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Cognitive Aspects of Hypochondriasis and the Somatization Syndrome

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The aim of this study was to evaluate whether specific cognitive aspects are present in patients suffering from somatoform disorders. With a sample of 493 patients from a center for behavioral medicine, the authors evaluated a questionnaire assessing typical cognitions concerning body perception, illness behavior, and health. The authors further examined 225 participants, including patients with a somatization syndrome, patients with somatization syndrome and additional hypochondriasis, patients with hypochondriasis, patients with other mental disorders (clinical control group), and nonclinical controls. The results showed that not only patients with hypochondriasis but also patients with somatization syndrome had cognitive concerns and assumptions that were specific for the disorder. These patients had a self-concept of being weak and unable to tolerate stress. A catastrophizing interpretation of minor bodily complaints found in hypochondriacal patients in earlier studies was also found for patients with multiple somatization symptoms.

Somatization and somatoform disorders are one of the most common problems in primary care. Following the results of Escobar, Rubio-Stipec, Canino, and Karno (1989), 4% of the participants in that study suffered from a somatization syndrome that was characterized by multiple somatic complaints not due to a physical condition. The symptoms led participants to doctor visits and had serious consequences for social functioning. Up to 40% of patients on neurology wards (Ewald, Rogne, Ewald, & Fink, 1994) and 26% of patients in family medicine clinics (Kirmayer & Robbins, 1991) have somatization symptoms. Costs for treatment of patients with somatization disorders are ninefold that of an average person (Smith, Monson, & Ray, 1986). The major part of treatment costs are due to medical investigations (91%) and not to psychiatric or psychotherapeutic treatment (Rost, Kashner, & Smith, 1994).

The diagnosis of somatization disorder, however, covers only a small subgroup of these patients. Therefore, Escobar and colleagues (Escobar, Burnam, Karno, Forsythe, & Golding, 1987; Escobar et al., 1989) proposed a group of patients with abridged somatization disorder or somatic symptom index (SSI)-4/6. This patient group was characterized by at least 4 symptoms for men and 6 symptoms for women out of the list of 35 somatization symptoms relevant for somatization disorder according to the *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., rev.; *DSM–III–R*; American Psychiatric Association, 1987). The SSI-4/6 criteria, however, may be overinclusive and are empirically not well based. The same holds true for the recently published criteria for multisomatoform disorder (Kroenke et al., 1997). Hiller, Rief, and Fichter (1995) proposed an empirically derived approach that favors a cutoff at 7 to 8 somatoform symptoms out of the list of 35 symptoms proposed for *DSM–III–R* somatization disorder. In the present article, we use the term *somatization syndrome* for these patients with multiple somatic symptoms not due to a physical condition. This group is also characterized by high levels of psychopathological distress (Hiller et al., 1995; Katon et al., 1991) and seems to better represent the health care relevance of somatization syndromes than somatization disorder. Although the classification between somatization disorder according to the *DSM–IV* (4th ed.; American Psychiatric Association, 1994) and International Classification of Diseases-10 (World Health Organization, 1992) differs substantially, the less strictly defined somatization syndrome included all patients with somatization disorder according to both classification approaches (Rief et al., 1996).

In most articles concerning the disorder, psychological factors are considered to play an important role for the exacerbation and the course of the disorder. However, the knowledge about these pathogenetic psychological and biological processes is limited. Most of the existing literature about this topic refers to patients with hypochondriasis, although these results may not hold for patients with somatization syndrome but without hypochondriasis. Barsky, Wyshak, and Klerman (1990) described a cognitive style of somatosensory amplification as the core aspect of a cognitive–behavioral model for hypochondriasis and demonstrated significant differences between hypochondriacal and control participants on the somatosensory amplification scale. In another study, Barsky, Coeytaux, Sarnie, and Cleary (1993) demonstrated that hypochondriacal patients believed good health to be relatively symptom free and considered symptoms to be equal to sickness. Thus, an inadequate concept of health could contribute to a perceptual and cognitive style of somatosensory amplification (Salkovskis & Clark, 1993).

In sum, however, until now the empirical base for a cognitive–behavioral theory or therapy of somatization has been insufficient. The few approaches to date have not been based on profound empirical evidence. Furthermore, most studies have not used clinical control groups to demonstrate specificity. Therefore, there is a major need to get more information concerning

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cognitive styles of patients with somatization syndrome. Together with physiological aspects (Rief, Shaw, & Fichter, 1998; Sharpe & Bass, 1992), cognition could be one important part of the vicious circle of maintaining somatization symptoms.

