how gender can be conceptualised within this perspective is Deaux and Major's (1987) gender-in-context model, which focuses on the situational nature of gender displays. Inter-personal interactions are thought to be dynamic processes whereby (gender) identities are negotiated, and to some extent dependent on context. Such negotiation process can be characterised by a conflict between the need for internal stability/consistency and the need to maintain a positive self-image through self-presentation. Individuals may vary their gender displays, depending on the situation, in order to reduce potential instability.

This approach contrasts with the theories outlined in the previous section, which assume a stability of behaviour patterns, and tend not to consider the dynamic nature of inter-personal interactions. For example, Deaux and Major's (1987) model takes account of the *perceiver* as well as the *target,* both of whom enter an interaction with a set of gender-related beliefs (e.g., stereotypes, identities, expectations, attitudes). Moreover, the *situation* is also considered in that it may vary in how salient gender issues are. There is an assumption that gender schemas will only be drawn on when activated by factors related to the perceiver (e.g., if the person is gender-schematic), to the target (e.g., physical characteristics, non-verbal mannerisms) or to the situation (e.g., being a single woman among men, involved in tasks with strong gender connotations). It is also assumed that a perceiver's actions may in themselves influence a target's gender display, and vice-versa, highlighting the complex nature of the interaction.

Thus, the second level of explanation views gender as more an act or display that is highly dependent on contextual factors than a stable and enduring characteristic (Table 1). We now highlight research that has examined gender-related pain behaviours from this perspective.

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5. 2 Research into gender and pain

5.2.1 The role of the sex of the target on medical judgements

Research on gender and pain at a situational level of analysis has focused on contextual and interpersonal interactions. For example, when investigating sex-related biases on medical judgements and decisions, women have been found to receive less adequate dosages of pain medications, have lower probability of being admitted in intensive care units or being submitted to more diagnostic procedures (e.g., Breitbart et al., 1996; Calderone, 1990; Cleeland et al., 1994; Hamberg et al., 2002; Hoffman and Tarzian, 2001; Johnson et al., 1996; McDonald and Bridge 1991). However, some studies fail to find patient's sex effects on such judgements (e.g., Criste, 2003; Turk and Okifuji, 1999).

Reasons why there are sex-related differences in treatment received are numerous. One relevant to the interpersonal level of analysis is that such sex-related differences may in part be due to biases in how an observer perceives painful conditions. Experimental studies on healthy participants have presented video images of males and females in pain and asked observers to comment on the display (Robinson and Wise, 2003, 2004). Observers tend to rate males as having lower pain intensity than females and to show a greater underestimation of male's pain (Robinson and Wise, 2003, 2004). However, this is incongruent with the results reported above, in that it is unclear why underestimation of male pain would lead to women receiving *less* treatment than men.

More clinically orientated studies have examined sex-related biases in treatment. For example, Marquié et al. (2003) found that male physician's gave male patients lower pain ratings than females. For female physicians, however, such differences in pain intensity ratings where dependent on whether the pain had an obvious cause or not. In situations where there was an obvious cause (e.g., fracture), female physicians did not rate male or female

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patients differently, whereas when the cause of pain was not so obvious (e.g., low back pain) female physicians rated male patients' pain as higher than female's pain. These results suggest that the sex of both the observer and the person in pain may be important in how pain is rated.

5.2.2. The role of the sex of the target on pain experiences

The experimenter's sex may also affect induced pain responses (Aslaksen et al., 2007; Levine and De Simone, 1991; Kállai et al., 2004). For example, Kállai et al., (2004) found that males exhibited greater cold pressor tolerance when tested by a female experimenter, whereas females were more tolerant when the experimenter was male. Such effect is more likely to be found for subjective pain ratings, than on physiological measures of arousal, indicating that experimenter's effects occur at a psychosocial level (Aslaksen et al., 2007). Although such experimenter effects are not always found (e.g., Otto and Dougher, 1985; Fillingim et al., 1999), such variability may be accounted for the fact that a target's sex *per se* might not be a sufficient condition to activate gender schemas (Deaux and Major, 1987). The absence of sex bias might be due to the fact that participant's were not engaged in a sex-typed information processing given that other types of information were more salient. Indeed, when the experimenter's sex category has been selected on the basis of attractiveness or dressing in a way that would accentuate stereotypic gender-congruent characteristics, more consistent results were found (Levine and De Simone, 1991; Gijsbers and Nicholson, 2005).

