

PAIN BEHAVIOR SCORING MANUAL

A brief guide scoring to the PROMIS® Pain Behavior instruments:

ADULT	PEDIATRIC	PARENT PROXY
PROMIS Item Bank v2.0 – Pain Behavior	PROMIS Pediatric Bank GenPop v3.0 – Pain Behavior	PROMIS Parent Proxy Bank GenPop v3.0 – Pain Behavior
PROMIS Scale v2.0 – Pain Behavior 20a	PROMIS Pediatric Bank GenPop v3.0 – Pain Behavior (screen-to-CAT)	PROMIS Parent Proxy Bank GenPop v3.0 – Pain Behavior (screen-to-CAT)
PROMIS Item Bank v1.0 – Pain Behavior*	PROMIS Pediatric Short Form GenPop v3.0 – Pain Behavior 8a	PROMIS Parent Proxy Short Form GenPop v3.0 – Pain Behavior 8a
PROMIS Short Form v1.0 – Pain Behavior 7a*	PROMIS Pediatric Item Bank v1.0 – Pain Behavior*	PROMIS Parent Proxy Item Bank v1.0 – Pain Behavior*
PROMIS Item Bank v1.1 – Pain Behavior*	PROMIS Pediatric Short Form v1.0 – Pain Behavior 8a*	PROMIS Parent Proxy Short Form v1.0 – Pain Behavior 8a*
PROMIS Short Form v1.1 – Pain Behavior 7a*		

*Retired measure

COMPARING SCORES ACROSS VERSIONS

Some PROMIS domains have multiple versions of instruments (i.e., v1.0, v1.1, v2.0, v3.0). Generally, **it is recommended that you use the most recent version available which can be identified as the instrument with the highest version number.** In most cases (though not in adult Pain Behavior), an instrument that has a decimal increase (v1.0 to v1.1) retains the same item-level parameters as well as instrument reliability and validity. In cases where a version number increases by a whole number (e.g., v1.0 to v2.0), the changes to the instrument are more substantial.

- For Adult Pain Behavior measures, the v2.0 calibrations are on the same metric as v1.1. This means that scores from v1.1 and v2.0 can be compared. The v1.1 item bank includes the same items as v1.0 items but uses revised item-level calibrations. Consequently, scores from v1.0 should not be compared with v1.1 or v2.0 measures.
- Scores from Pediatric and Parent Proxy GenPop v3.0 measures are NOT comparable with v1.0 measure scores.
 - Please note that, for the sake of naming consistency, Pediatric and Parent Proxy v2.0 Pain Behavior was deliberately skipped, to harmonize the Instrument Titles in this domain with the rest of the v3.0 GenPop set.

To learn more about PROMIS Pain Behavior v2.0, see:

Cook KF, Keefe F, Jensen MP, Roddey TS, Callahan LF, Revicki D, Bamer AM, Kim J, Chung H, Salem R, & Amtmann D. (2013) Development and validation of a new self-report measure of pain behaviors. *Pain*, 154, 2867-2876.

Transforming Scores between Versions:

To transform T-scores from Pediatric/Parent Proxy v1.0 Pain Behavior measures to the Pediatric/Parent Proxy GenPop v3.0 metric, rescore v1.0 measures using the [HealthMeasures Scoring Service](#) or Assessment Center API. This is the preferred strategy as it produces precise scores.

- Download the v3.0 measure from [Search & View Measures](#) on HealthMeasures.net.

2. Revise your dataset as needed to match the v3.0 item IDs and response scores:
 - No items were revised between the v1.0 and GenPop v3.0 Pain Behavior measures.
3. Follow the instructions for using the [HealthMeasures Scoring Service](#). Contact help@HealthMeasures.net if using the Assessment Center API for rescoring.

The crosswalk tables in Appendix 3 may also be used as a reference to guide understanding of how scores have shifted from the older v1.0 measures to the v3.0 measures. If these tables are used to convert older T-scores to GenPop v3.0, please note that the resulting T-scores are not as precise as those generated by using HealthMeasures Scoring Service or Assessment Center API.

