

THE ROLE OF SOCIAL SUPPORT IN COPING AND PAIN  
AMONG PATIENTS WITH RHEUMATOID ARTHRITIS:

A DAILY PROCESS STUDY

by

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## Abstract

Using a daily process methodology, the current study examined the role of social support processes in coping and pain severity among patients with rheumatoid arthritis (RA) over time. Seventy-three adults with RA completed a structured daily record twice daily for one week. Patients completed twice daily questionnaires regarding their current pain levels, satisfaction with support, disappointment in support, and ways of coping. Findings from Hierarchical Linear Modeling suggested that support influenced pain severity indirectly, both through encouraging the use of specific coping strategies, as well as by impacting the efficacy with which these coping strategies were employed. Satisfaction with support was associated with adaptive *and* maladaptive ways of coping with pain, while disappointment in support was associated with maladaptive coping. Findings highlight the importance of the role of close others in promoting adaptive pain coping strategies among patients with RA.

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Over the past 25 years, research has demonstrated beneficial effects of social support on the psychological and physical well-being of individuals suffering from chronic illnesses such as cancer (Helgeson & Cohen, 1996), coronary heart disease (Uchino, Cacioppo, & Kiecolt-Glaser, 1996), and diabetes (Cheng & Boey, 2000). The potentially therapeutic role of social support has also been of interest to researchers studying individuals with chronic pain. Although biomedical factors seem to instigate the initial report of pain among these patients, over time psychosocial factors may play a significant role in the disease course of various chronic pain conditions (Turk & Melzack, 2001).

The majority of studies that have examined social support in the context of chronic pain have focused on its relationship with depression, with findings generally indicating that individuals higher in support suffer from less depression and negative mood (e.g., Brown, Wallston, & Nicassio, 1989; Doeglas, Suurmeijer, Krol, Sanderman, van Rijswijk, & van Leeuwen, 1994). However, relatively few studies have investigated the relationship between social support and health outcomes, such as pain severity. To date, no consensus has been reached on either the magnitude or direction of the relationship between these variables. A number of studies have demonstrated an association between higher levels of social support and lower levels of chronic pain (Feldman, Downey, & Chaffer-Neitz, 1999; Jamison & Virts, 1990; Weinberger, Hiner, & Tierney, 1986). For instance, Feldman and colleagues conducted a study on individuals diagnosed with complex regional pain syndrome in which participants completed a daily structured record on mood, pain, and perceived support for 28 consecutive days. They found that perceptions of social support were predictive of decreases in pain on the following day. After completing the daily records, participants responded to an open-ended questionnaire regarding what others had said or done that was especially

helpful to them in coping with their condition. Participants reported that helpful exchanges typically involved the encouragement of active coping and the discouragement of helplessness and catastrophizing. Patients also noted as beneficial others' acknowledgement of the hardships they had faced, and reinforcement for past and present coping efforts. In a study by Jamison and Virts (1990), patients with chronic pain were measured on perceived family support prior to entering an outpatient pain program. One year following the completion of the program, patients who initially reported having supportive families reported significantly less pain intensity, less reliance on medication, and greater activity levels. However, other studies have failed to find a significant relation between social support and pain severity (e.g., Lauver & Johnson, 1997).

#### *Social Support and Rheumatoid Arthritis*

Rheumatoid Arthritis (RA) is an incurable auto-immune disease that affects approximately 1% of the western population (Evers, Kraaijmaat, Geenen, & Bijlsma, 1998). It is associated with a variety of distressing and debilitating symptoms including chronic pain, stiffness and inflammation of the joints, fatigue, and frequent mood changes (Smith & Wallston, 1992). Among these symptoms, pain of variable duration and intensity is the most significant and problematic symptom for patients with RA (Young, 1992). As a result of their disease and related distress, RA sufferers typically experience a wide range of daily stressors such as difficulties performing household chores, impaired ability to work or hold a job, difficulties engaging in leisure or social activities, and interpersonal tensions resulting from added burdens for friends and family members (Stenstrom, Lindell, Swanberg, Nordemar, & Harms-Ringdahl, 1992). Due to the lack of a cure for RA at the present time,

treatment focuses on the alleviation of symptoms and an attempt to maintain functional status (Evers et al., 1998).

As in other chronic pain conditions, disease factors only modestly predict future disability in RA (Van der Heide, Jacobs, Haanen, & Bijlsma, 1995; Wolfe & Cathey, 1991). As a result, there is a growing interest in and awareness of the influence of psychosocial factors on the disease progression of RA (Young, 1992). Although little research has been done in this area, extant findings indicate that social support has beneficial effects on levels of pain and disability among patients with RA (Evers et al., 1998; Goodenow, Reisine, & Grady, 1990; Savelkoul, Post, de Witte, & vanden Borne, 2000; Waltz, Kriegel, & van't Pad Bosch, 1998). In a study that examined patients with rheumatic diseases, including both RA and osteoarthritis, satisfaction with supportive interactions was associated with lower levels of pain frequency and intensity (Savelkoul et al., 2000). A recent longitudinal study by Waltz and colleagues (1998) found similar results. Among a sample of patients diagnosed with RA, a baseline measure of emotional support was found to predict less severe pain upon follow-up one year later.

Again, however, a relationship between support and pain has not always been found. In a study by Affleck and colleagues, individuals with RA completed a daily questionnaire for 75 consecutive days on levels of stress, mood, pain, and support (Affleck, Tennen, Urrow, & Higgins, 1994). Findings indicated that support was not able to buffer the negative effects of daily stress on next day pain. Furthermore, some studies have found higher levels of social support to be associated with a *greater* degree of functional impairment among patients with RA (Doeglas, Suurmeyer, Krol, Sanderman, van Rijswijk, & van Leeuwen, 1994; Taal, Johannes, Rasker, Seydel, & Wiegman, 1993).