5.2.3. The role of other target-related characteristics on pain judgements

Apart from the target's sex, not many studies have looked for the effect on pain experiences and judgements of other target-related characteristics that might activate gender-schemas. Birdwell et al. (1993) found that a female actress portraying cardiac symptoms (e.g.,

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chest pain) in a "business-like" manner was more likely to be diagnosed a cardiac disorder and to get cardiac workup than when portraying the same symptoms in a "histrionically" manner. Similarly, Chiaramonte and Friend (2006) found that when presented with symptoms of cardiovascular disease along with anxiety, large sex bias was found in medical students' diagnosis. Women were less likely to be referred to a cardiologist, given fewer CHD diagnoses and less likely to get an organic interpretation for their reported chest pain and other symptoms. Such sex bias was not apparent when symptoms were presented without stress-related emotions. Hence, women's pain experiences, more than men's, may be interpreted differently according to their presentation style.

5.2.4. The role of situational characteristics on pain experiences

The characteristics of the context where an interaction takes place have also been shown to influence pain experiences. Robinson et al. (2003) found that manipulating gender-role expectations for pain tolerance subsequently influences pain responses. When no expectations about pain tolerance were given, the usual sex-related differences emerged; men reported lower pain than women. These sex-related differences were not found when gender-role expectations were manipulated, in that females tended to adhere to the set standard instructions increasing their tolerance times and decreasing their pain intensity reports. Another contextual factor that may be important in terms of triggering gender-related schemas is prior experience. Robinson and Wise (2004) have found that a previous pain experience may affect the way people attribute gender-related traits to other people submitted to the same type of pain. Male participants where perceived as more feminine by all observers and female participants as more masculine, but only by male observers.

5. 3 Summary

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Most research conducted at the situational level of analysis has examined the role of a target's sex on pain experiences and judgements. We argue that there are potentially many other target-related and situational characteristics that may contribute towards pain experiences, which could be considered in future research. Given that pain experiences occur within social contexts (e.g., medical appointments, family interactions), it would be interesting to expand experimental paradigms to natural settings as well. There is considerable potential to examine sex-related differences in pain using a situational level of analysis, and in doing so enhance our understanding of important contextual and interpersonal factors.

6. Positional Level of Analysis

6. 1 Gender Theories and Concepts

The third level of analysis is the positional, which focuses on the impact social status has on individuals and their relationships. This level considers the social position individuals find themselves in i.e., the social categories to which they belong, that may be more or less dominant in society. There is an assumption that social position or status may moderate several intra-personal (e.g., identity or pain experience) or inter-personal processes (e.g., communication or pain behaviours). Thus, gender issues considered at this level focus on the asymmetrical value that is placed on sexual groups by society, which in turn forms the basis for gender inequality (e.g., Berger et al., 1980; Lorenzi-Cioldi, 1988, 2002; Kirchler, 1997).

An example of gender viewed from a positional level can be seen in work by Lorenzi-Cioldi's (1988) on social identity. This author highlighted that the relative position a person and his/her group of belonging occupies on the social structure can shape peoples social identities. Lorenzi-Cioldi's (1988) proposed a distinction between two types of social groups based on whether they allowed their members to evoke their own unique and idiosyncratic characteristics. Aggregate groups have a lower position in a hierarchy of social status and

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prestige, and are generally perceived (and perceive themselves) as more homogeneous, sharing a set of collective characteristics. Its members often resort to collective characteristics to define themselves, presenting a collective social identity. They are less likely to perceive themselves in an individual, autonomous manner being more dependent on contextual cues. The dominant or collection groups are defined as having higher social status and prestige, and would be perceived (and perceive themselves) as heterogeneous e.g., specific and autonomous individuals, defined by idiosyncratic characteristics despite their group memberships, i.e., personal social identity.

