

Beyond Unfavorable Thinking: The Illness Cognition Questionnaire for Chronic Diseases

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The literature on chronic diseases recognizes the role of illness cognition as a mediator between stress and illness. Few conceptualizations and instruments, however, give an indication of both unfavorable and favorable ways of adjusting to an uncontrollable long-term stressor, such as a chronic disease. The authors propose 3 generic illness cognitions that reflect different ways of reevaluating the inherently aversive character of a chronic condition: helplessness as a way of emphasizing the aversive meaning of the disease, acceptance as a way to diminish the aversive meaning, and perceived benefits as a way of adding a positive meaning to the disease. A self-report instrument, the Illness Cognition Questionnaire, was developed to assess these cognitions across different chronic diseases. The results support the reliable and valid assessment of these illness cognitions in patients with rheumatoid arthritis and multiple sclerosis and indicate the maladaptive function of helplessness and the adaptive function of acceptance and perceived benefits for the long-term physical and psychological health of patients with a chronic disease.

In recent decades, the role of cognition has been extensively recognized in the development, maintenance, and modification of emotional disorders and psychological well-being (e.g., Beck, Rush, Shaw, & Emery, 1979; Bower, 1981; Lang, 1984). Health psychologists have extended this line of research to the impact of health-related cognitions on physical health and disease outcomes, largely stimulated by stress-illness and self-regulatory approaches (Lazarus & Folkman, 1984; Leventhal, Nerenz, & Steele, 1984). In this tradition, it has been commonly assumed that illness cognitions are an important mediator between disease and patients' well-being and that the way patients perceive and think about their diseases accounts for much of the individual differences in their physical and psychological health status.

A main focus of attention has been the structure of illness cognitions when patients are faced with a chronic disease—by definition, an inherently aversive, long-term condition with a relatively high degree of uncontrollability and unpredictability. Various empirical approaches have identified multidimensional patterns of illness cognitions and provided a better understanding of possible cognitive reactions to long-term stress (e.g., Leventhal & Nerenz, 1985; Turk, Rudy, & Salovey, 1986; Weinman, Petrie, Moss-Morris, & Home, 1996; Weir, Browne, Roberts, Tunks, & Gafni, 1994; see also Scharloo & Kaptein, 1997). However, evidence of the generic structure across different populations (e.g., Heijmans & de Ridder, 1998; Schiaffino & Cea, 1995) and consistent prediction of future health status is rare (e.g., Pakenham, 1999; Schiaffino, Shawaryn, & Blum, 1998; Stanton & Snider, 1993). Instead, constructs broadly related to the concept of control, such as helplessness, hopelessness, and cognitive distortion, have most consistently been found to predict unfavorable long-term outcomes in various chronic diseases (e.g., DeVellis & Blalock, 1992; Everson et al., 1996; Greer, Morris, Pettingale, & Haybittle, 1990; Parle, Jones, & Maguire, 1996; T.W. Smith, Christensen, Peck, & Ward, 1994), suggesting that individual differences in adjusting to long-term stress can largely be explained by a single dimension of maladaptive thinking.

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Consistent with the supposed independence of positive and negative affect systems (e.g., Costa & McCrae, 1980; D. Watson & Tellegen, 1985), preliminary evidence indicates that assessing positive in addition to negative cognitions enhances the predictability of outcomes, such as depression (e.g. Kendall, Howard, & Hays, 1989), suggesting that both adaptive and maladaptive cognitions may be crucial to fully understanding individual differences in adjusting to chronic diseases. However, the role of pos-

sible adaptive cognitions has received far less attention, and there is a general lack of cognitive dimensions demonstrating consistently beneficial and health-promoting effects (see Gillham & Seligman, 1999). For example, although the lack of perceived control has generally been demonstrated to be maladaptive, perceived control does not appear consistently beneficial and can adversely affect well-being in uncontrollable situations, like disease flare-ups (e.g., Helgeson, 1999; Newsom, Knapp, & Schulz, 1996; Schiaffino, Revenson, & Gibofsky, 1991; Tennen, Affleck, Urrows, Higgins, & Mendola, 1992). This lack of uniform effects of factors assumed to be adaptive has been frequently ascribed to the complexity of adaptive processes in highly uncontrollable situations (e.g., Averill, 1973; Silver & Wortman, 1980; C. A. Smith, Wallston, Dwyer, & Dowdy, 1997; Thompson, Cheek, & Graham, 1988). However, recent theoretical approaches have focused more on the cognitive reevaluation of the stressor as a necessary component of successfully adjusting to reduce adverse effects, without controlling the stressor *per se* (e.g., Brandtstaedter & Renner, 1992; Heckhausen & Schulz, 1995; Rothbaum, Weisz, & Snyder, 1982; Thompson, Nanni, & Levine, 1994).

Considering that evaluative processes, in terms of the meaning ascribed to the event, are inherent to adjusting to long-term stress, maladaptive and adaptive processes might be relatively uniformly described as cognitive reevaluations of the stressor. In relation to positive-negative valence, three types of reevaluations can be distinguished when one is faced with long-term stress: (a) cognitions that emphasize the negative meaning of the stressor (e.g., with an attitude of helplessness or hopelessness), (b) cognitions that diminish the aversive meaning of the stressful event (e.g., by accepting the negative impact of the stressor and learning to live with it), and (c) cognitions that add a positive meaning to the event (e.g., by focusing on additional positive consequences of the stressor). This conceptualization of positively and negatively valenced cognitions, reflecting dimensions of increased negative, decreased negative, and increased positive thinking when one faces long-term stress (see also Kendall, 1992), may provide a comprehensive pattern of cognitive adjustment that can uniformly predict the long-term health status of patients with chronic diseases.