### *Dissatisfaction with Support*

The vast majority of research that has investigated social support among patients with chronic pain has focused on the benefits of social relationships, failing to consider the possibility of negative effects. Lack of research in this area is surprising given that previous studies have indicated that negative aspects of social relationships may be as potent, if not more potent, in predicting well-being (e.g., Pagel, Erdly, & Becker, 1987; Rook, 1984; Rook & Pietromonaco, 1987; Schuster, Kessler, & Aseltine, 1990; Walen & Lachman, 2000).

Although attempts to provide support are often well-intentioned, it is not the case that such attempts will always be *perceived* as helpful by the recipient. A small number of studies have demonstrated that dissatisfaction with support may have a negative impact on the psychological well-being of patients with RA (Griffen et al., 2001; Manne & Zautra, 1989; Revenson, Schiaffino, Majerovitz, & Gibofsky, 1991; Riemsma, Taal, Wiegman, Rasker, Bruyn, Van Paassen, 2000). However, with the exception of a study by Griffen and colleagues (2001), researchers have yet to examine the potentially harmful effects of these social exchanges on physical well-being.

### *Support as coping assistance*

Despite the number of studies that have found a link between support and well-being, little is known about the mechanism through which support influences health. One idea that has been put forth in the literature is that support is effective in enhancing well-being because it acts as coping assistance (DeLongis & O'Brien, 1997; Thoits, 1986). When faced with a stressful situation, social support may help individuals alter the meaning of the situation, the individual's emotional response to the situation and/or the situation itself. Evidence for this model has been found among studies of both healthy community samples (e.g., Holahan &

Moos, 1987; McMoll, Lei, & Skinner, 1995; Terry, 1995; Valentiner, Holahan, & Moos, 1994) and chronically ill populations (e.g., Ell, Mantell, Hamovitch, & Nishimoto, 1989; Holohan, Moos, Holahan, & Brennan, 1995; Kvam & Lyons, 1991). For example, in a longitudinal study of patients with cardiac disease, higher levels of social support at baseline were associated with fewer depressive symptoms one year later both directly and indirectly, through encouraging higher levels of approach coping (Holohan et al., 1995). However, other studies have failed to find an influence of support on ways of coping (e.g., Frazier, Tix, Klein, & Arikian, 2000; Mikail, DuBreuil, & D'Eon, 1993; Savelkoul et al., 2000).

A model in which social relationships serve as a coping resource is useful in addressing the mechanism through which both positive *and* negative social interactions impact well-being. For example, in a study of women diagnosed with RA, women who perceived their spouses as supportive engaged in higher levels of cognitive restructuring/information seeking, ways of coping associated with higher psychological functioning in that sample (Manne & Zautra, 1989). Meanwhile, critical remarks by patients' spouses were associated with higher levels of wishful thinking, a way of coping associated with lower levels of psychological functioning.

#### *Coping and chronic pain*

Studies that have examined the relationship between social support and coping have rarely examined, within the same study, the effect of coping on well-being (Shreurs & de Ridder, 1997). Therefore, if findings support the idea that social support influences ways of coping, it is difficult to conclude whether the coping strategies that are being encouraged by support providers are ones that lead to positive or negative health outcomes for the patient.

The present study attempted to clarify the role of support in facilitating four ways of coping that have been found to be associated with adjustment to either RA specifically, or, more generally, with chronic pain in previous research. Specifically, the effects of cognitive reframing, distancing, emotional expression, and problem solving were examined.

*Cognitive reframing*, attempts to perceive one's current situation more positively, has generally been found to be associated with positive outcomes among patients with RA (for a review, see Manne & Zautra, 1992). For example, cognitive reframing has been found to be associated with decreases in both depression and functional impairment (Felton & Revenson, 1984; Manne & Zautra, 1989; Parker, McRae, Smarr, Beck, Frank, Anderson, & Walker, 1988b). In a previous study based on the current sample, morning use of cognitive reframing predicted lower levels of evening pain severity (Newth, 1997). *Distancing* refers to attempts to avoid acknowledging, dwelling upon, or expressing the extent of pain and its associated distress. Suppressing thoughts and conversations about health problems were associated with increased functional impairment in a study of patients with RA (Parker et al., 1988b). Ignoring pain and diverting attention away from pain among patients with chronic pain have been associated with both decreases in physical disability (Turner, 1991) and increases in disability at lower levels of pain severity (Jensen & Karoly, 1991). In a study of patients with OA, distancing was associated with increased activity level, but unrelated to pain severity (Regan, Lorig, & Thoresen, 1988).

Findings from studies of *emotional expression* and chronic pain have been somewhat mixed as well. Emotional expression refers to efforts to express pain-related distress in an interpersonal context. In a study by Affleck and colleagues (1999), emotional support seeking predicted higher next day pain among patients with RA, however, venting emotions

was unrelated to pain severity. In this same study, emotional support seeking was associated with lower pain levels the following day among patients with OA. In a study by Turner and colleagues (1987), support seeking was correlated with lower levels of pain. However, Kelley and colleagues found no significant associations between emotional expression and pain (Kelley, Lumley, & Leisen, 1997). However, the discrepancy between his findings and that of other researchers may be due to differences in contextual factors between his study and others – participants in his study expressed their emotions by speaking into a microphone rather than to another person.

