Research Paper

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Self-compassion, pain, and breaking a social contract

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Abstract

Self-compassion is the ability to respond to one's failures, shortcomings, and difficulties with kindness and openness rather than criticism. This study, which might be regarded as a proof-of-concept study, aimed to establish whether self-compassion is associated with expected emotional responses and the likelihood of responding with problem solving, support seeking, distraction, avoidance, rumination, or catastrophizing to unpleasant self-relevant events occurring in 3 social contexts. Sixty chronic pain patients were presented with 6 vignettes describing scenes in which the principal actor transgressed a social contract with negative interpersonal consequences. Vignettes represented 2 dimensions: (1) whether pain or a nonpain factor interrupted the fulfillment of the contract and (2) variation in the social setting (work, peer, and family). The Self-Compassion Scale was the covariate in the analysis. Higher levels of self-compassion were associated with significantly lower negative affect and lower reported likelihood of avoidance, catastrophizing, and rumination. Self-compassion did not interact with pain vs nonpain factor. Work-related vignettes were rated as more emotional and more likely to be associated with avoidance, catastrophizing, and rumination and less likelihood of problem solving. The findings suggest that self-compassion warrants further investigation in the chronic pain population both regarding the extent of its influence as a trait and in terms of the potential to enhance chronic pain patients' ability to be self-compassionate, with a view to its therapeutic utility in enhancing psychological well-being and adjustment. Limitations regarding the possible criterion contamination and the generalizability of vignette studies are discussed.

Keywords: Self-compassion, Social context, Chronic pain, Vignette methodology

1. Introduction

Pain captures attention, disrupts the flow of ongoing behavior, and may elicit negative emotions and fearful thinking about pain.[13] The continued experience of pain frequently interferes with the performance of everyday activities,[39] engendering conflict between the desire to continuing to engage in a preferred activity or to transfer available cognitive, behavioral, and emotional resources in an attempt to ameliorate the pain. Disruption of valued ongoing activities may also have emotional and behavioral consequences[48] including disruption to social activity where an individual may break a social contract.[2,8,29,61,66] Pain-related difficulties in social contexts are associated with avoidance[3,12,41,53] and may place limitations on the benefits of social participation and can impact on the person's sense of self.[27,62] Variability in how people respond to pain-related interference raises the question of which factors might contribute to moderating response patterns? In this article, we examine the impact of self-compassion.

Self-compassion is conceptualized as a healthy attitude and relationship towards oneself, and there is evidence that in the face of difficulties, self-compassion promotes well-being, resilience, and coping.[32,33,46,69] Individuals with a self-compassionate attitude view their responses to difficult events accurately but respond with kindness and compassion rather than with self-criticism,[44] enabling self-soothing and emotion regulation.[21,22,31] In contrast to self-esteem, self-compassion does not rely on performance-based evaluations of the self, or comparison to idealized standards, in order to bolster oneself in the face of difficulty. The cultivation of a process not moderated by evaluation, which can regulate negative affect, has a particular relevance to a chronic pain population, where self-evaluations are commonly negative in the face of the perceived failure, which persistent pain may impose.[7,8,60,66] Research on self-compassion in chronic pain is sparse, but the data suggest that higher self-compassion is associated with increased acceptance of pain, lower negative affect, less catastrophizing, and pain disability.[10,70] Cultivation of compassion through loving-kindness meditation is also associated with lessened distress and anger.[6,19]

In this study, which might be regarded as a proof-of-concept study, we conjectured that high levels of self-compassion would moderate affective– and cognitive–behavioral responses to unpleasant self-relevant events occurring in a social context. We compared pain-related and nonpain events across in 3 social settings that varied with respect to the presence of others and likely social obligation. We examined whether the effects of self-compassion were consistent when the precipitating negative event could be attributed to pain or whether the presence of pain either facilitated or inhibited the influence of self-compassion. The

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presence of an interaction between pain and self-compassion would be observed in the latter case but not in the former. We used vignette methodology in which the social context of events was manipulated with respect to variation in the social setting and the presence/absence of pain. Participants made judgments about their likely affective– and cognitive–behavioral responses to each vignette.

2. Methods

2.1. Design

We used a 2 × 3 factorial within-subject design to present variation in the social context. Social context was defined by 2 factors: the presence or absence of pain and variation in the presence of others (family, peers, and work). Participants responded to each vignette by rating their expected affective– and cognitive–behavioral responses to the scene represented in the vignette. The effect of self-compassion was not manipulated but treated as a trait-like characteristic and assessed as a between-subject covariate rather than using a median split to dichotomize the variable.[37]

Ethical approval for the study was given by UK NHS Research and Ethics Committees, Bradford Teaching Hospitals Foundation Trust, and Mid Yorkshire Hospitals Trust Research and Development Departments.

2.2. Participants

A condition of ethical approval required that all patients be initially contacted by clinicians and not by the researchers. Clinicians at 2 multidisciplinary pain clinics in 2 hospitals in West Yorkshire were asked to refer all patients who fitted the inclusion criteria. The inclusion criteria were age 18 years and older (no upper age limit), presence of pain for 3 months or more, be accessing treatment and support through the pain rehabilitation team, and English speaking with a level of language fluency sufficient to complete standardized measures and understand vignettes. The exclusion criteria were alcohol and illicit drug use sufficient to impair performance during the research, known learning disability, currently actively experiencing an episode of psychosis, a pain condition with a malignant origin.

