Self-discrepancies in work-related upper extremity pain: Relation to emotions and flexible-goal adjustment

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ABSTRACT

Recurrent pain not only has an impact on disability, but on the long term it may become a threat to one's sense of self. This paper presents a cross-sectional study of patients with work-related upper extremity pain and focuses on: (1) the role of self-discrepancies in this group, (2) the associations between self-discrepancies, pain, emotions and (3) the interaction between self-discrepancies and flexible-goal adjustment. Eighty-nine participants completed standardized self-report measures of pain intensity, pain duration, anxiety, depression and flexible-goal adjustment. A Selves Questionnaire was used to generate self-discrepancies. A series of hierarchical regression analyses showed relationships between actual–ought other, actual–ought self, actual–feared self-discrepancies and depression as well as a significant association between actual–ought other self-discrepancy and anxiety. Furthermore, significant interactions were found between actual–ought other self-discrepancies and flexibility, indicating that less flexible participants with large self-discrepancies score higher on depression.

This study showed that self-discrepancies are related to negative emotions and that flexible-goal adjustment served as a moderator in this relationship. The view of self in pain and flexible-goal adjustment should be considered as important variables in the process of chronic pain.

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1. Introduction

Chronic pain often is associated with diminished functional abilities (Ostelo et al., 2005; Vlaeyen and Morley, 2005) and a disparity between a persons' views of self (Chapman and Gavrin, 1999; Harris et al., 2003; Morley and Eccleston, 2004). The chronic pain patient is faced with a need to re-examine his/her sense of self and matching goals and beliefs (Brandtstädter and Renner, 1990). Although several studies mention the loss of self in pain (Johansson et al., 1999; Morley and Eccleston, 2004; Lundberg et al., 2007; Smith and Osborne, 2007), there are few studies that examine the self in relation to chronic pain. Self-Discrepancy Theory (SDT) provides a useful theoretical framework for considering the emotional influences of pain experience on the self (Higgins, 1987, 1999). Discrepancies between who one believes oneself to be and

who one would like to be (ideal self) or ought to be (ought self), are assumed to elicit emotions of agitation (anxiety) and dejection (depression) respectively. Another important self, the feared self (who one fears one might become) has been proposed by Carver and Scheier (1990). A key aspect of SDT is that people are motivated to reduce the discrepancies between the self states, using strategies which best go together with their dominant self-discrepancy (actual–ought, actual–ideal, actual–feared). In chronic pain, this could imply that patients with different dominant self-discrepancies may experience different emotions and hence behave differently. To date, the role of self-discrepancies has only begun to be explored. For example, Waters and colleagues were the first to find evidence for the predicted relationships between depression and actual–ideal self-discrepancies and between psychological distress and actual–ideal as well as actual–ought self-discrepancies in chronic pain patients (Waters et al., 2004).

This aim of the present study was to examine the role of self-discrepancies in patients with work-related upper extremity pain disorder (WRUED). WRUED-patients are often described as perfectionists and overcommitted workers (Heuvel van den et al., 2007),

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we hypothesised that mainly ought self-discrepancies are present and related to negative emotions. In addition to testing the basic predictions of SDT we were also interested in the possible impact of variation in flexible-goal adjustment on emotional adjustment. In a study of assimilative (e.g. self-corrective actions to maintain goals) and accommodative coping (e.g. re-evaluation of personal goals), Schmitz et al. (1996) found that the ability to flexibly adjust personal goals attenuated the negative impact of the pain experience on psychological well-being. We tested the hypothesis that the relationship between pain experience, emotional adjustment and self-discrepancies is moderated by individual differences in how individuals adjust to the pursuit of goals in the face of obstacles. Individuals with flexible-goal adjustment are expected to experience comparatively less discrepancy between their actual and ought selves, and have less depressive emotions; to experience greater discrepancy between actual and feared selves, and to be less depressed and anxious.

More knowledge about the way chronic pain may influence the self as a result of the above mentioned discrepancies, might improve both the assessment and treatment of the large number of individuals seeking help for their chronic pain complaints.

