



Illness representations in depression

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Background and objectives. Illness representations in physical health problems have been studied extensively using the Self-regulation Model (SRM) focusing on five dimensions of illness beliefs (identity, consequences, causes, timeline and control, or cure). Associations have been found between beliefs about illness and a range of health outcomes. This study aimed to examine models of depression, to assess whether the five dimensions of the SRM are relevant, to compare depression models with those for physical illness, and to examine the psychometric properties of the Illness Perception Questionnaire (IPQ) when used with depression.

Design and method. A sample of 101 women either currently depressed or with a history of depression was asked to write about their experiences of physical sickness and depression. Their responses were analysed in terms of the dimensions of beliefs expressed and the two experiences were compared. The IPQ was also administered to assess the women's perceptions of depression.

Results. The women used the same five dimensions of illness as identified in the SRM in describing both their experience of depression and physical sickness. There was evidence of some consistency across the models of the two illnesses in terms of their content and structure. The IPQ was a reliable measure for depressed experiences and discriminated between women who were currently depressed or not. Comparing the women's descriptions of their depression with their IPQ scores showed some relationships between their responses on the two different measures, at least for the consequences and cause dimensions.

Conclusion. The SRM model and associated methodology may provide an appropriate framework to further explore illness representations in depression. Problems inherent in the study of illness models in depression including the influence of mood on the model are described. Applications of this research area to the understanding of treatment preferences and adherence to treatment in mood disorders are discussed.

Different models of psychopathology and treatment have developed within mental health and this is well illustrated in the case of depression. For example, Beck's

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theoretical rationale for cognitive therapy is that feelings and behaviour are largely determined by the way one interprets the world, and people who are depressed have distorted and negative interpretations about events pertaining to self (Beck, Rush, Shaw, & Emery, 1979). The goal of cognitive therapy is to share this model collaboratively with the patient and to help reinterpret his or her experiences as the fault of thinking biases that may potentially be corrected so that less negatively biased thinking is restored and mood improves. On the other hand, pharmacological treatments of depression are consistent with alternative and predominantly biological models of mood disorder relating to dysfunctions in neurotransmitters, and leading logically to attempts to treat affective disorders through medication.

However, little attention has been paid to people's *own* models of depression: How do people themselves interpret the experience of depression? Do people have idiosyncratic models of depression? If so, how do these perceptions relate to the ways they interpret and cope with the symptoms, the kind of help they seek, and whether they co-operate and persist with the treatments they are offered?

In contrast, the way in which people think about their *physical* health problems has been explored extensively using a range of social cognition models (Connor & Norman, 1995). This work on physical 'illness perception' has developed from studies examining the sense that people make of physical health threats and symptoms and how these act as a guide for coping responses such as help-seeking behaviour and treatment adherence (Weinman & Petrie, 1997). The dominant model has been the Self-regulation Model (SMR; Leventhal, Nerenz, & Steele, 1984), which is based on the premise that patients are active problem solvers whose health-related behaviours are attempts to close the perceived gap between their current health and a future goal state. The coping strategies they select (including whether to take medication) are guided by their interpretation and evaluation of their illness. The outcome of these behaviours is then evaluated and fed back into their model of the illness, and/or used to shape future coping responses. This dynamic aspect of the process is strongly emphasized in the model.

In applying the SRM to physical illness, five specific components have been identified as being key to guiding individual responses. These are the perceived *identity* of the illness (including a label and signs and symptoms), the perceived *consequences* (physical, social and behavioural), the likely *causes* of the illness, and a likely *timeline* or sense of how long the illness is likely to last. A fifth belief identified by Lau and Hartman (1983) about potential for *control or cure* of the illness has also been added to the model. In addition to a cognitive representation of illness, Leventhal *et al.* proposed an emotional representation, which they saw as existing in parallel. The relationship between these two systems does not seem to have been elaborated fully and the emotional representation arm of the model has been less well developed.

Since Leventhal *et al.* (1984) originally proposed the SRM, there has been considerable validation of the specific beliefs that constitute the way in which people think about physical health problems and support for their utility in accounting for variation in outcome in a number of areas. A questionnaire that assesses these dimensions, the Illness Perception Questionnaire (IPQ; Weinman, Petrie, Moss-Morris, & Harne, 1996), has been used with people with a wide range of health problems. Using this measure and a range of other methodologies, associations have been demonstrated between illness perceptions and emotional adjustment (e.g., Murphy, Dickens, Creed, & Berstein, 1999), overall functioning levels (e.g., Scharloo, Kaptein, Weinman, Willems, & Rooijmans, 2000), coping and managing symptoms (e.g., de Valle &

Norman, 1992; Hampson, Glasgow, & Zeiss, 1994), compliance with health care regimens (e.g., Wichowski & Kubsch, 1997) and cognitive processing of illness-related information (e.g., Croyle & Ditto, 1990).

