

Development and psychometric evaluation of a new measure of pain-related support preferences: The Pain Response Preference Questionnaire

Lachlan A McWilliams PhD RPsych¹, Kate M Saldanha BA(Hons)¹, Bruce D Dick PhD RPsych², Margo C Watt PhD RPsych³

LA McWilliams, KM Saldanha, BD Dick, MC Watt. Development and psychometric evaluation of a new measure of pain-related support preferences: The Pain Response Preference Questionnaire. *Pain Res Manage* 2009;14(6):461-469.

BACKGROUND: Behavioural conceptualizations of chronic pain posit that solicitous responses to pain behaviours are positively reinforcing and play a role in the development of chronic pain and disability. Recent research suggests that studies investigating this model were likely limited by the use of only a few narrowly defined categories of responses to pain behaviour. A measure of preferences regarding pain-related social support has the potential to improve behavioural models of chronic pain by identifying other potentially reinforcing responses to pain behaviour.

OBJECTIVE: The Pain Response Preference Questionnaire (PRPQ) was created to assess preferences regarding pain-related social support. The purpose of the present study was to empirically develop PRPQ scales and examine their psychometric properties.

METHODS: A large university student sample (n=487) free of chronic pain completed the 39-item PRPQ. Factor analysis was applied to the data from the present sample to empirically develop PRPQ scales. Using a second student sample (n=87), relationships between the PRPQ scales and theoretically related measures were examined to evaluate the construct validity of the scales. Factor analysis supported four factors that reflected preferences for emotional and instrumental support, assistance in managing pain and emotions, having one's pain ignored, and being encouraged to persist with one's activities. Based on this analysis, scales labelled solicitude, management, suppression and encouragement were created. Correlation analyses supported the construct validity of these scales.

CONCLUSIONS: The PRPQ is a psychometrically sound measure of preferences of pain-related social support. Research with clinical samples is needed to further evaluate its psychometric properties and clinical utility.

Key Words: Behavioural model; Factor analysis; Social support

Fordyce's (1) behavioural model of chronic pain proposes that pain behaviours, such as guarded movements and grimacing, may elicit solicitous responses toward the individual engaging in pain behaviour. Within this framework, massaging a spouse who displays pain behaviour is conceptualized as a solicitous response that has the potential to inadvertently encourage additional pain behaviour and increase disability through a process of operant conditioning (ie, positive reinforcement). Numerous studies have provided support for

Conception et évaluation psychométrique d'un nouvel outil d'évaluation des attitudes préférées face à la douleur

HISTORIQUE : Selon les conceptualisations comportementales dans la douleur chronique, les réponses bienveillantes au comportement douloureux exercent un effet de renforcement et contribuent au développement de la douleur chronique et de l'incapacité. De récentes recherches donnent à penser que les études portant sur ce modèle ont probablement été limitées par l'emploi d'un nombre restreint de catégories étroitement définies de réponses au comportement d'autrui face à la douleur. Une évaluation des attitudes préférées en matière de soutien social en présence d'un tableau douloureux permettrait d'améliorer les modèles comportementaux face à la douleur chronique en identifiant d'autres réponses de renforcement potentiel.

OBJECTIF : Un questionnaire sur les attitudes préférées face à la douleur, ou PRPQ (pour *Pain Response Preference Questionnaire*), a été créé pour évaluer les préférences quant aux types de soutien social dans le contexte de la douleur. Le but de la présente étude était de développer empiriquement des échelles PRPQ et d'examiner leurs propriétés psychométriques respectives.

MÉTHODE : Un volumineux échantillon d'étudiants universitaires (n = 487) indemnes de douleur chronique ont répondu au PRPQ de 39 éléments. L'analyse des facteurs a été appliquée aux données du présent échantillon pour développer empiriquement des échelles PRPQ. À l'aide d'un deuxième échantillon d'étudiants (n = 87), les rapports entre les échelles PRPQ et les mesures théoriquement reliées ont été examinés pour évaluer la validité des échelles. L'analyse a appuyé quatre facteurs qui reflètent les préférences, soit soutien émotionnel et instrumental, aide à gérer la douleur et les émotions, indifférence d'autrui face à la douleur et encouragement au maintien des activités. Sur la base de cette analyse, des échelles portant les étiquettes sollicitude, prise en charge, suppression et encouragement ont été créées. Les analyses de corrélation ont appuyé la validité du concept de ces échelles.

CONCLUSION : Le PRPQ est une mesure psychométrique valable des attitudes préférées en matière de soutien social en présence de douleur. Il faudra appliquer la recherche à des échantillons cliniques pour en analyser plus en profondeur les propriétés psychométriques et l'utilité clinique.

this model. For example, studies using the Multidimensional Pain Inventory (MPI) (2) have found patients' perceptions of solicitous responses to be positively associated with negative outcomes such as pain behaviour, pain severity and disability (3). More sophisticated research has also demonstrated that pain patients with solicitous spouses tend to engage in more verbal pain behaviour when in the presence of their spouses (4).

Much of the research based on Fordyce's (1) model has assumed that behaviours defined a priori as solicitous are

¹Department of Psychology, Acadia University, Wolfville, Nova Scotia; ²Departments of Anesthesiology and Pain Medicine & Psychiatry, University of Alberta, Edmonton, Alberta; ³Department of Psychology, St Francis Xavier University, Antigonish; and Department of Psychology, Dalhousie University, Halifax, Nova Scotia

Correspondence: Dr Lachlan McWilliams, Department of Psychology, Acadia University, Wolfville, Nova Scotia B4P 2R6. Telephone 902-585-1495, fax 902-585-1078, e-mail lachlan.mcwilliams@acadiau.ca

generally perceived positively, and that they are therefore reinforcing. The findings of Newton-John and Williams' (5) qualitative research with pain patients and their spouses challenged this assumption. In this study, spouses were interviewed regarding the manner in which they respond to pain behaviour. A content analysis of these interviews identified 12 different types of responses. These included providing help (eg, getting pain medications), offering help, observing the individual in pain, discouraging pain talk, encouraging pain talk, encouraging task persistence (eg, 'You look like you can cope with that'), shielding (eg, withholding bad news), expressing frustration, ignoring the pain behaviour, problem-solving (eg, providing specific suggestions for completing a task), hostile-solicitous responses (eg, providing help while expressing anger) and distraction. Interviews with the pain patients revealed that the most positively perceived responses were those involving active coping, such as encouraging task persistence and problem solving. Responses involving solicitous behaviours (ie, providing and offering help) were rated less favourably. Despite patients rating these responses more negatively, 46% of spousal responses involved either offering or giving the patient help. This is important because patients reported that these types of responses made them feel guilty, useless and burdensome. Moreover, this discrepancy illustrates that patients do not necessarily receive the type of support they desire.