The aim of this study was to investigate cognitive styles, attitudes, and interpretations of body perceptions that may be specific not only for patients with hypochondriasis but also for patients with somatization syndrome without hypochondriasis. Therefore, we compared patients with hypochondriasis, somatization syndrome, or both, not only with a healthy control group but also with a clinical control group. We hypothesized, for example, that patients with somatization syndrome without hypochondriasis would also have a strictly defined concept of being healthy, which could lead to a catastrophizing interpretation of bodily sensations. Although such cognitions might be accompanied by anxiety in the case of hypochondriasis, these cognitions could contribute to the maintenance of body misperceptions and reductions of physical well-being in the case of somatization syndrome.

Study 1

Method

Participants

To evaluate the psychometric properties of our assessment instruments, we investigated a sample of patients with mental and psychosomatic disorders. The sample consisted of 493 patients and was selected from consecutive first contacts of treatment candidates at a center for behavioral medicine (demographic variables are shown in Table 1, left column). Those patients seeking treatment for an eating disorder or tinnitus were excluded because they were treated in other departments of the treatment center.

The Center for Behavioral Medicine

The Roseneck Center for Behavioral Medicine is a German inpatient treatment unit that is open for patients of all social and occupational states. Indications for treatment are all mental and psychosomatic disorders except schizophrenia, manic episodes, severe addictions, or severe neurological disorders. In Germany, this treatment setting is typically selected in cases of comorbidity of psychological and physiological symptoms, in cases of chronic syndromes, or in cases of a regional lack of outpatient therapists. As was found in former studies, patients of this treatment unit are a high-risk group for somatization syndromes. Serious physical conditions that could explain the somatic symptoms in the long-term course are extremely rare (Rief, Hiller, & Fichter, 1995; Rief, Hiller, Geissner, & Fichter, 1995).

Cognitions About Body and Health (CABAH) Questionnaire

The original version of the CABAH (Rief, Hiller, & Margraf, 1996) consisted of 68 items that were answered on a 4-point scale as follows: 3 (*completely right*), 2 (*mostly right*), 1 (*mostly wrong*), and 0 (*completely wrong*). The item pool was selected from self-formulated items concerning interpretation of body signals, perception of minor body events, attitudes about body and health, health habits, and 9 items from Barsky's Somatosensory Amplification Scale (Barsky et al., 1990; for factor analysis, see *Results* section; for item formulations and factor loadings, see Table 2). The principal aim of the item selection was to find possible cognitive features for somatizing and hypochondriacal patients. However, we did not consider items that were just parallels of classification symptoms, but we were looking for items that might be present also in healthy controls yet to a lower degree. Because many cognitive aspects can only be evaluated in asking for interpretations of experiences and perceptions, we accepted some conceptual overlap with these other constructs.

Procedure

After their first mail contact with the Roseneck Center for Behavioral Medicine, all patients of the first sample received the questionnaires.

Results

For the analysis of dimensions of a questionnaire, the most common procedure is principal-components analysis. Because the subject-to-variables ratio was 1:7.3, the condition of a sufficient sample size was fulfilled. Floyd and Widaman (1995), however, discussed that common factor analysis is a more appropriate approach to understanding the relations among a set of measured variables. Therefore, we used principal axis factoring with subsequent varimax-rotation.

The factor analysis indicated that 17 factors had eigenvalues >1 and explained about 60% of the variance. However, some factors consisted of only a few items, indicating the well-known fact that the eigenvalue criterion of >1 may propose too many factors, after all with large sample sizes (cf. 500 and above; Floyd & Widaman, 1995). Therefore, we systematically varied the number of factors between 1 and 17 to search for stable factor patterns. The criteria for a useful factor solution were (a) that the item allocation for a specific factor should be stable

Table 1
Age and Sex Distribution of the Subsamples

		Study 2				
Variable	Study 1 sample	Somatization syndrome	Somatization & hypochondriasis	Hypochondriasis	Clinical controls	Nonclinical controls
N	493	46	30	16	32	101
Age in years	45.5 (11)	47.5 (11)	47.0 (12)	44.6 (8)	43.6 (13)	44.7 (13)
% female	66	85	70	38	88	58

Note. Standard deviations are given in parentheses.