2.3. Measures

2.3.1. Pain

Visual analog scales ([VAS], 150 mm) were used to measure pain at its highest, lowest, usual, and current intensity. All judgments were made with reference to the past week. The VAS for pain was anchored from "0 (no sensation)" to "150 (most intense sensation imaginable)."[68] The values were rescaled to a 0 to 100 scale for comparability with other studies.

2.3.2. Depression, Anxiety, and Positive Outlook Scale

The Depression, Anxiety, and Positive Outlook Scale (DAPOS) is an 11-item scale designed to measure depression, anxiety, and positive outlook in people who suffer from pain.[55] The DAPOS contains 3 subscales: Depression, Anxiety, and Positive Outlook. Each of these provides an independent score. There is no total score. The DAPOS has been demonstrated to have good internal consistency and construct validity for use in a chronic pain population.[54] Values of Cronbach's α for the 3 scales in this study were as follows: Depression: $\alpha = 0.88$, Anxiety: $\alpha = 0.85$, Positive Outlook: $\alpha = 0.74$.

2.3.3. Self-Compassion Scale

This 26-item scale comprises 6 subscales (representative items are shown in parenthesis); Self-kindness (I try to be loving towards myself when I'm feeling emotional pain), Self-judgment (I'm disapproving and judgmental about my own flaws and inadequacies), Common Humanity (When things are going badly for me, I see the difficulties as part of life that everyone goes through), Isolation (When I think about my inadequacies, it tends to make me feel more separate and cutoff from the rest of the world), Mindfulness (When something upsets me I try to keep my emotions in balance), and Over-identification (When I fail at something important to me I become consumed by feelings of inadequacy). Responses to each item are made on a five-point scale from "Almost never" to "Almost always."[43] The total score is the sum of each subscale after they are rescaled to 1 to 5; thus, the range of the Self-Compassion Scale (SCS) varies from 6 to 30. The scale has good predictive, convergent, and discriminant validity and has been shown to have good internal consistency when used with a pain population (α = 0.93-0.95).[10,70] Cronbach's α in this study was 0.91. Neff reports the average total score to be around 18 with values <15 as "low" and >21 as "high."

Self-compassion holds growing research interest, including in the field of health and pain.[10,36,64,70] Self-compassion is conceptually distinct from related concepts such as self-esteem because the focus is on a positive affective response, ie, kindness and warmth, to the self, which is unconnected to personal attributes or social comparison and is based on the idea that all people are intrinsically valuable and deserving of compassion rather than feelings of self-worth per se.[45] In a chronic pain context, where self-evaluations are often negative in the face of the perceived failure that persistent pain imposes,[60] this distinction appears particularly pertinent. The capacity to respond to oneself with kindness and understanding in the face of the limitations, difficulties, and suffering caused by pain would appear valuable within a chronic pain population.

2.3.4. Social Role Participation Questionnaire

We assessed participants' self-reported social participation across 11 social domains (work, education, intimate relationships, children/stepchildren/grandchildren, other family, community involvement, socializing, casual contact with others, travel, physical activity, and hobbies) specified in the modified 42-item Social Role Participation Questionnaire (SRPQ).[16,20]

The SRPQ provides 3 summary measures: (1) Salience (range, 0-60)—the extent to which different roles are important to a person, irrespective of whether or not an individual is currently engaged in that role; (2) Difficulty (range, 0-48)—how difficult it is, given their present health status, to participate in each of the role domains; and (3) Satisfaction (range, 0-60)—the extent of satisfaction in their ability to participate in each of the roles in the context of the difficulties associated with their health condition. Cronbach's α values in this study were as follows: Salience: $\alpha = 0.77$, Difficulty: $\alpha = 0.64$, and Satisfaction: $\alpha = 0.71$.

2.3.5. Social context vignettes

We constructed 6 vignettes to represent social situations in which the primary actor, with whom the participant was asked to

identify, negates a social contract, through being unable to complete an agreed social task or function. In 3 vignettes, breaking the social contract was attributed to the conflicting presence of pain, and in 3, it was attributed to a factor related to the self, such as poor organizational skills or difficulty managing competing interpersonal demands. Each vignette scenario was consistent with the parameters of an unpleasant self-relevant event, occurring within a social context.

2.3.5.1. Experimental manipulation of the vignette content

The vignette content was manipulated across 2 dimensions. These were selected on the basis of the literature that indicates that the context of pain and social context may influence a person's response to unpleasant self-relevant events. The pain- and nonpain-relevant comparison was included to test whether self-compassion would be equally associated with responses across pain and nonpain contexts. The alternative hypotheses are that the presence of pain either facilitates or inhibits the association with self-compassion.

The vignettes were developed and administered in accordance with the recommendations made by Paddam et al.[51] and Bradbury-Jones et al.[5] These included (1) reading background material, consulting patient narratives and experts in chronic pain as sources of further information, (2) gathering themes, (3) drafting vignettes to reflect real-life experience, (4) using an independent panel of experts to assess the vignettes, (5) modifying vignettes that did not consistently meet the panel's ratings, and (6) reassessment of vignettes by an expert panel if necessary.

Several sources were consulted to establish plausible depictions of commonly experienced unpleasant self-relevant events in a social context when pain is both absent and present (eg, Refs. 7,8,42,50). These included a recent comprehensive meta-ethnography of patient experience of chronic pain and consultation with the first author[66] and reviewing interviews with people with chronic pain conditions available online.[15] From this, specific examples of unpleasant pain-relevant events, occurring in a social context, were collected. To establish nonpain self-relevant events, unpleasant events schedule developed by Lewinsohn et al.[34] was consulted.