Emphasizing the negative meaning entails focusing on the adverse aspects of the disease as an uncontrollable, unpredictable, and unchangeable condition and generalizing these consequences to daily functioning. This kind of cognitive reaction has been described in helplessness-hopelessness theory as a negative explanatory style when one is faced with a stressful event (Abramson, Matalsky, & Alloy, 1989; Abramson, Seligman, & Teasdale, 1978; Seligman, 1975), consisting of negative outcome expectancies, global and stable attributions ascribed to the event, and inferred negative characteristics ascribed to the self. Considerable research has demonstrated the prominent role of helplessness-hopelessness constructs, indicating that they are a prospective risk factor for an unfavorable physical and psychological health status in various chronic diseases (e.g., DeVellis & Blalock, 1992; Everson et al., 1996; Greer et al., 1990; Parle et al., 1996; T. W. Smith et al., 1994).

In contrast, the aversive meaning of the disease can also be diminished by patients' acknowledging that they are chronically ill and simultaneously perceiving the ability to live with and master the consequences of their disease. This cognition has previously

been described in terms of acceptance (see, e.g., Hayes, Jacobson, Follette, & Dougher, 1994; McCracken, 1998). Acceptance means recognizing the need to adapt to a chronic illness while perceiving the ability to tolerate the unpredictable, uncontrollable nature of the disease and handle its aversive consequences. The possible beneficial function of this cognition has been supported by concurrent associations with a more favorable physical and psychological health status in various chronic conditions (e.g., Li & Moore, 1998; McCracken, 1998; Revenson & Felton, 1989; Summers, Rapoff, Varghese, Porter, & Palmer, 1991). Prospective studies have also provided preliminary evidence for beneficial long-term effects of this cognition on psychological health in patients with cancer and multiple sclerosis (Brooks & Matson, 1982; Carver et al., 1993).

One can also add a positive meaning to the disease by perceiving additional positive consequences of the stressful condition. A perception of benefits has been frequently reported as a reaction to highly uncontrollable and stressful life events and to confronting loss (for overviews, see Affleck & Tennen, 1996; Park, 1997; Tedeschi & Calhoun, 1996). Three major benefits seem applicable to most patients: changes in life priorities and personal goals, positive personality changes, and strengthened personal relationships. Aside from preliminary evidence from cross-sectional studies, prospective studies on rheumatoid arthritis patients and heart attack victims have supported the adaptive, long-term impact of perceived benefits on psychological and physical health indicators (Affleck, Tennen, & Croog, 1987; Tennen et al., 1992).

The concepts of helplessness, acceptance, and perceived benefits have been studied for various chronic diseases, and findings give preliminary evidence of generic, long-term effects on physical and psychological well-being. However, various instruments have been used to assess these concepts, measuring them as disease-specific cognitions or as traitlike constructs unrelated to chronic illnesses. For example, helplessness has been assessed with disease-specific scales for various chronic diseases (e.g., Flor, Behle, & Birbaumer, 1993; Nicassio, Wallston, Callahan, Herbert, & Pincus, 1985; M. Watson et al., 1988) or with traitlike measures of general hopelessness-helplessness constructs (e.g., Beck, Weissman, Lester, & Trexler, 1974; Millon, Green, & Meagher, 1982). Similarly, acceptance has been assessed with disease-specific scales for patients with disabilities, chronic pain, or HIV (e.g., Felton & Revenson, 1984; Linkowski, 1971; McCracken, 1998; Thompson et al., 1994) and with general coping questionnaires (e.g., Carver, Scheier, & Weintraub, 1989). Self-report instruments for assessing perceived benefits have been developed for patients with chronic pain (Tennen et al., 1992) and for individuals experiencing severe stress or trauma (Park, Cohen, & Murch, 1996; Tedeschi & Calhoun, 1996). So far, we know of no instrument that measures these constructs as generic illness cognitions across chronic diseases.

The object of our study was to develop a short, reliable, valid questionnaire for assessing the *a priori* constructs of helplessness, acceptance, and perceived benefits in patients with chronic diseases. We intended to identify a basic set of illness cognitions applicable across a range of chronic diseases that indicate both unfavorable and favorable ways of adjusting to chronic diseases. For this purpose, we developed the Illness Cognition Questionnaire (ICQ) in a sample of rheumatoid arthritis (RA) patients, and we cross-validated the factor structure in a sample of multiple