Newton-John and Williams (5) noted that some studies (6-8) have found patient disability levels and spouse solicitousness to be unrelated. They suggested that these null findings may have been obtained because responses conceptualized as solicitous in these studies may not have been perceived positively by patients, and as a consequence, these presumed solicitous responses did not reinforce behaviours that contribute to increased disability. A measure of preferences regarding pain-related social support has the potential to improve behavioural models of chronic pain by identifying other potentially reinforcing responses to pain behaviour. The Survey of Pain Attitudes (9) includes a solicitude scale that can be used to assess a desire for solicitous support. However, this measure does not include scales related to the other forms of pain-related support. To address this need, the Pain Response Preference Questionnaire (PRPQ) was developed and evaluated in the current study. Factor analysis was first used to empirically develop PRPQ scales. Using an independent sample, relationships between the PRPQ scales and a series of theoretically related measures were examined to evaluate the construct validity of the scales. Because support preferences are thought to be influenced by dispositional variables related to affiliative needs, many of the measures used to evaluate the construct validity of the PRPQ were trait-like measures of interpersonally oriented constructs. This approach was based on research concerning associations between personality traits and illness-specific social support preferences of individuals with cancer (10).

METHODS

Construction of the PRPQ

The PRPQ was created to assess a wide range of possible pain-related support preferences. The PRPQ items were developed by two registered clinical psychologists with experience in pain management (L McWilliams and B Dick) and were largely based on the categories of responses to pain behaviour

identified by Newton-John and Williams (5). For several reasons, the objective was not to create scales directly related to each of their 12 categories. First, their categories were identified using a qualitative approach, so it was unlikely that the same distinctions would be supported by a factor analytic investigation. For example, scales assessing the provision of help and offers of help would not be expected to form distinct factors. Second, the large number of items required to yield well-defined factors related to each of these constructs would have resulted in an extremely long measure that would be unfeasible for use in clinical settings. Third, some types of responses identified by Newton-John and Williams would unlikely be endorsed (eg, expressions of frustration and hostile-solicitous responses). Finally, items reflecting the observe only and shield categories were also excluded. It would be exceedingly difficult to find observable indicators of such responses, so reporting the degree of preference for such behaviours would be difficult.

Each of the 39 items created for the PRPQ were related to one of the remaining types of spouse response categories identified by Newton-John and Williams (5). Specifically, items were related to the provide help, offer help, discourage pain talk, encourage pain talk, encourage task persistence (and the new but related discourage task persistence), ignore, distraction and problem solve categories. The provide help and offer help categories identified by Newton-John and Williams could include a large range of activities. Accordingly, three other item categories (specific offer of help, solicitude and emotional support) were developed to cover this broad range. The specific offer of help items are similar to the offer help items, but the offers of help in this category are specific (eg, 'offer to get me pain medication'), rather than general (eg, 'offer me help'). The specific offer of help items were loosely based on the MPI solicitous response scale, which includes items assessing specific forms of help (eg, 'gets me something to eat'). Solicitude items include general statements regarding a desire for care (eg, "treat me with extra care and concern"). The content of these items is similar to the solicitude scale of the Survey of Pain Attitudes. The provide help items all concern the provision of instrumental support, so additional items assessing emotional support were also created.

Participants and procedures

Two separate samples were used. The first sample was comprised of students enrolled in an introductory psychology course at St Francis Xavier University (Antigonish, Nova Scotia). In total, 555 students provided complete data. A measure (see below) was used to identify students with chronic or persistent pain, who were excluded from the analyses. Of the students who provided complete data, 68 (12.25%) met criteria for having chronic or persistent pain. The majority (67.55%) of the 487 chronic pain-free participants was female. This subsample included participants ranging from 17 to 38 years of age, with a mean (\pm SD) age of 18.53 ± 1.90 years. A slight minority of these students (44.8%) reported that they were currently in a romantic relationship.

Participants in the first sample were recruited at the beginning of the academic year. All students enrolled in this course were provided with an opportunity to complete a battery of measures, including the PRPQ and the chronic pain measure,

to be considered for subsequent studies. All data collection for study 1 occurred during class time. Potential participants were first given a general consent form to read independently. If participants consented, they completed the questionnaire package and returned it to a research assistant. Participants were given course credit for their participation. This research was approved by the Research Ethics Board at St Francis Xavier University.

The participants in the second sample were 100 students enrolled in an introductory psychology course at Acadia University (Wolfville, Nova Scotia). After the criteria used to identify participants with chronic or persistent pain were employed, 13 participants were excluded from the analyses. The majority (71.26%) of the remaining 87 participants was female. This sample included participants ranging from 17 to 50 years of age, with a mean age of 19.26 ± 4.06 years. A majority (80.5%) of these students had experience in a dating relationship, and 42.5% were currently in a relationship.

Participants in the second subsample were recruited using an online research registration system. They completed a questionnaire package in a group testing setting outside of class and were given one course credit for their participation. This research was approved by the Research Ethics Board at Acadia University.

General measures

Both samples were administered a brief demographic questionnaire along with the two following measures.