2. Methods

2.1. Participants

Participants were recruited from one rehabilitation ward in an academic hospital and one health and safety executive in the Southern Part of the Netherlands. Participants were referred to these authorities because their work was interfered because of their pain. Inclusion criteria were: aged between 18 and 65 years, labeled as having pain in the upper extremities (arm, neck, shoulder), able to read and write in Dutch.

Participants were excluded when another specific medical disorder was diagnosed which required medical treatment. Participants with other a-specific pain problems at other locations were included.

2.2. Design

This study was a cross-sectional study with a single group. The sample size was based on (Morley et al., 2005), and determined using an algorithm suggested by Tabachnick and Fidell (2001) for a power of 80% with $\alpha = 0.05$ and a medium effect size. In this study, 89 subjects are needed to find an R^2 of 0.12.

2.3. Measures

In addition to the basic demographic (age, gender, education) and medical descriptive data (pain duration, use of medication and therapies) the following variables were assessed.

2.3.1. Pain intensity

Visual analogue scales (VAS; 100 mm) were used to measure pain at its highest intensity, pain at its lowest intensity and pain at its usual intensity. Since correlations between these three VAS scores were all significant at a 0.01 level, in further analysis the mean pain VAS scores were entered as a composite score.

2.3.2. Mood states

Seven visual analogue scales (VAS; 100 mm) were used to measure the following emotions that had accompanied the pain over the past week; anxiety, sadness, happiness, alertness, frustration, pride, and shame (Morley et al., 2005).

2.3.3. Depression

The Beck Depression Inventory – II (BDI; Beck et al., 1996) was used to measure depression. The BDI-II is a 21 item self-report measure of depressive symptomatology. Each item has four possible responses, ranging from 0 to 3, with 0 indicating absence of the symptom 3 the most intense statement. The conventional cut points for mild, moderate and severe depression are: <10, minimal depression; 10–19, mild depression; 20–29, moderate depression; >30, severe depression. The internal consistency and the construct validity of the BDI are good.

2.3.4. Anxiety

The trait version of the State-Trait Anxiety Inventory (STAI-T; Spielberger et al., 1970) is a self-report measure of trait anxiety and contains 20 items rated on a four-point scale, with 1 indicating no anxiety and four very anxious. STAI-T scores range between 20 and 80. A score of 50 labels a respondent as "anxious". The scale is highly valid and reliable (Spielberger et al., 1970; Van der Ploeg et al., 1980).

2.3.5. Upper-extremity functioning

The Upper Extremity Function Scale (UEFS) measures how participants perceive symptoms affect their overall function on daily activities. It is an eight item self-report measure in which each item has ten possible responses (1 = no problem to 10 = cannot do the activity); total scores range from 8 to 80. The UEFS has high internal consistency ($\alpha = 0.83$–0.93) and is correlated with measures of pain (Pransky et al., 1997). Although this was not a hypothesis, we expected that less functioning would be associated with larger discrepancies between the actual and ought self and with smaller discrepancies between the actual and feared self (Morley et al., 2005).

2.3.6. Self-discrepancies

Self-discrepancies were assessed with a modified semi-structured interview version of the Hardin's Selves Questionnaire (Hardin and Leong, 2005). This questionnaire was developed to address the criticism of the original Selves questionnaire of Higgins et al. (1985), which was thought to be too difficult for patients to complete and may limit the ability to obtain unique self-representations. The questionnaire (Hardin and Leong, 2005) combines idiographic and nomothetic methods, which allows participants the opportunity to not only generate attributes most salient to themselves, but also provides help to those participants for whom the task of idiographically generating attributes is too difficult. Discrepancies from two domains of the self were measured; ought (attributes a person feels obligated to possess) and feared (attributes a person does not want to possess). According to SDT actual–ought self-discrepancies lead to agitation-related emotions (e.g. guilt, anxiety and fear), whereas actual–feared self-discrepancies give rise to dejection-related emotions (e.g. disappointment, frustration, dissatisfaction) as well to agitation-related emotions (Carver et al., 1999). Consistent with Higgins's original approach (Higgins et al., 1985), participants were first asked to generate a list of five attributes for each domain of the self, from their own perspective and from the perspective of a self-generated significant other, resulting in four self-states (ought-own, ought-other, feared-own, feared-other). For example, for the actual–ought self respondents were instructed to enter five attributes/qualities that they ought to be or that they ought to possess, seen from their own perspectives. Thus for each self-state the participant entered up to five attributes. If fewer than five attributes were generated, participants were shown a list of 100 attributes from which they could choose additional words. Examples of attributes on the list were aggressive, ambitious, independent, pessimistic and unhappy. Second, participants were asked to rate the extent to which

