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# Development of a short measure of psychological recovery in serious mental illness: the STORI-30

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# Development of a short measure of psychological recovery in serious mental illness: the STORI-30

## Abstract

**Objective:** To develop a brief measure of stage of psychological recovery from mental illness by identifying the best-performing items of the 50-item Stages of Recovery Instrument (STORI). **Method:** Item response modelling was used to identify a short form of the full-length STORI. The resulting items were subjected to factor analysis to further refine the subscales. A second data set was used to confirm the construct validity of the new measure. A correlational analysis was conducted to examine relationships among the five subscale scores. **Results:** Analyses identified 30 items that represented the five stages of the full STORI. The five stage subscale scores of the shorter measure, the STORI-30, showed a pattern of correlations that demonstrated an ordinal relationship between the stages. **Conclusions:** There is a need for recovery-oriented measures to augment established clinical assessment tools. The shorter version of the STORI, the STORI-30, shows promise as a brief measure of stage of recovery, more feasible for routine clinical use. Further psychometric and longitudinal testing is recommended. Qualitative research would be valuable in establishing acceptability to consumers and the clinical usefulness of the STORI-30.

## Keywords

serious, mental, illness, recovery, stori, development, 30, measure, psychological, short

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The STORI-30

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## Abstract

### *Objective:*

To develop a brief measure of stage of psychological recovery from mental illness by identifying the best-performing items of the 50-item Stages of Recovery Instrument (STORI)<sup>1</sup>.

### *Method:*

Item response modeling was used to identify a short form of the full-length STORI. The resulting items were subjected to factor analysis to further refine the subscales. A second data set was used to confirm the construct validity of the new measure. Correlational analysis was conducted to examine relationships among the five subscale scores.

### *Results:*

Analyses identified 30 items that represented the five stages of the full STORI. The five stage subscale scores of the shorter measure, the STORI-30, showed a pattern of correlations that demonstrated an ordinal relationship between the stages

### *Conclusions:*

There is a need for recovery-oriented measures to augment established clinical assessment tools. The shorter version of the STORI, the STORI-30, shows promise as a brief measure of stage of recovery, more feasible for routine clinical use. Further psychometric and longitudinal testing is recommended. Qualitative research would be valuable in establishing acceptability to consumers and the clinical usefulness of the STORI-30.

**Keywords:** Outcome measurement, recovery measurement, mental health recovery, psychometric, STORI.

It is becoming widely recognised that mental health consumers, in describing recovery from severe and enduring mental illnesses, are not talking about a medical cure, but rather the return to a fulfilling and meaningful life. This meaning of recovery, which has been referred to as *psychological recovery*<sup>1</sup> or, more broadly, *personal recovery*<sup>2</sup>, is a consumer-driven and active process, in contrast to the perception of the consumer as a passive recipient of care. Measures traditionally used in mental health settings tend to stem from a medical model of illness, and consumers do not feel that these measures capture concepts important to their recovery<sup>3-4</sup>. These claims have been empirically supported with recovery-oriented measures showing little relationship to outcomes typically assessed in mental health services<sup>4</sup>. With recovery-oriented practice becoming adopted policy in many countries, including Australia<sup>5</sup>, there is increasing demand for outcome measures that capture consumer-defined recovery<sup>6-7</sup>. This is particularly important in the context of evidence-based practice, and the increasing drive towards routine outcome measurement<sup>8</sup>.

The stage model of psychological recovery is a conceptual model that seeks to capture the essence of recovery. It aims to inform the development of reliable and valid measures, while honouring individual personal experience<sup>9</sup>. The model consists of four overarching processes of psychological recovery:

- Finding and maintaining hope;
- Taking responsibility for life and wellbeing;
- Renewal of a sense of self and building a positive identity and
- Finding purpose and meaning in life.

These processes develop across five stages of recovery:

- (1) Moratorium, typified by the absence of hope and the loss of a positive identity and meaning in life;
- (2) Awareness, in which the possibility of recovery is recognised; there is separation of self from illness, and recognition of inner resources;
- (3) Preparation, during which the groundwork for recovery is laid; there is reconnection with values and goals, and information and resources are sought;
- (4) Rebuilding, involving setting and working towards meaningful goals; the person begins to take control of their life, and
- (5) Growth, wherein the person feels they have psychologically recovered from the illness, and is looking towards a productive and meaningful future.

