

THE INTERNAL STATE SCALE (ISS)

Version 2 and the ChronoBook

SCORING KEY AND SUMMARY

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OVERVIEW

Thank you for your interest in the Internal State Scale (ISS). This packet contains all the information necessary to begin using the ISS, including: this scoring key, a copy of the current version of the instrument (version 2), and reprints of articles summarizing the original study in 1991 and the replication and scoring revision in 2000. The ISS can be copied and used without charge, but reference in publication to the appropriate article(s) is expected. I would also like to receive a copy of any published manuscripts.

ISS version 2 has been used since 1991 in a variety of scientific studies of course and outcome in bipolar disorder. It has been used in several countries and has been translated into Spanish, French, and German.

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- French translator: Jean Michel Aubry (jaubry@worldcom.ch)
- German translator: Thomas Meyer (th.meyer@uni-teubingen.de)

The ISS was designed to provide a simple mood state self-report that could be gathered at frequent intervals and remote from clinical sites. Thus it can, for instance, be used for daily ratings by patients at home in order to track rapid cycling.

The ISS represents a substantial advance over earlier self-report mood ratings in that manic and depressive symptoms are tracked independently, rather than having the subject fill out a single forced choice manic-or-depressed bipolar scale. Thus the ISS does not presuppose that all manic or hypomanic episodes are euphoric. Rather, the ISS recognizes mixed states and depressive symptoms during manic and hypomanic episodes.

Psychometric analysis indicates that the ISS is composed of four principle components, producing four subscales. There are two major uses for the ISS subscales. First, two subscales, Activation and Well Being, are used in combination to discriminate mood state in bipolar disorder (euthymia vs. manic/hypomania vs. mixed vs. depression). Second, three subscales can be used as symptom severity self-report scales (Activation: manic symptoms; Depression Index: depressive symptoms; Perceived Conflict: global psychopathology). These uses are complementary and fill distinct needs in the longitudinal assessment of bipolar disorder.

Three separate studies have investigated psychometric properties of the ISS (see Annotated

Reference List) and give us confidence in its utility (Bauer et al, 1991; Cooke et al, 1996; Bauer et al, 2000); one additional study indicates its limitations (Brown et al, 2000). The four subscales have high inter-item consistency. Test-retest reliability during the same mood state is acceptable, as is sensitivity to change with changing mood state. Subscales have been validated against clinician-rated symptom severity scales and against clinician-assigned mood state.

DESCRIPTION OF INSTRUMENTS

ISSv.2:

The ISS consists of four subscales: Activation, Well Being, Perceived Conflict, and the Depression Index. A single-item Global Bipolar Scale has been added for reference to earlier single analog line mood scales for bipolar disorder.

The ISS is in the public domain. However, the authors would like information regarding who is using it and how. Correspondence should be sent to Dr. Mark S. Bauer at the address below.

The ChronoBook:

The ChronoBook is a month-long booklet that consists of a sleep-wake, medication, and event log and daily ratings for the ISS. Two additional experimental ISS items ("Hyper" and "Nervous Energy") are contained in the ChronoBook. The daily mood record section of the ChronoBook is scored as daily, individual ISSs. The two experimental items are not used in scoring the ISS. Thus the ChronoBook yields ISS scores for Day 1, Day 2, etc. The sleep, medication, and events log is included for investigator or clinician use in exploring the relationship of mood state to these variables.

Copyright holders for the ChronoBook are Drs. Mark S. Bauer and Peter C. Whybrow. Request to duplicate or inquiries regarding production should be forwarded to Dr. Bauer.

SCORING GUIDELINES

The original version of the ISS contained a series of visual analogue scale (VAS) items consisting of statement followed by a 100 mm line with anchor points at 0 and 100. Our most recent study (currently submitted) indicates no loss of precision in Likert-based format.

Specifically, the 100 mm VAS has been replaced by eleven "bins" (equivalent to 0-10, 11-20, ...91-100). This conversion represents a major improvement since scoring of the ISS can be fully automated using optical scanning technology. This also means that the ISS need not be duplicated by photocopy alone, but can be adapted to various op-scan forms and processes.

In Likert-based scoring, the first bin is scored as zero, the second as 10, and so on to the eleventh bin which is scored as 100.

Item Text	<u>Subscale</u>
Today my mood is changeable.	Perceived Conflict
Today I feel irritable.	Perceived Conflict
Today I feel like a capable person.	Well Being
Today I feel like people are out to get me.	Perceived Conflict
Today I actually feel great inside.	Well Being
Today I feel impulsive.	Activation
Today I feel depressed.	Depression Index
Today my thoughts are going fast.	Activation
Today it seems like nothing will ever work out for me.	Depression Index
Today I feel overactive.	Activation
Today I feel as if the world is against me.	Perceived Conflict
Today I feel "sped up" inside.	Activation
Today I feel restless.	Activation
Today I feel argumentative.	Perceived Conflict
Today I feel energized.	Well Being

ISS SUBSCALES AS DISCRIMINATORS OF MOOD EPISODES

The Well Being subscale used in conjunction with the Activation subscale is useful in discriminating between depressed, (hypo)manic, and subsyndromal/euthymic states. In this capacity, the ISS has proven valid by discriminant function analysis, although the exact cut-off scores may vary somewhat from site to site and therefore should be standardized by each investigator.