Applying this distinction to gender, Lorenzi-Cioldi (1988) presented evidence that women respond as members of aggregates and men as members of collections. For example, to describe themselves, women resorted to gender-schematic characteristics often used to establish a frontier between sex groups (e.g., being a woman), particularly when the context enhanced sex group membership. Men tended to focus on idiosyncratic characteristics that allow them to differentiate themselves from other members of their own group (e.g., Lorenzi-Cioldi, 1988, 1991). Consequently, women tend to describe themselves as either equally or more homogeneous than men, while men perceive themselves as less homogeneous than women (e.g., Lorenzi-Cioldi, 1993).

Lorenzi-Cioldi (1988; 1991) suggests that sex-related differences in social identities are to some extent determined by how society positions men and women, as broad social groups, in terms of social status and value. Although he focused on sexual social categories, predictions could be the same for any other types of asymmetrical social categories like race, class, and so on (Lorenzi-Cioldi, 1988). Therefore, taking a positional approach on gender is to interpret sex-related differences as synonym of social status differences, and consequently, to expect the same pattern of differences between members of other social groups with asymmetrical positions in societies' hierarchy of social value (Table 1).

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6. 2 Research into gender and pain

To our knowledge no authors have explicitly looked for a homology between the effects of sex and other asymmetrical social categories, like race, on pain experiences and judgements, and few have explicitly interpreted their findings within a positional level. One example is a study by Weisse et al. (2005), who examined sex and race effects on experimentally-induced pain. Race effects were only evident when the experimenter was female, while no race effects were found when the experimenter was male. Similarly, sex effects on pain unpleasantness were only evident when the experimenter was black, while no sex effects were found when the experimenter was white. The authors suggested that this could be interpreted as showing that experimenter's sex and race only influenced pain reports of members of disadvantaged or historically oppressed groups; women seemed to be more comfortable reporting higher levels of pain discomfort to black experimenters and black participants reported more pain discomfort to female experimenters. Therefore, Weisse et al. (2005) have put forth a positional interpretation of the isomorphism of results by suggesting that the two variables, sex and race, can to some extent be seen as reflecting social status asymmetries.

From Lorenzi-Cioldi's (1988) model it could also be argued that pain experiences of lower status group members may be more highly determined by contextual factors when compared to dominant group members. Some of the findings reported in the situational level of analysis might be reinterpreted from within a positional approach. For example, when gender-role expectations of pain were manipulated by experimental instructions, only female participants' responses were affected by such contextual variations (Robinson et al., 2003). Similarly, the presence or absence of stress-related symptoms only affected the way medical students' and residents' perceived a woman's (but not a man's) reported symptoms of

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cardiovascular disease (Chiaramonte and Friend, 2006). Thus, in pain research contextual factors seem particularly important for women. Again, this later evidence may be read as a particular application of a more general effect of context dependency of aggregate group members' behavioural patterns (Lorenzi-Cioldi, 1988).

6. 3 Summary

Whilst social status may be an important factor in determining pain experiences and judgements, there is little research that has examined this within the context of sex-related differences in pain. Further research is clearly required, testing explicitly the hypothesis derived from a social positioning approach to sex-related differences in pain. For example, researchers could explicitly test common patterns in the pain experiences of members of disadvantaged social groups. It would also be interesting to check if an experimental manipulation of status would have similar effects on pain experiences and judgements as the usual sex-related effects reported in the literature. If the pain behaviours of members of lower status groups are more dependent on contextual cues important practical implications may be drawn. All that can be concluded is that it may be theoretically useful to consider the positional level of explanation in future research.

