

# The relationship between fear of social and physical threat and its effect on social distress and physical pain perception



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Sponsorships or competing interests that may be relevant to content are disclosed at the end of this article.

## ARTICLE INFO

### Article history:

Received 11 January 2013

Received in revised form 4 October 2013

Accepted 15 November 2013

### Keywords:

Fear of pain

Ostracism

Pain overlap theory

Social threat

## ABSTRACT

Past research has found that measuring individuals' fear of pain predicts their physical pain perceptions: those reporting higher levels of fear of pain report higher levels of pain. We investigated links between fear of social threat and fear of physical pain, testing whether these fears predict responses to social distress and physical pain. In 3 studies, we found that fear of social and physical threat were related yet distinct psychological constructs (study 1), that fear of social (but not physical) threat predicted the perception of social distress (study 2), and that fear of physical (but not social) pain predicted the perception of physical pain (study 3). Thus, we found that, similar to the influence of fear of physical pain on physical pain perception, fear of social threat moderated the perception of social distress. However, we also found that these effects were specific, such that each type of fear uniquely predicted the experience of the same type of distress. We argue that timely identification of high levels of social threat-related fear is critical for identifying individuals who will benefit most from preventative interventions aimed to limit negative cycles of high avoidance and increased social threat perception. Furthermore, our work sets a boundary condition to pain overlap theory by showing that high levels of fear of one type of pain (e.g., social) are specifically linked to increased perception of that particular type of pain (e.g., social) but not the other (e.g., physical).

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## 1. Introduction

The observation that social distress activates some of the brain regions known to be associated with the experience of physical pain gave rise to pain overlap theory [11–13,26], according to which a system that uses similar signals for social separation and physical damage may have been evolutionarily advantageous [26]. Although the need for a more cautious interpretation was recently advised [21], data that show activation in the so-called pain matrix in response to social distress nevertheless suggests new testable hypotheses about potential relationships between physical pain and social distress. For instance, research showed that physical pain and social distress can cause similar psychological consequences [36].

Here, we turn our attention to the possible overlapping factors that might explain interindividual variability of both social distress and physical pain. We argue that the key role of cognitive and emotional processes related to the subjective experience of

physical pain may be important for the perception of social distress as well. In particular, fear of threat may be a common factor explaining interindividual differences in the experience of physical pain and social distress. In the context of physical pain, despite the key role of fear of pain in promoting the individual's safety and survival, theorists suggested that high levels of fear of pain can be detrimental [2]. Accordingly, several experiments found that physical pain-related fear (assessed by the Fear of Pain Questionnaire [29]) was a consistently stronger predictor of pain perception compared to other predictors [16,19].

However, a generic fear of pain may not necessarily account for the specific reactions to the 2 experiences. In keeping with this reasoning, hierarchical structural models of fears [42,43] posit there is a hierarchy of general and specific mechanisms that affect one's tendency to develop fears. General factors, such as neuroticism, relate to the acquisition of most fears, whereas specific factors are particular to a given type of stimulus (e.g., spiders). Therefore, fear of specific kind of threat (e.g., social) should be distinct (albeit associated) from other threat-related fears (e.g., fear of physical pain).

Our aim was to investigate the relationship between fear of social and physical threat and to test whether fear of social threat influences the reactions to social distress in a similar way in which fear of physical pain influences the reactions to physical pain.

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Specifically, the current set of studies was designed to test the following predictions. As hypothesis 1, we hypothesized that fear of social threat is related to, yet distinct from, fear of physical pain. That is, individuals with high fear of social threat should also exhibit high fear of physical pain, but these 2 constructs should be empirically distinguishable (study 1). As hypothesis 2, we hypothesized that, similar to the influence of fear of physical pain on the perception of physical pain, fears of social threat should exacerbate perception of social distress (study 2). Finally, as hypothesis 3, we hypothesized that individuals high in fear of one type of threat would report increased distress perception from being subjected to that type of distress than the other type (studies 2 and 3).

## 2. Study 1

In study 1, we examined the degree of overlap between fear of social and physical threat. We predicted that fear of social threat and fear of physical pain would factor separately, and these factors would be positively correlated (hypothesis 1). We also examined the degree to which fear of social threat might overlap with other constructs that would be expected to be conceptually associated with it. More specifically, we examined the relationship of fear of social threat and fear of physical pain as they overlapped with rejection sensitivity (e.g., the tendency to anxiously expect, readily perceive, and overreact to social rejection [10]), pain catastrophizing (e.g., cognitions of ruminating on negative outcomes resulting from the experienced pain, thinking pain is unbearable, and the inability to tolerate painful situations [16,19,40]), anxiety [32], depression [38], loneliness [29], and items related with past experiences of social distress and physical pain. The latter were included to investigate links between past experiences of social distress and physical pain and current levels of fears [3,9,22,24].

### 2.1. Methods

#### 2.1.1. Participants

Four independent samples were recruited for study 1. This methodological choice was adopted because our focus was on the relationships between the fear of social and physical threat and each of the considered concurrent constructs, rather than on the full matrix of relationships among all the measures. In this way, we avoided overloading the participants with a large number of items and avoided possible distortions in the correlation coefficients resulting from specific characteristics of a single sample.