In outlining the ways in which the SRM could be used to understand non-adherence to treatments in physical health, Leventhal, Diefenbach, and Leventhal (1992) suggested that this model could also be applied to psychological as well as physical problems. Current work that is consistent with this assertion is reviewed by Lobban, Barrowclough, and Jones (2003), and concludes that further exploration of how beliefs about mental health problems impact on emotional and behavioural responses is required.

To date, the study of beliefs held by people with mental health problems has generally focused on people's interpretations of internal and external experiences and how these interpretations contribute to the development and maintenance of symptoms (e.g., Kinderman & Bentall, 1996, 1997; Morrison, 2001). There has been less exploration of beliefs about the overall experience of having a mental health problem. Some attempts have been made to use the IPQ to assess beliefs about mental health problems. Clifford (1998) administered the IPQ to a sample of 38 psychotic patients and found the measure reliable. There was a positive association between non-adherence to medication and a perception of fewer and less severe symptoms, a shorter duration of illness, external attribution of cause and more severe negative consequences. The IPQ was also used with people with a diagnosis of schizophrenia by Talley (1999). She found that only the subscales measuring consequences and symptoms were internally reliable. The consequences subscale also showed some concurrent validity in correlating with other measures of the impact of the illness. To date only one published study has used a modified version of the IPQ to explore how illness cognitions in depressed people are associated with important outcome variables. Brown *et al.* (2001) assessed patients in the US who experienced mild to moderate depression. Statistically significant associations were found between illness beliefs and coping styles, mental health treatment and medication adherence. However, the conclusions of that study were limited by the lack of data on the reliability or concurrent validity of the measure in this population. In addition, there was no attempt to demonstrate that the dimensions assessed by the IPQ (and the SRM) were those that are pertinent to patients when describing their experiences of depression.

These shortcomings were taken into account in the present study, which had three basic aims:

- (1) to examine people's models of depression and to assess whether the dimensions of the SRM found in physical illness were relevant to depression;
- (2) to compare the content and structure of people's models of depression with those of a physical illness; and
- (3) to examine the potential utility of the IPQ when used for depression in terms of its reliability, internal coherence and some aspects of its validity.

Method

Participants

To ensure that all participants had experienced some depression, they were selected from the database of a large randomized trial of cognitive behaviour therapy for depressed women with pre-school children (Verduyn, Barrowclough, Tarrier, &

Harrington, 1994), which took place in South Manchester. The Mental Illness Needs Index (MINI; Glover, Robin, Emami, & Arabscheibani, 1995) provides figures for the participating localities, which are consistent with the area being one of socioeconomic disadvantage (e.g., 51% of the population has no access to a car; 20% of economically active adults are unemployed).

Participants were contacted at the end of the main trial and constituted a convenience sample in that only women with a telephone number were approached and the first 101 women who were available for interview and gave informed consent were included in the study. The mean age of participants was 33 years ($SD = 5.5$) with a mode of two children (range = 1–8). Of the participants, 64 were either married or living with a partner and 33 were working outside of the home.

The mean participant current score on the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) was 17.48 ($SD = 10.58$). Using a cut-off of a BDI score of ≥ 15 , 57 of the sample were identified as depressed at the time of interview. The suggested range for mild depression is a BDI score of 10–18 (Beck, Steer, & Garbin, 1988) and the 15+ cut-off had been used in the main trial as a conservative point at which to begin screening for a depressive disorder.

Since all women on the database had met screen criteria for the trial, irrespective of participants' current mood state they had a history of at least mild depression in the last two years. Their self-report of the mean number of years since the first episode of depression was 9.49 ($SD = 6.89$) with a mean of 2.62 ($SD = 1.35$) number of episodes. Of the participants, 70 had been prescribed antidepressants at some time in the past and 16 were on antidepressant treatment at the time of interview.

Procedure

Potential participants were contacted by telephone and provided with an information sheet by post. All consenting participants were interviewed at home and completed the assessments outlined below.