SCORING THE INSTRUMENT

Short Forms/Scale: PROMIS instruments are scored using item-level calibrations. This means that the most accurate way to score a PROMIS instrument is to use the HealthMeasures Scoring Service (https://www.assessmentcenter.net/ac_scoringervice) or a data collection tool that automatically calculates scores (e.g., REDCap auto-score). This method of scoring uses responses to each item for each participant. We refer to this as “response pattern scoring.” Because response pattern scoring is more accurate than the use of raw score/scale score look up tables included in this manual, it is preferred. Response pattern scoring is especially useful when there is missing data (i.e., a respondent skipped an item), different groups of participants responded to different items, or you have created a new questionnaire using a subset of questions from a PROMIS item bank.

If you are scoring either a v1.0 or v1.1 Adult Pain Behavior measure, use the v1.1 scoring table included in this manual. The HealthMeasures Scoring Service does not include the v1.0 or v1.1 measures. Scores calculated from the v1.1 table in this manual can be compared with v2.0 Pain Behavior measures. If you would like to transform v1.0 scores to the v1.1/v2.0 metric using statistical software, please contact us.

If you are scoring a scale or custom short form, the HealthMeasures Scoring Service is the preferred approach. If you are using a scale, use the v2.0 scoring table included in this manual.

To use the scoring tables in this manual, calculate a summed score. Each question usually has five response options ranging in value from one to five. To find the total raw score for a short form with all questions answered, sum the values of the response to each question. For example, for the v2.0 adult 20-item form, the lowest possible raw score is 20; the highest possible raw score is 100 (see short form scoring table in Appendix 1). **All questions must be answered in order to produce a valid score using the scoring tables.** If a participant has skipped a question, use the HealthMeasures Scoring Service (https://www.assessmentcenter.net/ac_scoringervice) to generate a final score.

With the total raw score for a measure, locate the applicable score conversion table in Appendix 1 and use this table to translate the total raw score into a T-score for each participant. The T-score rescales the raw score into a standardized score with a mean of 50 and a standard deviation (SD) of 10. Therefore a person with a T-score of 40 is one SD below the mean.

For the Adult PROMIS Pain Behavior 20a scale version v2.0, a raw score of 20 converts to a T-score of 32.9 with a standard error (SE) of 0.53 (see scoring table in Appendix 1).

CAT: A minimum number of items (e.g., 4) must be answered in order to receive a score for the Pain Behavior CATs. The response to the first item will guide the system's choice of the next item for the participant. The participant's response to the second item will dictate the selection of the following question, and so on. As additional items are administered, the potential for error is reduced and confidence in the respondent's score increases. The CAT will continue until either the standard error drops below a specified level (e.g., on the T-score metric 3.0), or the participant has answered the maximum number of questions (e.g., 12), whichever occurs first. For some CATs, specifically "recommended" and "screen-to-CAT" there are additional stopping rules. These include stopping when the standard error isn't improving much or if a respondent is asymptomatic. For details on the exact stopping rules for Pain Behavior CATs, view the Measure Differences summary.

SCORES

For most PROMIS instruments, a score of 50 is the average for the United States general population with a standard deviation of 10 because calibration testing was performed on a large sample of the general population. For pediatric and parent proxy Pain Behavior, 50 is the mean for a sample of children with painful conditions. You can read more about the calibration and centering samples on HealthMeasures.net (<http://www.healthmeasures.net/score-and-interpret/interpret-scores/promis>). The T-score is provided with an error term (Standard Error or SE). The Standard Error is a statistical measure of variance and represents the "margin of error" for the T-score.

Important: *A higher PROMIS T-score represents more of the concept being measured.* For negatively-worded concepts like Pain Behavior, a T-score of 60 is one SD worse than average. These individuals show more pain-related behaviors than average. By comparison, a Pain Behavior T-score of 40 is one SD better (less) than average.

Standard Error (SE): A PROMIS score includes a T-score and a standard error (SE). The standard error is a measure of the variability for a given T-score across hypothetical repeated measurements. The standard error can be used to construct confidence intervals around a T-score. A 95% confidence interval is common. A 95% confidence interval means there is a 95% probability that the true T-score is within this range. The formula for a 95% confidence interval is $(T\text{-score} \pm (1.96 * SE))$. For example, if $T=52$ and $SE=2$, the lower boundary of the confidence interval is $(52 - (1.96 * 2)) = 48$ and the upper boundary is $(52 + (1.96 * 2)) = 56$.

FREQUENTLY ASKED QUESTIONS (FAQs)

Q: I am interested in learning more. Where can I do that?

Review the HealthMeasures website at www.healthmeasures.net.