7. Ideological Level of Analysis

7. 1 Gender Theories and Concepts

Gender theories at an ideological level of analysis try to understand how dominant and pervasive ideologies account for its social hierarchies of power, dominance and status (Table 1). There is a focus on the dominance of men over women, its social function and on the largely shared values and beliefs that maintain it (e.g., Acker, 1992; Amâncio, 1997; Connell, 1987, 1995, 2002; West and Zimmerman, 1987). Thus at this level of analysis, power and

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status asymmetries stressed in the last level are interpreted in a broader way as a functional and/or structural feature of a given society.

An example of an ideological perspective is Connell's (1987, 2002) social theory of gender, who defines it as a pervasive pattern of social practices and relations (i.e., social structure) focused on the bodies of men and women, and their reproductive differences. Such patterns constrain people's acts and discourses, and often translate reproductive differences into social relations differences (e.g., sexual division of labour). Patriarchy is seen as the result of prevailing and enduring *gender regimes* that constrain social relations. For example, it has been argued that power, production and emotional relations are institutionalized by the state, the labour market / workplaces and the family, respectively (Connell, 1987). Additionally, discourses are viewed as reinforcers of patriarchy, and hence symbolic relations are perpetuated by language (e.g., Connell, 2002). For example, Amâncio (1997) has shown that the widely consensual social constructions of the ideal adult person overlap the social representation of the ideal man, while women are seen as a particular case of sexed human beings.

These gender regimes reinforce what has been termed Hegemonic Masculinity, which is seen as a specific set of social practices (acts, discourses) where heterosexuality, strength, endurance, stoicism, rationality, competence, expertise and control are the main pieces (Connell, 1995, 2002). It is a cultural ideal constantly promoted by societies through the production of activities or symbols exemplifying such specific, dominant, type of masculinity (e.g., media images of football players or highly successful business men). Such institutionalized masculinity ideology is seen as a pattern against which all men and women's behaviours are evaluated, hence, maintaining dominance relations not only between men and women but also within men.

In the next section, we will give some examples of how the institutionalization of

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dominant masculinity ideologies is reflected and/or reinforces the widely shared values and beliefs on pain behaviours and expressions. Moreover, we will also present evidence showing how such beliefs, running through medical institutions and practices, may account for differences in the phenomenological experiences of men and women with chronic pain.

7. 2 Research into gender and pain

7.2.1 Societal views on gendered pain behaviours and expressions

An ideological approach to gender and pain focused on widely shared beliefs and values about gender and pain expressions. Doise (1982/1986) notes that cross-cultural studies can work at the ideological level given that they are exploring widely shared beliefs that may or may not differ from one culture to another. A few cross-cultural studies based on self-report measures of gendered beliefs on appropriate pain behaviours show that Indian, Japanese and Euro-American students share the belief that overt pain expressions are more appropriate in women than men (Nayak et al., 2000; Hobara, 2005). These studies suggest that within patriarchal cultures males are less accepting of other men's pain behaviours than females. Using Connell's terms, the incompatibility between being hegemonically masculine and being emotionally expressive in pain seems to be widely shared by people in different cultures, and in particular by men. These results are also consistent with the studies into gender-role expectations and the willingness to express pain (McCaffery and Ferrell, 1992; Robinson et al., 2001), in that the suppression of emotions when in pain and the neglect of pain warning signs for injury may be synonymous with maleness. For example, qualitative analyses of athletes' discourses on pain and injuries have shown that ignoring pain and pursuing sports activities at the risk of being permanently physically disabled is the ultimate proof of masculinity (White et al., 1995; Howe, 2001).