Chronic and Persistent Pain Screen: The Chronic and Persistent Pain Screen (11) was used to determine whether a participant met the criteria for chronic or persistent pain. It first poses a yes/no question regarding chronic or persistent pain ('Do you have pain or discomfort that has persisted continuously or intermittently for longer than three months?'). Participants who respond affirmatively are then asked several follow-up questions regarding pain frequency (ie, a single item ranging from a ['It is almost constant pain'] to f ['It occurs about once a month']), pain severity (ie, a single item ranging from 0 [no pain] to 5 [excruciating]) and treatment contact ('Have you ever consulted with a physician regarding this pain?'). Participants were considered to have chronic or persistent pain, and were excluded from the analyses, if they reported the presence of continuous or intermittent pain over the previous three months; indicated that the pain occurred almost every day or more; rated the pain's intensity as discomforting or worse; and reported consulting with a physician regarding this pain. These criteria were developed as a liberal method of identifying persons experiencing chronic or persistent pain (11), and were originally adapted from questions used in an epidemiological study of chronic pain (12).

PRPQ: The PRPQ is a 39-item measure designed to assess preferences regarding social support from significant others when experiencing pain. It presents a wide range of ways that one's romantic partner could respond to one's pain (eg, 'When I am in pain, I want my significant other to help me with whatever I am doing'). Respondents are instructed to indicate how they would like a romantic partner to respond to them, rather than how partners actually respond. Each item is rated on a four-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). The PRPQ is described above

and includes 12 content areas (provide help, offer help, discourage pain talk, encourage pain talk, encourage task persistence, discourage task persistence, ignore, distraction, problem solve, specific offer of help, solicitude and emotional support). The items and their respective content areas are included in Table 1.

Validation measures

The second sample used for the construct validity investigation was also administered the following measures.

The COPE: The COPE (13) is a 60-item measure designed to assess coping from a dispositional, or trait-like, approach. It instructs respondents to indicate what they "generally do and feel" when experiencing stressful events. It consists of 15 scales that represent a different manner of coping with a stressful or traumatic event. Each scale consists of four items that are rated on a four-point Likert scale ranging from 1 ('I usually don't do this at all') to 4 ('I usually do this a lot'). The internal consistencies (Cronbach's alphas) of these scales have been estimated to range from 0.49 on the mental disengagement scale to 0.96 on the alcohol/drug use scale (13). In support of its construct validity, Clark et al (14) found the scales of the COPE to be significantly correlated with related scales on both the Coping Strategy Indicator (15) and the Ways of Coping - Revised (16). The mental disengagement scale of the COPE was not used in the present study because it was found to have a low level of internal consistency (Cronbach's alpha = 0.35).

Personal Attributes Questionnaire: The Personal Attributes Questionnaire (PAQ) (17) is a 24-item measure consisting of paired contradictory adjectives (eg, 'very rough' and 'very gentle') separated by a five-point scale in which participants select the letter that best represents their personal balance on the two adjectives. It operationalizes the personality constructs of agency (seven items) and communion (six items). Agency refers to socially instrumental traits such as independence, competitiveness and persistence. Communion refers to interpersonal sensitivity and caring. An emotional vulnerability subscale (five items), which overlaps with neuroticism both conceptually and empirically, was also identified through a series of factor analyses (18). Numerous past studies (19) have supported the construct and predictive validity of the PAQ. Internal consistency as measured by Cronbach's alpha has been estimated to be 0.67 to 0.78 for the masculinity scale and 0.72 to 0.80 for the femininity scale (19).

Depressive Experiences Questionnaire: The Depressive Experiences Questionnaire (DEQ) (20) is a 66-item measure designed to assess personality traits associated with depression (ie, self-criticism and dependency). It uses a response format ranging from 1 (strongly disagree) to 7 (strongly agree). Rude and Burnham's research (21) regarding the DEQ indicated that the construct of dependency operationalized in the DEQ can be further divided into neediness and connectedness. The neediness factor is characterized by anxious concerns about rejection, and is associated with depression. The connectedness factor is characterized by a valuing of relationships and sensitivity regarding the effects of one's actions on another, and is not associated with depression. Several subsequent studies (22,23) have provided support for this distinction. Although the full DEQ was administered in the present study, only the neediness and connectedness scales were used. Items for these

TABLE 1
Pain Response Preference Questionnaire: Items, content areas and principal axis analysis pattern matrix (n=487)

Items (content areas)	Factor 1	Factor 2	Factor 3	Factor 4
1. Help me with whatever I am doing (PH)*	0.80	-0.21	0.23	0.05
7. Offer me help (OH)*	0.69	0.02	-0.11	-0.03
32. Take good care of me (S)*	0.66	-0.01	-0.08	0.05
31. Help me out (PH)*	0.62	0.08	-0.05	0.03
12. Ask if I need help (OH)*	0.62	0.02	-0.08	-0.01
14. Treat me with extra care and concern (S)*	0.60	0.12	0.01	-0.10
4. Finish the job that I started (PH)*	0.59	-0.04	0.28	-0.16
3. Ask me about my pain (ET)*	0.55	0.08	-0.06	0.01
6. Do nice things to make me feel better (S)*	0.48	0.17	-0.01	0.13
33. Seem interested in my pain (ET)*	0.46	0.02	-0.11	0.15
23. Say he or she is concerned (ES)*	0.44	0.21	-0.12	0.06
29. Be willing to listen to me talk about my pain (ET)	0.38	0.08	-0.26	0.15
27. Offer to get me something to eat or drink (SH)	0.37	0.30	0.02	0.01
25. Let me do things alone until I ask for help (OH)	-0.36	0.06	0.20	0.22
35. Be available if I want help (OH)	0.36	0.03	-0.20	0.21
22. Offer to get me pain medication (SH)	0.34	0.30	0.13	-0.18
28. Suggest ways to stop me from making my pain worse (PS)*	0.09	0.63	0.03	0.02
16. Offer suggestions about managing or reducing the pain (PS)*	0.09	0.56	-0.03	0.03
26. Try to prevent me from getting upset (ES)*	-0.06	0.55	0.07	0.08
24. Tell me to take it easy (DP)*	0.19	0.54	0.18	-0.21
38. Tell me not to strain myself (DP)*	0.18	0.49	0.13	-0.14
9. Encourage me to rest (DP)	0.38	0.42	0.06	-0.17
34. Suggest fun or interesting activities that will not make my pain much worse (PS)*	-0.05	0.41	0.01	0.28
19. Try to take my mind off the pain by turning on the TV or music (D)*	-0.05	0.39	0.28	0.08
17. Offer to give me a massage (SH)*	0.07	0.35	-0.17	0.16
8. Distract me from my pain (D)*	0.20	0.31	0.11	0.08
20. Tell me not to talk about my pain (DT)*	0.01	0.13	0.76	0.03
15. Change topics when I talk about my pain (DT)*	-0.03	0.20	0.68	0.11
10. Stop me from talking about my pain (DT)*	0.09	0.05	0.66	0.19
21. Ignore my pain (I)*	-0.11	-0.15	0.53	0.06
37. Act like I am not in pain (I)*	-0.17	-0.01	0.47	0.19
39. Help me ignore the pain (D)	0.01	0.34	0.41	0.02
13. Tell me to keep active (EP)*	0.02	-0.05	0.18	0.65
11. Try to keep me involved in activities (EP)*	-0.14	0.03	0.10	0.65
2. Encourage me to keep going (EP)*	0.37	-0.27	0.13	0.59
30. Tell me I can do things despite pain (EP)*	-0.13	0.10	0.10	0.51
36. Tell me that I can handle the pain well (EP)*	-0.07	0.33	0.05	0.43
5. Tell me that I can cope with the pain (EP)*	0.15	-0.09	0.31	0.38
18. Try to help me stay positive (ES)*	0.12	0.29	-0.25	0.35