Q: How do I handle multiple responses when administering a short form on paper?

Guidelines on how to deal with multiple responses have been established. Resolution depends on the responses noted by the research participant.

- If two or more responses are marked by the respondent, and they are next to one another, then a data entry specialist will be responsible for randomly selecting one of them to be entered and will write down on the form which answer was selected. Note: To randomly select one of two responses, the data entry specialist will flip a coin (heads - higher number will be entered; tails – lower number will be entered). To randomly select one of three (or more) responses, a table of random numbers should be used with a statistician's assistance.



- If two or more responses are marked, and they are NOT all next to one another, the response will be considered missing.

Q: What is the minimum change on a PROMIS instrument that represents a clinically meaningful difference? To learn more about research on the meaning of a change in scores, we suggest conducting a literature review to identify the most current information. The HealthMeasures website (<http://www.healthmeasures.net/score-and-interpret/interpret-scores/promis>) has additional information on interpreting scores.

APPENDIX 1 — SCORING TABLES

PROMIS Adult Scale v2.0 – Pain Behavior 20a								
Conversion Table								
Raw Summed Score	SE	T-score	Raw Summed Score	SE	T-score	Raw Summed Score	SE	T-score
20	0.53	32.9	51	0.14	57.8	82	0.14	68.7
21	0.38	38.0	52	0.14	58.1	83	0.14	69.1
22	0.33	40.6	53	0.14	58.5	84	0.15	69.6
23	0.30	42.4	54	0.13	58.8	85	0.15	70.0
24	0.27	43.8	55	0.13	59.1	86	0.15	70.5
25	0.25	45.0	56	0.14	59.5	87	0.15	70.9
26	0.23	46.0	57	0.14	59.8	88	0.16	71.4
27	0.21	46.9	58	0.14	60.1	89	0.16	71.9
28	0.20	47.7	59	0.14	60.5	90	0.17	72.5
29	0.19	48.4	60	0.14	60.8	91	0.17	73.0
30	0.18	49.0	61	0.14	61.1	92	0.18	73.7
31	0.18	49.6	62	0.14	61.5	93	0.19	74.3
32	0.17	50.2	63	0.14	61.8	94	0.20	75.1
33	0.16	50.7	64	0.14	62.2	95	0.22	76.0
34	0.16	51.2	65	0.14	62.5	96	0.24	76.9
35	0.16	51.7	66	0.14	62.9	97	0.26	78.1
36	0.15	52.1	67	0.14	63.2	98	0.29	79.5
37	0.15	52.6	68	0.14	63.5	99	0.33	81.2
38	0.15	53.0	69	0.14	63.9	100	0.39	83.7
39	0.15	53.4	70	0.14	64.3			
40	0.14	53.8	71	0.14	64.6			
41	0.14	54.2	72	0.14	65.0			
42	0.14	54.6	73	0.14	65.3			
43	0.14	55.0	74	0.14	65.7			
44	0.14	55.3	75	0.14	66.0			
45	0.14	55.7	76	0.14	66.4			
46	0.14	56.0	77	0.14	66.8			
47	0.14	56.4	78	0.14	67.2			
48	0.14	56.7	79	0.14	67.5			
49	0.14	57.1	80	0.14	67.9			
50	0.14	57.4	81	0.14	68.3			

PROMIS Pediatric SF GenPop v3.0 – Pain Behavior 8a		
<i>Short Form Conversion Table</i>		
Raw Summed Score	T-score	SE*
8	40.9	6.1
9	48.0	3.2
10	50.7	2.3
11	52.3	2.0
12	53.5	1.8
13	54.6	1.7
14	55.6	1.6
15	56.6	1.6
16	57.5	1.7
17	58.2	1.7
18	58.9	1.7
19	59.6	1.6
20	60.2	1.6
21	60.9	1.6
22	61.4	1.5
23	62.0	1.5
24	62.5	1.4
25	63.0	1.4
26	63.5	1.4
27	63.9	1.4
28	64.4	1.4
29	64.8	1.4
30	65.3	1.4
31	65.7	1.4
32	66.1	1.4
33	66.6	1.4
34	67.0	1.4
35	67.5	1.4
36	67.9	1.4
37	68.4	1.4
38	68.9	1.4
39	69.4	1.4
40	69.9	1.4
41	70.4	1.5
42	71.0	1.5
43	71.6	1.6
44	72.4	1.8
45	73.1	1.9
46	74.2	2.2
47	75.3	2.3
48	78.4	3.4
*SE = Standard Error on T-score metric		

