

Brief Symptom Inventory
(Year 14)
Fast Track Project Technical Report
Richard L. Lamb
March 12, 2010

Table of Contents

- I. Scale Description
- II. Report Sample
- III. Scaling
- IV. Differences between Groups
- V. Recommendations for Use
- VI. Item Scale Means and SD
- VII. Scale Correlations
- VIII. Clinical Significance

Citation

Instrument

Derogatis, L. & Melisaratos, N. (1983). *The Brief Symptom Inventory: an introductory report*. The Journal of Psychological Medicine, 13, 595-605

Kuhn, W., Bell, R., Seligson, D., Laufer, T., & Lindner, JJ. (1988). The tip of the iceberg: Psychiatric consultations on an orthopedic service. International Journal of Psychiatry in Medicine, 18(4), 375-382

Lamb, R. (2010). *Brief Symptom Inventory* (Fast Track Project Technical Report). Available from the Fast Track Project Web site, <http://www.fasttrackproject.org>

Data Sources

Raw: C14BJ1

Scored: BSI14

I. Survey Description

The Brief Symptom Inventory (BSI) is a 53-item, free standing, self-reporting survey measuring nine symptom dimensions and three global indices of distress. The BSI is most useful in a clinical and research setting where time is the major limiting factor (Derogatis & Melisaratos, 1983). This measure was added to the Fast Track protocol in year 14 (2004) for cohort 1.

The BSI used for the Fast Track Project is a modified 35 item paper survey measuring a total of five indices of distress resulting in a point-in-time measure of the subjects' states of distress. Responses are provided via zero (not at all) to four (Extremely) on a Likert scale.

II. Report Sample

These analyses were conducted on the first cohort on the high-risk control sample (n = 155) and the normative sample (n = 387, N = 463 with overlap) for the fourteenth year of the study. One hundred twenty records were missing for the complete measure. Forty-one records from the control sample (19 from Durham, 21 from Nashville and 1 from Washington) and 104 records were missing from the normative sample (45 from Durham, 39 from Nashville, 8 from Pennsylvania and 12 from Washington).

III. Scaling

The 35 items evaluate five symptom dimensions (*Somatization, Interpersonal Sensitivity, Depression, Anxiety* and *Hostility*) and three global indices of distress (PST, PSDI and the Global Severity Index). Each item is scored on a response scale of 0 to 4, where 0 = *Not at all*, 1 = *A little bit*, 2 = *moderately*, 3 = *Quite a bit* and 4 = *Extremely*. There are five derived scores and six diagnostics scores for this measure. The five subscales from which the diagnostic scores are derived from are *Somatization, Interpersonal Sensitivity, Depression, Anxiety* and *Hostility*. All of the subscale scores are summary scores converted to diagnostics scores using a standardized t-table. Item and subscale designations are listed in table 1.

Raw scores are developed by summing the participants answer for each item in each of the five symptom dimensions (subscales) and remaining additional items. The resultant score is then divided by the number of items answered in each subscale by the participant. This raw score for each of the dimensions is then converted to a standardized t-score based upon normalized and gender specific t-tables.

Three global scores are also created based on Derogatis' scoring methods. For each of these scales 31 items from the Fast Track version of BSI are included – these are the items adapted from Derogatis' original measure. Derogatis' *Global Severity Index* (GSI) is calculated by taking the mean of the items. In the Fast Track version of the BSI, only 31 of the original 53 items are included. Thus, to create the *Global Severity Index*, we multiply the original definition of the GSI by 53/31, the ratio of the original BSI items to Fast Track BSI items. This transformation ensures that the range of our version corresponds to the range of the original so that Fast Track can use the published tables to create T-scores for the dimensions. Derogatis' *Positive Symptom Total* is derived by counting the number of items endorsed with a positive response. In the Fast Track version, the result is then multiplied by 53/31 to account for the difference in the number of items included in the measure. Derogatis' *Positive Symptom Distress Index* (PSDI) is derived by summing across the items and then dividing by the *Positive Symptom Total*. Again, the Fast Track version is then multiplied by 53/31 to account for the difference in the number of items included in the measure.

Table 1.

Item and Subscale Designation

Variable	Number	Item	Subscale
C14BJ02	2	Faintness or dizziness	Somatization
C14BJ07	7	Pains in heart or chest	Somatization
C14BJ23	23	Nausea or upset stomach	Somatization
C14BJ29	29	Trouble getting your breath	Somatization
C14BJ30	30	Hot or cold spells	Somatization
C14BJ33	33	Numbness or tingling in parts of your body	Somatization
C14BJ37	37	Feeling weak in parts of your body	Somatization
C14BJ20	20	Your feelings being easily hurt	Interpersonal Sensitivity
C14BJ21	21	Feeling that other people are unfriendly or dislike you	Interpersonal Sensitivity
C14BJ22	22	Feeling inferior to others	Interpersonal Sensitivity
C14BJ42	42	Feeling very self-conscious with others	Interpersonal Sensitivity
C14BJ09	9	Thoughts about ending your life	Depression
C14BJ16	16	Feeling lonely	Depression
C14BJ17	17	Feeling blue	Depression
C14BJ18	18	Feeling no interest in things	Depression
C14BJ35	35	Feeling hopeless about the future	Depression
C14BJ50	50	Feelings of worthlessness	Depression
C14BJ01	1	Nervousness or shakiness inside	Anxiety