*Items included in the final measure. Bold print indicates salient loadings (≥ 0.30). D Distract; DP Discourage task persistence; DT Discourage pain talk; EP Encourage task persistence; ES Emotional support; ET Encourage pain talk; I Ignore; OH Offer help; PH Provide help; PS Problem solve; S Solitude; SH Specific offer of help

scales were selected based on the results of Rude and Burnham's (21) factor analysis. Items were selected if they had a high loading on their respective factor and a low loading on the other factor. This resulted in a six-item neediness scale and eight-item connectedness scale. Scores for these scales were created by taking the mean score of the items comprising the scales.

Marlowe-Crowne Social Desirability Scale – Short Form: Reynolds' (24) Short Form A of the Marlowe-Crowne Social Desirability Scale (MCSD-SF) (25) is 11-item version of the original 33-item measure designed to assess social desirability. It includes behaviours that are socially acceptable but unlikely to occur and behaviours that are inappropriate but more probable. Participants respond either true or false to each of these items, five of which are keyed in the true direction and six of which are keyed in the false direction. Reynolds (24) found

this short form to be significantly correlated with the original version ($r=0.91$), as well as with the Edwards Social Desirability Scale (26) ($r=0.37$). Additionally, it has been found that all available short forms have significant improvements in fit over the full scale, and that Reynolds' Form A and Form B are the best models (27).

RESULTS

Exploratory factor analysis

To develop empirically derived PRPQ scales, exploratory factor analysis was conducted using SPSS (version 15.0; SPSS Inc, USA). A principal axis analysis was used because it does not require the assumption of normality (28), which is typically violated when analyzing items from self-report measures. Promax rotation was used because the factors were expected to

be correlated. Parallel analysis (29), which is one of the most accurate methods of determining the number of factors to retain (30), was considered when deciding on the number of factors to retain. Based on the suggestion of Longman et al (31), parallel analysis was performed using mean eigenvalues and 95th percentile eigenvalues. Both methods supported a four-factor solution that accounted for 44.19% of the variance. The pattern matrix for this solution is presented in Table 1. When factor loadings of at least 0.30 were considered salient, there were no hyperplane items (ie, items without a salient loading on at least one factor) and seven complex items (ie, items with a salient loading on two or more factors).

Factor 1 included 16 salient items and accounted for 23.58% of the variance. This factor was comprised of items from the content areas of provide help, offer help, solicitude, encourage pain talk, emotional support and specific offer of help. Examination of the content of the items in factor 1 indicated that they reflect a desire for both instrumental support (eg, 'help me with whatever I am doing') and emotional support (eg, 'ask me about my pain'). To capture both of these components of support, this factor was labelled solicitude.

Factor 2 included 10 salient items and accounted for 11.41% of the variance. This factor was comprised of items from the content areas of problem solve, emotional support, discourage task persistence, distract and specific offer of help. The content of the items in factor 2 reflect a desire for assistance in managing pain (eg, 'suggest ways to stop me from making my pain worse') and emotional distress (eg, 'try to prevent me from getting upset'). As a result, this factor was labelled management.

Factor 3 included six salient items and accounted for 5.44% of the variance. The items comprising this factor were from the content areas of discourage pain talk, ignore and distract. Factor 3 was labelled suppression because items with salient loadings on it reflect a desire to receive no reaction to one's pain (eg, 'act like I am not in pain') and to avoid discussion of one's pain (eg, 'change topics when I talk about my pain').

Factor 4 included seven salient items and accounted for 3.75% of the variance. This factor was comprised of items from encourage task persistence and emotional support content areas. These items assess a desire to be encouraged to continue with activities (eg, 'encourage me to keep going'), so this factor was labelled encouragement.

PRPQ scale creation, internal consistencies and descriptive statistics for sample 1

The first goal of the present study was to develop empirically supported and internally consistent PRPQ scales. The pattern matrix was used to select items for scales representing each of the factors. Internal consistency analyses of data from the second sample were also used to assess the impact of dropping items from the scales.

To ensure that the solicitude scale captured a different construct than the other PRPQ scales, only the 11 items with a particularly high loading (ie, greater than 0.40) on factor 1 were used. The management scale included items with a loading greater than 0.30 on factor 2, but item 19 was dropped because it had a salient cross-loading on factor 1. The suppression scale was created by including all items with a salient

TABLE 2
Scale summary and descriptive statistics for the Pain Response Preference Questionnaire in sample 1 (n=487)

Scale	Items	Alpha	Minimum	Maximum	Mean ± SD
Solicitude	11	0.87	1.36	4.00	3.18±0.47
Management	9	0.77	1.22	4.00	3.12±0.45
Suppression	5	0.79	1.00	4.00	2.15±0.65
Encouragement	7	0.75	1.00	4.00	3.03±0.48

loading on factor 3 and no significant cross-loadings. The encouragement scale was created by including all items with a salient loading on factor 4. Three items had salient cross-loadings. However, these items were retained because they had a clear theoretical connection with the construct assessed by this scale, and because their removal would have adversely impacted the scale's internal consistency. Scale scores were created by taking the average score of the items comprising each scale. Table 2 presents the number of items, internal consistencies and descriptive statistics of these scales from the first sample.