Four clinical psychologists with experience working in chronic pain and 1 chronic pain patient reviewed 6 draft vignettes. Reviewers were asked to rate the face validity of the scenarios on a scale of 1 to 10 and also provided spontaneous qualitative feedback. We adopted the criteria proposed by Paddam et al. and revised the vignettes until each vignette achieved a mean rating above 6 and a SD below 3 (Ref. 51, page 67). The final versions had mean face validity scores of between 7.4 and 8.8 with SDs ranging from 0.84 to 1.41. The vignettes were constructed to fulfill 3 conditions: (1) the main character had made a prior commitment to fulfill a social obligation; (2) an event attributable to either pain, eg, a pain "flare-up" or nonpain, eg, a competing personal or social demand; (3) the social (negative) consequences of the interference were described. To capitalize on one of the hypothesized mechanisms of self-compassion, ie, the capacity to perceive events realistically and in a non–self-critical or self-blaming manner,[33,44] the vignettes were written in a manner that deliberately required participants to attribute the failure either to themselves or externalize the failure to another cause. For example, taking a nap during the day and the alarm not going off could be attributed to either the participant not prioritizing others' needs and being selfish by having a nap or not having set the alarm correctly and being incompetent, or due to an external factor—failure of the alarm.

The response items were a series of single-item ratings on 0 to 6 scales. There were 4 affective items (sadness, anxiety, anger, embarrassment) rated as the expected feeling from "not at all" to "extremely strongly," and 6 cognitive and behavioral responses (problem solving, support seeking, distraction, avoidance, rumination, and catastrophizing) rated the likelihood of engaging in the action from "not at all" to "extremely likely." The response scales were adapted from those used by Leary et al.[33] by including 5 categories of coping proposed by Skinner et al.[59]: cognitive coping, problem solving, support seeking, distraction, and escape/avoidance, since it has been suggested that "this taxonomy is useful for considering the nature of self-compassion as a coping strategy" (Ref. 1, page 109). In developing the response scales, in addition to considering the literature on self-compassion, we considered the chronic pain literature regarding the impact of negative cognitive styles and avoidance.[12,67] The set of vignettes and the response scales are reproduced in Appendix 1 (available online as Supplemental Digital Content at http://links.lww.com/PAIN/A124).

3. Procedure

Participants were interviewed and tested individually at a location of their choice. After completing the necessary consent procedure, demographic details were collected. Thereafter the pain rating scale, SRPQ, SES, and DAPOS were administered before presentation of the vignettes.

3.1. Vignette administration

All testing was completed in a face-to-face interview by the first author. The administration of the vignettes was designed to engage participants in each scenario. Each vignette was presented on a separate card, and participants were asked to read them to reduce potential bias caused by having them read aloud by the researcher. After reading each vignette, participants were asked to consider the impact of the depicted scenario in a consistent manner. They were asked 3 standard questions in sequence: (1) "What does this make you think of?," (2) "What emotions would you feel if you were X?," where X was the named main character in the vignette, and (3) "What would you do if you were in X's shoes?" The prompts were designed to improve engagement and encourage vivid imagination of them in the scenario in order to prime them to provide the most realistic response to the closed questions in the response scales. The vignettes were given in a counterbalanced order using a 6 × 6 Latin square. After all measures were completed, participants were debriefed.

3.2. Analysis

After data verification and cleaning, the distributional characteristics of the data set were examined and 2 extreme cases were identified. After removing the 2 outlier cases, the distribution of all the dependent variables fell within the normal limits of skewness and kurtosis. Parametric summary statistics and correlations were computed for descriptive purposes. The analysis of responses to the vignette was performed using repeated-measures analysis of covariance (ANCOVA). Self-compassion employed as a continuous between-subjects factor and entered as a covariate. Delaney and Maxwell[17] note that a potential limitation of the use of ANCOVA is that the main effects can be obscured, and they recommend *mean centering the covariate* before running the ANCOVA. There were 2 within-subject factors: levels of pain relevance (pain vs nonpain-

relevant) and a 3-level factor of social setting (family, peer, and work context). A priori contrasts to further investigate differences between social settings were specified. On the basis of previous work,[7,8,40,60,66] we conjectured that stronger emotional responses and less effective cognitive–behavioral coping responses would be graded across the social setting from work to friends to family. The 2 contrasts therefore compared the work setting with the combined effect of family and peers and then compared family with peers. We set a conservative α value for all tests at 0.01.

Olejnik and Algina[49] and Bakeman[4] recommend the use of generalized η^2_G rather than partial η^2_p as a measure of effect size. Olejnik and Algina[49] argued that η^2_p can be misleading as an estimate of the proportion of variance accounted for by an effect. The reason for this is that in the computation of η^2_p, the denominator comprises sums of squares of the effect plus the sums of square for the error term used to test the effect. The denominator therefore excludes sources of variance from other factors and covariates. As a consequence, η^2_p overestimates the effect size. Olejnik and Algina developed η^2_G to include additional sources of variance in the denominator to account for individual differences and fixed factors. As a consequence, the values of η^2_G will be smaller than η^2_p. An advantage of η^2_G is that it provides an estimate of an effect that is comparable across between- and within-subject designs. Bakeman[4] (page 383) suggests that it is appropriate to apply the guidelines suggested by Cohen[9] for η^2. Cohen suggested that a value of 0.02 be regarded as a small effect, 0.13 as medium, and 0.26 as large. We follow this convention but are mindful that the allocation of descriptors is somewhat arbitrary.