Table 2
Items and Factor Loadings

Item	I	II	III	IV	V
Allocated to Factor 1, Catastrophizing Interpretation of Bodily Complaints (14 items)					
5. A suddenly appearing joint pain can be a sign of a beginning paralysis.	.40	.14	.13	.33	−.08
6. I'm healthy when I don't have any bodily sensations.	.47	.04	.10	.08	−.01
8. My doctor or I must be capable of finding an explanation for all bodily complaints.	.49	.20	.09	.07	.10
9. When suffering from constipation, one should consult an expert immediately to be certain that one doesn't have intestinal cancer.	.62	.02	.14	.23	.10
10. The most serious diseases develop unnoticed and then break out at some time or other.	.49	.25	.07	.17	.05
11. Bodily complaints are always a sign of disease.	.58	.10	.18	.19	.03
15. Red blotches on the skin are a threatening sign of skin cancer.	.63	.01	.09	.26	.05
20. When suffering from joint pain, one should take good care of oneself.	.45	−.03	.14	−.01	.07
24. When one sweats a lot, it can be due to an overburdened heart.	.58	.26	.28	.16	.08
27. The most common reason for discomfort is a serious illness.	.64	.05	.17	.27	.09
38. If a doctor refers me for further examinations, then he is convinced that there is a serious problem.	.55	.15	.08	.12	.02
39. Only persons who do not exert themselves physically stay healthy in the long run.	.59	.18	.14	.07	.01
45. A healthy body doesn't cause complaints.	.40	.12	.10	−.08	.11
55. A tingling sensation in the legs can be a serious sign of a nerve disorder.	.52	.19	.18	.19	.17
Allocated to Factor 2, Autonomic Sensations (4 items)					
44. I can sometimes hear my pulse or my heartbeat throbbing in my ear.	.17	.46	.01	.08	.03
59. When I take a bath I often feel how my heart is beating.	.21	.54	.13	.13	−.03
60. I hate to be too hot or too cold.	.10	.48	.27	.20	−.01
63. I often feel my heart beating because my circulatory system is very sensitive.	.30	.53	.22	.12	.07
Allocated to Factor 3, Bodily Weakness (6 items)					
7. I can't take much physical exertion as my ability to perform is slowly decreasing.	.19	.14	.54	.06	.06
18. I'm not as healthy as most of my friends and acquaintances.	.19	.04	.43	.05	.03
23. After physical exertion I often have a feeling of being weak.	.18	.34	.60	−.06	.06
31. I have to avoid physical exertion in order to save my strength.	.38	.24	.55	.09	.11
48. I'm physically rather weak and sensitive.	.16	.31	.61	.12	.01
65. My body can tolerate a lot of strain.	.11	−.14	−.64	−.11	−.04
Allocated to Factor 4, Intolerance of Bodily Complaints (4 items)					
1. If something is wrong with my bodily sensations, it upsets me at once.	.20	.28	.10	.53	.04
14. I consult a doctor as soon as possible when I have bodily complaints.	.29	.08	.14	.55	.14
32. If I don't observe my body often, I could become seriously ill without noticing it.	.34	.27	.02	.58	.12
41. If I have sudden bodily complaints, I first wait and see what happens.	.03	.10	−.04	−.42	.04
Allocated to Factor 5, Health Habits (3 items)					
21. I'm always careful to live really healthily.	.06	−.11	.10	.04	.69
34. I make sure that I eat healthily.	.04	−.09	.10	.03	.72
52. If I feel physically weak, I get some fresh air to recuperate.	.16	.08	−.06	.00	.48
Excluded because of equivocal loadings (on Factor 1 ≥ .40 and on other factors ≥.34)					
2. If bodily complaints don't go away with the use of medicine, then I must have a serious illness.	.48	.13	.13	.44	.01
16. When my body feels weak, it is often a sign of something serious.	.55	.12	.24	.37	−.04
28. When I have unexpected bodily complaints, then I must be seriously ill.	.52	.23	.18	.34	−.03
33. Nausea is often a sign of an undetected ulcer.	.55	.08	.09	.36	.08
35. If one has complaints of the throat, one should immediately have a checkup to make sure that the larynx is not diseased.	.57	.07	.03	.45	.10
43. Every time I sweat it becomes apparent to me that my body is weak.	.41	.34	.42	.18	−.01
47. If there is tingling sensation in my legs, then I have problems with my circulation.	.42	.36	.09	.08	.03
49. If I'm bloated, I constantly ask myself what the possible cause may be.	.46	.14	.10	.34	−.04
Excluded because of inconsistency of item-to-factor allocation					
50. Medical tests only make sense when the complaints are present at the time of testing.	.50	.24	−.02	−.10	.02
56. When I bruise myself, it stays noticeable for a long time.	.07	.43	.13	−.00	.11

Note. Twenty-seven items were excluded because of factor scores <.40. The original version of the questionnaire was in the German language. Two experienced clinicians and Americans living in Germany independently translated the questionnaire into the English language. In cases of discrepancies, a decision was based on the consensus of Winfried Rief and Wolfgang Hiller.

even for solutions with more or less factors than that examined and (b) that the factors should be clinically meaningful. For solutions between 1 and 4 factors, we found stable item allocations; however, useful and interpretable factors were merged together. Factor solutions with more than 5 factors produced instability (the allocation of core items at one solution was not reproduced for another solution with one factor more or less) or the number of items per factor was very small (2 items or less). The 5-factor solution seemed to aggregate the most stable and specific factors.