sclerosis (MS) patients. Test–Retest reliability was assessed in subsamples of these groups. We hypothesized that three relatively distinct, reliable, and stable dimensions of the a priori illness cognitions would emerge from both patient groups. In addition, we examined concurrent validity by studying relationships between the ICQ scales and constructs assumed related to illness cognitions in stress–illness approaches, such as physical and psychological health outcomes, process measures of coping and social support, and two basic personality dimensions of the Big Five—neuroticism and extraversion—that have been demonstrated to be most significant for health and well-being. On the basis of theoretical and empirical literature indicating that helplessness is relatively closely related to unfavorable physical and psychological health status, moderately to closely related to more neuroticism and less extraversion, and weakly to moderately related to more passive coping and less social support (e.g., Costa & McCrae, 1980; DeVellis & Blalock, 1992; Everson et al., 1996; Nicassio et al., 1985; Shnek et al., 1997; C. A. Smith & Wallston, 1992; T. W. Smith et al., 1994), we expected similar relationships to support this scale's concurrent validity. In contrast, relatively opposite relationships provide evidence for the concurrent validity of acceptance and perceived benefits (e.g., Affleck & Tennen, 1996; Affleck et al., 1987; Carver et al., 1993; Li & Moore, 1998; McCracken, 1998; Revenson & Felton, 1989; Summers et al., 1991; Tennen et al., 1992). To obtain preliminary evidence for discriminant validity between cognitions assumed to be adaptive and maladaptive, we expected acceptance and perceived benefits to demonstrate the closest associations to positive outcome, personality, and process measures, such as positive mood, optimism, and active coping (e.g., Affleck & Tennen, 1996; Costa & McCrae, 1980; Park et al., 1996; T. W. Smith & Christensen, 1996; D. Watson & Tellegen, 1985; Zautra et al., 1995), and we expected that the significance of these effects would continue when we controlled for their negative counterparts (i.e., negative mood, pessimism, and passive coping). Moreover, we prospectively investigated the predictive validity of ICQ scales for the long-term health status of RA and MS patients, hypothesizing that helplessness would be related to deterioration of patients' physical and psychological health status, and acceptance and perceived benefits to improvement. To obtain additional support for the generic character of the illness cognitions, we expected all relationships to be relatively uniform in both RA and MS patients and unaffected by the type of chronic disease. Finally, because the specificity of health-related constructs has been questioned insofar as they reflect aspects of neuroticism or negative affectivity (Costa & McCrae, 1980; McCrae, 1990; D. Watson & Pennebaker, 1989), particularly in relation to positive personality, outcome, or process measures (e.g., Funk & Houston, 1987; Green, Salovey, & Truax, 1999; T. W. Smith, Pope, Rhodewalt, & Poulton, 1989), we controlled for confounding effects of neuroticism in all correlational analyses.

Method

Generation of Items and Scale Development of the ICQ

On the basis of the proposed conceptualization of illness cognitions, an item pool was generated, consisting of newly constructed items and items from existing inventories that were revised slightly to assess illness cog-

nitions (Carver et al., 1989; Felton & Revenson, 1984; Linkowski, 1971; Nicassio et al., 1985; Tennen et al., 1992). All items had to meet the following scale construction criteria: be positive and unidirectionally formulated in simple, clear language; contain less than 20 words; be unambiguous and relevant to the proposed construct; and contain a direct link between the person and the illness. Respondents were asked to indicate on a 4-point Likert scale the extent to which they agree with a list of statements of people with a long-term illness (1 = *not at all*, 2 = *somewhat*, 3 = *to a large extent*, 4 = *completely*). The following instruction was used:

On the next page is a list of statements of people with a long-term illness. Please indicate the extent to which you agree with these statements by circling one of the answers following the statement. Do not spend too much time considering your answer. Your first impression is usually the best.

Then, an example of how to respond to these statements was given.

The item pool was judged on the basis of relevance and comprehensibility by several researchers or health care professionals working with patients having a wide range of chronic diseases. Subsequently, interviews were conducted with patients with different chronic diseases who again evaluated the relevance and comprehensiveness of the items. Forty-five items were then selected for future research. This initial pool was administered to the RA patients described below. Results indicated that none of the items had to be eliminated because of skewed distributions (skewness and kurtosis < 1). An exploratory principal-components factor analysis with oblique rotation was then performed with the 45-item version of the questionnaire. The scree test indicated that a three-factor solution was preferable. Items with a loading above .65 and a difference in loading to the secondary factors of .40 or more were retained. Twenty-three items met this criterion. In addition, 5 items were discarded because of overlapping contents, resulting in 18 ICQ items.

Participants and Procedures

Participants were 263 outpatients with RA from seven participating hospitals and 167 patients with MS seeking treatment in one of two MS outpatient clinics in the Netherlands. Inclusion criteria for RA were a minimum age of 18 years and a diagnosis of RA according to American College of Rheumatology criteria (Arnett et al., 1988). The RA sample was predominantly female (66%) and married (78%) with at least a primary educational level (an average of 7 years of formal education) or a secondary educational level (an average of 11–13 years of formal education) (25% and 64%, respectively). The mean age was 58.1 years ($SD = 13.6$, range = 20–85). Mean time since diagnosis was 10.3 years ($SD = 9.7$, range = 0–54). Inclusion criteria for the MS sample were a minimum age of 18 years and a diagnosis of MS according to the revised criteria for definite MS (Poser et al., 1983). The total group involved 89 relapsing remitting, 68 secondary progressive, 3 relapsing progressive, and 7 primary progressive patients. Most of the participants were female (67%) and married (81%) and had a secondary educational level (2% primary and 70% secondary). The mean age was 40.6 years ($SD = 8.8$, range = 21–67). Mean time since diagnosis was 9.4 years ($SD = 5.9$, range = 0–29). In comparison with the RA patients, the MS patients were younger, $t(428) = -16.15$, $p < .001$, and had a higher educational level, $t(428) = 8.07$, $p < .001$; there were no differences with regard to gender, marital status, or duration of disease.

To examine the temporal stability of the instrument, we administered the questionnaire twice to a subsample of 81 RA patients and 67 MS patients, with a 1-year time interval. Although a 1-year time interval is rather long for analyzing test–retest reliability, the scales are supposed to reflect long-term adjustment and were expected to be relatively stable within 1 year. Patients from these subsamples took part in a long-term follow-up study and had a relatively long duration of disease (> 7 years). Besides the differences in disease duration, $t(261) = 9.47$, $p < .001$, and $t(165) = 4.25$,

$p < .001$, for RA and MS, respectively, the MS patients in this subsample were also older than in the original sample, $t(165) = 2.42$, $p < .05$; there were no differences with regard to gender, marital status, or educational level.