All analyses were performed using SPSS routines following the guidance set out in Tabachnick and Fidell.[63] In the repeated-measures analysis, corrections were applied where the data did not meet sphericity assumptions. η^2_G was computed from the relevant sums of squares provided by the SPSS output.

4. Results

4.1. Participants

The clinicians referred 96 patients who agreed to be contacted. Of these, 13 were not contactable, 8 did not meet the inclusion/exclusion criteria, and 9 were unwilling to participate once the study had been explained. Sixty-six people entered the study; 2 were unable to complete and withdrew, 2 provided incomplete data for the repeated-measures analysis, and 2 were excluded after being identified as extreme statistical outliers on the vignette ratings following data screening. Of the 60 participants included in the final analysis, there were 47 women (76%). The mean age of the sample was 46.9 years (SD = 11.6; range, 22-69), and the mean age at onset of pain was 33.2 years (SD = 13.2) with a mean duration of pain of 13.9 years. The self-reported average typical intensity of pain (rescaled to 0-100 scale) was 58.2 (SD = 20.4). The sample was drawn from a pain rehabilitation assessment clinic. The conditions included in the sample broadly incorporated those with pain associated with degenerative changes (35%), patients with chronic widespread pain (23.3%), patients with other diagnoses including inflammatory arthritis (1.6%), adhesions (1.6%), and Guillain–Barré syndrome (1.6%), and patients with no known formal diagnosis (36.7%).

4.2. Mood

Mean scores on the DAPOS were as follows: depression = 14.9 (SD = 5.6), anxiety = 9.2 (SD = 3.5), and positive outlook = 8.7 (SD = 3.4). These values are in line with those reported in the development and validation of the scale[54,55] in a chronic pain sample.

4.3. Social role participation

The mean score for total role salience was 44.49 (SD = 7.81). The mean score for total role satisfaction was 20.61 (SD = 6.73). Overall mean scores for satisfaction were low, and across all social roles, participants were the most likely to report that they were not at all satisfied with their social participation. The area of social participation in which participants were the least satisfied was physical leisure (M = 1.34, SD = 0.54), and participants were more satisfied with ability to fulfill roles as parents and grandparents (M = 2.58, SD = 1.40), family members (M = 2.39, SD = 1.17), and partners (M = 2.35, SD = 1.52). The mean score for total role difficulty was 30.19 (SD = 5.44). The frequencies revealed that overall, participants were the most likely to report having "a lot of difficulty" in all aspects of social participation, with the exception of casual contacts (phone calls, e-mails) in which the majority reported having "some difficulty."

4.4. Self-compassion

The mean total score on the SCS was 15.24 (SD = 3.8). Using Neff's descriptors, the average self-compassion score was on the borderline between average and low. The value observed in this sample is slightly lower by 3 to 4 points than the values reported by Costa and Pinto-Gouveia[10] and Wren et al.[70] in their samples (mixed chronic pain and rheumatic disease and musculoskeletal pain in the context of obesity). The SCS score did not correlate significantly with any of the VAS ratings of pain (range of correlations, −0.082 to −0.134; n = 60; all *P*-values >0.3).

4.5. Vignettes

Table 1 reports the covariate-adjusted mean values and SEs for participant ratings of their anticipated affective– and cognitive–behavioral responses to each of the vignettes. In an attempt to report the analysis clearly without the inclusion of many F-values in the text, we summarize the analysis in **Table 2**, which reports η^2_G values. The first column shows the effect for the between-subject covariate of self-compassion, followed by within-subject main effects (presence vs absence of pain; variation in social setting) and the interaction between each factor and the between-subject covariate. The η^2_G values are coded so that all values associated with a significant F test ($\alpha <$ 0.01) are shown in bold and all other values in italics. We first comment on the overall pattern of results and then report further details of the a priori contrast analyses comparing variations in social setting.

4.5.1. Self-compassion

There are 2 notable findings with regard to self-compassion. First, there was a consistent effect of self-compassion across all 4 of the affect measures (sadness, anxiety, anger, and embarrassment) and the 3 cognitive–behavioral responses associated with affect (rumination, catastrophizing, and avoidance). Higher levels of self-compassion were associated with lower self-reported affective responses, less rumination, catastrophizing, and avoidance. In contrast, there was no relationship between self-

Table 1

Covariate-adjusted mean values (M) and SEs for all vignette conditions.