Twenty-seven items were excluded because of small factor loadings (<.40). As in most factor analyses, numerous items had high loadings on the first factor. This fact allowed us to eliminate items with high loadings on other factors as well as to sharpen the discrimination of the first scale. Eight items with high factor loadings on Factor 1 (≥.40) and high factor loadings on other factors (≥.34) were excluded, resulting in 14 items allocated to Factor 1. Two items with factor loadings ≥.40 (1 on Factor 1, the other on Factor 2) were added to other items in factor solutions with 4 or 6 factors; therefore, they were excluded because of inconsistency of item-to-factor allocation (see Table 2).

Because the naming of factors should be done with caution, the following interpretation should be considered as a suggestion. Factor 1 described the tendency to interpret body signals in a catastrophizing manner (i.e., as a sign of a severe illness). Factor 2 included minor bodily sensations of the autonomic nervous system that are typically not perceived but which may be perceived by persons focusing their attention on them. Factor 3 included a negative self-concept of being weak, feeling exhausted, and not tolerating any stress. Factor 4 was high for persons who rated themselves as not tolerating bodily complaints, aches, and pains. Factor 5 described typical habits of people who want to live healthily. Whereas Table 2 presents the items and factor loadings, Table 3 presents the internal consistency of the five factors as well as for the total scale. The Cronbach's alpha scores showed satisfactory internal consistency.

We expected that the dimensions of the CABAH would reflect specific cognitive concerns of patients with somatization, hypochondriasis, or both. This hypothesis was tested with the second study.

Table 3
Internal Consistencies (Cronbach's Alphas) for the CABAH Questionnaire

Factor	Study 1 sample (N = 493)	Study 2: Nonclinical controls (n = 101)	Study 2: Clinical sample (n = 124)
All items	.90	.80	.89
1. Catastrophizing Cognitions	.88	.71	.88
2. Autonomic Sensations	.70	.57	.71
3. Bodily Weakness	.80	.76	.76
4. Intolerance of Bodily Complaints	.67	.49	.76
5. Health Habits	.68	.66	.60

Note. CABAH = Cognitions About Body and Health.

Study 2

Method

Participants

In contrast to the sample in Study 1, the first to fourth samples (total N = 124) of the Study 2 were diagnosed not only by questionnaires but also by structured clinical interviews to obtain valid diagnoses according to the *DSM–IV* (American Psychiatric Association, 1994). The first sample included 46 patients who reached the criteria for somatization syndrome SSI-8 but did not fulfill the criteria for hypochondriasis. These criteria seem to be a good compromise between the exclusive criteria for somatization disorder and the perhaps overinclusive SSI-4/6 criteria. The second, third, and fourth groups were recruited in the same way as the first group, but the 30 patients of the second group fulfilled the criteria for somatization syndrome (SSI-8) plus hypochondriasis; the 16 patients of the third group fulfilled the criteria of hypochondriasis (without somatization syndrome); and the 32 patients of the fourth group had other diagnoses and fulfilled neither the criteria for hypochondriasis nor for somatization syndrome, nor even for the SSI-4/6 criteria. Thus, the fourth sample served as a clinical control group. Sixteen patients of the somatization group (35%) and 11 patients from the combined somatization–hypochondriasis group (37%) fulfilled not only the criteria for somatization syndrome but also the criteria for somatization disorder. The refusal rate of consecutively admitted patients to participate in this study was below 5%. Because the samples of Study 1 and Study 2 were recruited in the same way, they should be highly similar with regard to selection characteristics. The fifth sample was a nonclinical control group of 101 participants. Age and sex distribution of the groups are presented in Table 1. The groups did not differ significantly in age, $F(4, 224) = 0.7$, *ns*; however, there was a difference in the male:female ratio, $\chi^2(4, N = 225)$, $p < .001$, which was mainly due to a higher proportion of men in the hypochondriasis group.

The investigator of the nonclinical group (Elefant, 1995) was instructed to include participants whose ages were between 18 to 65 years, with a mean age of about 40, and about 60% of whom should be female. These data were drawn from earlier studies conducted in the same clinical setting (cf. Rief, Hiller, & Fichter, 1995). Of the nonclinical control group, participants should not have been in psychiatric or psychotherapeutic treatment. The control group was recruited from the surroundings of the German city, Dresden. The control participants were selected to cover all educational levels (34% were employees with German high-school education, 6% were students, 51% were without high-school education, and 9% were pensioners).