each of the 20 attributes describing their ought and feared selves applied to them at the current time on a five-point rating scale, where 1 = does not apply to me at all, to 5 = completely applies to me. If for example the participant mentioned "independent" as one of the actual–ought (own) self attributes, then the participant was instructed to rate the extent to which being independent describes your actual–ought self at the moment. For the actual–feared self the instructions were: "Please rate the extend to which being (f.e.) unhappy describes your actual–feared self seen from your own perspective at this moment."

By doing so, the participants directly rated the extent to which they perceived a discrepancy between their actual self and the two target selves. So for the actual–ought self-discrepancy a higher score indicates a smaller discrepancy between the actual self and the ought self and a small score means a more detrimental state. For the actual–feared self-discrepancy a higher score indicates a more detrimental state, which means that the distance between who you are at the moment and who you fear to become is small. The internal consistency of the ideal, ought and feared self-discrepancy were satisfactory ($\alpha = 0.73–0.88$). Psychometric evidence to support the validity of the SDT was presented by Hardin and Leong (2005); significant correlations were found between the actual–ideal discrepancies and depression, between actual–ought discrepancies and anxiety and between actual–feared discrepancies and both type of emotions.

2.3.7. Flexible-goal adjustment (FGA)

Flexible-goal adjustment was measured with the Brandstädter and Renner Questionnaire (Brandtstädter and Renner, 1990). The flexible-goal adjustment scale describes the tendency to adjust personal goals and standard to situational limitations. The questionnaire consists of 15 items. Each item has five possible answers (totally agree to not agree at all); total scores range from 0 to 60. The internal consistency is satisfactory ($\alpha = 0.80$) (Brandtstädter and Renner, 1990). For FGA negative correlations were reported with depression (Brandtstädter and Renner, 1990) and positive correlations with life satisfaction and optimism (Brandtstädter and Renner, 1990) and happiness and self-acceptance (Mueller and Kim, 2004).

2.4. Procedure

Five participants were recruited from the rehabilitation ward and eighty-four participants from the health and safety executive. After informed consent was obtained a series of questionnaires was completed by the participants. The interview took place either at the Maastricht University or at the workplace of the participant. The interview started with the collection of demographic questions. To control for possible sequential effects of emotions on the selves, the participants were randomly divided into two groups; the first group started with the Selves Questionnaire followed by the remaining measures. The second group finished the interview with the Selves Questionnaire.

2.5. Statistical analysis

Data of all 89 subjects were used for the analysis. First the data were checked on their distributions and for possible outliers. For data with a skewness <2 the square root was used, when skewness >2 a $\log_{10}$ transformation was used. One-way ANOVAs were performed to identify possible order effects in the administration of the questionnaires. Descriptive statistics of the sample and Pearson correlations were carried out to analyze hypothesized associations. Variables were centred prior to the further analysis. A total of four separate hierarchical multiple regression models were constructed to test the hypothesised role of self-discrepancies and their inter-

action with flexible problem solving on two dependent variables, depression (BDI) and trait anxiety (STAI-T). For each dependent variable two models were constructed: one for the actual–ought self-discrepancies and one for the actual–feared discrepancies. In each model both the 'own' and 'other' perspectives were included simultaneously. After controlling for demographic variables, age and gender (step 1) and pain characteristics, duration and intensity (step 2), the relevant self-discrepancies were entered in step 3. In step 4, flexibility and the interaction terms between flexibility and the relevant self-discrepancies were entered. In the case of a significant interaction further analysis using the protocol outlined by Aiken and West was followed (Aiken and West, 1991).