	Pain present			Pain absent		
	Family	Peer	Occupation	Family	Peer	Occupation
	M (SE)	M (SE)	M (SE)	M (SE)	M (SE)	M (SE)
Negative affect						
Sadness	4.77 (0.16)	4.77 (0.18)	5.17 (0.17)	4.62 (0.20)	3.88 (0.23)	4.62 (0.21)
Anxiety	3.60 (0.22)	4.40 (0.20)	4.50 (0.19)	3.87 (0.21)	3.05 (0.24)	4.40 (0.21)
Anger	4.63 (0.20)	4.38 (0.21)	4.97 (0.19)	3.88 (0.23)	3.28 (0.24)	4.90 (0.16)
Embarrassment	3.93 (0.24)	4.08 (0.24)	4.13 (0.23)	3.93 (0.26)	3.03 (0.25)	4.28 (0.23)
Cognitive–behavioral						
Rumination	3.84 (0.24)	3.81 (0.26)	4.68 (0.25)	3.22 (0.27)	3.07 (0.27)	4.61 (0.22)
Catastrophizing	3.35 (0.26)	3.12 (0.26)	4.17 (0.27)	3.02 (0.26)	2.41 (0.25)	3.95 (0.25)
Avoidance	2.27 (0.27)	1.37 (0.22)	3.07 (0.27)	1.23 (0.19)	0.93 (0.20)	3.17 (0.27)
Distraction	2.32 (0.24)	2.15 (0.26)	2.58 (0.29)	2.03 (0.27)	2.07 (0.24)	2.78 (0.26)
Support seeking	2.45 (0.27)	3.38 (0.27)	4.35 (0.26)	2.15 (0.28)	3.60 (0.29)	4.45 (0.21)
Problem solving	4.40 (0.21)	4.40 (0.24)	4.18 (0.23)	5.13 (0.18)	5.28 (0.15)	4.55 (0.18)

compassion and distraction, support seeking, and problem solving. The η^2_G values for these findings are "small" according to Cohen's description. To explore the magnitude of the significant effects in terms of the scales used, we regressed the centered self-compassion measure onto the ratings. The regression coefficients (b) and correlation coefficients (*r*) for each measure for the significant effects were as follows: Catastrophizing (b = −9.55, *r* = −0.54), embarrassment (b = −6.89, *r* = −0.51), anxiety (b = −5.56, *r* = −0.50), rumination (b = −5.53, *r* = −0.39), anger (b = −4.84, *r* = −0.46), avoidance (b = −3.99, *r* = −0.35), and sadness (b = −3.83, *r* = −0.39). The effects are illustrated in **Figure 1** in which the mean ratings for those with low self-compassion (n = 32) vs those with moderate/high self-compassion (n = 28) are plotted. We used the cut scores for low/medium/high self-compassion suggested by Neff[43] to form the groups rather than the sample-dependent median split method. Only 4 participants scored above the high cut point, and we combined these with the moderate group.

The second notable feature was that there was no evidence that variation in self-compassion interacted with variation in the manipulated content of the vignettes, ie, the presence vs absence of pain or the social setting. None of the F-values approached significance, and the values of η^2_G were very small (last 3 columns of **Table 2**). This pattern of data suggested that in this experiment, self-compassion does not interact with the presence or absence of pain or variation in the social setting.

4.5.2. Social context

The effects of variation in the social context and perceived cause of the negation of the social contract, eg, pain vs other, are reported in the columns headed Pain, Setting, and Pain × Setting in **Table 2**. The overall impression given by the pattern of data is that there are predominantly main effects attributable to presence vs absence of pain in the vignette and to variation across the 3 social settings (family vs friends vs work), but there is minimal evidence of interaction effects of the 2 manipulated factors.

4.5.2.1. Pain

The presence of pain in the vignette was associated with reports of anticipated greater affective responses (sadness, anxiety, and anger) and reports of a greater likelihood in engaging in rumination, catastrophizing, and avoidance (**Figure 2**, Panel A) but less likelihood of engaging in problem-solving activity. There was no effect of the presence of pain with respect to anticipated embarrassment or the likelihood of distraction or support-seeking activity. The values of η^2_G would be classified as small using Cohen's descriptive nomenclature.[9]

Table 2

Generalized η^2_G values for all main effects and interactions.

	Between subjects	Within subjects					
					Self-compassion interaction		
	Self-compassion	Pain	Social setting	Pain × social setting	Pain	Social setting	Pain × social setting
	df = 1,58	*df* = 1,58	*df* = 2,116	*df* = 2,116	*df* = 1,58	*df* = 2,116	*df* = 2,116
Negative affect							
Sadness	**0.019***	**0.046***	**0.037†**	*0.011*	*0.001*	*0.001*	*0.020*
Anxiety	**0.030***	**0.020†**	**0.060†**	**0.061†**	*0.001*	*0.012*	*0.011*
Anger	**0.023***	**0.056***	**0.109***	*0.023*	*0.002*	*0.018*	*0.010*
Embarrassment	**0.039***	*0.009*	*0.032*	**0.030†**	*0.000*	*0.007*	*0.001*
Cognitive–behavioral							
Rumination	**0.031†**	**0.029***	**0.129***	*0.011*	*0.011*	*0.016*	*0.003*
Catastrophising	**0.090***	**0.024***	**0.133***	*0.006*	*0.002*	*0.008*	*0.008*
Avoidance	**0.015†**	**0.023†**	**0.222***	*0.022*	*0.002*	*0.004*	*0.003*
Distraction	*0.002*	*0.001*	**0.032†**	*0.005*	*0.002*	*0.014*	*0.002*
Support seeking	*0.006*	*0.000*	**0.232***	*0.006*	*0.000*	*0.002*	*0.008*
Problem solving	*0.001*	**0.062***	*0.020*	*0.006*	*0.002*	*0.017*	*0.001*

Significance values of $*p < 0.001$, and $†p < 0.01$.