C14BJ12	12	Suddenly scared for no reason	Anxiety
C14BJ19	19	Feeling fearful	Anxiety
C14BJ38	38	Feeling tense or keyed up	Anxiety
C14BJ45	45	Spells of terror or panic	Anxiety
C14BJ49	49	Feeling so restless you couldn't sit still	Anxiety
C14BJ06	6	Feeling easily annoyed or irritated	Hostility
C14BJ13	13	Temper outburst that you could not control	Hostility
C14BJ40	40	Having urges to beat, injure, or harm someone	Hostility
C14BJ41	41	Having urges to break or smash things	Hostility
C14BJ46	46	Getting into frequent arguments	Hostility
C14BJ01	1	Worrying	Additional Items
C14BJ10	10	Feeling tired	Additional Items
C14BJ18	18	Headaches	Additional Items
C14BJ20	20	Trouble falling asleep	Additional Items
C14BJ32	32	Feeling dissatisfied	Additional Items
C14BJ35	35	Feelings of guilt	Additional Items

Table 2 summarizes inter-item reliability for each of the subscale by sample group and gender using Cronbach's Alpha. Some areas of the survey do not show an appropriate level of internal consistency – shown with bold italics- particularly within the normative sample group. However, the overall internal consistency across the entire survey, sample grouping and genders show a high level of internal consistency with a alpha coefficient of 0.9222.

Table 2.

Alpha Coefficient for Inter-reliability of Subscales by Gender and Sample Group

Subscale	Female		Male	
	Control	Normative	Control	Normative
Somatization	0.7800	0.7280	0.5701	0.6148
Interpersonal Sensitivity	0.8490	0.4441	0.7532	0.6634
Depression	0.8631	0.8432	0.8316	0.7823
Anxiety	0.7348	0.6838	0.5634	0.7070
Hostility	0.6788	0.4102	0.7747	0.4839
Overall	0.9222			

IV. Differences between Groups

Tables 3 and 4 show the results of a series of one-way Analysis of Variance comparisons between the control and normative sample groups. Results indicated a significant difference (indicated by asterisks) within the male sample for four of the five subscales. The four subscales showing a significant difference are *Anxiety*, *Somatization*, *Depression*, *Interpersonal Sensitivity* and the *Global Severity Index*. For each of the subscales showing significance the control sample group showed higher mean scores. Comparison of mean scores for the female normative and control groups shows no significant difference between groups.

Table 3.

One-way ANOVA Comparing Subscale t-score for Control and Normative, Female

Mean

Subscale t-score	Control	Normative	<i>df</i>	F-ratio	Prob >F
Anxiety	48.67	47.15	150	0.67	0.4152
Somatization	46.80	47.00	150	0.02	0.9000
Hostility	52.20	51.54	150	0.15	0.7456
Depression	49.23	47.67	150	0.92	0.3398
Interpersonal Sensitivity	49.73	48.47	149	0.51	0.4752
Global Severity Index	50.23	50.88	149	0.09	0.7666

Table 4.

One-way ANOVA Comparing Subscale t-score for Control and Normative Sample, Male

Subscale t-score	Mean		df	F-ratio	Prob >F
	Control	Normative			
Anxiety	50.82	47.44	184	4.88	0.0285*
Somatization	49.64	46.14	184	7.95	0.0053*
Hostility	51.10	48.64	185	3.05	0.0822
Depression	51.45	48.40	185	4.92	0.0278*
Interpersonal Sensitivity	51.84	48.65	185	5.85	0.0166*
Global Severity Index	53.41	48.55	184	7.97	0.0053*

V. Recommendations for Use

The Brief Symptoms Inventory is appropriate in settings in which time is limited. The BSI is commonly used as a single point in time assessment of an individual's clinical status. Conversion of the raw scores to standardized t-scores allows for meaningful comparisons across groups and previous tests. Group mean comparisons of standardized t-values enable the researcher to compare psychological states and characteristics which might differ between the normative and control samples.

One female subject's raw scores (in the normative sample) showed the presence of a ceiling effect in the Depression subscale. The subject reported an overall raw scale score of 4.0. The highest possible raw scale score is 3.60.

VI. Scale Means and SD

Table 5 and table 6 show the subscale means and standard deviations for each of the scored subscales broken down by sample group. The normative sample group's means are slightly lower than the control sample means. Though the difference is not statistically significant it may warrant further investigation.

Table 5.

Summary Statistics of Subscales from the Control Sample

Subscale	N	df	M	SD	Sum	Minimum	Maximum
Anxiety	113	112.00	50.2478	10.9720	5678.00	38.0000	78.0000
Somatization	113	112.00	48.8850	9.1082	5524.00	41.0000	70.0000
Hostility	113	112.00	51.3894	10.7997	5807.00	39.0000	73.0000
Depression	113	112.00	50.8584	10.2738	5747.00	42.0000	78.0000
Interpersonal Sensitivity	113	112.00	51.2832	10.0040	5795.00	41.0000	78.0000
Global Severity Index	113	112.00	52.5664	12.9566	5940.00	33.0000	80.0000

Table 6.