PRPQ descriptive, internal consistency and interscale correlation statistics for sample 2

Descriptive statistics for the PRPQ scales in the second sample are presented in Table 3. Consistent with the findings from the first sample, solicitude had the highest mean score and suppression had the lowest mean score. Table 3 also includes the internal consistencies of the PRPQ scales. These levels of internal consistency are in the good to adequate range and are generally consistent with the findings obtained using the first sample. However, the internal consistency of the management scale was reduced when using the second sample (0.70 versus 0.79).

The interscale correlations in the second sample indicate that the solicitude, management and encouragement scales are positively correlated with each other. The *r*-squared values indicate that the shared variance between them ranges from 18.5% to 27.0%. The suppression scale had a significant negative association with the solicitude scale, but was not significantly correlated with the other scales.

Construct validity

The construct validity of the PRPQ was examined by using a convergent and discriminant validity procedure. The PRPQ scales were correlated with the COPE scales. These are reported in Table 4. For the purposes of the present study, each COPE scale was considered to belong to one of three categories.

First, the COPE scales involving social support seeking were included to investigate the convergent validity of the PRPQ. Consistent with expectations, the use of emotional support scale had significant positive associations with solicitude, management and encouragement, all of which involve a desire for receiving social support. In addition, use of emotional support was negatively associated with suppression, which reflects a desire to minimize attention directed toward pain. Given that the solicitude scale has a stronger conceptual connection with emotional support than with instrumental support, it was expected that the solicitude scale would be more strongly correlated with the use of emotional social support scale than with the use of instrumental social support scale. This expectation

TABLE 3
Scale reliability and interscale correlations of the Pain Response Preference Questionnaire (PRPQ) in sample 2 (n=87)

PRPQ	Alpha	Mean ± SD	PRPQ interscale correlations			
			Solicitude	Management	Suppression	Encouragement
Solicitude	0.86	3.08±0.50	1.00			
Management	0.70	2.92±0.46	0.52*	1.00		
Suppression	0.75	1.65±0.54	-0.37*	0.09	1.00	
Encouragement	0.77	3.06±0.52	0.49*	0.43*	-0.19	1.00

* $P \leq 0.01$ (two-tailed)**TABLE 4**
COPE descriptive statistics and correlations with Pain Response Preference Questionnaire (PRPQ) scales (n=87)

COPE scale	Alpha	Mean ± SD	Correlations with PRPQ scales			
			Solicitude	Management	Suppression	Encouragement
Convergent validity†						
Use of emotional social support	0.93	10.60±3.79	0.42**	0.27*	-0.33**	0.32**
Use of instrumental social support	0.82	10.59±3.23	0.23*	0.27*	-0.19	0.14
Discriminant validity†						
Denial	0.77	5.68±2.11	0.16	0.25*	0.02	0.02
Religious coping	0.94	6.18±3.45	-0.05	-0.09	-0.03	0.03
Humour	0.93	8.18±3.57	-0.19	-0.02	0.30**	0.03
Behavioural disengagement	0.73	5.84±1.92	-0.03	0.09	0.01	-0.13
Restraint	0.62	8.69±2.19	-0.06	0.16	0.12	0.05
Substance use	0.95	5.44±2.60	-0.01	0.06	0.05	-0.03
Planning	0.82	11.06±2.66	-0.02	-0.07	-0.06	0.17
Exploratory†						
Focus on and venting of emotions	0.89	9.94±3.56	0.45**	0.42**	-0.31**	0.22*
Positive reinterpretation and growth	0.73	11.23±2.42	-0.03	0.05	-0.06	0.23*
Active coping	0.77	10.56±2.41	0.01	-0.09	-0.09	0.21
Acceptance	0.66	10.73±2.43	0.04	0.09	-0.22*	0.19
Suppression of competing activities	0.69	8.90±2.48	-0.02	-0.08	-0.25*	0.10

* $P \leq 0.05$ (two-tailed); ** $P \leq 0.01$ (two-tailed); †Purpose of scale inclusion

was met (ie, 0.42 versus 0.23). Meng et al's (32) method for comparing correlation coefficients indicated this difference in magnitude was statistically significant ($Z=2.74$, $P=0.003$). Also supportive of the construct validity of the PRPQ scales, the two scales involving some form of instrumental support (ie, solicitude and management) were positively associated with the COPE use of instrumental social support scale, whereas the two PRPQ scales that did not reflect a desire for instrumental support (ie, suppression and management) were not significantly associated with the use of instrumental social support scale.

The second group of COPE scales were those expected to be unrelated to the PRPQ scales. For example, religious coping (sample item, 'I seek God's help') has no obvious connection with any of the PRPQ scales. Correlations between these COPE scales and the PRPQ were used to examine the discriminant validity of the PRPQ scales. As can be seen in Table 4, correlations between the PRPQ scales and this group of COPE scales were almost all small and nonsignificant. However, suppression had a moderate association with the humour scale of the COPE, and management had a smaller positive association with the denial scale of the COPE.

The final group of COPE scales were those that were included for exploratory purposes. While no a priori hypotheses were developed regarding these scales, they were used to provide information that could be used to characterize the PRPQ scales. The focus on and venting of emotions scale was significantly correlated with all four PRPQ scales. Like many

other emotion-focused copings scales (33), this measure tends to reflect the tendency to respond with negative emotion (sample item, 'I feel a lot of emotional distress and I find myself expressing those feelings a lot').

The present findings indicated that solicitude and management were the PRPQ scales most strongly associated with the tendency to experience, or acknowledge, distress in response to stressful situations. In contrast, the suppression scale had a significant negative association with the focus on and venting of emotions scale. The suppression scale also had significant negative associations with the acceptance (sample item, 'I accept the reality of the fact that it happened') and suppression of competing activities (sample item, 'I put aside other activities in order to concentrate on this') scales of the COPE. This pattern of findings suggests that those who strongly endorsed the suppression scale also tend to have difficulty accepting stressful situations and tend to persist with their normal activities rather than engage in efforts to resolve such situations. The positive correlation between the positive reinterpretation and growth scale of the COPE and the encouragement scale is not surprising because they both involve efforts to maintain a positive outlook.