Measures

Investigation of depression and physical illness dimensions

This simple method was first described by Lau, Bernard, and Hartman (1989) and used to identify illness cognitions in a sample reporting their last minor physical illness. In the present study, the method was used to identify illness cognitions about participants' most recent episode of depression and their most recent physical illness. Participants were presented with two separate sheets of paper each with 12 blank lines. The instruction was to think back either to the last time they were 'sick' (physical illness) or the last time they were 'depressed' (depression) and to write down everything they could remember about this experience. They were encouraged not to be concerned about grammar or punctuation. The order in which each task was presented was counterbalanced to eliminate any possible order effects. These free-response questions were also presented to participants prior to the administration of the IPQ (see below) and the BDI to avoid priming participants about the symptoms of depression. A sample response for depression and physical illness episodes from one participant can be seen in Appendix A.

In accordance with the method of analysis described by Lau *et al.* (1989), the responses to each free-response interview were divided into 'distinct thoughts' (usually

separate sentences) by an independent researcher unaware of the aims or hypotheses of the study. A psychology undergraduate student completed this task. Each thought was then marked with a number and letter so its corresponding participant and whether it was a depression or physical illness response could be identified. To check on the reliability of this method, another researcher independently rated 10% of the responses. Reliability was high (over 90% of the responses were separated identically by the researcher).

The first author, (G. F.) and a graduate psychology assistant, (S. M.) then coded all of the 'distinct thoughts' from every participant (depression and physical illness responses separately) into each of the five dimensions of the SRM. On the few occasions where there was disagreement about which category to use or where a 'thought' might have fitted into more than one category, the definitions used for each dimension were referred to and a decision was reached. Each 'thought' was placed in one category only. In the case of disagreement, a 'best fit' was the objective. This categorization was used as the standard against which to measure the subsequent responses of the assessors detailed below.

Five raters who were familiar with the SRM (informed raters) but not with the hypotheses of the current study were recruited to categorize statements into the five SRM dimensions. All of the raters had at least one degree in psychology. A random sample of statements was used for this purpose. In all, 117 (26%) of the depression cognitions and 120 (29%) of the illness cognitions were selected from the total data set. Examples of each of the five dimensions were selected randomly, with the only proviso that each statement came from a different person. The number selected was arbitrary and was based on estimates of how long it would take raters to complete the task. It took each rater on average 60 min to complete the entire task. The informed raters' level of agreement with the author measured using Kappa calculations on the depression and illness cognitions can be seen in Table 1.

Overall the level of agreement with the author was very high. All of these 'informed' raters reported that the task was relatively easy. The only difficulty that these raters reported was on separating 'identity' and 'consequences' in the depression cognitions. Therefore, given these five dimensions as a starting point, it might be assumed that this categorization can be done easily and reliably. It was important to test this assumption and also to establish whether naïve raters who were unfamiliar with the SRM would also come up with the five basic dimensions.

Accordingly, eight naïve raters performed the coding task on the same data and were asked to sort the statements into categories that 'make sense for you'. When they had finished and had labelled their chosen categories, they were then given the definitions of the five dimensions and asked whether they could collapse the categories they had created for each of the illness samples separately into these five dimensions without rearranging any of the individual statements. Table 1 also shows the corresponding level of agreement with the author when the naïve raters' categories were collapsed into the basic five dimensions.

As can be seen from Table 1, the naïve raters also achieved a very high level of agreement with the author. They also reported that the coding task was easy and when given the definitions of the five basic dimensions they felt that their categories could be easily collapsed into these generic categories. This may be confirmed by inspection of Appendix B, which presents all the category labels produced by the eight naïve raters for depression and physical illness and shows how they were fitted to the five-SRM dimensions.

Table 1. Informed and naïve raters' level of agreement with the author on the depression and illness cognitions using Kappa calculations.

	Rater agreement with author (K)	
	Depression cognitions	Physical illness cognitions
Informed rater no.		
1.	.57	.80
2.	.82	.81
3.	.89	.83
4.	.92	.73
5.	.85	.57
Naïve rater no.		
1.	.61	.69
2.	.72	.67
3.	.81	.74
4.	.79	.75
5.	.83	.74
6.	.70	.70
7.	.74	.79
8.	.80	.78

The modified illness perception questionnaire (IPQ; Weinman et al., 1996)