3. Results

3.1. Descriptive analysis and mood states

Eighty-nine respondents with WRUED participated in the study, of which 57% were men with a mean age of 38 ($SD = 10.74$) and an average duration of pain since onset of 2 years ($SD = 0.67$). Two-thirds of the respondents were highly educated (higher technical and vocational training and university training), all participants were still active at work. Scores on mood states (VAS) were low, indicating that respondents were not currently anxious ($M = 0.96$; $SD = 0.45$), sad ($M = 0.68$; $SD = 0.49$) or ashamed ($M = 1.11$; $SD = 0.35$). They were mildly frustrated ($M = 31.05$; $SD = 22.92$), somewhat more proud ($M = 51.94$; $SD = 18.02$) and alert ($M = 58.56$; $SD = 18.62$). In contrast, they rated themselves as not very happy ($M = 23.52$; $SD = 18.76$). Table 1 shows the means and standard deviations for the measures of negative affect, pain, discrepancies, upper-extremity functioning and flexibility. All participants completed the self-questionnaire and the other questionnaires. There were no effects for the order in which the tests were administered (all $P > .05$).

3.2. Pain and distress

The mean scores on the highest, lowest and actual pain VAS were respectively $M = 54.9$ ($SD = 23.45$), $M = 7.92$ ($SD = 8.51$) and $M = 26.00$ ($SD = 20.74$). The composite score of pain intensity was $M = 29.61$ ($SD = 14.26$), which suggests somewhat lower pain levels compared to an other sample of non-clinical WRUED patients in the Netherlands ($M = 41.5$; $SD = 25.4$) (Roelofs et al., 2007). The mean scores on the BDI was $M = 7.90$ ($SD = 5.12$), indicating no depression. Mean score on the STAI-T was $M = 40$ ($SD = 8.88$). Pain intensity was positively correlated with the BDI ($P < .01$) and with the mood states anxious, sad, ashamed, frustration and happiness. Significant correlations ranged from $r = 0.24$ to $r = 0.47$ ($P < .05$).

3.3. Upper-extremity functioning and flexible-goal adjustment

The mean score for upper-extremity functioning was $M = 28.08$, indicating that compared with WRUED patients (Pransky et al., 1997) the participants experienced relatively few problems undertaking the activities represented in the UEFS. A mean score of $M = 36.89$ on FGA suggests that participants on average did not assimilate their earlier goals and were less flexible compared to a general population sample (Brandtstädter and Renner, 1990).

3.4. Self-discrepancies

Mean scores on the self-discrepancy measure were: the actual–ought own ($M = 3.92$; $SD = 0.53$), actual–ought other ($M = 3.62$; $SD = 0.73$), actual–feared own ($M = 1.04$; $SD = 0.28$), and actual–feared other ($M = 2.31$; $SD = 0.94$). Higher scores on the actual–ought

Table 1
Means standard deviations and correlations between the different measures.

Variable (range)	α	Mean	SD	A	B	1	2	3	4	5	6	7	8	9
A. Age		37.94	10.74											
B. Gender ♀%		43%		−0.17										
1. Actual–ought own (1–5)	.64	3.92	0.53	0.32**	0.11									
2. Actual–ought other (1–5)	.75	3.62	0.73	0.09	0.07	0.29**								
3. Actual–feared own (1–5) (SQRT)	.73	1.04	0.28	−0.04	−0.10	−0.27*	−0.23*							
4. Actual–feared other (1–5)	.75	2.31	0.94	0.16	0.09	0.00	−0.22*	0.59**						
5. Pain intensity (0–100 mm)		29.61	14.26	−0.14	0.21*	−0.03	0.08	0.16	0.15					
6. Pain duration (years) (SQRT)	.64	1.93	0.67	0.34**	0.05	0.11	0.28**	0.05	0.09	0.24*				
7. Depression (BDI: 0–63)	.78	7.90	5.18	.06	0.23*	−0.19	−0.24*	0.32**	0.22*	0.35**	0.09			
8. Trait anxiety (STAI: 20–80)	.90	39.99	8.88	−.04*	0.12	−0.21*	−0.27*	0.28**	0.14	0.08	−0.07	0.57**		
9. Upper-extremity functioning (UEFS: 8–80)	.86	28.08	14.79	−.01	0.55*	0.00	−0.08	0.04	0.09	0.49**	0.21*	0.48**	0.23*	
10. Flexible-goal adjustment (0–60)	.80	36.89	7.35	0.10	−0.10	0.26*	0.24*	−0.32**	−0.29**	0.02	−0.03	−0.36**	−0.53**	−0.10

SQRT = Square route.
* Pearson correlations is significant at $P < .05$.
** Pearson correlations is significant at $P < .01$.