Summary Statics of Subscales from the Normative Sample

Subscale	N	df	M	SD	Sum	Minimum	Maximum
Anxiety	225	224.00	47.2844	9.1714	10639.0	38.0000	78.0000
Somatization	225	224.00	46.6044	7.6467	10486.0	40.0000	70.0000
Hostility	226	225.00	50.2080	9.2403	11347.0	39.0000	71.0000
Depression	226	225.00	48.0088	7.8836	10850.0	42.0000	78.0000
Interpersonal Sensitivity	225	224.00	48.5556	8.1503	10925.0	41.0000	74.0000
Global Severity Index	224	223.00	49.8125	10.3591	11158.0	33.0000	80.0000

VII. Scale Correlations

Table 7.

Subscale Correlation Coefficients, Female Control Sample, $r(28)$, $p < 0.05$

	ANX	SOM	HOS	DEP	IPS	GSI
ANX	1.0000	0.6977	0.7987	0.7816	0.7346	0.9075
SOM	0.6977	1.0000	0.5989	0.7464	0.5669	0.7469
HOS	0.7987	0.5989	1.0000	0.6377	0.5207	0.8754
DEP	0.7816	0.7464	0.6377	1.0000	0.8244	0.8596
IPS	0.7346	0.5669	0.5207	0.8244	1.0000	0.7880
GSI	0.9075	0.7469	0.8754	0.8596	0.7880	1.0000

Table 8.

Subscale Correlation Coefficients, Female Normative Sample, $r(120)$, $p < 0.05$

	ANX	SOM	HOS	DEP	IPS	GSI
ANX	1.0000	0.5058	0.5060	0.5952	0.5303	0.7833
SOM	0.5058	1.0000	0.3498	0.3785	0.4485	0.6026
HOS	0.5060	0.3498	1.0000	0.5242	0.4949	0.7060
DEP	0.5952	0.3785	0.5242	1.0000	0.5908	0.7049
IPS	0.5303	0.4485	0.4949	0.5908	1.0000	0.7282
GSI	0.7833	0.6026	0.7060	0.7049	0.7282	1.0000

Table 9.

Subscale Correlation Coefficients, Male Control Sample, $r(82)$, $p < 0.05$

	ANX	SOM	HOS	DEP	IPS	GSI
ANX	1.0000	0.5601	0.6476	0.6916	0.5119	0.7855
SOM	0.5601	1.0000	0.4720	0.5127	0.5236	0.6542
HOS	0.6476	0.4720	1.0000	0.6082	0.5385	0.8053
DEP	0.6916	0.5127	0.6082	1.0000	0.7412	0.8065
IPS	0.5119	0.5236	0.5385	0.7412	1.0000	0.7640
GSI	0.7855	0.6542	0.8053	0.8065	0.7640	1.0000

Table 10.

Subscale Correlation Coefficients, Male Normative Sample, r(105), p < 0.05

	ANX	SOM	HOS		IPS	GSI
ANX	1.0000	0.4260	0.5049	0.5623	0.5229	0.7318
SOM	0.4260	1.0000	0.2002	0.3192	0.4198	0.5487
HOS	0.5049	0.2002	1.0000	0.3850	0.4306	0.7299
DEP	0.5623	0.3192	0.3850	1.0000	0.5847	0.6744
IPS	0.5229	0.4198	0.4306	0.5847	1.0000	0.7462
GSI	0.7318	0.5487	0.7299	0.6744	0.7462	1.0000

VIII. Clinical Significance

Kuhn, Bell, Seligson, Laufer and Lindner (1988) developed the operational score for clinical significance when using the BSI. The operational score for clinical significance according to Kuhn et. al. is that a subject shows a t-score greater than 63 in GSI or a score greater than 63 in any two of the five primary dimensions. Table 11 shows the number of subjects by dimension who show a t-score greater than or equal to 63 in each of the individual dimensions.

Table 11.

Number of Control and Normative Sample Subjects with t-Scores Greater than 63

Dimension	Control, t-score ≥ 63	Normative, t-score ≥ 63
ANX	19	21
SOM	10	9
DEP	19	16
HOS	21	25
IPS	20	19

There are 41 clinically significant cases with t-scores in two dimensions greater than or equal to 63. There is not a statistically significant difference between the control and normative group in the number of clinically significant cases. Table 12 shows the number of clinically significant cases for each of the sample groups.

Table 12.

Number of Clinically Significant Cases using Two Dimensions

Sample	Number Significant
Control	23
Normative	18

There are 54 clinically significant cases with t-scores in the GSI dimension greater than or equal to 63. Some of the subjects overlap with the clinically significant subjects using the two primary dimensions method of determination of clinical significance. Table 13 shows the number of clinically significant cases for each of the sample groups.

Table 13

Number of Clinically Significant Cases using GSI

Sample	Number Significant
Control	27
Normative	27