For studying concurrent validity, subsamples of 208 RA patients and 134 MS patients from the original samples were randomly selected. Clinical and self-report measures of physical and psychological health, personality dimensions, coping, and social support were simultaneously administered to these patients with the ICQ. When possible, the same instruments were used in the two samples to allow comparisons of the relationships between different chronic diseases. An exception was the disease-specific measurement of the most prominent physical complaints, that is, pain in RA patients and fatigue in MS patients. In addition, disease-specific measures of disease activity were collected in randomly selected subsamples (106 RA patients and 88 MS patients). To study predictive validity, we again compiled the physical and psychological health status outcome measures 1 year later in randomly selected subsamples of 95 RA and 100 MS patients.

Measures

Disease activity was assessed in the RA sample by clinical joint score ratings (number of swollen and painful joints; Fuchs, Brooks, Callahan, & Pincus, 1989). In the MS sample, disability was scored by a neurologist on the basis of Kurtzke's (1983) expanded disability status scale. A standardized composite score of these disease-specific measures was used as a common indicator of disease activity.

Functional disability was assessed in both samples with a composite score on the Mobility and Self-Care scale of the Impact of Rheumatic Diseases on General Health and Lifestyle (IRGL; Evers, Taal, et al., 1998; Huiskes, Kraaijaat, & Bijlsma, 1990), a questionnaire derived from the Arthritis Impact Measurement Scales (AIMS), which was originally developed to assess various aspects of physical, psychological, and social health in arthritis patients. Previous research showed reliability and validity of the IRGL scales to be highly satisfactory in RA patients (Evers, Taal, et al., 1998; Huiskes et al., 1990), and the instrument from which it was derived, the AIMS, has also been shown to be reliable and valid for use in MS patients (Schiaffino, Shawaryn, & Blum, 1996; Schiaffino et al., 1998). Items of the IRGL scales are scored on a 4- or 5-point Likert scale. The Mobility and Self-Care scales assess the functional capacities of the lower and upper extremities in the past month (15 items). Higher scores indicate higher levels of functional disability. Cronbach's alpha for the Functional Disability scale in the present study was .98 for RA patients and .92 for MS patients.

Physical complaints were assessed by a standardized composite score from the most prominent physical complaint (i.e., pain in RA patients and fatigue in MS patients). Pain was assessed with the IRGL Pain scale (6 items), which measures the severity and frequency of painful episodes and swollen joints and the duration of morning stiffness in the last month. Cronbach's alpha for the Pain scale in the present study was .93. Fatigue was assessed with the Fatigue scale (8 items) of the Checklist Individual Strength (Vercoulen et al., 1996), which measures patients' level of fatigue for the previous 2 weeks. Cronbach's alpha for the Fatigue scale in the present study was .92.

Negative mood was measured in both samples with a standardized composite score on the IRGL Anxiety and Depressed Mood scales. The Anxiety scale is a shortened version of the Dutch State Anxiety Scale (10 State-Trait Anxiety Inventory items; Van der Ploeg, Defares, & Spielberger, 1980) that assesses anxiety level in the past month. The Depressed Mood scale (6 items) is derived from Zwart and Spooen's questionnaire (1982) and assesses various depressed mood states over the previous 2 weeks. Cronbach's alpha for the Negative Mood scale in the present study was .97 and .94 in RA and MS patients, respectively.

Positive mood was measured in both samples with the IRGL Positive Mood scale. The Positive Mood scale (6 items) is derived from Zwart and

Spooen's questionnaire (1982) and assesses various positive mood states over the previous 2 weeks. Cronbach's alpha for the scale in the present study was .96 and .92 in RA and MS patients, respectively.

Disease impact on daily life was measured in both samples by the IRGL Disease Impact scale (10 items), which refers to the general impact the disease has on several areas of daily life (i.e., work, leisure, relationships, sexuality, and eating). Cronbach's alpha in the present study was .96 and .89 in RA and MS patients, respectively.

Personality dimensions, that is, neuroticism and extraversion, were measured by a Dutch version of the Eysenck Personality Questionnaire (Eysenck & Eysenck, 1991; Wilde, 1963). Optimism and pessimism were measured by a Dutch version of the Life Orientation Test (Scheier & Carver, 1985). Cronbach's alpha in the present study was .85 and .89 for neuroticism, .81 and .83 for extraversion, .81 and .80 for optimism, and .82 and .88 for pessimism in RA and MS patients, respectively.

Coping strategies were assessed in both samples with the Utrecht Coping List (Schreurs, Van de Willige, Brosschot, Tellegen, & Graus, 1993), a well-documented coping questionnaire in the Netherlands, adapted from Westbrook (1979), which measures active and passive coping strategies when dealing with everyday problems, on a 4-point Likert scale. Active coping was assessed by a composite score on the strategies of problem focusing and comforting cognitions (12 items). Passive coping was measured with the strategy of avoidance (8 items). Cronbach's alpha in the present study was .85 and .82 for active coping and .73 and .68 for passive coping in RA and MS patients, respectively.

Social support was measured in both samples with the Social Functioning scales of the IRGL, which assesses qualitative and quantitative aspects of social support in the past 6 months, that is, the level of perceived support (5 items) and the size of the social network (number of friends and family members with whom patients associate). Cronbach's alpha for the Perceived Support scale in the present study was .98 for RA patients and .88 for MS patients.