(both own and other) discrepancies denote less discrepancy between the two selves, whereas higher scores on the actual–feared discrepancies denote smaller discrepancy between the selves. Hardin and Leong reported self-discrepancies of healthy Asian Americans and European Americans of respectively $M = 2.41$ ($SD = 0.73$) and $M = 2.01$ ($SD = 0.59$) for actual–ought self-discrepancies and respectively $M = 1.89$ ($SD = 0.65$) and $M = 1.61$ ($SD = 0.51$) for actual–feared self. Compared to these healthy subjects the self-discrepancies of our population are moderate to small (Hardin and Leong, 2005). Thus on average the current sample regarded their actual and ought selves as being moderately proximate to each other. In addition the mean value of the actual–feared own discrepancy was almost one, which indicates that the distance between their actual self and the person they fear to become was almost at the maximum possible. However, when the perspective of the other was taken the feared self was nearer to the actual self. In contrast the feared self seen from the viewpoint of a significant other was moderately distant to the actual self. The correlations between the different self-discrepancies are presented in Table 1. Except for actual–ought own and actual–feared other, all of the self-discrepancies were significantly related to each other, with correlations varying between $r = 0.22$ and $r = 0.59$. The negative correlations between ought and feared selves indicate that the smaller the actual–ought discrepancy, the larger the actual–feared discrepancy.

3.5. Self-discrepancies and its relation to pain, emotions and flexible-goal adjustment

Pearson correlation coefficients showed a significant association between actual–ought own discrepancies and age ($r = 0.32$; the older the participant, the smaller the discrepancy between actual–self and ought own self) and between actual–ought other and pain duration ($r = 0.28$; the longer the pain, the smaller the discrepancy between actual–self and ought other self). There were no correlations between the other self-discrepancies and pain duration and all self-discrepancies and pain intensity, gender and age (see Table 1).

In line with the prediction from the Self-Discrepancy Theory the first order correlations for the actual–ought self-discrepancy and anxiety and for actual–feared self-discrepancy and both anxiety and depression were significant. With the current sample size ($n = 89$), a correlation of $r > 0.21$ is required for significance at $P < 0.05$: an $r = 0.2$ is equivalent to an effect size of $d = 0.41$. Overall the relationship between self-discrepancies and measures of emo-

tional adjustment are reflected in a medium effect size. There were significant associations between FGA and all four self-discrepancy measures; the more flexible the participants were in adjusting their goals, the smaller the discrepancy between the actual and ought-self (own and other) and the greater the distance between the actual and feared self (own and other). Since there were no significant associations between self-discrepancies and upper-extremity functioning, this variable was not included in the further regression analyses.

3.6. Interaction between self-discrepancies, emotions and flexible-goal adjustment

Table 2 shows the results of the stepwise multiple regression analyses for the BDI as the dependent variable and the self-discrepancies as independent variables. In blocks 1 and 2 the contribution of the demographics and pain variables were checked. Block 3 specifies the main effect of the self-discrepancies actual–ought own and actual–ought other (model a) and the self-discrepancies actual–feared own and feared other (model b) on depression which showed that actual–ought self-discrepancies and actual–feared self-discrepancies were significantly associated with the BDI score, each explaining 11% of the variance. This means that participants with larger discrepancies between who they currently are and who they feel obliged to be are more depressed as well as participants with smaller discrepancies between their actual self and the person they fear to become, are more depressed. In this, the contribution of actual ought-other self-discrepancy and the actual feared-own self-discrepancy were significant. In the final block of the regression analyses, the interaction with flexibility was added to the model. For the actual ought-other self-discrepancy a statistically significant interaction was found between self-discrepancy and flexible-goal adjustment ($\beta = -0.29$, $SE = 0.13$, $P < 0.05$); for less flexible respondents, larger ought-other self-discrepancies result in higher scores on the BDI, whereas for high flexible respondents, depression ought other self-discrepancies are not associated with depression. Fig. 1 presents a graphical representation of the interaction between actual–ought self-discrepancies and flexible-goal adjustment in the prediction of BDI. As can be seen, for respondents with low flexible-goal adjustment the relationship between depression and actual ought-other self-discrepancy is negative ($\beta = -0.40$, $SE = 0.14$, $P = 0.014$), whereas for respondents who are highly flexible there is a non significant positive association ($\beta = 0.16$, $SE = 0.19$, $P = 0.35$).