*Problem solving* involves attempts to directly impact the source of the problem. Active coping strategies such as problem solving have generally been associated with positive health outcomes (Jensen, Turner, Romano, & Karoly, 1991). However, this relationship has not always been found. In a study by Newth (1997) based on the sample used in the current study, morning use of problem solving was associated with greater levels of evening pain severity. This seemingly contradictory finding was viewed as a possible reflection of the consequences of failing to disengage from potentially harmful activities, leading to overexertion. Research has also shown that problem solving may not be an effective strategy for patients dealing with a stressor over which they have little or no control over, such as RA pain (Aldrich, Eccleston, Crombez, 2000; Folkman, Lazarus, Gruen, & DeLongis, 1986a).

#### *Methodological Issues*

Recent calls in the stress and coping literature have been made for the use daily process methods involving intensive day-to-day monitoring in order to view support and coping processes close to their real-time occurrence (Tennen, Affleck, Armeli, & Carney,

2000). Multiple time-points are often necessary to create an appropriate test of the stability and magnitude of the relation between variables (Epstein, 1983). One method that has been used to examine the temporal patterning of support and coping processes is the structured daily record approach. Using this design, the validity and reliability of self-report data can be increased by decreasing recall error of various events and experiences. A further advantage of this methodology is that it allows a better mapping of methods onto conceptual models of social support and coping as processes (Gottlieb & Wagner, 1991; Lazarus & Folkman, 1984; Rutter, 1987). That is, the causes and effects of these variables are believed to occur over time (Tennen et al., 2000).

### *The Current Study*

Although research has demonstrated associations between both social support and coping with well-being among patients with chronic illness, these lines of research have developed relatively independent of one another. Schreurs and deRidder (1997) have suggested that in order to gain a better understanding of how patients cope with their illness and the influence of the social context in which coping occurs, researchers should examine the combined effects of support and coping on well-being. Thus, the current study utilized a structured daily record method to examine the relations among social support, coping, and pain severity among patients with RA over time. Given that levels of social support, ways of coping, and pain severity have been demonstrated to vary across time and context within individuals (e.g., Affleck et al., 1994; Grennan & Jayson, 1989; Tennen et al., 2000; Wethington & Kessler, 1991), an appropriate framework existed in which to take an idiographic-nomothetic approach to examining these variables (Keefe, Affleck, Lefebvre, Starr, Caldwell, & Tennen, 1997; Tennen & Affleck, 1996).

The current study tested three possible pathways through which support may impact pain severity among patients with RA. First, we examined whether measures of satisfaction with social support and disappointment in social support were directly related to subsequent levels of pain severity, independent of the effects of coping. Based on previous research (e.g., Feldman et al., 1999), we expected that support would be associated with decreases in pain severity across the course of a day. Although no previous research has examined the influence of dissatisfaction in support on pain severity, based on previously established relations with mood and disease status (e.g., Griffen et al., 2001; Revenson et al., 1991), it was expected that disappointment in support would be associated with higher levels of pain severity over the course of a day. The final two questions investigated ways in which satisfaction with support and disappointment in support might relate with coping to predict pain. According to Carpenter and Scott (1992), social support may encourage both the use of specific coping strategies and the skill with which coping strategies are employed. The second question asked whether support and coping interact to predict subsequent pain levels. In other words, are perceptions of support related to increases or decreases in the effectiveness of various ways of coping. Given that this question has not been addressed in previous research among patients with chronic health problems, no specific hypotheses were made. Finally, we asked whether satisfaction and disappointment with support are associated with the use of coping strategies. Based on past research (e.g., Manne & Zautra, 1989), it was expected that satisfaction with support would be associated with higher levels of adaptive coping and disappointment in support would be associated with higher levels of maladaptive coping.

## Method

### *Sample*

The final sample consisted of 73 patients with RA. Respondents were recruited via the British Columbia Rheumatoid Arthritis Registry and the Provincial Department of Vital Statistics. To be eligible, individuals were required to meet the following criteria: (1) diagnosed with RA as defined by the American Rheumatism Association criteria (Arnett et al., 1988), (2) non-hospitalized and had utilized outpatient services during the previous three years, (3) did not meet criteria for major co-morbidity (e.g., life-threatening illness, major heart disease, stroke complications), (4) had clearance from their primary physician, (5) lived within the Greater Vancouver Region and (6) spoke English.

Respondents were predominantly female (77%) and married (68%), ranging from 24 to 81 years old ( $M = 56.2$ ,  $SD = 13.12$ ).<sup>1</sup> The majority of respondents had completed at least a high school education (96%). Thirty-seven percent were working at the time of the study, while the remainder were either retired (38%), on sick leave (15%), unemployed (7%), or laid off (1%). The mean number of years since diagnosis was 10.91 ( $SD = 9.87$ ), ranging from 1 to 41 years. Respondents reported frequency of morning stiffness on a scale from 1 (*never*) to 6 (*all of the time*). Respondents indicated an average stiffness frequency of 3.03 ( $SD = 1.55$ ). On a measure assessing the degree to which individuals experienced difficulties completing eight daily activities on a scale ranging from 0 (*no difficulty*) to 3 (*unable to do*), respondents reported a mean level of functional disability of .78 ( $SD = .55$ ).