Assessment Instruments

The diagnostic interview. Two interviewers were trained to use the Structured Clinical Interview for *DSM–III–R* Diagnoses (SCID; Spitzer, Williams, Gibbon, & First, 1990; German version, Wittchen et al., 1990). Both diagnosticians were clinical psychologists. The original interview was slightly expanded and modified to obtain *DSM–IV* diagnoses. The first 10 patients per interviewer were diagnosed using the SCID. Afterward, the International Diagnostic Checklists (IDCL; Hiller, Zaudig, & Mombour, 1990, 1995, 1996) were used to simplify the diagnostic procedure and to guarantee a high level of diagnostic quality. The IDCL are interview checklists recommended by the World Health Organization for reliable and valid diagnoses; the interrater reliability of trained raters is as high as those for structured interviews like the SCID (cf. for affective disorders, $\kappa = 0.83$; for anxiety disorders, $\kappa = 0.76$; Hiller, von Bose, Dichtl, & Agerer, 1990).

Screening for Somatization Symptoms (SOMS). The SOMS is a questionnaire that includes all items relevant for somatization disorder. Participants were instructed to answer yes when a symptom was present

in the last 2 years, when doctors did not find a sufficient explanation, and when the symptom bothered her or him a lot. Although the original version (cf. Rief, Hiller, Geissner, & Fichter, 1995) covered all 35 symptoms from the *DSM–III–R* list of somatization disorder (SD), the modified version used in the present study included all *DSM–IV* SD symptoms, as well as those of ICD-10 SD and ICD-10 somatoform autonomic dysfunction (SAD; Rief, Hiller, & Heuser, 1997). Thus, the questionnaire consisted of 53 somatization symptoms and 15 inclusion and exclusion criteria mentioned in the classification approaches (such as duration of illness or frequency of doctor visits). The number of positively identified symptoms were added up for the somatization index. This index showed good retest reliability (for the *DSM–III–R* symptom list, r_{tt} = .85; Rief, Hiller, Goebel, & Fichter, 1995). According to the different classification approaches, the modified version of the SOMS allowed us to compute the sum scores of the SOMS somatization index *DSM–IV* (*DSM–IV* somatization disorder symptom list), the somatization index ICD-10 (ICD-10 somatization disorder), the SAD-index (ICD-10 somatoform autonomic dysfunction symptom list), and a symptom total score. Because these somatization indices are highly correlated, for the present purpose, we concentrate on the somatization index according to the *DSM–IV*. The correlation between the somatization index (*DSM–IV*) according to interview and questionnaire is .75; further validation indices are reported in the manual (Rief et al., 1997).

Whiteley Index (WI). The WI is one of the most commonly used self-rating scales for hypochondriacal tendencies. In the present study, we used the 14-item version with dichotomic answer categories (true–false). The German version was also validated and showed a factor structure comparable with the original English form (Pilowsky, 1967; Rief, Hiller, Geissner, & Fichter, 1994).

CABAH. The CABAH was already described in Study 1. Items were unit-weighted to create each of the five scales.

Procedure

All patients received the questionnaires 1 week before admission to the Roseneck Center for Behavioral Medicine. They were interviewed during the first week after admission. The nonclinical control group was recruited during the same time period as the other groups.

Results

Replication of Internal Consistency

The samples of Study 2 allowed us to replicate the internal consistency of the CABAH questionnaire (see Table 3). Confirming the high internal consistency in patient samples, our clinical groups of Study 2 again showed high scores for Cronbach's alpha. For the healthy control group, however, the internal consistency of two scales (Scales 2 and 4) was not satisfactory. Because we focused on the comparison of clinical groups, we accepted this shortcoming.

Correlation Analyses

To assess the common variance of cognitions and somatization–hypochondriasis, we correlated all factors of the CABAH questionnaire with the SOMS and the WI (see Table 4). Separate analyses were done on the data of the healthy controls and of the clinical groups. The intercorrelations of the five CABAH factors were significant except for the factor, Health Habits. Patients, as well as healthy controls, showed nearly the same pattern of significance, apart from two correlations not reaching statistical significance in the control group but reaching significance in the clinical groups (Scale 2 with Scale 4 of the CABAH and Scale 1 of the CABAH with the Somatization Index). Although the intercorrelations were substantial, they were lower than intercorrelations from other dimensions of clinical self-rating scales (e.g., for the Symptom Check List, SCL-90R; Rief & Fichter, 1992).