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Ideological approaches to gender and pain can also be examined through discourses on pain expression. Analysing in-depth interviews with men and women about pain, Bendelow (2000) shows how discourses reflect a split between emotional and sensory pain components, with emotional pain often being perceived as less legitimate than physical pain. Moreover, not only were men's discourses on pain less holistic and more critical of emotional pain than women's discourses, but laypeople tended to perceive pain as a natural condition in women but not in men. In fact, Bendelow (2000) found that the representation of women was intrinsically associated with hormonal and reproductive functions and hence, pain was naturalized in women's bodies. A recent phenomenological analysis of forty women's narratives about their chronic pelvic pain has also stressed the "normalization" of pain in women's bodies, through the use of narratives focused on hormones and an image of a female "unruly" and unbalanced body system (Grace and McBride-Stewart, 2007). These results may be interpreted as evidence of what Amâncio (1997) has termed symbolic asymmetry; women are perceived as belonging to a "natural and sexed world" where the bodily functions are central as compared to a higher status male world of thought and rationality where pain, and especially emotional pain, do not belong. Moreover, according to Bendelow (2000) the split between emotional and sensory pain may be interpreted as the reflection of the values and beliefs running through the dominant biomedical model, which is orientated towards cure through the manipulation of organic, observable and objective symptoms, and so contributes to the perception of emotional pain experiences as less legitimate. Again using Connell's terms, normative biomedical expectations of pain may be reflecting the institutionalization of hegemonic masculinity. A recent study by Kempner (2006) illustrates how medical knowledge may convey and reinforce dominant masculinity ideologies. Using a grounded-theory approach to analyse a comprehensive set of data on produced medical knowledge on cluster headache (e.g. from in-depth interviews with medical experts to medical literature),

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she showed how the syndrome went from one of the few pain conditions more prevalent among men to a disorder of excessive masculinity. Additionally, this author showed how despite growing medical evidence against a physical and psychological profile of cluster headache, patients are still often depicted as hyper-masculine and aggressive, with 'typical leonine faces and rugged, athletic looks'.

While the above studies illustrate how biomedical and laypeople's discourses on pain can be seen to reflect dominant gender ideologies, such shared ideologies may also determine how people perceive a chronic pain sufferer. An experimental study by Bernardes and Lima (2006) found that laypeople and nurses perceived a man with chronic low back pain as less dominant, more dependent and, particularly in the eyes of male participants, as less stoical than the typical man. This suggests that a man with chronic pain may not be perceived as hegemonically masculine (i.e., a typical male). Given that it can be argued that the most valued type of masculinity in our society is based on the image of a strong and healthy body (Connell, 1995), a chronic pain or disease condition may become a primary threat to a man's sense of being male. In fact, as it is highlighted in the next section there is some evidence showing that these widely held ideologies may have profound impacts on the phenomenological experiences of pain in men and women.

7.2.2. Impacts of institutionalized gendered pain beliefs on phenomenological pain experiences

The ideological approach has also examined the institutionalization of gendered ideologies of pain expression by the dominant biomedical model (e.g., Bendelow, 2000; Johansson et al., 1999). Since men and women's pain experiences are judged against this same background, and what is expected of males in pain is more socially valued than what is expected of females in pain, then, pain phenomenological experiences of men and women

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could be different. Evidence comes from studies that find women with chronic muscular pain have to strongly negotiate their own identities, both as women and patients, in medical encounters (Johansson et al., 1999; Werner and Malterud, 2003; Werner et al., 2003). An analysis of women's narratives on their medical encounters has shown that most portrayed them as "legal court cases" where they fought for legitimacy and credibility. Credibility seemed to be measured by the way a female patient fits into the normative biomedical expectations on what is "being a good female patient" (Werner and Malterud, 2003). Women were found to distance themselves from the image of the weak, malingerer and complainer female patient by restraining feminine actions, resorting to narratives of personal strength and expressing negative attitudes towards women seen as "whiners and complainers" (Werner et al., 2003). Simultaneously, they risked being perceived as healthy and losing patient status. Women with chronic pain have also reported pressure to perform multiple roles (wife, mothers; Johansson et al., 1999), which if successful led to perceptions that their pain was disbelieved.