### *Attrition*

Of the 230 eligible respondents initially identified by the researchers, 200 gave consent via mail to be reached by telephone. One hundred and forty-nine individuals agreed via telephone to participate in the current study and were mailed study materials. In total,

114 completed study material packages were returned. We were able to interview 25 of the respondents who did not return the study materials in order to establish reasons for their withdrawal. Reasons for withdrawal included unexpected illness (RA related or other types of illness), leaving town, or reluctance to complete study materials twice daily. Of the 114 respondents who completed and returned the study materials, 14 completed less than 50% of the 14 timepoints within the structured record and were dropped from the analyses due to insufficient data. An additional 23 respondents indicated they had absolutely no RA related pain to cope with during the course of the study and three respondents indicated they had done nothing over the course of the study to cope with their RA pain. Given the focus of the current analyses and the requirement for within subject variability in order for participants to be included in the analyses, these individuals were also excluded. Lastly, one respondent was an outlier on a predictor variable, and was therefore dropped from the analyses. Analyses indicated that dropped respondents were not significantly different from the final sample in educational status, years since diagnosis of RA, or age (i.e.,  $p > .10$  for all tests). However, the final sample reported more frequent morning stiffness,  $t(92) = -3.12$ ,  $p < .01$ , and greater difficulties in daily living activities,  $t(93) = -3.67$ ,  $p < .001$ , in comparison to those dropped from the current analyses. Given that several respondents were dropped due to absence of RA related pain, these findings suggest that dropped respondents were also experiencing lower levels of overall disease activity.

#### *Procedure*

Respondents completed an initial background questionnaire, followed by a structured daily record twice daily for one week. Respondents were asked to complete the records around lunchtime, and again before going to bed each day. At each of the 14 timepoints,

respondents reported levels of satisfaction with support, disappointment in support, coping, and pain since the last record entry. Respondents were encouraged to seal the records after completing each timepoint using stickers provided by the researchers. In this way, the period of cued recall was limited to no more than half a day.

### *Measures*

In order to address the hypotheses in the current study, information was drawn from data collected as part of a larger study investigating stress, coping, and support among patients with RA. Only those measures that were examined in the current study will be addressed here.

#### *Background Questionnaire*

Respondents provided demographic and medical status information including age, sex, education level, marital status, work status, year of RA diagnosis, morning stiffness frequency, and functional disability. Functional disability was operationalized as difficulties performing eight daily activities (e.g., dressing oneself, getting in and out of bed, walking). These items were drawn from the Modified Stanford Health Assessment Questionnaire (Pincus, Summey, Soraci, Wallston, & Hummon, 1983), which is a short-form of the Difficulty in Mobility Subscale of the Stanford Health Assessment Questionnaire (HAQ; Fries, Spitz, & Kraines, 1980).

#### *Daily Record Measures*

The following measures were completed twice daily as part of the structured daily record.

*Pain Severity.* Respondents indicated severity of RA pain on a 10 cm visual analogue scale (VAS) with possible scores ranging from 0 (*no pain*) to 100 (*severe pain*; Huskisson,

1974). The VAS has demonstrated good validity in previous research, displaying positive associations with other self-report measures of pain intensity (e.g., Paice & Cohen) and observed pain behaviours (e.g., Gramling & Elliot, 1992). Participants reported an average level of pain severity of 40.16 ( $SD = 22.97$ ) in the morning and 40.02 ( $SD = 22.91$ ) in the evening.

*Satisfaction with Support.* Respondents were asked to indicate “Who was helpful to you in dealing with your arthritis pain this morning (or afternoon) – either by talking with you, comforting you, listening to you, giving you advice, or giving you practical assistance?” Respondents indicated sources of support which they found helpful using a checklist which included: a) no one, b) spouse, c) brother or sister, d) child(ren), e) parent, f) parent-in-law, g) other relative, h) friend, i) neighbor, j) someone at work, or k) someone else (who?). The number of sources of support were summed to create a total score for morning and evening satisfaction with support. Due to the skewed nature of the data (96% of the total scores on this variable were either 1 or 0), satisfaction with support was treated as a dichotomous variable that was coded as “1” (satisfied with at least one person’s support) or “-1” (not satisfied with support from any source).<sup>2</sup> Seventy-one percent of respondents reported satisfaction with support on a least one morning of the study. Seventy percent of respondents reported satisfaction with support on at least one evening.

*Disappointment in Support.* Respondents were also asked to indicate “Who disappointed you in helping you deal with your arthritis pain this morning (or afternoon)?” Respondents indicated sources of disappointment using the same checklist of individuals described above. The number of sources of disappointment in support were summed to yield a total score for morning and evening disappointment in support. Given that none of the participants reported

a total disappointment score of greater than one, disappointment in support was also treated as a dichotomous variable that was coded as “1” (disappointment in support) or “-1” (no disappointment in support). While 15% of respondents reported being disappointed in the support they received on at least one morning, 18% reported disappointment on at least one evening. The relatively low level of disappointment reported by participants in the current study is consistent with previous findings that negative interpersonal events occur infrequently compared to positive interpersonal events (Rook and Pietromonaco, 1987).

*Coping Strategies.* Participants completed a brief Ways of Coping inventory that was based on the longer Revised Ways of Coping (WOC-R; Folkman, et al., 1986). The WOC-R was adapted here specifically for use with a chronic pain population. In addition to the scales tapped with the WOC-R (planful-problem solving, confrontation, distancing, self-control, escape-avoidance, accepting responsibility, positive reappraisal and seeking social support), the brief WOC used here also assessed downward social comparison. This latter form of coping has been found to be an important component of coping with pain and illness in previous studies (e.g., Affleck, Tennen, Pfieffer, Fifield, & Rowe, 1987; Affleck, Tennen, Pfieffer, & Fifield, 1988a; Wood, Taylor, & Lichtman, 1985).