A modified version of the IPQ was used in this study. In its original form, this theoretically derived measure comprises five scales that provide information about the five components that have been found to underlie the cognitive representation of illness in the physical health literature. It is designed to be flexible enough to be modified for use with a wide range of illnesses, and has good psychometric properties including validation of the scales from factor analysis and discriminant validity between groups of people diagnosed with different physical health problems. The identity scale assesses how great is the range of symptoms believed to be part of the illness measured from a checklist of possible symptoms. Timeline indicates the patient's perceptions of the likely duration of the illness and these have been categorized as acute, chronic or episodic. The consequences scale contains items designed to assess the respondent's perception of the illness severity and its impact on all areas of functioning including psychological, social and economic. The control/cure scale is concerned with the respondent's belief about how amenable the illness is to control or cure. Cause refers to the person's ideas about the likely cause(s) of the illness. For the identity scale, the respondent rates a list of physical illness symptoms as to whether or not they are experienced as part of the person's illness. The cause scale consists of a listing of specific beliefs about the aetiology of the illness. In this and all other scales except identity, statements are presented that must be rated by the respondent on 5-point scales ranging from 'strongly disagree' to 'strongly agree'. Since the IPQ was originally designed to assess patients' perceptions of their own physical illness, it was modified for the purposes of this study by replacing the word 'illness' with the word 'depression' in every instance. The symptom checklist for the identity scale was inappropriate and was substituted by an alternative symptom list based on the DSM-IV criteria for major depressive disorder. This contained 14 items and participants were asked to rate how frequently they had experienced each of these during their last episode of depression,

ranging from 'never' to 'all the time'. The five scales of the modified form of the IPQ for depression can be seen in Appendix C.

The first 52 participants completing questionnaires were reassessed on the modified IPQ for depression two weeks after initial completion. Questionnaires were completed and returned by post.

Results

Investigation of dimensions

Number of cognitions produced

A total of 442 cognitions were identified for the depression data and a total of 408 cognitions for the physical illness data. A paired sample *t* test showed that there was no significant difference between the number of cognitions produced by participants for the depression and physical illness free-response tasks (depression $M = 4.38$, $SD = 2.37$; physical illness $M = 4.04$, $SD = 1.66$), $t(100) = 1.28$, $p = .203$.

Number of dimensions used

Consistent with previous research (e.g., Lau *et al.*, 1989), participants' descriptions of their depression or most recent physical illness did not contain all five of the illness cognitions dimensions but combinations of two or more dimensions. The percentage frequencies of the different combinations of the five dimensions were as follows:

- (1) only 1% of the sample used all five dimensions for both the depression and physical illness cognitions;
- (2) 3% and 5% of the sample respectively used four dimensions for the depression and physical illness cognitions;
- (3) 30% and 39% of the sample respectively used three dimensions for the depression and physical illness cognitions;
- (4) 46% and 40% of the sample respectively used two dimensions for the depression and physical illness cognitions; and
- (5) 20% and 15% respectively used one dimension for the depression and physical illness cognitions.

Most common dimensions referred to for depression and physical illness

For both depressed and non-depressed participants, the most common illness cognition model of depression was a combination of identity and consequences cognitions with one third of each subsample using this model for their most recent episode of depression. This combination of dimensions was also the most common model used by participants describing their most recent episode of physical illness with 29% of the overall sample favouring this model.

Comparative complexity of illness cognition models across different illnesses

One way of defining complexity of models is by the number of dimensions referred to within the free-response task. Using this definition, a comparison of complexity of models for depression and physical health was made by comparing the number of dimensions employed by each participant for each illness using a paired *t* test. There

was no significant difference in the number of dimensions employed (depression $M = 2.19$, $SD = .82$; physical illness $M = 2.36$, $SD = .83$), $t(100) = -1.44$, $p = .153$.

Consistency of dimensions used across different illness models

The cognitions from the free-response data were examined to determine whether there was consistency between the use of the dimensions for each illness. Table 2 shows the total number of cognitions classified by dimension for physical health and depression. A chi-square test to examine differences in the number of cognitions across the five dimensions showed a difference between the pattern of cognitions for the two illnesses, $\chi^2(4) = 43.2$, $p < .001$. Visual inspection of the data (see Table 2) suggests that this difference is attributable to two dimensions: for the sample as a whole, there were more cause cognitions for depression and more timeline cognitions for physical illness.

Table 2. Total number of cognitions classified into five dimensions for physical and depression free response data

Dimension	Physical	Depression
Identity	160	168
Cause	18	72
Timeline	27	7
Consequence	172	166
Control/cure	31	29
Total	408	442

The IPQ

The psychometric properties of the modified IPQ for depression scales were examined in terms of internal consistency, test-retest reliability and interscale correlations (see Tables 3 and 4).