For male pain experiences, evidence suggests that credibility and legitimacy are less an issue compared to the threat to 'being male'. A set of studies analysing either men's narratives about their pain or health professionals discourses about men with chronic pain shows that as hegemonic masculinity is founded in the representation of a man's healthy and strong body, pain can become an identity threat, and fear and shame become central emotional experiences (Paulson et al., 1999; Paulson et al., 2002; White et al., 1995). Such narratives have been interpreted as showing that in order to cope with such threatened identities, men often react negatively (e.g., emotional avoidance), to prevent a perceived 'loss of masculinity'. As a consequence, health-care technicians report difficulty reaching them (Paulson et al., 1999) and permanent feelings of isolation persist among these men (Paulson et al., 2002). Men's narratives have also reflected a tendency to ignore chest pain symptoms and

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delay help seeking until they could justify their vulnerability and/or loss of maleness (White and Johnson, 2000). Taken to the logical extreme, such behaviours could result in men putting their own lives at risk.

7. 3 Summary

The ideological level of explanation stresses broad societal beliefs that maintain patriarchy. Studies show how shared beliefs about pain simultaneously reflect and maintain dominant masculinity ideologies. It is argued that the gendered ideologies that run through main institutions in society (e.g., modern medical institutions) allow us to understand some of the differences in phenomenological pain experiences of men and women. Studies suggest that hegemonic masculinity standards have detrimental consequences not only to women in pain but also to men. However, while men's difficulties mainly revolve around identity issues, women are also at risk of loosing their credibility as patients, and hence, not having their pain experiences taken as seriously. In fact, these later findings may help us begin to understand some of the evidence on sex bias in pain medical judgements reported in level 2.

8. Summary and future directions

The goal of the current review has been to better understand the psychosocial roots of men and women's pain experiences. We have aimed to achieve this through the articulation of the gender concept, and show how gender-based research can facilitate this understanding. The current review reveals multiple conceptualizations of gender, which can be conceptualised using Doise's (1982/1986) meta-theoretical framework of explanation (Table 1). We shall briefly summarize the main conclusions from our review, before moving on to consider the future directions for both theory and research.

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8.1 Summary of four levels of analysis

We have argued that the role of gender on pain can be considered at four different levels of analysis. At an intra-personal level of analysis, gender is conceptualized as a stable personal characteristic, either as a general personality orientation or as a complex and multidimensional gender-schema that influences how we perceive ourselves, others and the world in general. At a situational level of explanation, gender is seen as something people do according to specific characteristics of context. While the first level of analysis tends to focus researchers into accounting for stability in sex-related differences, in the second level of analysis they look for its variability.

Most research focuses on stability, instead of the variability, of sex-related differences in pain. Considerable work has examined the influence of general (gender) personality orientations like instrumentality and expressiveness in pain experiences. More recently, specific and pain-related dimensions of gender-schemas have been examined, although the multi-dimensionality of gender-schemas and their relation to pain may be further explored. As observed sex-related pain differences may result from contextual variability, the articulation between these levels of analysis should bring us closer to more considered understanding of gendered pain behaviours. There remains a considerable amount of work into the potential impact of contextual characteristics on gendered pain experiences (e.g., symptom presentation styles, health professionals' attitudes and behaviours towards patients).

Conceptualizing gender at a positional and ideological level considers power and status issues. At the positional level, gender is viewed as a synonym for positions in a social status hierarchy. Although there are very few studies on the impact of sex as social status in pain, future research could be a promising addition to the area. Not only may the pain experiences of lower status groups be more contextually dependent than for dominant groups, but the social status of those judging their pain may also be important. Studies at an

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ideological level of analysis help us to further understand why such status differences exist and their impact on pain experiences. The focus here has been on shared and pervasive ideologies (e.g., hegemonic masculinity) that by being institutionalized can contribute to maintaining a social order of male dominance. Women's pain may be measured against a masculine standard, resulting in inequalities that could account for sex-related biases in medical judgements.