Table 2
Summary of the stepwise multiple regression analyses for depression and self-discrepancies, with interaction self-discrepancies (SeD) and flexibility.

Model steps	Variables entered	Standardized β	B	SE B	R^{2a}	P
Blocks						
1. Demographics	Age	0.06	0.06	0.11	0.04	ns
	Gender	0.21	0.41	0.22		
2. Pain	Pain duration	−0.05	−0.05	0.12	0.05	ns
	Pain intensity	0.24[*]	0.24	0.11		
3a. SeD	Actual–ought own	−0.14	−0.15	0.12	0.11	0.01
	Actual–ought other	−0.26[*]	−0.27	0.12		
4a. SeD * Flexibility	Actual–ought own * flexibility	−0.16	−0.15	0.12	0.12	0.01
	Actual–ought other * flexibility	0.29[*]	0.30	0.13		
	Flexibility	−0.32[*]	−0.32	0.10		
3b. SeD	Actual–feared own	0.33[*]	0.32	0.13	0.11	0.05
	Actual–feared other	0.031	0.03	0.13		
4b. SeD * Flexibility	Actual–feared own * flexibility	−0.19	−0.17	0.12	0.08	ns
	Actual–feared other * flexibility	0.07	0.080	0.14		
	Flexibility	−0.26	−0.26	0.11		

[a] For blocks 2–4 the value of the R^2 is the incremental R^2 value for that block.
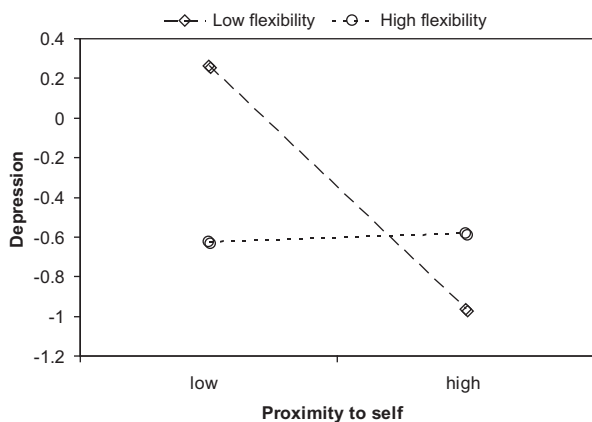
Fig. 1. Graphical representation of the interaction between proximity to the ought-other self-discrepancy and flexibility in the prediction of depression (z-scores).

Table 3 shows the results for trait anxiety as dependent variable and the self-discrepancy scores as independent scores. In line with the previous analysis, the contribution of the actual–ought other self-discrepancy and the actual–feared own self-discrepancy was significant, explaining respectively 12% and 8% of the variance. There was no statistical significant interaction between self-discrepancies and flexible-goal adjustment. The significant R^2 in step 4 of the models were attributable to the main effects of flexible-goal adjustment ($R^2 = 0.067$, $P < 0.05$; $R^2 = 0.235$, $P < 0.01$) for the ought and feared discrepancies respectively.