In an effort to develop a consumer-oriented measure of recovery, the Stages of Recovery Instrument (STORI)<sup>3</sup> was developed based on the stage model. The STORI demonstrated concurrent validity with recovery-related variables, and the stage subscales were found to be ordinal<sup>3</sup>. Weeks et al<sup>10</sup>, also found concurrent validity, test-retest reliability and feasibility, as measured by positive feedback on a survey of consumers in the UK.

The STORI has generated considerable international interest from researchers and clinicians, and has been translated from the original English into at least five other languages. However, the length of the STORI, at 50 items, has proven to be an obstacle to its widespread acceptance. Consequently, there is a need to develop a short form of the STORI – the current study attempts to address this need.

## Method

The study was conducted in two parts. In Part 1, we used item response modelling (IRM) to identify a short form of the original STORI, and followed this with a factor analysis of those items. Graded response models were used, given the response options used for the STORI; item parameters (including item discrimination) were used to assess items of the STORI. In Part 2, we tested the concurrent and construct validity of the resulting 30-item version of the STORI.

*Data:* Part 1 utilised archival STORI data from a number of previous studies<sup>3;11; Pratt unpubl. data (2009)</sup>. The combined data represented 232 participants (109 male, 123 female), mean age 43.56 years ( $SD = 12.23$ ), representing (1) community-based volunteer research participants ( $n=119$ ), (2) clients of a non-government community-based service ( $n=44$ ) and (3) participants in a self-help program ( $n =69$ ). Diagnoses reported for this combined data set were: Schizophrenia 60%, Bipolar Disorder 14%, Other 25%, with 1% of diagnostic information missing. In Part 2, a second data set, from a UK study<sup>10</sup>, was used for preliminary testing of the new 30-item measure. This data represented 50 participants (33 male, 17 female), with an average age of 32.4 years ( $SD=12.1$ ). Reported diagnoses were: Schizophrenia 42%, Other Psychotic Disorder 22%, Disorder due to substance abuse 12%, Bipolar Disorder 10% and Other 14%.

*Measures:* The Stages of Recovery Instrument (STORI)<sup>3</sup>, the focus of Part 1, is a self-rated measure, consisting of 50 items. Each item represents one of the four processes of recovery at one of the five stages of recovery. Example items for each stage are:

Stage 1: *I feel my life has been ruined by this illness.*

Stage 2: *I'm starting to think I could do something to help myself.*

Stage 3: *I am beginning to learn about mental illness and how I can help myself.*

Stage 4: *These days I am working on some things in life that are personally important to me.*

Stage 5: *My life is really good now, and the future looks bright.*

Items are rated on a six-point scale ranging from 0 = 'Not at all true now' to 5 = 'Completely true now', and are presented as 10 groups of five items, with an item in each group representing each stage of the model. This format was designed to help respondents to compare items between stages. The STORI results in five stage subscale scores. The highest subscale score represents the person's stage of recovery.

The Recovery Assessment Scale (RAS)<sup>12</sup>, used in Part 2, is a continuous measure of recovery consisting of 41 items rated on a five-point scale from 1 to 5. The RAS has demonstrated construct validity in a number of studies e.g.<sup>13;14-16</sup>, and was used for preliminary validation of the STORI-30.

*Analyses:* In Part 1, we fitted a unidimensional graded response model to identify the six best-performing items in each of the five stage subscales. A factor analysis was then performed to determine whether these 30 items grouped according to the stages to which they theoretically belonged. In Part 2, using the second data set, Cronbach's alpha determined the internal consistency of the stage subscales. Next, Pearson correlation analyses were performed between the subscale scores, in order to determine whether there was an ordinal relationship. Correlations were then performed between the individual stage subscales and the RAS, to examine the relationship between the individual subscales and the recovery construct.

## **Results**

### *Part 1.*

#### *Item analysis:*

A graded item response model was employed to identify the best-performing six items for each of the five stages. These 30 items were then subjected to an exploratory factor analysis.

#### *Factor Analysis:*

Factor analysis identified four interpretable factors. Factor 1 consisted of all six Stage 1 items. Factor 2 consisted of all the Stage 2 and 3 items, plus three Stage 4 items. Factor

3 consisted of four Stage 4 items plus one Stage 5 item. Factor 4 consisted of five Stage 5 items and one Stage 4 item. We used these results to inform the composition of the five subscales, retaining six items per stage, as follows:

Stage 1 - retained as is, with all six items identified by the item analysis.