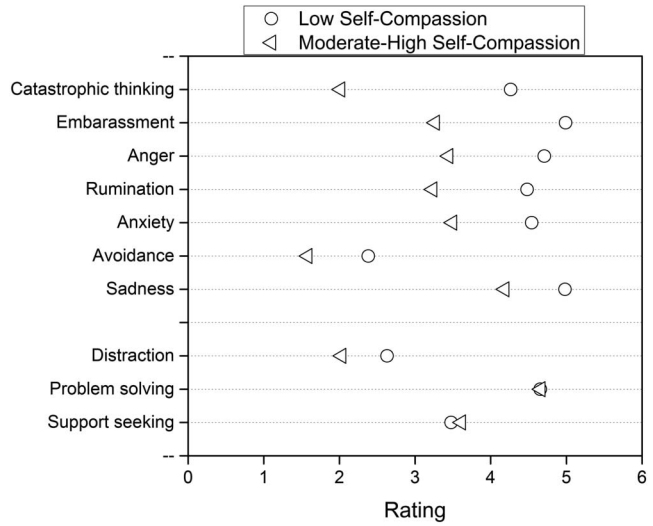

Figure 1. The plot illustrates the magnitude of the main effect for self-compassion for the response scales where a significant effect ($P < 0.01$) was observed and shows the mean ratings for participants with low self-compassion (n = 32) and for those with moderate and high self-compassion (n = 28).

4.5.2.2. Social setting

The variation in social setting was also associated with anticipated differences in negative affect, with the exception of embarrassment. In comparison with the pain factor, variation in social setting had a more marked effect on the reported likelihood of all the cognitive–behavioral coping responses with the exception of problem solving. The η^2_G values for the cognitive–behavioral responses were generally larger, and using Cohen's terminology, they would be categorized as medium rather than small. The a priori defined contrasts ($\alpha < 0.01$) indicated that the work setting was associated with greater sadness ($P < 0.01$), anxiety ($P < 0.001$), and anger ($P < 0.001$) in comparison with the combined family and peer settings (**Figure 2**, Panel B). Similarly, the work setting was associated with greater anticipated likelihood of catastrophizing, avoidance, rumination, and distraction but less support seeking (P-values for all contrasts <0.001) (**Figure 2**, Panel C). There were few differences for the second a priori contrast (family vs peers). Participants rated the likelihood of avoidance as less when their peer group was present ($P < 0.01$), but in the same context, they thought that they would be more likely to engage in problem-solving activity ($P < 0.01$).

There was minimal evidence of interaction between the pain and social setting factors. The significant interactions ($P < 0.01$) were restricted to the anticipated emotional states of anxiety and embarrassment. The source of the interaction is shown in **Figure 2**, Panel D. The anticipated experiences of anxiety and embarrassment were greater when experiencing pain in the presence of peers.

4.6. Correlational data

We computed several sets of correlations to explore the relationship between responses to the vignettes and other measured variables. When n = 60, the critical value for r for a two-tailed test with $\alpha = 0.01$ is 0.33.

The ratings for each of the 10 vignette response variables were averaged over the 6 vignettes. There were no significant correlations between the average vignette response ratings and the participants' ratings of pain or with the duration of pain, the age at onset of pain, or other demographic characteristics. Similarly, there was no observed relationship between the positive outlook subscale score of the DAPOS with vignette response. Unsurprisingly, the 2 affective (depression and anxiety) subscales of the DAPOS correlated positively with the affective ratings (median $r = 0.42$; range, 0.28 [nonsignificant] to 0.59) and with the ratings of rumination and catastrophizing (median $r = 0.45$; range: $r = 0.39$-0.58) and correlated negatively with the SCS (Depression, $r = -0.70$ and Anxiety, $r = -0.52$). The later correlations confirm the previously observed relationships between mood and self-compassion.

The relationship between responses to the vignettes and the self-reported measure of social role performance (SPRQ) was also explored. We conjectured that of the 3 SPRQ scales, associations between vignette ratings would be more likely for the role difficult measure as opposed to either role salience or role importance. Overall, there were few significant relationships (30 correlations in total) between the vignette measures and the SPRQ, but the role difficulty subscale correlated with the embarrassment ($r = 0.38$) and avoidance ($r = 0.34$) ratings.

5. Discussion

Higher levels of self-compassion were associated with lower intensities of negative emotion and less likelihood of rumination, catastrophizing, and behavioral avoidance regardless of whether the context contained pain-relevant or nonpain information. These findings are consistent with previous research that indicates that self-compassion is associated with emotional resilience[64,70] and reduced likelihood of engaging in coping responses that are associated with poorer mental health and well-being.[32,33,46,57] Importantly, there was no interaction between self-compassion and the presence of pain in the vignette. The effect of self-compassion was consistent across social contexts despite the likely variation in personal significance and implication for social status across the 3 contexts depicted.[14,25]

Could the associations between the SCS covariate and responses to the vignettes be accounted for by generalized negative affect, criterion contamination, or method variance? While these cannot be definitively excluded, there are factors that counter these explanations. The definition of self-compassion includes "attention and intention towards alleviating distress."[36] Self-compassion is a response to negative affect. It is associated with the presence of negative affect, but it is not negative affect per se. There are 2 differences between the measure of self-compassion and the affect ratings completed by the participants. While the SCS aims to assess this reflexive component, the scale is not perfect and there are some items that make a reference to negative emotion, eg, feeling of inadequacy, but these are in the minority. In addition, only 4 of the 10 ratings directly assessed affect; the other 6 assessed expected cognitive–behavioral responses. Indeed, we would expect these ratings to be subject to greater criterion contamination with the SCS, as both measures assess a response, but the effects here were variable in comparison with the 4 affect ratings. With respect to method variance, the vignettes required participants to generate their expected responses to scenarios before making their ratings rather than simply endorse predefined categories as in the SCS.