4. Discussion

To the best of our knowledge, we believe that this is the first study examining the relationship between self-discrepancies and negative emotions and their explanatory variance in participants with WRUED. The study has several interesting findings. First, as hypothesized self-discrepancies were related to negative emotions. Larger ought self-discrepancies and smaller feared self-discrepancies were significantly related to more depression and higher anxiety. Second, pain duration, pain intensity and daily functioning, were not related to magnitude of the discrepancies between the actual and the ought self, or to the actual and the feared self-discrepancies. Finally, significant interactions were found between self-discrepancies and flexible-goal adjustment. Compared with the Waters study (Waters et al., 2004) all self-discrepancies, except for feared-other self-discrepancies and ought-own self-discrepancies, were moderately but significantly correlated with each other (correlations ranging from 0.22 to 0.59). This indicates that the participants with WRUED are able to distinguish between the four types of self-discrepancies, and that each type of self-discrepancies holds a unique aspect of self-discrepancy. The associations between self-discrepancies and both type of emotions (depression as well as anxiety), are not entirely consistent with the original hypothesis of SDT (Higgins, 1987), but are in line with recent studies (Carver et al., 1999; Gramoz et al., 2000; Bruch et al., 2000), which reported that self-discrepancies not only provoke a distinct type of emotion, but both, agitation-related emotions (e.g. anxiety) as well as dejection-related emotions (e.g. depression). The same was recently observed in a chronic pain population (Waters et al., 2004). We did not observe the associations between self-discrepancies and pain intensity and pain duration, except for a positive association between pain duration and actual–ought other self-discrepancies; the longer the individual's pain history, the smaller the discrepancy between the actual self and the person one feels obliged to be, seen from the perspective of the significant other. An explanation for this opposite relationship may be found in the acceptance of living with chronic pain, which stands for the willingness to experience the pain without fruitless attempts to control it and to function with the pain (Viane et al., 2004; McCracken et al., 2007). When a patient finds him/herself in a continuous and usually irreversible situation (such as living with chronic pain), according to the dual-process model of Brandstädter & Renner, one needs to be flexible enough to change or revalue earlier defined goals or uplift the pain situation (Brandstädter and Renner, 1990; Brandstädter and Rothermund, 2002). Possibly in our sample, the respondent addressed oneself more to a significant other and also defined new goals as obliged to fulfill even with the chronic pain. In line with this interpretation, we identified flexible-goal adjustment as a moderator in the relationship between actual–ought other self-discrepancies and negative emotions. Self-discrepancies only gave rise to negative emotions when the participants behaved inflexibly to the consequences of the pain problem only. This implies that in participants with stronger feelings of obligations towards a significant other, certain defensive and tenacious coping mechanisms, such as the urge to control personal goals, overwhelm in the adjustment to the life with pain. The moderating effect did not hold for the actual–feared self-discrepancies,

Table 3
Summary of the stepwise multiple regression for anxiety and self-discrepancies with interaction self-discrepancies (SeD) and flexibility.

Model steps	Variables entered	Standardized β	B	SE B	R^{2a}	P
Blocks						
1. Demographics	Age	−0.02	−0.02	0.11	0.02	ns
	Gender	0.13	0.26	0.23		
2. Pain	Pain duration	−0.04	−0.04	0.13	0.00	ns
	Pain intensity	0.07	0.07	0.12		
3a. SeD	Actual–ought own	−0.06	0.06	0.13	0.12	0.01
	Actual–ought other	−0.33**	−0.34	0.13		
4a. SeD * flexibility	Actual–ought own * flexibility	0.007	0.006	0.11	0.25	0.00
	Actual–ought other * flexibility	0.14	0.14	0.12		
	Flexibility	−0.53**	−0.53	0.10		
3b. SeD	Actual–feared own	0.29*	0.29	0.14	0.08	0.05
	Actual–feared other	−0.02	−0.02	0.14		
4b. SeD * flexibility	Actual–feared own * flexibility	−0.09	−0.08	0.11	0.26	0.00
	Actual–feared Other * flexibility	−0.09	−0.10	0.14		
	Flexibility	−0.51**	−0.51	0.11		

[a] For blocks 2–4 the value of the R^2 is the incremental R^2 value for that block.

although we observed a relationship between flexible-goal adjustment and actual–feared self-discrepancies. Earlier studies indeed showed that in chronic pain, an inflexible coping style is related to negative emotions (Schmitz et al., 1996; Brandtstädter and Rothermund, 2002; McCracken and Vowles, 2007) and that a flexible, so called accommodative coping style is needed to positively reverse the negative emotions. In this coping style, patients accept that the pain is incurable and personal goals are unattainable unless they disengage from blocked goals and fruitless commitments and reorient themselves towards new and more feasible standards. These results seem to suggest that helping patients approaching their goals in a more flexible way might reduce their self-discrepancies and improve their affect and daily functioning. Novel interventions such as Self-System therapy, in which flexibility and its relation to self-discrepant feeling are part of the treatment rationale, are successful in significantly improving psychological well-being (Strauman et al., 2006). Self-System therapy is designed to improve the patient's ability to self regulate in the service of attaining personal goals.