Results

Principal Components Analysis and Confirmatory Factor Analysis

A principal components factor analysis with oblique rotation was performed in the RA sample. The scree test and the eigenvalues above 1 indicated that a three-factor solution was preferable, explaining 62% of the total variance. Table 1 shows the items of the three factors with the rotated factor loadings in this sample. The factors, labeled according to the a priori constructs as Helplessness, Acceptance, and Perceived Benefits, all consisted of six items and explained 19%, 34%, and 10% of the variance, respectively. The composition of the factors was completely in accordance with the a priori assignment of items, demonstrating loadings on the a priori factor above .65, with a .40 or greater difference in loading on the secondary factors.

The three-factor model for the ICQ items was then tested in the MS sample by using confirmatory factor analyses (Amos 4.0; Arbuckle, 1994). Two different confirmatory factor analyses were performed, testing an orthogonal and an oblique solution. The fit indices consistently indicated a highly satisfactory fit (with fit indices above .90) only for the oblique model, $\chi^2(132, N = 167) = 230.91$, $p < .001$; comparative fit index = .94; Tucker-Lewis Index = .93; incremental goodness-of-fit index = .94. When comparing the two models, the oblique model also had a significantly better fit than the orthogonal model, $\chi^2_{diff}(3, N = 167) = 79.02$, $p < .001$.

Table 1

Principal Components Factor Analysis With Oblique Rotation in Patients With Rheumatoid Arthritis (RA), and Means and Standard Deviations, Cronbach's Alpha, and Test-Retest Reliability in Patients With RA and Multiple Sclerosis (MS)

Item	Helplessness	Acceptance	Perceived benefits
15. My illness frequently makes me feel helpless.	.81	-.35	-.03
12. My illness limits me in everything that is important to me.	.81	-.41	.02
5. My illness controls my life.	.80	-.36	.00
1. Because of my illness, I miss the things I like to do most.	.76	-.23	-.02
9. My illness prevents me from doing what I would really like to do.	.76	-.27	-.03
7. My illness makes me feel useless at times.	.77	-.33	-.01
10. I have learned to accept the limitations imposed by my illness.	-.22	.85	.34
3. I have learned to live with my illness.	-.30	.84	.30
13. I can accept my illness well.	-.34	.84	.24
17. I can cope effectively with my illness.	-.39	.82	.22
2. I can handle the problems related to my illness.	-.40	.79	.29
14. I think I can handle the problems related to my illness, even if the illness gets worse.	-.38	.73	.24
4. Dealing with my illness has made me a stronger person.	-.03	.27	.79
6. I have learned a great deal from my illness.	.00	.31	.79
18. My illness has taught me to enjoy the moment more.	-.04	.27	.78
8. My illness has made life more precious to me.	.02	.35	.75
16. My illness has helped me realize what's important in life.	-.11	.31	.71
11. Looking back, I can see that my illness has also brought about some positive changes in my life.	-.04	.03	.65
<i>M (SD)</i>			
RA	12.66 (4.24)	16.65 (4.20)	15.20 (4.22)
MS	13.44 (4.40)	15.78 (4.37)	15.53 (4.46)
Cronbach's alpha			
RA	.88	.90	.84
MS	.88	.91	.85
Test-retest reliability			
RA	.79	.76	.74
MS	.73	.78	.68

Note. The following items were adapted from existing scales: Items 4, 6, 8, and 16 (Tennen, Affleck, Urrows, Higgins, & Mendola, 1992); Items 1, 7, and 9 (Felton & Revenson, 1984; Linkowski, 1971); Items 5 and 17 (Nicassio, Wallston, Callahan, Herbert, & Pincus, 1985); and Item 3 (Carver, Scheier, & Weintraub, 1989). Factor loadings above .60 are in boldface type. For RA, $n = 263$; for MS, $n = 167$.

Psychometric Properties

Reliability. Means and standard deviations, Cronbach's alpha, and test-retest reliability for RA and MS patients are presented in Table 1. Cronbach's alpha demonstrated adequate internal consistencies for all scales, ranging from .84 to .91 in the samples. In addition, Pearson's product-moment correlation coefficients between the two measurement points indicated high test-retest reliability for all scales in both samples (all above .67).

Intercorrelations among the scales. Intercorrelations between the scales revealed nonsignificant to moderate relationships. Helplessness and Acceptance were moderately negatively correlated in both samples ($r = -.43, p < .001$; $r = -.45, p < .001$, for RA and MS patients, respectively), whereas Acceptance and Perceived Benefits were moderately positively correlated ($r = .36, p < .001$; $r = .46, p < .001$, for RA and MS patients, respectively). The correlation between Helplessness and Perceived Benefits was nonsignificant in the RA sample ($r = -.03, ns$) and weakly negative in the MS sample ($r = -.19, p < .05$).