Correlations between PRPQ scales and scales of the PAQ, DEQ and MCSD-SF are reported in Table 5. The PAQ was included primarily to assess agency and communion with the aim of further investigating the construct validity of the PRPQ scales. Agency involves desire to take independent action, so

TABLE 5
Validation measures' internal consistencies, descriptive statistics and correlations with Pain Response Preference Questionnaire (PRPQ) scales (n=87)

Scale	Alpha	Mean ± SD	Correlations with PRPQ scales			
			Solicitude	Management	Suppression	Encouragement
PAQ agency	0.64	18.43±3.71	-0.21	-0.17	0.25*	0.07
PAQ communion	0.81	18.46±3.37	0.43**	0.34**	-0.13	0.27*
PAQ emotionality	0.71	11.78±3.68	0.54**	0.39**	-0.23*	0.25*
DEQ neediness	0.69	3.60±1.02	0.22*	0.22*	-0.07	-0.02
DEQ connectedness	0.57	5.18±0.71	0.37**	0.36**	-0.28**	0.33**
MCSDF-SF	0.69	4.41±2.54	-0.08	-0.08	-0.04	-0.09

* $P \leq 0.05$ (two-tailed); ** $P \leq 0.01$ (two-tailed). DEQ Depressive Experiences Questionnaire; MCSDF-SF Marlowe-Crowne Social Desirability Scale – Short Form; PAQ Personal Attributes Questionnaire

the agency scale was expected to be positively associated with the suppression scale and to be negatively associated with PRPQ scales involving support from others. This set of expectations was partially met; agency was positively associated with suppression and had a marginally significant negative association ($r = -0.21$, $P = 0.052$) with the solicitude scale. However, it did not have significant associations with the management and encouragement scales. Communion involves a desire to connect emotionally with others, so it was expected to have positive associations with the PRPQ scales involving the receipt of support from others, and to be negatively associated with the suppression scale. This set of expectations was also partially met; communion had significant positive associations with solicitude, management and encouragement. However, communion was not significantly associated with the suppression scale. Overall, this pattern of findings is supportive of the construct validity of the PRPQ scales. It suggests that those high in agency tend to more strongly endorse scales reflecting a preference to respond to pain without the assistance of others, and those high in communion tend to prefer assistance in responding to pain. The emotionality scale of the PAQ was used to characterize the PRPQ scales in terms of their overlap with a measure indicative of the tendency to experience distress. Consistent with the findings regarding the focus on and venting of emotions scale of the COPE, emotionality was positively associated with the solicitude scale and negatively associated with the suppression scale.

The DEQ was included to assess maladaptive and more adaptive versions of interpersonal dependency through the neediness and connectedness scales, respectively. The solicitude scale was initially thought to reflect a more maladaptive reliance on others, so it was expected that it would be more strongly related to the DEQ neediness scale than to the DEQ connectedness scale. While the solicitude scale did have a significant positive association with neediness, it actually had a larger association with the connectedness scale of the DEQ. The management and encouragement scales were conceptualized as involving more adaptive preferences regarding pain-related assistance, so it was expected that these scales would be more strongly associated with the DEQ connectedness scale than with the neediness scale. Consistent with expectations, encouragement had a significant positive association with connectedness and was not significantly associated with neediness. As well, the correlation between management and connectedness was significantly larger than the association between

management and neediness (0.36 versus 0.22), but this difference was not statistically significant ($Z = 1.25$).

The MCSDF-SF was included to assess whether participants attempted to appear socially desirable in their response selections. Because none of the PRPQ scales include items likely to be influenced by social desirability, it was hypothesized that the PRPQ scales would be unrelated to the MCSDF-SF. Consistent with this expectation, small, nonsignificant negative associations were found between the MCSDF-SF and each of the PRPQ scales.

DISCUSSION

Newton-John and Williams (5) identified a wide range of possible responses to pain behaviour and found that chronic pain patients reported preferring responses that encourage active coping over those typically viewed as solicitous. The PRPQ was developed to facilitate research regarding preferences for pain-related social support. The present study describes the development and psychometric evaluation of the PRPQ.

Factor analysis revealed factors labelled solicitude, management, suppression and encouragement. These factors reflect a wider array of possible responses to pain behaviour than other related measures, such as the MPI. In both samples, solicitude and management had the highest scores, so it appears those who have more limited experiences with pain generally prefer responses to their pain that are solicitous or involve assistance in managing pain and distress. In contrast, the findings of Newton-John and Williams (5) suggest that those with chronic pain would likely most strongly endorse items on the encouragement scale. Thus, it appears that what is viewed as desirable varies across pain contexts (ie, nonclinical versus chronic pain) and that preferences may evolve as pain persists and becomes chronic.

Exploratory factor analysis of the PRPQ items served as the basis for creating four scales using a total of 32 items. Using a second sample, these scales were found to have adequate to good levels of internal consistency. The PRPQ could be useful in clinical contexts. For example, it could be used to identify the type of responses to pain behaviour that are most likely to be positively reinforcing for a particular individual. As well, chronic pain treatment programs generally encourage a reduction of pain behaviour and a shift from more passive forms of coping to a self-management style of coping. The PRPQ may be useful for identifying those who are unlikely to embrace these goals (eg, those scoring high on the solicitude scale). It may

offer unique information because it concerns a person's preferences related to dyadic forms of coping with pain rather than the intrapersonal variables, such as individual coping strategies, that have received the most attention to date. Given its potential clinical applications, developing a version of the PRPQ that is invariant across a range of potential study samples is important. At this point, the use of the entire 39 items is recommended, so the possibility of identifying competing factor models is maintained. Ideally, a series of exploratory and confirmatory factor analyses will identify a set of items and scales that is psychometrically sound across a wide variety of samples.