Stage 2 - retained the original six Stage 2 items

Stage 3 –retained the original six Stage 3 items

Stage 4 - deleted one Stage 4 item that loaded heavily on Factor 2; changed the Stage 5 item which loaded with Stage 4 items to Stage 4.

Stage 5 - to replace the deleted item, we included the next-best performing Stage 5 item from the item analysis.

### *Part 2.*

Using data from the UK study<sup>10</sup>, which used the full STORI, analyses were run on the selected 30 items. Internal reliability for the individual subscales was examined using Cronbach's alpha, which ranged from  $\alpha = 0.77$  for Stage 2 to  $\alpha = 0.85$  for Stage 4.

Intercorrelations between the subscales showed an expected pattern. Adjacent subscales, for example, Stages 3 and 4 ( $r = .783, p < .01$ ), demonstrated strong positive correlations, while distal subscales showed negative correlations, for example, Stages 1 and 5 ( $r = -.51, p < .01$ ) (See Table 1). Correlations of the stage subscales with the RAS demonstrated a similar pattern, ranging from strong negative correlations with Stage 1 through to strong positive correlations with Stage 5 (see Table 2). Combined, these results support the ordinal relationship of the subscales.

### **Discussion**

The shorter version of the STORI, the STORI-30, utilises 30 best-performing items of the original, while retaining the theoretical stages of the model as demonstrated by the correlational relationships. Stages that are theoretically adjacent show strong positive correlations, and as the stages become more distal in the model, correlations are weaker. Negative correlations between Stage 1 and the other subscales are expected, since this stage is qualitatively very different from the other four stages of recovery.

It was expected that by identifying the six best-performing items for each stage, five clear factors representing the stages of the model would emerge. Disappointingly, this did not eventuate, mirroring earlier analyses of the STORI which resulted in identifying only three clusters<sup>3,10</sup>. A three stage model has been suggested<sup>10</sup>, and it is possible that stages 2, 3 and 4 could be phases of rebuilding, and quantitatively rather than

qualitatively different, thus not forming distinct factors. The difficulty in identifying five factors may also be due to the complexity of the model. It is likely that the four psychological processes of the model do not occur in ‘lockstep’ through the stages. Indeed, the complex pattern of psychological processes across stages of recovery has been noted by Wolstencroft et al.<sup>17</sup>. Given that all empirical work aimed at identifying the stages to date has been based on the original items of the STORI, and mindful of the strong qualitative evidence for the stages, it would be prudent to re-examine the items before abandoning the five stage model. That is, it may be a measurement issue as opposed to an issue with the model. Therefore, we retained the five stage subscales in the subsequent analysis, which confirmed their ordinal nature.

The STORI-30 is potentially more feasible for routine clinical use than the original STORI, due to its shorter length<sup>18</sup>. It retains the elements of recovery important to consumers, while presenting less of a burden to consumers and clinicians, and should prove acceptable and meaningful<sup>10</sup> to consumers, as did the original STORI<sup>10</sup>. Identifying a person’s stage of psychological recovery in practice, when taken in the context of the theoretical model, has the potential to open up discussion between the clinician and consumer, nurturing the working alliance and aiding in the collaborative setting of treatment goals in keeping with the consumer’s personal values.

Further testing is required, with a new sample, to investigate the psychometric properties of the STORI-30. Perhaps more importantly, qualitative studies would make a valuable contribution to establishing the clinical utility of the STORI-30 in terms of its relevance, acceptability and usefulness in the clinic from the point of view of practitioners and consumers.

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Table 1. Intercorrelations of stage subscales of the STORI-30

	Stage 1	Stage 2	Stage 3	Stage 4
Stage 1	1			
Stage 2	.09	1		
Stage 3	-.17	.76**	1	
Stage 4	-.49**	.40**	.78**	1
Stage 5	-.51**	.17	.59**	.70**

\*\* =  $p < .01$

Table 2. Correlations between STORI-30 stages and RAS

STORI-30 Subscale	RAS Total
Stage 1	-.65**
Stage 2	.11
Stage 3	.40**
Stage 4	.62**
Stage 5	.77**

Note: RAS=Recovery Assessment Scale<sup>12</sup>

\*\* =  $p < .01$