We hypothesized that less upper-extremity functioning would be associated with larger discrepancies between the actual–ought and smaller discrepancies between the actual–feared self. Indeed we observed that prolonged experience of pain is related to functioning; however unlike Morley et al. (2005), there was a lack of association between daily functioning and self-discrepancies. A possible explanation for this can be found in the measurement instrument which appeared to be unsuitable for this purpose. The UEFS-measure only assessed specific activities of daily living (e.g. to open a can, to open a door, to do the dishes) (Pransky et al., 1997), whereas the association between disability and self-discrepancies is more situated at a higher structure of goals and activities (unable to work, socialize, etc.). When a person is unable to open a can, still his higher order goal of being a good parent is within reach. In future studies that examine the relation between self-discrepancies, negative emotions and disability, then inclusion of a more appropriate measure of functioning (or disability) is desirable.

Although we made no predictions with respect to the importance of the different perspectives, the results showed that assessing self-discrepancies from different viewpoints is worthwhile in chronic pain. Originally, Higgins' methodology (Higgins et al., 1985) asked patients to generate self-discrepancies from their own perspective and from the perspective of a self-generated significant other. Nevertheless, combining the own and the other per-

spective in the analysis is consistent with previous self-discrepancy research (Higgins et al., 1985; Hardin and Leong, 2005). We observed the significant other to be crucial in the discrepancy between the actual and the ought self as well as in the perspective of the actual–feared self-discrepancy. Does this mean that the person they are obliged or fear to be is dictated by what they think a significant other demands or thinks? Content analysis of the ought-self in undergraduates revealed that the duties, obligations and responsibilities, resembling the ought self, are indeed mainly based on *inter*personal competence and relationships (Bybee et al., 1997). Waters et al. (2004) who observed this interpersonal perspective in a chronic pain population, argued that in chronic pain the feedback of others (doctors, friends, family, colleagues) is of crucial importance for the view of the self. Maybe this need is fueled by the lack of comprehension and understanding, the feeling of being ignored and belittled, which have often been mentioned in qualitative studies (Morley and Eccleston, 2004; Lundberg et al., 2007).

The other viewpoint seemed to be more important in the feared self compared to the own viewpoint, which implies that the person one fears to become is prompted by intrapersonal requirements or fears. But what do chronic pain patients fear? Morley and Eccleston (2004) inquired chronic pain patients to report about who they feared to become in the future. They discovered five themes of fears, comprising spread of the pain, functional consequences of the pain, possible health needs, financial and social consequences. Although these themes not consequently cluster as intrapersonal, it seems that most themes are oriented towards the own perspective. We did not analyze the content of the selves in this study yet, however, from a clinical point of view paying attention to the content as well as the perspective of the self-discrepancies seems to be worthwhile in future intervention.

The associations reported in this paper were all significant, nevertheless, most correlations were moderate to small (r = 0.21–0.59). A possible explanation can be found in the population we recruited for this study. We expected this group of participants with WRUED to have larger actual–ought self-discrepancies compared to actual–feared self-discrepancies. The ought and feared self-discrepancies observed in this group were respectively moderate to small for actual–ought and large for actual–feared and were even smaller compared to a group of healthy subjects (Hardin and Leong, 2005). One explanation for these small self-discrepancies is that our sample appeared to be less disabled as expected before. The group generally showed marginal scores on depression, agita-

tion-related emotions, and only marginal pain and complaints on upper-extremity functioning. Since this raises questions about the issue of generalizability to all WRUED patients, future studies might include participants with a wider range of functional disability and psychological distress.

To conclude, the results of this study suggest that it might be worthwhile to broaden the perspective of psychological assessment and to incorporate measures of the view of the self. As no causal inferences can be made based on these cross-sectional data, longitudinal studies or studies in which self views are experimentally manipulated, for example using priming techniques are warranted.

Acknowledgements

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