Correlation analyses involving established self-report measures were used to evaluate the construct validity of the PRPQ scales. To make precise statements regarding differences between correlations, an inferential test was used to determine whether relevant pairs of correlations were statistically different in magnitude. The findings with the COPE were largely supportive of the construct validity of the scales. For example, supportive of the convergent validity of the scales, the COPE use of emotional support scale had significant positive associations with each of the PRPQ scales involving some form of emotional support (ie, solicitude, management and encouragement) and was negatively associated with the PRPQ scale involving the minimization of attention directed toward pain (ie, suppression). As well, consistent with expectations, the solicitude scale had a stronger association with the COPE use of emotional support scale than with the use of instrumental support scale.

Supportive of the discriminant validity of the PRPQ scales, the COPE scales that were theoretically unrelated to the constructs operationalized by the PRPQ were, with two exceptions, unrelated to these COPE scales. The first unexpected finding was that the COPE denial scale (sample item, 'I pretend that it hasn't really happened') was positively associated with management. This finding could have occurred because preferences for social support may not match with one's individual coping style. The COPE denial scale seems to reflect a purposeful individual effort to ignore stressful situations. It is plausible that individuals who adopt this approach to coping could also report a desire for assistance in managing pain and pain-related distress captured by the PRPQ management scale (sample items, 'offer suggestions about managing or reducing the pain' or 'distract me from my pain'). The second unexpected finding was that the COPE humour scale (sample item, 'I laugh about the situation') was positively associated with the PRPQ suppression scale. It may be that those who prefer to have their pain ignored use humour as a means of keeping their focus off of their pain and encouraging others to minimize or ignore it.

The pattern of findings obtained with the PAQ was also supportive of the construct validity of the PRPQ scales because the communion scale was positively associated with the three PRPQ scales involving a desire for support from others and the agency scale was positively associated with the PRPQ suppression scale. Furthermore, the small nonsignificant correlations between the PRPQ scales and a measure of socially desirable responding indicated that the current participants were not intentionally misrepresenting their pain preferences when responding to the PRPQ. It is reasonable to be concerned that respondents may self-deceptively perceive encouraging responses to be most desirable, but would actually be more strongly

reinforced by solicitous responses. However, the mean scores of PRPQ scales indicated that participants in the current study were willing to acknowledge a preference for solicitous support.

The identification of pain-related support preferences other than solicitude raises the question of whether they are more adaptive. For example, those who prefer to receive encouragement during an episode of pain may be less likely to enter a vicious cycle of increasing activity avoidance, fear of pain and deconditioning, which are posited in fear-avoidance models (34) as central to the development of chronic pain. A longitudinal study of pain-related social support preferences and actual pain-related support would be needed to determine whether a preference is particularly adaptive or maladaptive. However, some of the correlation analyses may provide clues. Solicitude and management may capture more maladaptive preferences than encouragement because they have relatively large associations with the two scales assessing emotional distress (ie, COPE focus on and venting of emotions and PAQ emotionality). However, they both had a significant positive association with the DEQ connectedness scale, which suggests that they may also partially capture an adaptive interpersonal orientation.

Suppression is the PRPQ scale that appears to operationalize the most unique construct. It was only significantly associated with the solicitude scale and the *r*-squared value indicated these scales share minimal variance (13.7%). Suppression had significant negative associations with the COPE focus on and venting of emotions and PAQ emotionality scales, so it may represent a particularly adaptive pain-support preference. Other findings, however, suggest another possibility. The correlations involving the COPE acceptance scale and suppression of competing activities scale suggest that suppression is associated with difficulty accepting stressful situations and a tendency to persist with one's activities rather than taking action to address such situations. In the context of minor pain, this approach may be adaptive. However, in the context of a more serious condition, a response to pain characterized by suppression may lead to additional damage and a failure to seek adequate treatment. Individuals with chronic pain holding this preference may be those who are reluctant to use pacing strategies or accept appropriate assistance from others.

Two limitations of the construct validation procedure should be noted. First, the PRPQ operationalizes constructs related to dyadic coping (eg, How do you want someone else to assist you?), but the validation procedure relied on personality measures and a measure of intrapersonal coping styles (eg, How do you cope?). Ideally, the validation procedure would have used measures of dyadic coping, but such measures do not yet exist. It may soon be possible to examine the construct validity of the PRPQ scales using measures or procedures developed to study dyadic coping, given the emerging literature (35). Second, the size of the sample used to investigate the construct validity of the PRPQ was not ideal. Cohen (36) suggested that correlations of 0.30 or greater be considered to represent a medium effect, and indicated that a sample size of 85 provides adequate power to detect such effects when alpha is set at 0.05. The sample size of 87 certainly provided adequate statistical power for detecting medium effects. However, a larger sample would have provided the power necessary for detecting smaller effects, and would have enabled the use of a more conservative

alpha level to reduce the chances of type I errors. In addition, it is acknowledged that this initial validation was completed with a nonclinical sample. However, this approach is common in questionnaire development, and it is recognized as providing valuable information. Nonetheless, the most appropriate next step in the development of this measure would be to examine its factor structure and construct validity in a chronic pain sample.

The PRPQ was developed to assess preferences regarding pain-related social support. The current findings suggest the PRPQ is most accurately conceptualized as assessing preferences for responses involving solicitude, management, suppression and encouragement. The PRPQ scales were internally consistent and there was ample support for their construct validity. This new measure may also be useful for expanding the behavioural model of chronic pain by allowing for the consideration of preferences in research based on operant conditioning

principles. For example, solicitous responses may reinforce pain behaviours and play a role in the development of chronic pain, but this relationship may be moderated by the pain support preferences of those experiencing pain. Those with a preference for solicitous support, and who receive such support, may report a high level of relationship satisfaction, but could be at higher risk for engaging in unhelpful pain coping strategies. Other combinations of support preferences and support received may also be problematic. For example, a desire for solicitous support paired with the absence of such support may lead an increase in pain behaviour in an effort to obtain the desired form of support. At present, further research evaluating the PRPQ's psychometric properties and clinical utility is warranted.

ACKNOWLEDGEMENTS: The present research was supported a grant awarded to Dr McWilliams from the Social Sciences and Humanities Research Council of Canada.