Respondents indicated the degree to which they had utilized each of 18 coping strategies specifically to cope with RA pain on a three point scale labeled 0 (*not at all*), 1 (*some*) and 2 (*a lot*).

The Brief WOC contains four subscales, which were derived from a factor analysis of the current data (Newth, 1997):

*Cognitive Reframing* represents efforts to perceive one's current situation positively. Items reflect both positive reappraisal and downward social comparison. Therefore, this scale

includes both downward social comparison strategies that enable the individual to see themselves as better off than others (e.g., “Realized how, in some ways, I’m more fortunate than others”) and coping efforts geared towards focusing on positive elements within one’s current situation (e.g., “Changed or grew as a person in a good way”). The average levels of morning and evening cognitive reframing reported by respondents were .42 ( $SD = .48$ ) and .39 ( $SD = .48$ ), respectively.

*Distancing* represents attempts to avoid acknowledging, dwelling upon, or expressing the extent of the pain and its associated distress. This scale includes elements of distancing both oneself and others from the pain or pain-related distress as a means of coping (e.g., “Went on as if nothing had happened” or “Tried to keep my pain to myself”). The average levels of morning and evening distancing reported were .72 ( $SD = .52$ ) and .69 ( $SD = .52$ ).

*Emotional Expression* represents efforts to express the pain-related distress within an interpersonal context. This scale includes items reflecting both the expression of pain-related emotions (e.g., “Expressed anger”) as well as efforts to obtain social support for such feelings (e.g., “Accepted sympathy and understanding from someone”). Respondents reported average levels of morning and evening emotional expression of .27 ( $SD = .37$ ) and .26 ( $SD = .34$ ), respectively.

*Problem Solving* represents increased efforts to engage oneself cognitively and behaviorally in order to directly impact the source of stress as a means of coping. Items on this scale reflect effortful and attentive attempts to develop and execute a course of action that will directly impact the pain and its effects (e.g., “I knew what I had to do so increased my efforts to make things work”). The average levels of morning and evening problem solving reported were .53 ( $SD = .57$ ) and .51 ( $SD = .57$ ).

## Results

Pearson product moment correlations were calculated among daily record variables and demographic and medical status variables. Values for daily record variables were aggregated across timepoints for each individual. Evening pain severity was not significantly associated with gender, age, marital status, or years since diagnosis (i.e.,  $p > .10$  for all tests). However, it was significantly positively associated with morning stiffness frequency,  $r(73) = .44, p < .001$ , and functional disability,  $r(73) = .47, p < .001$ . Satisfaction with support, but not disappointment in support, was significantly positively associated with functional disability,  $r(73) = .41, p < .001$ . Cognitive reframing and emotional expression were associated with greater levels of functional disability,  $r(73) = .24, p < .05$  and  $r(73) = .30, p < .01$ , respectively. Emotional expression was also significantly associated with greater frequency of morning stiffness,  $r(73) = .26, p < .05$ . Finally, distancing and problem solving were negatively related to age,  $r(73) = -.42, p < .001$  and  $r(73) = -.23, p < .05$ , respectively.

Correlations were then calculated among daily record variables (see Table 1). At the bivariate level, evening pain severity was found to be significantly positively associated with morning pain severity, satisfaction with support, and somewhat, but not significantly, associated with higher disappointment in support. Two of the four coping strategies were significantly related to evening pain severity (c.f., Newth, 1997). Specifically, morning use of emotional expression and problem solving were both significantly positively associated with evening pain severity. Satisfaction with support and disappointment in support were also found to be significantly associated with coping. Satisfaction with support was significantly associated with greater use of cognitive reframing, emotional expression, and

problem solving. Meanwhile, disappointment in support was significantly positively associated with emotional expression and problem solving.

### *Hierarchical Linear Modeling*

Hierarchical linear modeling (HLM) was used to examine relations among support, coping, and pain severity over time. Within-person variation in support and coping processes was examined, while simultaneously taking into account between-person variation in the dependent variables. We used a random-intercept model in which the intercept is specified as random and the slopes are specified as fixed. With the exception of perceived support and disappointment in support, all daily record study variables were standardized. In addition, each predictor variable was centered around the mean of each individual's average score during the study.<sup>3</sup>

### *Lagged effects of morning coping and morning support with evening pain severity*

Before specifying models testing the relations among morning support, coping and evening pain severity, demographic and medical status variables (gender, age, years since diagnosis, stiffness frequency, and functional disability) were modeled individually onto the intercept of evening pain severity in the absence of any explanatory variables (i.e., the null model). Stiffness frequency and functional disability were found to be significantly positively related to evening pain severity. Consistent with recommended multilevel model specification, the insignificant effects were dropped and stiffness frequency and functional disability were retained as control variables in subsequent analyses predicting evening pain severity (Snijders & Bosker, 1999; Kreft & De Leeuw, 1998).

*Do morning satisfaction with support, disappointment in support, and coping have independent effects on evening pain severity?* We specified a model predicting evening pain

severity that included morning levels of satisfaction with support, disappointment in support, and coping (cognitive reframing, distancing, emotional expression, and problem solving), controlling for stiffness frequency, functional disability, and morning pain. Results indicated that morning use of cognitive reframing significantly predicted lower levels of evening pain severity,  $\beta = -.16$ ,  $t(414) = -2.39$ ,  $p < .05$ , while morning use of problem solving significantly predicted higher levels of evening pain severity,  $\beta = .19$ ,  $t(414) = 3.46$ ,  $p < .001$  (c.f., Newth, 1997). Morning use of distancing and emotional expression were not significantly related to evening pain severity,  $\beta = .01$ ,  $t(414) = .19$ ,  $p > .50$  and  $\beta = .02$ ,  $t(414) = .42$ ,  $p > .50$ , respectively. In addition, morning satisfaction with support, and disappointment in support were not significantly associated with evening pain severity,  $\beta = .00$ ,  $t(414) = -.05$ ,  $p > .50$ , and  $\beta = -.02$ ,  $t(414) = -.20$ ,  $p > .50$ , respectively.