Relationship to demographic variables and duration of disease. Gender differences were not found between the scales. Nor were the scales significantly related to age and educational level, with the exception of a weak negative correlation between Helplessness

and education level in the RA sample ($r = -.23, p < .001$) and a weak negative correlation between age and Perceived Benefits in the MS sample ($r = -.18, p < .05$), indicating greater Helplessness for patients with a lower education level in the RA sample and more Perceived Benefits among younger patients in the MS sample. In addition, duration of disease was related to Helplessness in both samples ($r = .19, p < .01$; $r = .20, p < .05$, for RA and MS, respectively), to Perceived Benefits in the RA sample ($r = .17, p < .01$), and when controlling for age, to Perceived Benefits in the MS sample ($r = .16, p < .05$), indicating increased Helplessness and Perceived Benefits for patients with longer duration of disease. Because there is preliminary evidence that cognitive adjustment takes place particularly in the initial years of a chronic disease (e.g., Cassileth et al., 1984; Evers, Kraaiaa, Geenen, & Bijlsma, 1998; C. A. Smith et al., 1997), correlations with duration of disease were also calculated for patients with a maximum disease duration of 5 years (123 RA patients and 47 MS patients). Whereas correlations with Helplessness and Perceived Benefits were no longer significant in these subgroups, significant correlations were found in both samples with Acceptance ($r = .24, p < .01$; $r = .30, p < .01$, for RA and MS, respectively), indicating increased acceptance during the initial years of the disease.

Concurrent Validity

Pearson's correlation coefficients between the ICQ scales and the measures of concurrent validity were first calculated separately for the RA and MS samples. As expected, results demonstrated a very similar pattern in the direction and strength of correlations in both samples. Multiple regression analyses were then performed to examine possible differences in the relationships between the ICQ scales and the measures of concurrent validity between the two samples. In the first two steps, illness category (RA and MS) and one of the ICQ scales were entered, followed by their centered interaction term in the third step. As anticipated, the interaction between illness category and the scales of the ICQ were nonsignificant for all measures of concurrent validity with one exception: that between illness category and Acceptance for the prediction of functional disability. Separate analyses revealed that Acceptance was significantly related to lower levels of functional disability in RA patients but not in MS patients. Because of the uniform pattern of all other criterion measures in both illness groups, we subsequently calculated correlations for both samples together.

As shown in Table 2, the direction and magnitude of the correlations closely corresponded to hypothesized relations. Illness cognitions of Helplessness were moderately ($r = .25-.45$) to relatively highly ($r > .45$) related to a worse physical and psychological health status, that is, more pronounced levels of disease activity, functional disability and physical complaints, increased negative mood and decreased positive mood, and increased impact of the disease on daily life. In personality dimensions, Helplessness was highly related to more neuroticism and less optimism and moderately related to less extraversion. For coping and social

support measures, weak to moderate correlations were found with the more frequent use of passive coping, less frequent use of active coping, and less social support.

A nearly opposite pattern emerged for Acceptance. Although correlations with physical health were somewhat lower than for Helplessness, Acceptance was relatively highly related to a better psychological health, less neuroticism, and more optimism. In addition, weak to moderate correlations were found with more extraversion, higher levels of active coping, and more social support. A similar pattern became apparent for Perceived Benefits, although the general strength of the correlations was overall lower than for Acceptance. As expected, Acceptance and Perceived Benefits in particular correlated highly with positive outcome, personality, and process measures (positive mood, optimism, and active coping). This pattern became even more evident when we controlled for their negative counterparts (negative mood, pessimism, and passive coping), as correlations with positive outcome, personality, and process measures were substantially reduced for Helplessness but not for Acceptance and Perceived Benefits. When we controlled for the influence of neuroticism for all measures of concurrent validity, correlations were overall only marginally reduced for the three scales, and most correlations remained significant (see Table 2).

We then performed multiple regression analyses to evaluate the amount of variance explained by the three scales and their relative contribution to the criterion measures. When we entered all predictors together in one model, illness cognitions explained between 5% (for social network) and 45% (for negative mood) of the variance in the criterion variables. Beta coefficients indicated that

Table 2
Correlations and Partial Correlations (Controlling for Neuroticism) Between the Illness Cognition Questionnaire Scales and the Criterion Measures of Concurrent Validity in Rheumatoid Arthritis (RA) and Multiple Sclerosis (MS) Patients

Criterion measure	Helplessness		Acceptance		Perceived benefits	
	<i>r</i>	<i>pr</i>	<i>r</i>	<i>pr</i>	<i>r</i>	<i>pr</i>
Physical health						
Disease activity ^a	.44***	.47***	-.05	-.02	.00	.00
Functional disability	.54***	.54***	-.22***	-.16***	-.01	-.01
Physical complaints ^b	.50***	.38***	-.32***	-.18***	-.21***	-.16***
Psychological health						
Negative mood	.62***	.40***	-.54***	-.33***	-.18**	-.08
Positive mood	-.53***	-.33***	.50***	.33***	.29***	.24***
Disease impact on daily life	.64***	.56***	-.36***	-.22***	-.07	.00
Personality dimensions						
Neuroticism	.54***	—	-.47***	—	-.18**	—
Extraversion	-.34***	-.14**	.22***	.03	.16**	.10
Optimism	-.47***	-.26***	.59***	.43***	.39***	.35***
Coping						
Active	-.26***	-.15**	.38***	.30***	.43***	.41***
Passive	.29***	.24***	.03	.14**	.03	.07
Social support						
Perceived support	-.31***	-.20***	.20***	.08	.08	.03
Social network	-.19**	-.14**	.15**	.09	.14*	.11*

Note. $n = 342$.

^a Disease activity was assessed in subsamples of 194 patients (106 RA and 88 MS). ^b The most prominent physical symptom was assessed (i.e., pain in RA and fatigue in MS).

* $p < .05$. ** $p < .01$. *** $p < .001$ (two-tailed).