Internal consistency

The Cronbach alpha scores show the modified IPQ scales for depression to have good to moderate levels of internal consistency.

Table 3. IPQ—depression version scales: mean scores, Cronbach's α reliabilities, and test-retest reliabilities

IPQ subscale	Subscale score		α	Test-retest (Pearson's r)
	M	SD		
Identity (14 items)	12.39	2.21	.78	.40
Timeline (4 items)	8.43	2.48	.76	.73**
Consequences (7 items)	24.5	4.68	.74	.73**
Control/cure (6 items)	22.92	3.47	.56	.68**

** $p < .01$.

Table 4. Pearson's intercorrelations between IPQ subscales and with BDI scores

Scales	Identity	Timeline	Consequences	Control/cure	BDI scores
Identity	—	.28*	.47**	-.18*	.54**
Timeline	—	—	.58**	-.40**	.37**
Consequences	—	—	—	-.26**	.56**
Control/cure	—	—	—	—	-.42**

* $p < .05$; ** $p < .01$.

Test-retest reliability

Pearson's correlations (r) between Time 1 and Time 2 scores revealed significant positive correlations for all four modified scales with the exception of the identity scale ($r = .40$). The latter finding suggests that participants' perceptions of the nature of depression symptoms fluctuated even in this short time period.

Intersubscale correlations

To further examine the psychometric properties of the IPQ, interscale correlations were calculated (see Table 4).

The significant intercorrelations present indicated that there were logical relationships between women's illness dimensions. Women with a stronger depression identity were more likely to perceive their depression as lasting longer and having more serious consequences. Women with higher timeline scores were less likely to see their depression as potentially controllable or curable and to have more severe personal consequences.

Concurrent validity

Pearson correlations were calculated between the IPQ scales and scores on the BDI (see Table 4).

As would be expected, the identity scale was positively related to a high BDI score. Similarly, a higher timeline score, indicating a belief that illness would last a long time, was correlated positively with a high BDI score. Women with more severe depression also perceived the depression to have more severe consequences, while greater perceived control over the depression was related to a lower depression score on the BDI.

A series of independent sample t tests was conducted on the IPQ scales to assess differences in illness cognitions between the currently depressed ($n = 58$) and non-depressed ($n = 43$) women (see Table 5). The depressed women had a significantly stronger depression identity, chronic timeline and belief in serious consequences, and less perceived control over their depression.

The cause scale

The depressed and non-depressed subsamples were also compared using independent sample t tests to check for differences in response to each of the cause items. The only significant difference in attributions made by the depressed and non-depressed subsamples was on cause item 3 ('My illness is largely due to my own behaviour'), with the depressed women rating a greater belief in this attribution (depressed women $M = 2.19$; non-depressed women $M = 1.89$), $t(99) = 2.24$, $p = .028$. The stress item had the highest mean scores for both depressed and non-depressed women. This was

probably due to the questionable relevance of the remaining causal items to depression, a point that was frequently raised by respondents.

Table 5. Independent sample *t* tests between IPQ subscale scores for depressed ($n = 58$) and non-depressed ($n = 43$) women

IPQ subscale	Subscale score				t value
	Depressed women		non-depressed women		
	M	SD	M	SD	
Identity	13.27	1.34	11.18	2.57	5.29*
Timeline]	8.96	2.04	7.69	2.82	2.62*
Consequences	26.13	3.54	22.27	5.10	4.47*
Control/cure	21.91	3.54	24.27	2.88	-3.58*

* $p < .001$.

Comparison of causes of depression mentioned in free-response task and those endorsed in IPQ

In order to compare participants' responses about the causes of depression given in the free-response written task and in the IPQ, the listing of causal thoughts for each participant in the free-response task was checked against their scores on the IPQ causal section. The latter consisted of a 5-point scale from 1-strongly disagree to 5-strongly agree. Only 49 of the sample offered causal explanations in the free-response task, so the analysis was restricted to this subgroup. Where the free-response causal material mentioned or gave an example of one of the 11 causal items in the IPQ, the IPQ score was checked to see if this cause had been endorsed by a score of 4 or 5 (agree or strongly agree). In this way, for example, 'the stress of Christmas' was checked against the 'stress' IPQ item, 'My husband was never there' against the 'Other people' IPQ item and so on. Of the free responses of the subgroup of 49 participants in this analysis, some participants gave more than one causal statement and a total of 75 separate causal statements were made. For some participants, multiple statements were examples of the same IPQ item, and some statements could be categorized under more than one IPQ item. The most common examples of the latter dual categorization were events that were stressful and involved other people (IPQ items 'Stress' and 'Other people'; see Appendix C). Due to the resulting non-independence of the data, only descriptive statistics were appropriate. Table 6 shows that there was good concordance between free-response causal statements and the IPQ items: 84% of causal statements in the free-response task that could be classified under an IPQ item were endorsed on the IPQ.