*Does morning satisfaction with support interact with morning coping to predict evening pain severity?* Models were specified to determine whether satisfaction with support interacted with coping to predict subsequent pain severity. Although potential interactions between disappointment in support and coping in predicting subsequent pain severity were also of interest in the current study, low endorsement of disappointment in support did not permit its examination within an interaction term. That is, comparing the effects of coping when patients reported disappointment in support versus no disappointment in support would have resulted in a greatly imbalanced  $n$  for the two groups.

The interaction between satisfaction with support and coping was tested in four separate models. Each model was specified to include morning support, morning coping (cognitive reframing, distancing, emotional expression, and problem solving), and an interaction term between support and one of the four coping styles, controlling for stiffness

frequency, functional disability, and morning pain. Given that disappointment in support was non-significant in the previous model, it was excluded from all subsequent analyses predicting evening pain severity.

Of the four coping x support interaction terms examined, distancing was found to interact significantly with support to predict evening pain severity,  $\beta = -.08$ ,  $t(417) = -2.46$ ,  $p < .01$ . This interaction is illustrated in Figure 1, in which the relationship between morning distancing and evening pain severity is displayed as a function of whether or not respondents reported satisfaction with support that morning. On mornings when respondents reported satisfaction with support, increased use of distancing was associated with lower levels of pain severity in the evening. However, when distancing was used in a context in which helpful support was not perceived, this way of coping was actually associated with higher levels of pain severity across the day.

#### *Concurrent relations among morning support and morning coping*

*Do satisfaction with support and disappointment in support influence evening pain severity through indirect effects on coping?* Models predicting morning measures of each the four coping strategies were specified.<sup>4</sup> In order to control for the effects of various demographic and medical status variables on coping, preliminary analyses were conducted for each of the four models in order to determine the presence of significant relationships between level two variables and ways of coping. Significant level two predictors were retained in the models and all others were dropped. Morning satisfaction and disappointment with support were entered as predictor variables, while morning pain severity, and the three ways of coping (not being predicted) were entered as control variables. Results are presented in Table 2. Findings indicated that on mornings when respondents reported satisfaction with

support, they reported engaging in significantly higher levels of cognitive reframing, emotional expression, and problem solving,  $\beta = .10$ ,  $t(418) = 2.39$ ,  $p < .05$ ,  $\beta = .34$ ,  $t(417) = 6.28$ ,  $p < .001$ , and  $\beta = .07$ ,  $t(416) = 2.12$ ,  $p < .05$ . On mornings when respondents reported being disappointed in support, they also reported using significantly higher levels of emotional expression, and problem solving,  $\beta = .23$ ,  $t(417) = 2.00$ ,  $p < .05$  and  $\beta = .14$ ,  $t(416) = 2.34$ ,  $p < .05$ , respectively. Thus, although morning satisfaction and disappointment with support did not have direct effects on evening pain severity, these variables appeared to exert indirect effects on pain severity through associations with ways of coping.

### Discussion

Using a daily process methodology, the present study examined the role of satisfaction and disappointment with support in coping and pain severity among patients with RA. Consistent with our hypotheses, support appeared to influence pain severity both through encouraging the use of specific coping strategies, as well as by impacting the effectiveness with which these coping strategies are employed. Thus, our findings provide support for models conceptualizing social support as a coping resource (O'Brien & DeLongis, 1997; Thoits, 1986).

#### *Satisfaction with Social Support and Ways of Coping*

Patients' reports of greater satisfaction with their support were associated with higher reported use of cognitive reframing. This finding is consistent with previous research demonstrating a positive relationship between these variables (Dunkel-Schetter et al., 1987; Manne & Zautra, 1989). It also provides evidence for Thoits' suggestion that social support helps individuals reinterpret their situation so that it becomes less distressing. Given that cognitive reframing in the morning predicted decreases in evening pain severity in a study of

the current sample (Newth, 1997), this finding is also consistent with studies demonstrating that positive aspects of support are associated with adaptive ways of coping (see Schreurs and de Ridder, 1997, for a review).

When patients in our study reported satisfaction with support, they also tended to report using higher levels of emotional expression. This relation between social support and emotional expression is consistent with previous research (e.g. Dunkel-Schetter, Folkman, & Lazarus, 1987). However, emotional expression was unrelated to pain outcomes in the present study (Newth, 1997). Therefore, this particular mode of coping may be a more important factor in predicting other outcomes such as negative affect (e.g., Felton & Revenson, 1984; Stanton, Danoff-Burg, Cameron, & Ellis, 1994).

Finally, when patients reported satisfaction with support, they tended to indicate using higher levels of problem solving. This finding is consistent with previous studies that have found support to be related to active ways of coping such as problem solving (Schreurs & deRidder, 1997). However, in contrast to previous research, problem solving was found to be a maladaptive way of coping with pain in the current sample of patients with RA (Newth, 1997). It is possible that when friends and family encourage patients to directly impact their pain, they may inadvertently push patients too hard, leading them to overexert themselves. Even if efforts to influence pain directly do not result in overexertion, the increased attention towards the pain that occurs in the meantime may be responsible for increases in pain ratings (McCracken, 1997; Newth, 1997).