Helplessness proved to be a significant predictor for all criterion measures, independent of the effects of Acceptance and Perceived Benefits. Acceptance significantly predicted all indicators of psychological health, the personality dimensions of neuroticism and optimism, and active and passive coping, beyond the effects of Helplessness and Perceived Benefits. Perceived Benefits was ultimately an additional significant predictor for positive mood, optimism, and active coping when the effects of Helplessness and Acceptance were taken into account.

Predictive Validity

We examined predictive validity by studying the relationships between the ICQ scales at first assessment and change in physical and psychological health within 1 year. To produce reliable change scores, we regressed the health status measures at first assessment on the health status measures at second assessment, resulting in residual gain scores. Pearson correlation coefficients were then separately computed for RA and MS patients. As in the analyses of concurrent validity, the relationships between the ICQ scales at first assessment and changes in health status measures revealed a relative uniform pattern for the direction and strength of the correlations. To examine whether these relationships would be different for both samples, we studied the interaction between illness category and the ICQ scales for all criterion measures in a series of multiple regression analyses. The health status measure at first assessment was entered in the first step, followed by illness category (RA and MS) and one of the ICQ scales in Steps 2 and 3 and their centered interaction term in Step 4. According to the results of the single correlation analyses, the interaction between the ICQ scales and illness category was nonsignificant for all criterion measures with one exception: that between illness category and Perceived Benefits when the impact of the disease on daily life was the dependent variable. Separate analyses for RA and MS patients revealed that benefits significantly predicted a

decrease in the impact of the disease on daily life in RA patients but not in MS patients.

Pearson correlation coefficients were then computed between the residual gain scores and the ICQ scales at first assessment for both samples. Although there was hardly any systematic change in physical and psychological health status, as indicated by nonsignificant changes in all outcome measures but one (disease activity), several significant correlations were found for all three scales in the expected direction (see Table 3). Helplessness was primarily related to a deterioration of physical health (i.e., an increase of disease activity, functional disability, and physical complaints) as well as to an increase in the impact of the disease on daily life. Acceptance, in contrast, was related to increases in physical and psychological health status. Significant correlations were found between Acceptance and a decrease in disease activity and physical complaints, a decrease in negative mood, and an increase in positive mood. Finally, Perceived Benefits were related to an increase in positive mood. When we adjusted these correlations for the influence of neuroticism, most correlations remained significant (see Table 3). An exception were the correlations between Helplessness and an increase in disease activity and physical complaints and between Acceptance and a decrease in negative and an increase in positive mood.

Multiple regression analyses were then performed to evaluate the amount of variance explained by the three scales and their relative contribution to long-term health status measures. When we included all illness cognitions in one model, illness cognitions additionally explained between 2% and 9% of variance beyond the considerable variance explained by the baseline values of the outcome variables (between 27% and 75%). Beta coefficients indicated different predictors for all outcome measures. Helplessness significantly predicted an increase in functional disability and an increase in the impact of the disease on daily life. Acceptance predicted a decrease in disease activity, physical complaints, and negative mood. Perceived Benefits predicted an increase in positive mood.

Table 3
Correlations and Partial Correlations (Controlling for Neuroticism) Between the Illness Cognition Questionnaire Scales at First Assessment and the Criterion Measures of Predictive Validity in Rheumatoid Arthritis (RA) and Multiple Sclerosis (MS) Patients

Criterion measure	Helplessness		Acceptance		Perceived benefits	
	<i>r</i>	<i>pr</i>	<i>r</i>	<i>pr</i>	<i>r</i>	<i>pr</i>
Change in physical health						
Disease activity ^a	.21*	.08	-.31**	-.20*	.00	.05
Functional disability	.24**	.23**	-.09	-.07	-.09	-.07
Physical complaints ^b	.15*	.09	-.24**	-.20**	-.08	-.05
Change in psychological health						
Negative mood	.05	.05	-.17*	-.09	-.08	-.04
Positive mood	-.13	-.06	.18*	.11	.22*	.19**
Disease impact on daily life	.16*	.15*	-.13	-.12	-.07	-.06

Note. *n* = 195. Criterion measures of predictive validity were the residual gain scores of the outcome measures. Higher scores indicate an increase in the outcome measure.

^a Disease activity was assessed in RA patients only. ^b The most prominent physical symptom was assessed (i.e., pain in RA and fatigue in MS).

* *p* < .05. ** *p* < .01 (two-tailed).

Discussion

A common characteristic of chronic diseases is their inherently threatening nature, as patients are confronted with an incurable long-term condition that imposes multiple limitations on functioning in daily life. Individual differences in long-term adjustment may be explained by different ways of cognitively reevaluating the inherently aversive nature of the disease with constructs such as helplessness, acceptance, and perceived benefits. The development of the ICQ provides a self-report instrument that reliably assesses these cognitions in various chronic diseases and shows both unfavorable and favorable ways for adjusting to a chronic condition.

The applicability of the questionnaire to different patient populations with chronic diseases was indicated by the invariant internal structure in patients with RA and MS, revealing a closely corresponding, reliable, and stable pattern of cognitive reactions to a chronic disease. Analyses of concurrent validity strongly supported the proposed stress-vulnerability approach, in which illness cognitions are related to physical and psychological health, personality dimensions, coping, and social support, and these relationships proved to be relatively independent of the influence of neuroticism. In addition, preliminary evidence for discriminant validity between cognitions assumed to be adaptive and maladaptive was provided by the relatively stronger correlations of acceptance and perceived benefits with positive outcome, personality, and process variables. The corresponding correlations in the two samples further indicate the generic nature of these cognitions in patients with different chronic diseases. In addition, correlations with duration of disease give an initial indication that the scales are sensitive to long-term adjustment in chronic diseases, suggesting increased acceptance in the first years of the disease and increased helplessness and perceived benefits in the longer term. Analysis of predictive validity ultimately indicated the expected maladaptive and adaptive function of cognitions; that is, helplessness was related to unfavorable changes, and acceptance and perceived benefits were related to beneficial changes in physical and psychological health. And again, these relationships were relatively independent of the influence of neuroticism. The uniformity of these relationships in both samples, corresponding to previous findings in a wide range of chronic diseases, additionally supports the generic character of the cognitions. Moreover, the capacity of the scales to predict different outcome measures supports the utility of the multidimensional approach and indicates the distinct function of maladaptive and adaptive cognitions in terms of the long-term outcome in chronic diseases.