It seems unlikely that the consistent effect of self-compassion is an artifact of a general response bias because there was systematic marked variation in the pattern of responses to the different vignettes. Vignettes in which pain was depicted as the cause of social interruption and negative social consequences

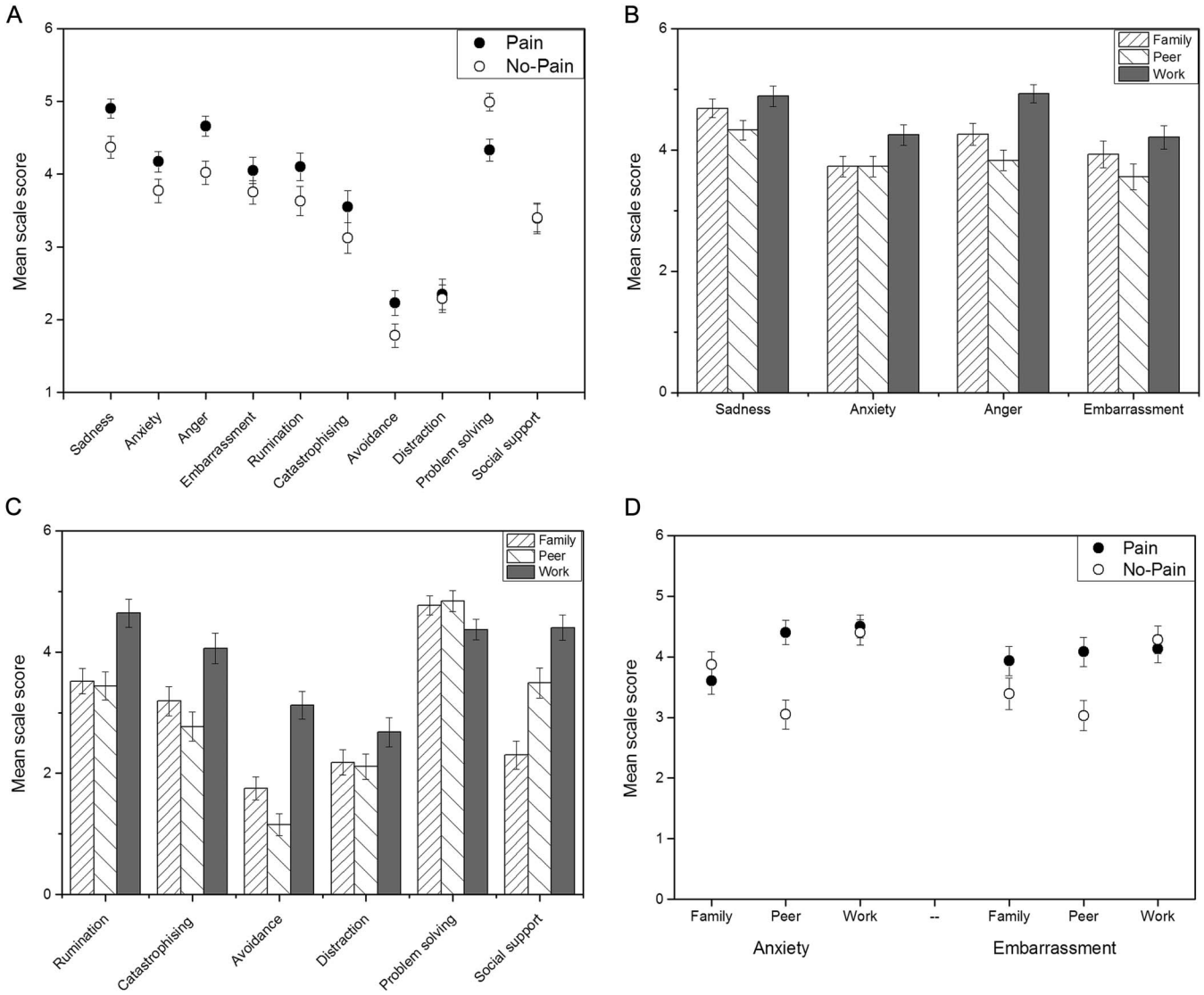

Figure 2. Responses to vignette characteristics. All responses were made on a 0 to 6 numerical rating scale. The data are covariate-adjusted marginal mean values and SEs. Panel A shows the mean responses for the vignettes in pain and nonpain conditions. Panel B shows the mean values for ratings of anticipated emotions on the affect scales for sadness, anxiety, anger, and embarrassment for the 3 social settings. Panel C shows the data for the rating of likely cognitive–behavioral responses across the 3 social settings. Panel D shows the interaction of pain and social settings for anxiety and embarrassment.