The revised algorithm for mood state discrimination (Bauer et al, 2000) is as follows:

Mood State	Activation Subscale Score	Well-Being Subscale Score
(Hypo)Mania	≥ 155	≥ 125
Mixed State	≥ 155	< 125
Euthymia	< 155	≥ 125
Depression	< 155	< 125

ISS SUBSCALES AS INDICATORS OF SYMPTOM SEVERITY

The Activation subscale correlates highly and specifically with clinician ratings of manic symptoms ($r=0.60$ vs. Young Mania Rating Scale), while the Depression Index correlates highly and specifically with clinician ratings of depressive symptoms ($r=0.84$ vs. Hamilton Depression Rating Scale). These are the two most useful subscales in tracking mood disorders.

The Perceived Conflict subscale correlates most highly with the Brief Psychiatric Rating Scale ($r=0.56$), but also correlates significantly with the Hamilton Depression and Young Mania Rating Scales. Thus it appears to serve as an index of global psychopathology. Preliminary evidence indicates that it is particularly high in patients with psychotic symptoms.

ANNOTATED REFERENCE LIST (selected references, as of January, 2007):

Bauer M, Crits-Christoph P, Ball W, Dewees E, McAllister T, Alahi P, Cacciola J, Whybrow P. Independent assessment of manic and depressive symptoms by self-rating. scale characteristics and implications for the study of mania. *Arch Gen Psychiatry* 1991; 48:807-12.

- Original paper on instrument development, psychometrics of mood state discrimination and symptom severity correlation. Conducted in tertiary care academic medical center sample.

Palmer A, Williams H. CBT in a group format for bi-polar affective disorder. *Beh Cogn Psychother* 1995; 23:153-68.

- Example of the use of the ISS as a clinical trial outcome measure.

Cooke R, Kruger S, and Shugar G. Comparative evaluation of two self report mania rating scales. *Biol Psychiatry*. 1996, 40:279-83.

- Independent replication of basic properties of ISS.

Lam D, Jones S, Hayward P, Bright J. Cognitive Therapy for Bipolar Disorder. A Therapist's Guide to Concepts, Methods, and Practice. Chichester, UK, Wiley Series in Clinical Psychology, 1999.

- Illustrates integration into cognitive therapy outcome assessment for bipolar disorder in a British modality.

American Psychiatric Association Task Force for the Handbook of Psychiatric Measures. Handbook of Psychiatric Measures. Washington, DC, American Psychiatric Press, 2000

- Summary and critique of ISS concept, psychometric properties, and applications.

Bauer M, Vojta C, Kinosian B, Altshuler L, Glick H. The Internal State Scale: replication of its discriminating abilities in a multi-site, public sector sample. *Bipolar Disorders* 2000; 2: 340-346. .

- Four-site, VA study replicating the mood state discrimination abilities of the ISS. Revision of algorithm to identify mixed states. Confirmation of ISS abilities in multi-site, public sector sample.

Brown ES, Bauer MS, Suppes T, Khan D, Carmody T. Comparison of the Internal State Scale to clinician-administered scales in asthma patients receiving corticosteroid therapy. *Gen Hosp Psychiatry* 2000; 22:180-83.

- ISS performs less well in patients with manic or depressive symptoms due to medical factors who do not have bipolar disorder. Conducted in medical clinic of an academic medical center.

Lam D, Bright J, Jones S, Hayward P, Schuck N, Chisolm D, Sham P. Cognitive therapy for bipolar illness—a pilot study of relapse prevention. *Cognitive Ther Res* 2000; 24:503-20.

- Example of the use of the ISS as a clinical trial outcome measure.

Scott J, Garland A, Moorhead S. A pilot study of cognitive therapy in bipolar disorders. *Psychol Med* 2001; 31:459-67.

- Example of the use of the ISS as a clinical trial outcome measure.

Vojta C, Kinosian B, Glick H, Altshuler L, Bauer M. Self-reported quality of life across mood states in bipolar disorder. *Comprehensive Psychiatry* 2001; 42:190-95

- Four-site VA study investigating quality of life and preference (utility) measures in relation to ISS scores.

Glick HA, McBride L, Bauer MS. A manic-depressive symptom self-report in optical scanable format. *Bipolar Disorders* 2003; 5:366-69.

- The ISS loses no discriminating ability when converted from VAS format to likert-based scoring, which makes feasible automated, optical scanned scoring.

Lam DH, Watkins ER, Hyward P, Bright J, Wright K, Kerr N, Parr-Davis G, Sham P. A randomized controlled study of cognitive therapy for relapse prevention for bipolar disorder. outcome of the first year. *Arch Gen Psychiatry* 2003; 60:145-52.

- Example of the use of the ISS as a clinical trial outcome measure.

Bolanos SH, Khan DA, Hanczyc M, Brown ES, Bauer MS. Assessment of mood states in patients receiving chronic corticosteroid therapy with the Internal State Scale. *Annals of Allergy and Immunology* 2004; 92:500-05.

- ISS assessment of manic and depressive symptoms in patients chronically receiving corticosteroids, which frequently induce manic and/or depressive symptoms.

Srisinroongruang R, Brown ES, Khan DA, Bauer MS. Comparison of the Internal State Scale to clinician-administered assessments in patients with bipolar disorder and alcohol abuse or dependence. *J Dual Diagnosis* 2005; 1:61-69.

- ISS assessment in individuals with bipolar disorder complicated by comorbid alcohol dependence.

Pope M, Dudley R, Scott J. Determinants of social functioning in bipolar disorder. *Bipolar Disorders* 2007; 9:38-44.

- ISS subscale Depression Index correlation with indices of social function, similar to clinician ratings of depression.

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