According to the conceptualization of illness cognitions, our assessment of helplessness differs slightly from the original helplessness-hopelessness theory, as it directly refers to the aversive consequences of a chronic disease. The advantage of this disease-specific concept of helplessness may correspond to its greater predictive validity for the physical health status. Our results generally support this assumption, demonstrating that helplessness predicted a deterioration of physical health, particularly an increase in functional disability. In contrast, acceptance seemed to have benefits for both physical and psychological health, as demonstrated by a decrease in disease activity, physical complaints, and negative mood. Relationships to increased psychological health have previously been reported in patients with breast cancer and multiple sclerosis (Brooks & Matson, 1982; Carver et al.,

1993), whereas even maladaptive relationships between stoic or realistic acceptance and mortality have been reported in AIDS and cancer patients (Greer et al., 1990; Reed, Kenemy, Taylor, Wang, & Visscher, 1994). The different relationships are probably due to differences in conceptualization. Acceptance was assessed as a type of resignation in the studies demonstrating maladaptive relationships (Greer et al., 1990; Reed et al., 1994), whereas our conceptualization entails the perceived ability to live with and master the aversive consequences of the disease. Relationships of perceived benefits corresponded most to the hypothesized effects of adaptive process variables on positive outcome measures. As in the cross-sectional analyses, where perceived benefits were most closely related to positive outcome, personality, and process measures, the prospective analyses revealed a beneficial relationship to an increase in positive mood, corresponding to previous prospective findings in rheumatoid arthritis patients and individuals experiencing life stress (Park et al., 1996; Tennen et al., 1992).

Instrument development is an ongoing process requiring multiple studies over time. We have demonstrated some aspects of reliability and validity, but several important psychometric characteristics are missing. One limitation may be that the RA and MS populations studied share various common characteristics. Both conditions have a medically based diagnosis (unlike chronic fatigue syndrome), are in most cases progressive and highly uncontrollable and unpredictable (unlike diabetes), lead to physical impairment and confront patients with multiple losses in daily life (unlike asthma), and are not directly life threatening, consequently requiring long-term adjustment processes to find a way to live with the disease (unlike some forms of cancer). Although our conceptualization was theoretically and empirically founded on common elements in chronic diseases, future research would be warranted in studying psychometric properties in other patient populations with chronic illnesses. In terms of construct validity, we did not assess relationships between the ICQ scales and similar constructs more directly related to perceived control, such as self-efficacy or health locus of control. Previous studies comparing these constructs have suggested that the associations between acceptance and benefits and perceived control constructs vary particularly in the face of highly uncontrollable situations. For example, in RA patients with severe pain, perceived benefits and perceived control have been shown to be related to favorable versus unfavorable changes in subsequent health outcomes, respectively (Tennen et al., 1992). Finally, studies on sensitivity to change by treatment modules are clearly recommended.

What is the additional value of a generic instrument of illness cognitions like the present one? Because it contains adjusted constructs of existing single-dimensional questionnaires, the ICQ can be viewed as an instrument refinement, indicating the multidimensional representation of constructs for use in various chronic diseases. Instruments that generalize across chronic diseases offer an opportunity to compare different conditions and study the possible common mechanisms that contribute to individual differences in health outcomes (see, e.g., Felton & Revenson, 1984). In addition, the simultaneous assessment of both maladaptive and adaptive cognitions offers an opportunity to study the relatively unexplored role of adaptive mechanisms, for example, how and under what circumstances adaptive cognitions buffer the effects of maladaptive ones or show rather independent protective effects in adjustments to uncontrollable long-term conditions. Finally, re-

search on the possible physiological, affective, and behavioral paths linking these cognitions to health and well-being in patients with chronic diseases could be encouraged.

Aside from research purposes, the psychometric properties of the ICQ are sufficiently high for clinical purposes. The comprehensive assessment of illness cognitions, applicable across diverse patient populations with chronic diseases, can serve as a complementary tool to medical diagnosis in screening for psychological risk factors in patients who may benefit from psychosocial interventions. Increasing knowledge about the mechanisms underlying their uniform effects can then stimulate the development of generic treatment components for various populations. Perhaps even more important, the identification of adaptive cognitions can lead to expanding these interventions by systematically building health-promoting processes (see, e.g., Hayes, Strosahl, & Wilson, 1999). Particularly in the case of an inherently threatening circumstance, like a chronic disease, when the focus of attention is automatically directed to negative consequences, an incorporated stimulation of adaptive cognitions may considerably enhance the effectiveness of psychosocial treatments. With our present conceptualization and assessment of illness cognitions, we intended to take one further step in this direction, going beyond unfavorable thinking to what others have called a more strength-oriented, positive psychology in the face of uncontrollable long-term stress, such as a chronic disease (e.g., Gillham & Seligman, 1999).

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