It should be noted that five causal statements could not be classified into IPQ items and the IPQ appeared to be an unsatisfactory measure of participants' causal beliefs about depression. By far the most commonly used IPQ item to classify statements was 'stress' given that it covers a wide range of experiences and life events (32/75 or 43% of classifications), followed by 'other people' (22/75 or 29% of classifications) and 'state of mind' (10/75 or 7.5% of classifications), with other items being very infrequently mentioned, suggesting that most of the causal items on the IPQ were not appropriate for depression.

Table 6. Causal statements given in free response (depression) task and endorsed (score 4 or 5) in IPQ ($n = 49$)

IPQ causal item	% of causal statements that could be classified under, and where participant endorses IPQ item	
Stress	30/32	94%
Chance	1/2	50%
Own behaviour	1/4	25%
Hereditary	0/0	n.a.
Diet	1/1	100%
Other people	20/22	91%
Pollution	0/0	n.a.
Poor medicine	1/1	100%
Germ/infection	0/1	0%
State of mind	7/10	70%
Upbringing	2/2	100%
Total	63/75	84%

Comparison of dimensions mentioned in free-response task with scores on IPQ

For each of the four dimensions for which a mean score was obtained in the IPQ (identity, timeline, control/cure, and consequences), participants were divided into those who did or did not mention the dimension in the free-response task and the IPQ scores were compared (this was only possible for the depression data since no IPQ data for physical illness were available). The results are presented in Table 7. For identity and timeline there were no differences between the groups in terms of IPQ score. However, for the consequences dimension, participants who mentioned the dimension in free response identified more negative consequences on the IPQ. For the control/cure dimension, again participants who mentioned the dimension had higher scores on the relevant IPQ subscale, but this difference just failed to reach statistical significance.

Table 7. Mean scores SDs for IPQ scales grouped by whether or not (yes–no) patient mentioned relevant dimension in free response task

IPQ subscales	Yes			No			<i>t</i>	<i>p</i>
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>		
Identity	72	12.49	2.04	29	12.14	2.61	0.71	n.s.
Consequences	69	25.26	4.19	32	22.84	5.29	2.48	.015
Timeline	7	8.86	2.54	94	8.39	2.48	0.48	n.s.
Control-cure	22	24.18	3.77	79	22.57	3.32	1.95	.054

Discussion

The study supports the proposal that people have models of depression that are similar in content and structure to the models of physical ill health that have been identified in the SRM literature. When asked to write about recent episodes of depression and

physical sickness, it was found that people tended to use the same dimensions as had been identified in the SRM. The use of naïve raters to categorize thoughts and dimensions ensured that these raters were not blinkered by prior knowledge of the five dimensions in the SRM and hence increased the validity of this finding. The women rarely used all the dimensions, tending rather to use combinations of two or more for both depression and physical illness in accord with previous findings (e.g., Lau *et al.*, 1989). The dimensions most commonly described in people's accounts of both their recent physical illnesses and their depression were the *identity* or symptoms of the illness and the *consequences* or sequelae of the illness on their life. It was found that causal factors were more often referred to in depression. There was some evidence of consistency in the structure of the physical illness and depression models in so far as there were no significant differences in the number of cognitions elicited for each model nor in the number of dimensions employed in describing the two illnesses. The second part of the study demonstrated that the IPQ reliably measured people's perceptions of depression and that the questionnaire discriminated between women who were currently depressed or not depressed. The findings from the questionnaire also suggested considerable internal consistency for the models with logical associations between the illness dimensions. Comparing the women's descriptions of their depression with their IPQ scores showed some relationships between their responses on the two different measures, at least for the consequences and cause dimensions.