Our samples comprised 272 participants (135 female subjects; mean age 19.48 years, standard deviation [SD] 2.92) for sample 1, 111 participants (38 female subjects; mean age 19.56 years, SD 1.53) for sample 2; 113 participants (42 female subjects; mean age 19.48 years, SD 1.55) for sample 3, and 146 participants (90 female subjects; mean age 19.36 years, SD 3.76) for sample 4. All participants were students at Purdue University who participated in this study as part of a course requirement.

#### 2.1.2. Procedures and materials

Each participant in every sample completed a written informed consent form, a brief demographic questionnaire, and the Fear of Social Threat Scale and the Fear of Pain Questionnaire, along with a number of additional measures.

**Fear of Social Threat Scale.** Given that no fear of social threat assessment currently exists, we drew on the item structure of the Fear of (physical) Pain Questionnaire [30] and constructed a 15-item self-report scale that incorporated a variety of instances of social threatening events. These instances included feeling socially excluded [1], ostracized [45,46], humiliated [17,33], betrayed [15], interpersonally devalued [23], and verbally abused (i.e., being harmed by others with words [7]). For item reduction, a pilot study

was conducted to identify a set of items from the 25 items initially generated. Forty-five students (21 women; 19.76 years, SD 2.34) at Purdue University took part in a preliminary study to exchange course credits. Ten items were dropped from the original set of 25 items. Specifically, 3 items were removed because they demonstrated a ceiling effect, and the remaining 7 items were dropped because of conceptual overlap and varying degrees of redundancy with the content in other items. The final Fear of Social Threat Scale consisted of 15 items, with 4 items related to relational devaluation (e.g., “your partner forgetting your birthday”), 3 items related to ostracism (e.g., “feeling ignored by someone who is important to you”), 2 items related to rejection (e.g., “being left out of a group”), 2 items related to betrayal (e.g., “being betrayed by someone who is important to you”), 2 items related to humiliation (e.g., “being embarrassed in front of your classmates by your professor”), and 2 items related to verbal abuse (e.g., “being verbally abused by your boss”). Our primary aim was to build a short scale that could provide a valid and reliable index of fear of social threat and be comparable to the overall score of the Fear of Pain Questionnaire.

**Fear of Pain Questionnaire.** The FPQ-III is a 30-item self-report instrument measuring fear of a variety of physical pain-related stimuli [30]. For the purposes of the present study, we used a shorter version of the Fear of Pain Questionnaire. We selected 9 items, retaining the 3 items that in the original validation study [30] showed the highest factor loadings on each of the 3 domains of the Fear of Pain Questionnaire (the same procedure for item selection has been previously adopted; e.g., [6]). Considering the aims of the present investigation, we focused more on obtaining a brief measure of the construct of fear of physical pain in order to compare it with fear of social threat rather than on distinguishing its specific subdimensions (e.g., severe pain, minor pain, medical pain).

For sample 1, participants completed a questionnaire that included a set of items developed to assess fear of social threat ( $\alpha = .943$ ) and a subset of items taken from the Fear of Pain Questionnaire ( $\alpha = .833$ ) [30]. The items used for both scales can be seen in the [Supplementary Appendix](#). For sample 2, the questionnaire package included the 15-item Fear of Social Threat Scale ( $\alpha = .940$ ), the 9-item subset of the Fear of Physical Pain Scale [30] ( $\alpha = .850$ ), and the Rejection Sensitivity Questionnaire [10] ( $\alpha = .827$ ). Sample 3 completed the 15-item Fear of Social Threat Scale ( $\alpha = .921$ ), the 9-item subset of the Fear of Physical Pain Scale ( $\alpha = .848$ ), and the Pain Catastrophizing Scale [39] ( $\alpha = .916$ ). Finally, participants in sample 4 were asked to complete the 15-item Fear of Social Threat Scale ( $\alpha = .946$ ), the 9-item subset of the Fear of Physical Pain Scale ( $\alpha = .846$ ), the Beck Anxiety Inventory [4] ( $\alpha = .916$ ), the Beck Depression Inventory [5] ( $\alpha = .874$ ), the 3-item Scale for Measuring Loneliness [20] ( $\alpha = .832$ ), and 2 sets of ad-hoc composed indexes regarding past experience of social ( $\alpha = .747$ ) and physical ( $\alpha = .878$ ) pain. The 3 items for the Past Experience of Social Distress Index were: “In the past, people have not been there to give me warmth, comfort, and affection”; “In the past, I often felt excluded and ignored”; and “In the past, I haven’t felt that I am special to someone.” The 3 items for the Past Experience of Physical Pain Index were: “In the past, I have suffered a lot from illness and injury”; “In the past, I have suffered much physical pain”; and “In the past, I often had pain in my body.” Responses to all these items were recorded on a 1 (“Completely untrue of me”) to 7 (“It describes me perfectly”) scale and were averaged together to create the 2 overall indexes. For each sample, the order of the presentation of scales and items in each scale was randomized.

### 2.2. Results

#### 2.2.1. Data management

The means, standard deviations, and corrected item total correlations of the items are presented in [Table 1](#). The 2 subscales also

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