were associated with higher levels of sadness, anxiety, and anger, a higher reported likelihood of rumination, catastrophizing, and behavioral avoidance but a lower reported likelihood of problem solving. Several factors may have contributed to the responses to pain-relevant events. The degree of perceived threat associated with pain might have been higher than that occurring for nonpain-relevant events. Second, the literature suggests that the incorporation of self-with-pain into one's identity is associated with significant internalized stigma and shame.[7,60,66] Vignettes, which depicted a work scenario, were associated with greater ratings of emotion and likelihood of rumination, catastrophizing, avoidance, and distraction but less likelihood of engaging in problem solving. The variation between social settings is consistent with findings that social context is an influential factor regarding the degree of distress experienced, as well as the likelihood of maladaptive coping strategies, in response to negative events in a chronic pain population.[7,26,60,66] Failure in an occupational context may have greater significance because it poses a public threat to social identity, as well as financial security.[14,25] Hughes and Huby (Ref. 28, page 384) note that there is potential for the vignettes not to match the participants' real-world experience. We attempted to mitigate this problem and to ensure validity in the development of the vignettes by extensive sampling of the literature, consultation, and through clinician and patient ratings. The attempt to develop realistic vignettes was traded off against a high degree of standardization, ie, keeping the content of the vignettes constant apart from 1 or 2 key elements. Nevertheless, the use of only 6 vignettes limits the generalizability of the conclusions, and replication with additional vignettes is desirable as would be the development of realistic laboratory tasks. Differences between the social settings might also be attributable to extraneous features in the vignettes rather than the manipulated content. In the absence of replication across social settings using other vignettes, there is no way within the current data set to disambiguate the 2 interpretations, namely the specific vs nonspecific (extraneous) features of the vignette. Further potential limitations were the constrained nature of the vignettes and the

range of responses available. In the vignettes, actors were depicted as allowing pain to interrupt the social contract with negative social consequences. This might not necessarily have been consistent with participants' typical responses, and the use of limited set of cognitive–behavioral options may not have captured the full range of potential participant responses.

We consider several plausible alternative explanations for the findings. The association between self-compassion and depression is consistent with previous research, but we note that correlations do not necessarily imply construct redundancy c.f.[24] The correlation between self-compassion and depression may be a function of item contamination because the items in the DAPOS depression scale predominantly employ items that depict self-critical and self-blaming cognitions, eg, "I am disappointed with myself." These items also load highly when measuring self-compassion.[47,58] There is evidence that self-compassion attenuates depression and anxiety by lowering depressive rumination, indicating a primary effect of self-compassion.[56] Second, social desirability can influence responding to vignettes,[38] and we tried to obviate this bias by using character names in the vignettes to provide a level of externalization and asking participants to complete the vignette ratings independently. Future studies examining self-compassion, social functioning, and chronic pain might benefit from the inclusion of direct observations chronic pain patients' social behavior and responses. Third, we consider the possibility of a biased sample. Comparing the demographics in this study with the UK National Pain Audit suggests that the sample was consistent with that found in pain services in terms of age and gender.[65] The levels of self-compassion found in the study are similar to those reported in other chronic pain populations[10] in the United Kingdom. The fact that a significant proportion of our sample was not in employment may have influenced responding to the work-related vignettes. Finally, the results might be a statistical artifact. However, we set both a conservative α level ($P < 0.01$) and effect size (η^2_G) estimator.

5.1. Clinical implications

The results suggest that self-compassion may be one mechanism by which the impact of maladaptive cognitions in response to unpleasant self- and pain-relevant events might be significantly attenuated in a chronic pain population. As the arousal of negative emotions can trigger, maintain, or exacerbate pain and is associated with poorer adjustment to pain overall,[30,35] the potential for self-compassion to positively influence emotion regulation in response to negative events in a chronic pain population has implications for improvements in psychological well-being and adjustment. In addition, the findings that self-compassion was associated with lower levels of catastrophizing, rumination, and avoidance suggest that enhancing self-compassion may have a beneficial effect given the evidence that "negative" cognitive styles have a detrimental impact on pain-related coping and adjustment.[35] For example, avoidance responses to pain have been postulated as central to pain-related functioning and social disability.[3,12]

The relationship between self-compassion and affect regulation has been extensively considered by Gilbert.[21] He proposes that self-compassion activates a self-soothing affect regulation system underpinning mammalian attachment and kinship. Affiliative and attachment relationships have a physiologically soothing quality, which not only reduce threat sensitivities but also alter pain thresholds.[11,18,52] The theoretical implication is that self-compassion may provide the means to replicate this process intrapersonally. We are unaware of any published studies documenting the effects of a compassion-focused intervention in a chronic pain population, although the results of a loving-kindness meditation showed promising results in terms of pain reduction and adjustment.[2] Gilbert has documented compassion-focused therapeutic interventions in other clinical populations in which enhanced psychological well-being, lower self-criticism, and self-attacking were reported.[9] Neff et al.[46] also documented the effectiveness of brief therapy in enhancing self-compassion using a Gestalt technique intended to reduce self-criticism and facilitate greater self-compassion. This theorized regulation of difficult emotions is consistent with our findings that people with a greater ability to be self-compassionate reported they would feel lower intensities of emotion in response to unpleasant self-relevant events.

6. Conclusions

This is essentially a proof-of-concept study demonstrating an association between self-compassion and responses to unpleasant social events in chronic pain. Experimental manipulation of self-compassion is required to establish the causal sequence. Techniques based on clinical interventions might be adapted for this purpose.[23] The measure of self-compassion was a single scale whose construct validity has yet to be fully established. Further experimental research is required to demonstrate that self-compassion has incremental validity and utility beyond more general constructs such as negative affectivity in accounting for variation in responding when pain is present.

Conflict of interest statement

The authors have no conflicts of interest to declare.

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Appendix A. Supplemental Digital Content

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