Before discussing some of the implications from the study and directions for future research, we need to take account of the study's limitations. First, this was essentially a convenience, single sex sample, selected from a small geographical area of significant social disadvantage, so the results may not generalize beyond this group. The design was cross-sectional; thus we are unable to assess the predictive value of the models, or the extent to which they change over time. This is a particular problem for interpreting the differences between the depressed and non-depressed groups. Clearly, women who were more depressed had a more 'pessimistic' model of depression: they perceived it to have more symptoms, more impact on their lives, a longer time period, and perceived themselves to have less control in influencing the condition, and a stronger belief that their own behaviour contributed to the depression. Since those currently not depressed had recovered from a prior episode of low mood, the findings do not rule out the possibility that more optimistic expectations and perceptions of the depressed experience contributed to recovery. However, severity of depression was highly correlated with more negative perspectives on the illness dimensions, which would seem to suggest that mood influenced the models rather than vice versa. In order to assess the contribution of beliefs about depression to outcome appraisals for depression, more complex study designs are required. These might take the form of prospective studies where never-depressed participants' beliefs are assessed as predictors of outcome for those who subsequently develop depression, or interventions studies where there is an attempt to reduce the negative aspects of models and assess the impact of changed models on recovery. The SRM is a dynamic model that postulates that beliefs about the illness influence responses which in turn are modified in the light of outcome appraisals. Longitudinal studies where the stability of models is assessed in relation to depressed and non-depressed mood states over time would help us to understand the dynamic nature of illness cognitions and how the experience of the illness feeds back into the model.

It may be argued that investigating illness models in people with a diagnosis of

depression is less relevant than in those with a physical illness because the nature of the problem may interfere with their ability to reflect on their experiences and to form meaningful models. However, this argument implies a distinction between physical and mental experiences that is not supported by evidence (Lobban *et al.*, 2003). Moreover, when mood does influence a person's model of depression, this does not invalidate the model nor make it less likely that it will influence the person's behaviour in terms of help seeking or co-operation with treatments. Nor does it necessarily mean that the pre-depression model does not continue to contribute to the person's responses.

We would suggest that an important application of future research into illness models in depression may well be in helping to understand and possibly modify people's response to treatments offered. A recent review of non-adherence in affective disorders highlighted the importance of attitudes and beliefs about medication, and argued for more research to identify specific targets for intervention (Scott & Pope, 2002). Depression is the most commonly experienced mental health problem, and a range of treatments is now available including pharmacotherapies and psychological therapies. Yet the effectiveness of all treatments is limited by non-adherence or people not seeking help initially. Katon *et al.* (1992; cited in Lin *et al.* 1995) found that as many as 60% of primary care patients stop taking prescribed antidepressant medication before completing the recommended six months of therapy. Our impression is that similar drop-out rates exist for psychological interventions. There are many possible factors that could explain why some people do not seek help or why they discontinue treatment. However, previous research in physical health suggests that differences in cognitive representations, assessed within the SRM, could explain a significant part of this variation.

One area of illness models in depression that particularly merits further assessment would seem to be the causal dimension. The study demonstrated that the causal items of the IPQ had limited relevance for depression and this may be an important weakness of the measure in this context. Even in its more recently modified form (Moss-Morris *et al.*, in press), the IPQ may require some further modification on this dimension. It is notable that more causal cognitions were mentioned for depression than for physical health in the free-response task, suggesting the potential importance of the causal dimension in people's understanding of mood disorders. In affective disorders, idiosyncratic causal models may be linked to personally meaningful coping strategies and preferred treatment options.

We suggest that the preliminary study reported here has affirmed that models of illness can be measured reliably in people who are depressed. Future studies are required to determine the dimensions that have particular relevance for mood disorders and whether assessing the idiosyncratic models of patients will be useful in understanding some of the variance in outcomes, including treatment adherence.

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Appendix A: Sample response from depression and physical illness: free-response interviews with one participant.

Depression cognitions

The last time was about a month ago when I felt like crying all the time for no reason. I felt isolated and as if everybody hated me. I felt guilty for bringing my children into such an uncaring world. I felt as though I was in a dark cloud and couldn't get out of it. Everything was dull and grey. No matter how tired I was, I couldn't get to sleep until the early hours and then it would be time to get up. I couldn't be bothered to do anything. Everything took a lot of effort and I felt physically heavy and weighed down. I had no concentration, a bad memory and my head felt numb.

Physical illness cognitions

I had an ear, nose and throat infection about 12 months ago. I was in pain walking around with cotton wool inserted in my ears, taking antibiotic medicine and sucking throat lozenges. I was still able to carry on with everyday things but I felt irritated because I couldn't eat or talk properly. I also had a headache so I took painkillers which helped.