With regard to the healthy control group, the perception of minor autonomic body sensations and the self-concept of being weak showed significant correlations with the Somatization Index. Whereas intolerance of bodily complaints did not correlate significantly with somatization, it had a significant impact on hypochondriasis. Moreover, the perception of autonomic sensations did not correlate significantly with hypochondriasis in the group of healthy controls.

With regard to the inpatient group, all factors of the CABAH except Health Habits showed significant correlations with somatization and hypochondriasis. The highest correlation between somatization and cognition was found for the self-concept of Bodily Weakness (Factor 3). Intolerance of Bodily Complaints correlated closer with hypochondriasis than with somatization (z = 2.94, p < .01, for clinical groups; z = 1.90, p < .06, for healthy controls; both two-tailed). In the healthy control group, Catastrophizing Cognitions correlated slightly lower with somatization than with hypochondriacal attitudes, as measured by the WI (z = 1.66, p < .10), whereas Autonomic Sensations

Table 4
Correlations Among Somatization, Hypochondriasis, and Cognitions

Variable	1	2	3	4	5	6	7
1. Catastrophizing	—	.39**	.59**	.51**	.11	.41**	.51**
2. Autonomic Sensations	.30**	—	.53**	.36**	−.10	.44**	.46**
3. Bodily Weakness	.53**	.42**	—	.45**	.02	.55**	.51**
4. Intolerance of Bodily Complaints	.44**	.18	.40**	—	.08	.25**	.56**
5. Health Habits	−.10	−.05	−.03	−.04	—	−.02	.01
6. Somatization Index (*DSM–IV*)	.15	.41**	.36**	.06	−.02	—	.50**
7. Whiteley Index	.37**	.14	.45**	.32**	.04	.30**	—

Note. Above the diagonal are correlations for 124 patients; below the diagonal are correlations for 101 control participants. CABAH = Cognitions About Body and Health; *DSM–IV* = *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.).
** p < .01, two-tailed.

Table 5
Comorbidity Patterns in Percentages (Lifetime Diagnoses)

Diagnosis	Somatization syndrome (n = 46)	Somatization & hypochondriasis (n = 30)	Hypochondriasis (n = 16)	Clinical controls (n = 32)
Major depression	76	83	69	66
Dysthymia	24	27	19	28
Panic disorder	30	40	31	16
Social phobia	26	20	25	22
Drug abuse	15	23	6	9

Note. Chi-squares were nonsignificant for all diagnoses.

showed higher correlations with somatization than with hypochondriasis (z = 2.07, p < .05). The difference between the correlation coefficients of the clinical group failed to reach significance. Health Habits did not have any significant impact on somatization or hypochondriasis.

Comparison of Diagnostic Groups

For the interpretation of possible differences in cognitive styles of patients with and without somatization syndrome, it is important to consider possible group differences concerning other diagnoses and comorbidity patterns. Table 5 shows that the comorbidity patterns of the groups with somatoform disorders and the clinical control group were comparable. No significant difference was found.

The principal aim of this study was the evaluation of specific cognitive styles of patients with somatization syndrome. A multivariate analysis of variance, including five variables (the CABAH factors) and five groups, revealed significant overall effects (Wilks's lambda = .49), approximate $F(20, 691) = 8.3$, $p < .001$. Table 6 includes the means and standard deviations of all five groups. Because the clinical and nonclinical control groups were highly comparable and the most interesting analysis was the comparison between the clinical groups, pairwise comparisons between the four clinical groups were reported when the main effect for the variable was significant. This was the case for four of the five factors of the CABAH questionnaire. As already found in correlation analysis, Health Habits did not represent specific aspects of somatization syndromes or hypochondriasis. Patients with somatization syndrome and comorbid hypochondriasis had the highest scores for the four factors with significant main effects. For the variables, Catastrophizing Cognitions and Autonomic Sensations, the three groups with somatization or hypochondriasis differed significantly from the clinical control group. The scores for Bodily Weakness were significantly higher for the two groups with somatization syndrome as compared with the clinical controls, whereas the hypochondriasis group did not differ significantly from the controls. In contrast, the variable, Intolerance of Bodily Complaints, seemed to be specific for the hypochondriasis groups. The psychometric measures for somatization (SOMS) and hypochondriasis (WI) confirmed more somatization symptoms and higher hypochon-