When considering the four levels of analysis, what becomes apparent is that the expressiveness dimension is a central component of gender representations in pain research. Examples in table 1 highlight such relationships. Although trans-cultural gender representations often include several different clusters of traits used to differentiate men and women (e.g., competency, independence, sociability; Eagly and Dielman, 1997), it is the cluster of expressiveness-related traits that comes out as most significant in a pain context. This is perhaps unsurprising given the nature of pain experiences. Emotions and emotional expression not only play an important role in pain, but pain only becomes a visible and social experience through its overt expression. Competency-related traits have not (yet) emerged as central components of gender representations in pain research, perhaps because they are have a less immediate relevance to pain experiences. This may be one of the reasons why level 1 studies show a more consistent relationship between femininity (defined as a set of expressiveness-related traits) than masculinity (a set of instrumentality-related traits). Therefore, it seems to be through this particular dimension – expressiveness - that the concept of gender gains its relevance within pain research.

Finally, although gender may be considered at different levels of analysis, such theories should not be seen as mutually exclusive. In fact, as we have been arguing, looking for an articulation between different levels will hopefully contribute to a more complete understanding of men and women's pain experiences. In fact, even within gender literature,

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models and theories have been gradually working toward an increasing articulation of different levels of analysis (e.g., Deaux and LaFrance, 1998; Lorenzi-Cioldi, 2002). Increased conceptual complexity should be accompanied by increased methodological complexity, and so methodological triangulation is important to grasp the complexities of gendered pain experiences.

8.2 Future directions

We believe that the approach adopted here can be seen as a useful way of organizing gender-based research and ideas. However, we hope that this review will stimulate more than just a convenient way of organising existing literature, but points to future directions for research.

One area for potential development is to consider the interactions of gender issues in pain with other socio-demographic variables like age, race or class. Masculinity and femininity may not present the same characteristics and/or influences on individuals' pain behaviours across life-span. For example, Meyers et al. (2006) found that the relationship between gender-related personality traits and pain tolerance only becomes significant by late adolescence. Moreover, Weisse et al.'s (2005) study showed similar patterns of induced-pain behaviours between women and black men, (but not white men) suggesting that the interaction of sex and race issues should also be considered.

Future research could also consider in more detail the potential influence of gender on factors that mediate sex-related differences in pain e.g., coping processes, perceived control, catastrophizing, emotions, or even biological factors like hormones (Berkeley et al., 2002; Robinson et al., 2000). For example, Thorn et al. (2004) showed that more negative femininity traits (e.g., being whiny and emotionally vulnerable) accounted for sex-related differences in pain catastrophizing, which in turn had a negative effect on cold pressor pain

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tolerance. However, more studies are needed on the influence of gender on psychosocial factors mediating the sex/pain relationship.

Similarly, we might find that gender interacts with biological factors such as sex hormones, genetics, immune responses etc. For example, we are already aware of the important relationships between psychological factors and immune functions in predicting health and illness (Kiecolt-Glaser et al., 2002), and it would be fascinating to consider whether gender impacts on this within the context of pain. Research has already indicated that interpersonal (spousal) interactions affect both immune functions and pain-behaviours in a sex-specific manner (e.g., Kiecolt-Glaser and Newton, 2001; Smith et al., 2004). There is evidence that psychosocial factors play a role in sex hormone function (Fenster et al., 1999), and again it would be interesting to consider the impact that gender roles have on the relationship between sex hormones and pain.

9. Conclusions

The biopsychosocial approach has been advocated as a means of explaining sex differences in pain. However, it is only by identifying the various biological, psychological and social mechanisms that we can begin to consider the potential interactions between them. To date there has been a general lack of clarity within the psychosocial side of this model, partly due to confusion as to how to conceptualize the different approaches to gender and pain. What we have hopefully achieved within the current paper is to assimilate some of the main issues in gender studies, and show how they may be applied to pain in men and women, and in doing so add to what we already know about biological and psychological mechanisms. In conclusion, we hope that this paper may help increase the awareness of the conceptual complexities associated with gender research. By indicating how the levels of analysis approach can be applied to pain and gender research, we hope this will stimulate

researchers to considering alternative approaches and/or explanations, which will increase our understanding of this fascinating area.

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