Appendix B: Category labels produced by the 8 naïve raters for depression and physical illness fitted to the five SRM dimensions (frequency of use)*

SRM dimensions	Depression labels produced	Physical labels produced
Identity	Symptoms (1) Physical symptoms of depression (5) Psychological symptoms (1) Experience of depression (1) Ways they felt/description of feelings/feelings (5) Negative feelings (2) Negative emotions (1) Low self-esteem (2) Confusion (1) Sleeping problems (1) Lack of appetite (1)	Symptoms (2) Physical symptoms (4) Physical experiences (1) Pain and sickness experience (1) Names of illnesses/diagnosis/name given to illness (7) Loss of appetite (1)
Cause	Causes of depression (2) Reason (1) Triggers or causes (3) Explanation of why illness occurred (1) Insight into negative feelings (1)	Causes of illness (3) Thoughts about causes (1) Reason (1) Insight or reasons for physical symptoms (1) How they became ill (1)

	Thoughts about causes (1)	
Timeline	Length of illness (1) How long it lasted (1) Time span of symptoms (1) Duration of depression (1)	Duration of illness (1) Time span of illness (1) Time period (1) Time involved (1) Length of illness (1) How long it lasted (1) Concerns related to duration of illness (1) Temporally related symptoms (1)
Consequences	Psychological aspects of depression (1) Motivational aspects of depression (1) Externalization of negative symptoms (1) Effects on significant others (1) Social consequences (2) Things it got in way of/made difficult (1) How behaviour was affected (1) Feeling useless and unable to undertake regular activities (1) Negative actions (1) Activity consequences/changes in activity (2) Resulting anger (1) Resulting fear (1)	Psychological aspects of illness (1) Motivational aspects of illness (1) Consequences of illness (1) Mental or physical consequences (1) Things couldn't do (2) Things didn't want to do or feel like doing (1) Activities got in way of or prevented/activity restrictions (2) Changes in activity (1) Negative feelings about illness (1) How felt because of illness (1) How affected by illness (1) Embarrassed by appearance (1) Description of emotions about illness (1) Unable to cope with usual responsibilities as result of illness (1) Bodily needs as result (1) Responsibilities affected (1) Shame as result of illness (1) Illness permeating all areas of life (1)
Control/cure	Methods of lifting mood or recovering (1) Positive ways of dealing with depression (1) Reasons for positive feelings or emotions (1) Steps taken to feel better (1) Thoughts/feelings about recovery (1) Finding help (1) Personal responsibility vs. external cure (1) Treatment (1) Medication (1)	Action taken due to illness (1) Positive coping (1) Medication (3) Anxiety about future illness (1) Steps or medication taken to relieve illness (1) How illness was treated or not treated (2) Professional responsibility (1)

* Some raters produced no labels and some multiple labels for each SRM dimension.

Appendix C: Symptom list used to assess depression identity

Depressed mood
 Loss of interest
 Weight loss or gain (not through dieting)
 Increase or decrease in appetite
 Problems with sleep
 Loss of energy
 Feelings of worthlessness
 Problems with concentration
 Increased thinking about death
 Loss of interest in sex
 Feelings of hopelessness and despair
 Increased irritability
 Feelings of guilt
 Physical symptoms such as heaviness in limbs, backache, headaches, muscle aches

Illness perception questionnaire modified for depression

I am interested in your own personal views of how you now see your depression.
Please indicate how much you agree or disagree with the following statements about your depression by circling one response. Rated: strongly agree, agree, neither agree nor disagree, disagree, strongly disagree

Causes items

Stress was a major factor in causing my depression
 It was just by chance that I became depressed
 My depression is/was largely due to my own behaviour
 My depression is hereditary—it runs in families
 Diet played a major role in causing my depression
 Other people played a large role in causing my depression
 Pollution of the environment caused my depression
 My depression was caused by poor medical care in the past
 A germ or virus caused my depression
 My state of mind played a major part in causing my depression
 My upbringing played a big part in causing my depression

Consequences items

My depression is/was a serious condition
 My depression has strongly affected the way others see me
 My depression has had major consequences on my life
 My depression has become easier for me to live with
 My depression has not had much effect on my life
 My depression has had strong economic and financial consequences for me
 My depression has strongly affected the way I see myself as a person

Control-cure items

My depression will improve in time
 Recovery from my depression is largely dependent on chance or fate
 My treatment will be effective in curing my depression
 There is a lot I can do to control my depression
 What I do determines whether my depression gets better or worse
 There is very little that can be done to improve my depression

Timeline items

My depression will last a short time

My depression will last for a long time

There will be periods of more depression and periods of improvement—ups and downs

My depression is likely to be permanent rather than temporary