Table 6
Group Differences of Cognitions

Variable	Instrument	Group A (n = 46)	Group B (n = 30)	Group C (n = 16)	Group D (n = 32)	Nonclinical controls (n = 101)	F(4, 223) (total)
Catastrophizing	CABAH	16.0 (7.9) D	18.1 (8.3) D	15.8 (8.0) D	11.2 (6.7) A, B, C	12.5 (5.4)	6.5***
Autonomic Sensations	CABAH	5.6 (2.8) B, D	7.1 (3.1) A, C, D	5.6 (2.4) B, D	4.0 (2.9) A, B, C	2.8 (2.0)	21.8***
Bodily Weakness	CABAH	9.2 (3.1) B, D	11.6 (3.5) A, C, D	8.4 (4.3) B	7.1 (2.8) A, B	4.3 (3.3)	37.6***
Intolerance of Bodily Complaints	CABAH	4.1 (2.3) B, C	6.0 (2.9) A, D	5.6 (2.5) A, D	3.5 (2.4) B, C	3.3 (2.0)	10.2***
Health Habits	CABAH	5.5 (1.6)	5.2 (2.1)	5.8 (1.1)	5.5 (2.1)	5.9 (1.8)	1.0 (*ns*)
Somatization Index (*DSM–IV*)	SOMS	8.9 (4.6) B, D	11.1 (4.0) A, C, D	7.1 (3.6) B, D	3.6 (1.4) A, B, C	3.2 (3.0)	46.2***
Whiteley Index (WI)	WI	6.1 (3.3) B, C, D	8.9 (3.4) A, D	9.2 (2.3) A, D	4.4 (3.2) A, B, C	1.7 (1.5)	65.0***

Note. Because all F scores were significant at the .001 level, a correction of the alpha error was not conducted. In cases of significant group effects, pairwise comparisons between each of *the four clinical* groups were done. The letters indicate significant group differences. Values in parentheses are standard deviations. A = somatization group; B = somatization–hypochondriasis group; C = hypochondriasis group; D = clinical control group; CABAH = Cognitions About Body and Health questionnaire; SOMS = Screening for Somatization Symptoms questionnaire; *DSM–IV – Diagnostic and Statistical Manual of Mental Disorders* (4th ed.).
*** p < .001.

driasis scores in the hypochondriasis and somatization groups as compared with the clinical controls, a fact that validated the group allocation.

Gender Analyses

To analyze the possible effect of gender differences in the groups, we reanalyzed the CABAH data by using male:female ratio as a second between-subjects variable. All main effects for diagnostic group remained as in the analyses above. Only one significant main effect for gender was found, Variable 2, autonomic sensation, indicating higher scores for women; $F(1, 214) = 6.6$, $p < .05$. No further significant main effect for gender nor any Diagnostic Group × Gender interaction was found for any of the five CABAH factors. Thus, the different male:female ratios did not account for the differences found for diagnostic groups.

General Discussion

Various types of cognitions appear to be broadly characteristic of all groups of somatizers and hypochondriacs. Examples for such features were the catastrophizing interpretation of body perceptions ("Bodily complaints are always a sign of disease"; "Red blotches on the skin are a threatening sign of skin cancer") or the description of usually ignored autonomic body sensations ("When I take a bath, I often feel how my heart is beating"). These are nonspecific, general attributes of somatization.

Our results concerning the catastrophizing interpretation of bodily complaints by hypochondriac and somatizing patients were similar to those of Barsky et al. (1993); hypochondriacal patients believed good health to be relatively symptom free, thus they had a very restrictive concept of health. Frequent but typically undangerous symptoms were more easily interpreted as signs of disease (Hitchcock & Mathews, 1992; Salkovskis, 1989). Robbins and Kirmayer (1991) demonstrated that such attributional styles for bodily sensations could predict the illness behavior in the future. These cognitions could also amplify the effect of selective attention to body symptoms (Kirmayer, Robbins, & Paris, 1994). A catastrophizing cognitive style was also correlated with low subjective coping skills (Wickramasekera, 1995). This may contribute to a personal belief of being powerless, which is a risk factor for distress and disability (Cope, David, & Mann, 1994).

Persons with somatization syndrome and hypochondriasis are typically aware of what happens in their bodies. Whereas bodily sensations of healthy controls usually are processed in an automatic manner, this automaticity may be distorted in patients with multiple somatization symptoms or hypochondriasis so that the information processing of minor bodily sensations is conscious and capacity demanding. This may be correlated with selective attention to body processes. Selective attention to minor bodily sensations may lead to an amplified perception or somatosensory amplification, as Barsky (1992) has pointed out.

There are also cognitive factors that might distinguish the hypochondriasis and the somatization groups. The most striking effect was found for the cognitive variable, Intolerance of Bodily Complaints, with items such as "I consult a doctor as soon as possible when I have bodily complaints," or, inversely formulated, "If I have sudden bodily complaints, I first wait and see what happens." Bodily complaints cause these persons to seek help immediately, to take medication, or to seek other solutions. Thus, this cognitive style has high relevance for the behavioral dimension. The hypochondriasis and the somatization groups differed significantly on this dimension, with higher scores for the hypochondriasis group. Moreover, in healthy controls, as well as in clinical groups, this factor correlated significantly closer with the WI compared with the correlation with the Somatization Index.