Overall, our findings suggest that when respondents reported feeling supported, they also reported using more of a variety of coping strategies, perhaps reflecting a greater effort put forth to cope with pain. This may be because support providers are encouraging patients'

efforts to cope, which may serve to both increase satisfaction with support and to increase coping efforts. However, our findings suggest that these increased coping efforts are not always well-placed. That is, our findings indicate that the coping efforts of patients in our study were not always tied to better pain outcomes. This highlights the need for psychoeducational approaches that help patients and their families to best direct their efforts towards more efficacious modes of coping with pain. These findings suggest that including support providers in clinical interventions may increase their effectiveness (cf., Johnson, 2002).

#### *Disappointment in Social Support and Ways of Coping*

Our study also suggested that when patients are disappointed in the support they receive, they tend to increase their use of emotional expression. This finding is consistent with that of Griffen and colleagues (2001) who found a relationship between perceived punishing responses of support providers and a greater use of venting negative emotions. It seems that when patients become disappointed in their support, efforts to engage in adaptive ways of coping may become derailed. The focus of coping may instead turn to the expression of distress related to both their pain and disappointment in support. In addition, at times when patients reported being disappointed in the support they received, they tended to use higher levels of the one form of coping we found to be associated with poorer pain outcomes: problem solving. This finding is consistent with research and theory suggesting that negative social interactions are associated with maladaptive ways of coping (see Schreurs and de Ridder, 1997, for a review).

#### *Support and Coping Effectiveness*

Upon examination of the potential interactions between morning support and coping in predicting evening pain severity, we found that on mornings when patients felt supported by their networks, the use of distancing was associated with lower levels of evening pain severity. However, when patients reported using distancing in the absence of support, distancing was associated with higher levels of evening pain severity. In other words, distancing appeared to be effective only when patients felt they were supported by their social networks. This may reflect situations in which support providers help patients distance themselves from their pain by distracting them and not engaging them in a discussion about their pain. However, support providers may render patients' efforts to distance as ineffective if they draw attention to the patient's pain by asking them about their pain or providing them with sympathy or pity. Previous findings have indicated that misunderstood needs of arthritis patients may lead to poorer illness adjustment (e.g., Melamed & Brennar, 1989). Our findings suggest that if patients' needs are misunderstood, support providers may not be able to successfully support the patient's coping efforts.

Our finding that the use of distancing was only effective when supported by members of one's social environment suggests a possible explanation for contradictory findings on the benefits of coping via illusion and other denial-like strategies (e.g., Colvin and Block, 1994; Taylor and Brown, 1988). Contradictory findings regarding the benefit versus harm of illusions may be due in part to a failure to consider the social context in which they occur. In other words, illusions may be beneficial to the extent that they are supported by one's social network. If the patient tries to distance themselves from the negative, but realistic, aspects of his or her situation, and others in their social network do not support these efforts, but rather

continue to talk about the (perhaps realistically) negative aspects of the situation, then our findings indicate that the patient's coping efforts are not likely to be successful.

*Direct effects of support and disappointment in support on pain severity*

In contrast to previous research that has demonstrated direct effects of support among patients with chronic pain (e.g., Feldman et al., 1999, Evers et al., 1998), we did not find a significant direct relationship between satisfaction with support and pain severity over time. Our subsequent finding that support was associated with adaptive *and* maladaptive ways of coping may help shed light on this result. That is, no direct relationship between morning support and evening pain severity may have emerged in the present study because support providers were encouraging both adaptive and maladaptive ways of coping with pain.

Similarly, disappointment in support in the morning did not predict increases in pain severity in the evening. Although "negative" support has been shown in previous research to exert direct (harmful) effects on psychological well-being (e.g., Revenson et al., 1991; Riemsma et al., 2000), little is known about its relation to physical well-being. Our findings suggest that negative interpersonal exchanges may impact physical well-being indirectly, rather than directly, through ways of coping.

The focus of the present study was the role support played in both coping and pain outcomes. However, it is likely that support and coping are two dynamic processes that are *mutually* influential over time (O'Brien & DeLongis, 1997; Thoits, 1986). In an effort to clarify the relations among these variables in the current study, additional analyses examined morning support predicting evening coping, as well as morning coping predicting evening support. Overall, findings were consistent with a model in which social support influences

coping. In particular, satisfaction with support in the morning was found to predict higher levels of problem solving in the evening, controlling for prior levels of problem solving. With respect to disappointment in support, however, the direction of relationship seemed to be reverse. That is, findings were consistent with a model in which disappointment in support was an outcome, rather than a determinant, of coping. Although morning disappointment in support did not predict evening coping, morning coping via distancing did predict evening disappointment. This finding suggests that if patients try to keep others from knowing how much pain they are in, they may not provide sufficient cues to others in their social environment concerning the types of help they might need. A consequence of this appears to be subsequent disappointment in support. This finding is consistent with existing literature that suggests when individuals engage in avoidant coping such as distancing, they are more susceptible to decreases in social resources (Dunkel-Schetter et al., 1987; O'Brien & DeLongis, 1997).

#### *Future Directions*

The current study suggests that in order to gain a better understanding of the mechanisms through which social support processes influence well-being, it is necessary to examine these processes in relation to coping. To our knowledge, this is the first study that has used a daily process methodology to examine the interplay between support and coping among patients with chronic pain. Findings of the current study warrant additional research of this nature to further explore the support and coping process as it unfolds over time in this population.