REFERENCES

1. Fordyce WE. A behavioural perspective on chronic pain. *Br J Clin Psychol* 1982;21:313-20.
2. Kerns RD, Turk DC, Rudy TE. The West Haven-Yale Multidimensional Pain Inventory (WHYMPI). *Pain* 1985;23:345-56.
3. Flor H, Kerns RD, Turk DC. The role of spouse reinforcement, perceived pain, and activity levels of chronic pain patients. *J Psychosom Res* 1987;31:251-9.
4. Block AR, Kremer EF, Gaylor M. Behavioral treatment of chronic pain: The spouse as a discriminative cue for pain experience. *Pain* 1980;9:243-52.
5. Newton-John TR, Williams AC. Chronic pain couples: Perceived marital interactions and pain behaviours. *Pain* 2006;123:53-63.
6. Burns JW, Johnson BJ, Mahoney N, Devine J, Pawl R. Anger management style, hostility and spouse responses: Gender differences in predictors of adjustment among chronic pain patients. *Pain* 1996;64:445-53.
7. Lousberg R, Schimdt AJM, Groenman NH. The relationship between spouse solicitousness and pain behavior: Searching for more experimental evidence. *Pain* 1992;51:75-9.
8. Schwartz L, Slater MA, Birchler GR. The role of pain behaviors in the modulation of marital conflict in chronic pain couples. *Pain* 1996;65:227-33.
9. Jensen MP, Karoly P, Huger R. The development and preliminary validation of an instrument to assess patients' attitudes toward pain. *J Psychosom Res* 1987;31:393-400.
10. Manne S, Alfieri T, Taylor K, Dougherty J. Preferences for spousal support among individuals with cancer. *J Appl Soc Psychol* 1999;29:722-49.
11. McWilliams LA, Asmundson GJG. The relationship of adult attachment dimensions to pain-related fear, hypervigilance, and catastrophizing. *Pain* 2007;127:27-34.
12. Elliott AM, Smith BH, Penny KI, Smith WC, Chambers WA. The epidemiology of chronic pain in the community. *Lancet* 1999;354:1248-52.
13. Carver CS, Scheier MF, Weintraub JK. Assessing coping strategies: A theoretically based approach. *J Pers Soc Psychol* 1989;56:267-83.
14. Clark KK, Bormann CA, Cropanzano RS, James K. Validation evidence for three coping measures. *J Pers Assess* 1995;65:434-55.
15. Amirkhan JH. A factor analytically derived measure of coping: The coping strategy indicator. *J Pers Soc Psychol* 1990;59:1066-75.
16. Folkman S, Lazarus RS. If it changes it must be a process: A study of emotion and coping during three stages of college examination. *J Pers Soc Psychol* 1985;48:150-70.
17. Spence JT, Helmreich R, Stapp J. Ratings of self and peers on sex role attributes and their reaction to self-esteem and conceptions of masculinity and femininity. *J Pers Soc Psychol* 1975;32:29-39.
18. Ward LC, Thorn BE, Clements KL, Dixon KE, Sanford SD. Measurement of agency, communion, and emotional vulnerability with the Personal Attributes Questionnaire. *J Pers Assess* 2006;86:206-16.
19. Helmreich RL, Spence JT, Wilhelm JA. A psychometric analysis of the personal attributes questionnaire. *Sex Roles* 1981;7:1097-108.
20. Blatt SJ, D'Afflitti JP, Quinlan DM. *Depressive Experiences Questionnaire*. New Haven: Yale University Press, 1976.
21. Rude SS, Burnham BL. Connectedness and neediness: Factors of the DEQ and SAS dependency scales. *Cognit Ther Res* 1995;19:323-40.
22. Bacchiochi JR, Bagby RM, Crispien C, Watson J. Validation of connectedness and neediness as dimensions of the dependency construct. *Cognit Ther Res* 2003;27:233-42.
23. McBride C, Zuroff DC, Bacchiochi JR, Bagby RM. Depressive experiences questionnaire: Does it measure maladaptive and adaptive forms of dependency? *Soc Behav Pers* 2006;34:1-16.
24. Reynolds WM. Development of reliable and valid short forms of the Marlowe-Crowne social desirability scale. *J Clin Psychol* 1982;38:119-25.
25. Crowne DP, Marlowe D. A new scale of social desirability independent of psychopathology. *J Consult Psychol* 1960;24:349-54.
26. Edwards AR. *The Social Desirability Variable in Personality Assessment and Research*. New York: Dryden, 1957.
27. Loo R, Thorpe K. Confirmatory factor analyses of the full and short versions of the Marlowe-Crowne social desirability scale. *J Soc Psychol* 2000;140:628-35.
28. Floyd FJ, Widaman KF. Factor analysis in the development and refinement of clinical assessment instruments. *Psychol Assess* 1995;7:286-99.
29. Horn JL. A rationale and test for the number of factor in factor analysis. *Psychometrika* 1965;30:179-85.
30. Zwick WR, Velicer WF. Comparison of five rules for determining the number of components to retain. *Psychol Bull* 1986;99:432-42.
31. Longman RS, Cota AA, Holden RR, Fekken GC. A regression equation for the parallel analysis criterion in principal components analysis: Mean and 95th percentile eigenvalues. *Multivariate Behav Res* 1989;24:59-69.
32. Meng X, Rosenthal R, Rubin DB. Comparing correlated correlation coefficients. *Psychol Bull* 1992;111:172-5.
33. Stanton AL, Danoff-Burg S, Cameron CL, Ellis AP. Coping through emotional approach: Problems of conceptualization and confounding. *J Pers Soc Psychol* 1994;66:350-62.
34. Asmundson GJG, Norton PJ, Vlaeyen JWS. Fear-avoidance models of chronic pain: An overview. In: Asmundson GJG, Vlaeyen JWS, Crombez G, eds. *Understanding and Treating Fear of Pain*. Oxford: Oxford University Press, 2004:3-24.
35. Bodenmann G. Dyadic coping and its significance for marital functioning. In: Revenson TA, Kayser K, Bodenmann G, eds. *Couples Coping with Stress: Emerging Perspectives on Dyadic Coping*. Washington, DC: American Psychological Association, 2005:33-49.
36. Cohen J. A power primer. *Psychol Bull* 1992;112:155-9.