A most striking and significant cognitive aspect of patients with somatization syndrome is a self-concept of being weak, of not being able to tolerate physical effort, and of not being able to imagine that physical exercise could be useful. Therefore, as a result, patients with somatization syndrome tend to avoid physical activity. Although patients with somatization syndrome had significantly higher CABAH-3 scores than clinical controls, this effect failed to reach significance for patients with hypochondriasis. The correlation analyses, however, revealed significant associations of this feature with somatization as well as with hypochondriasis. These aspects of illness behavior may be acquired already in childhood. Livingston, Witt, and Smith (1995) found that children of patients with somatization disorder had elevated rates of doctor visits. Somatizers were also more likely than other groups to report parental physical illnesses as well as physical illness of themselves in childhood (Craig, Boardman, Mills, Daly-Jones, & Drake, 1993).

The specific cognitive sets of patients with somatization syndrome or hypochondriasis were not correlated with variables of health-seeking behavior, such as consuming only healthy food, avoiding polution, and looking for places with fresh air. This result confirmed an earlier study of Kellner, Abbott, Winslow, & Pathak (1987) who found that patients with hypochondriasis did not take better precautions with their health. A further confirmation came from the recently published study of Lecci, Karoly, Ruehlman, and Lanyon (1996) who found that hypochondriacal tendencies (as measured with the WI) could not be predicted by general health goals (such as "maintain exercise routine," "quit smoking," or "eat healthier food"); however, more symptom-specific health goals (such as "manage chronic illness" or "manage stress") were predictors for higher hypochondriasis scores. Thus, one could suppose that modern campaigns for the promotion of a general, healthy style of living do not seem to augment hypochondriacal tendencies because the correlation between health habits and hypochondriasis was close to zero in our study. However, this interpretation needs further evidence.

Patients suffering from somatization and additional hypochondriasis were characterized by the highest mean scores on most cognitive dimensions. The mean scores of the combined somatization and hypochondriasis groups were significantly higher than those for "pure" somatization or "pure" hypochondriasis patients for the variables of autonomic sensations and bodily weakness. Consistent with the general observation, the comorbid group tended to show the most severe cognitive dysfunction.

These results may contribute to a cognitive–behavioral and psychophysiological formulation of somatization syndrome, as

has already been done for hypochondriasis (Salkovskis, 1989; Warwick, 1989) or panic disorder (Clark, 1986). Further studies are needed to develop a model of somatization that integrates cognitive, affective, behavioral, and physiological aspects. The core cognitive aspect in such a model could be the misinterpretation of bodily sensations as somatic symptoms. Features such as low pain tolerance, an inadequate concept of health as a state without bodily sensations, a negative self-concept of not tolerating any stress and being weak, or selective attention (Haenen, Schmidt, Kroeze, & van den Hout, 1996) may be further cognitive aspects of somatization. In another study (Rief et al., 1998), we demonstrated that patients with somatization syndrome had elevated levels of cortisol and showed a lack of habituation in physiological parameters. Thus, the cognitive features interact with physiological arousal. Cognitions may be the trigger for stress responses as well as for factors that maintain stress responses. The interpretation of being physically ill leads to avoidance behavior that is typically accompanied by a lower rate of physical activity. The reduction of physical fitness, however, may enhance the probability of body misperceptions. Stressors and deficits in coping mechanisms, as well as affective components (such as negative affectivity; see Leventhal, Hansell, Diefenbach, Leventhal, & Glass, 1996; Watson & Pennebaker, 1989), may be moderating features for most of the variables mentioned.

This vast group of patients needs much more scientific effort than has been made in the past decades. A shortcoming of the present study is the examination of present states and not of processes. A most important question may be whether the cognitive aspects are risk factors for the development of or reactions to somatization symptoms; therefore, longitudinal studies are needed. A further shortcoming is the naming of factors. The proposed labels for the factors must be considered as suggestions. Therefore, further studies may use other names for central cognitive features. Moreover, the effect of selective attention, which is well documented in panic disorder (cf. Ehlers, Margraf, & Roth, 1988), should also be examined with experimental study designs regarding somatization syndromes. The development of the described cognitive styles could be the result of other risk factors found for somatization (cf. traumatic life experiences; Pribor, Yutzy, Dean, & Wetzel, 1993; Walker et al., 1992). These interactions merit further studies.

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