Research that has been conducted on the role of support and coping among patients with chronic pain has focused on psychological adjustment as an outcome. Along with the

present study, research is accumulating to suggest that these processes also influence physical outcomes, such as pain severity. Thus, future research should attend to the effects of support and coping on both psychological *and* physical well-being among patients with chronic pain.

Previous research has suggested that it is the *perception* of social support, rather than the actual enactment of support, which is key in promoting well-being (see Sarason, Sarason, & Pierce, 1990, for a review). Therefore, the present study asked individuals to indicate whether they perceived others as being helpful in dealing with their pain. In order to gain greater insight into the supportive exchanges that occur between individuals, it would also be informative to obtain ratings from support providers as to whether they felt they provided support to the patient, and if so, what sort of support was offered.

The present study used a global measure of perceived support similar to measures used in previous daily record studies (e.g., Bolger, DeLongis, Kessler, & Schilling, 1989). In the present study, this measure of support was found to be associated with both adaptive and maladaptive ways of coping with pain. This suggests the potential advantage of using a measure of support that distinguishes between various functions of support, such as emotional and instrumental support, so that the unique effects of different supportive functions on coping and pain may be examined.

Our finding that disappointment in support is related to ways of coping with pain among patients with RA suggests the need for further research on the effects of dissatisfaction with support among patients with chronic pain. Previous research has shown that individuals may become dissatisfied with the support they receive when it is judged to be excessive or unwanted, inconsistent with their needs, or coming from the “wrong” support

provider (Lanza, Cameron, & Revenson, 1995). Future research should further explore the conditions under which disappointment occurs, as well as the subsequent effects on ways of coping and health outcomes.

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## Footnotes

<sup>1</sup> The higher percentage of women in the current study is consistent with the greater prevalence of RA among women (i.e., the overall ratio is 3:1; Anderson, Bradley, Young, McDaniel, & Wise, 1985).

<sup>2</sup> The use of dummy coding was used for all dichotomous study variables, as recommended by Pedhazur (1982) to ease interpretation. With this type of effect coding, a positive beta coefficient indicates that the effects of the independent variable are stronger for “1”, and a negative beta coefficient indicates that the effects are stronger for “-1”.

<sup>3</sup> This type of centering allows one to examine the effects of individual changes in coping and support during the period of observation (Raudenbush, Brennan, & Barnett, 1995). For example, one can answer the question, what is the impact on evening pain severity when an individual uses more cognitive reframing than they do on average. Further, by using deviation scores, each person becomes his or her own control, thereby diminishing possible confounds (Aldwin, 1994; Vitaliano, Maiuro, Russo, & Becker, 1987).

<sup>4</sup> To further explore the direction of relationship among support and coping variables, a secondary set of analyses was conducted. First, morning satisfaction with support and disappointment in support were modeled to predict evening ways of coping, controlling for morning coping and morning pain. Second, morning coping variables were modeled to predict evening satisfaction with support and evening disappointment in support, controlling for morning perceived support, morning disappointment in support, and morning pain. Findings indicated that morning support predicted levels of coping in the evening. Specifically, morning support predicted a greater level of evening problem solving,  $\beta = .08$ ,  $t(417) = 2.12$ ,  $p < .05$ . Meanwhile, the relationship between disappointment in support and

copied seemed to be in the opposite direction. Specifically, morning use of distancing was found to be associated with higher levels of disappointment in support in the evening,  $\beta = .09$ ,  $t(418) = 1.92$ ,  $p < .05$ .

*Table 1: Intercorrelations among morning and evening pain severity, morning satisfaction with support, morning disappointment in support, and morning coping*

	1	2	3	4	5	6	7	8
1. AM Cognitive Reframing	-	.28*	.49***	.53***	.26*	.13	.27*	.17
2. AM Distancing		-	.25*	.45***	.19	.17	.11	.08
3. AM Emotional Expression			-	.45***	.48***	.34**	.37***	.29*
4. AM Problem Solving				-	.34**	.41***	.30**	.37***
5. AM Satisfaction with Support					-	.35**	.29*	.30**
6. AM Disappointment in Support						-	.15	.22†
7. AM Pain Severity							-	.87***
8. PM Pain Severity								-

Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

†  $p < .10$

Table 2: Hierarchical Linear Model (HLM) Analyses: Relations of satisfaction with support and disappointment in support to coping, controlling for pain severity

Effect	Cognitive Reframing		Distancing		Emotional Expression		Problem Solving	
	$\beta$	t	$\beta$	t	$\beta$	t	$\beta$	t
Stiffness	- <sup>a</sup>	-	.13*	2.27	.12**	3.00	.11*	2.21
Frequency								
Age	-	-	-.03***	-4.18	-	-	-.02*	-2.06
Pain Severity	-.08†	-1.73	.14**	2.78	.03	.37	.06	1.07
Cognitive Reframing	-	-	.33***	5.65	.25	2.28	.28**	5.90
Distancing	.26***	4.38	-	-	.02	.33	.20**	3.64
Emotional Expression	.12*	2.16	.01	.16	-	-	.00	.06
Problem Solving	.27***	5.20	.25***	4.35	.01	.19	-	-
Satisfaction with Support	.10*	2.39	-.03	-.77	.34***	3.28	.07*	2.12
Disappointment in Support	-.11	-1.35	.05	.63	.23*	2.00	.14*	2.34

Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

†  $p < .10$

<sup>a</sup>Dashed line indicates predictor variable was dropped from model. With respect to age and stiffness frequency variables, dashed line indicates variable was dropped based on preliminary analyses demonstrating non-significant relationship.

Figure 1: Evening pain severity as a function of morning distancing and support