PROMIS Parent Proxy SF GenPop v3.0 – Pain Behavior 8a		
<i>Short Form Conversion Table</i>		
Raw Summed Score	T-score	SE*
8	41.6	6.2
9	49.2	2.6
10	51.4	1.9
11	52.8	1.7
12	53.9	1.5
13	55.0	1.5
14	56.0	1.5
15	57.0	1.6
16	57.9	1.6
17	58.7	1.6
18	59.5	1.6
19	60.2	1.6
20	60.9	1.5
21	61.6	1.5
22	62.2	1.4
23	62.7	1.4
24	63.3	1.4
25	63.8	1.3
26	64.3	1.3
27	64.9	1.3
28	65.4	1.3
29	65.9	1.3
30	66.4	1.3
31	66.9	1.4
32	67.5	1.4
33	68.0	1.4
34	68.5	1.4
35	69.1	1.4
36	69.6	1.3
37	70.1	1.3
38	70.7	1.3
39	71.2	1.3
40	71.8	1.3
41	72.3	1.3
42	72.9	1.4
43	73.5	1.4
44	74.2	1.5
45	75.0	1.6
46	76.0	1.9
47	77.1	2.0
48	80.0	3.1
*SE = Standard Error on T-score metric		

APPENDIX 2 — SCORING TABLES FOR RETIRED MEASURES

PROMIS SF V1.1 Pain Behavior 7a <i>Short Form Conversion Table</i>		
Raw Score	T-score	SE*
7	34.1	4.9
8	39.3	2.8
9	41.5	2.2
10	43.1	2.0
11	44.5	2.0
12	45.9	2.0
13	47.3	2.0
14	48.6	2.1
15	49.9	2.1
16	51.1	2.1
17	52.3	2.1
18	53.4	2.1
19	54.4	2.0
20	55.4	2.0
21	56.4	1.9
22	57.3	1.9
23	58.1	1.9
24	59.0	1.9
25	59.8	1.8
26	60.6	1.8
27	61.4	1.8
28	62.2	1.8
29	63.0	1.8
30	63.7	1.8
31	64.5	1.8
32	65.3	1.8
33	66.1	1.8
34	66.9	1.8
35	67.8	1.9
36	68.7	1.9
37	69.7	2.0
38	70.8	2.1
39	72.0	2.2
40	73.5	2.4
41	75.3	2.7
42	78.9	3.6
* SE = Standard error		

PROMIS Pediatric v1.0 – Pain Behavior 8a					
Short Form Conversion Table					
Raw Summed Score	T-Score	SE*	Raw Summed Score	T-Score	SE*
8	20.0	N/A	29	51.0	2.2
9	28.4	3.3	30	51.8	2.2
10	30.7	2.8	31	52.5	2.2
11	32.6	2.6	32	53.2	2.2
12	34.2	2.5	33	53.9	2.2
13	35.7	2.5	34	54.7	2.2
14	37.1	2.5	35	55.4	2.3
15	38.5	2.5	36	56.2	2.3
16	39.8	2.5	37	57.0	2.3
17	40.9	2.5	38	57.7	2.3
18	41.9	2.5	39	58.5	2.3
19	42.9	2.5	40	59.4	2.3
20	43.9	2.4	41	60.3	2.4
21	44.8	2.4	42	61.2	2.4
22	45.7	2.4	43	62.2	2.5
23	46.5	2.3	44	63.3	2.7
24	47.3	2.3	45	64.6	2.8
25	48.1	2.3	46	66.2	3.2
26	48.8	2.3	47	67.9	3.4
27	49.6	2.2	48	80.0	N/A
28	50.3	2.2			
*SE = Standard Error on T-score metric					
Marginal reliability of the scaled scores for summed scores = 0.93604					

PROMIS Parent Proxy v1.0 – Pain Behavior 8a					
Short Form Conversion Table					
Raw Summed Score	T-Score	SE*	Raw Summed Score	T-Score	SE*
8	10.0	N/A	29	47.6	2.7
9	19.0	3.1	30	48.7	2.6
10	21.2	2.9	31	49.6	2.4
11	23.3	2.8	32	50.5	2.4
12	25.2	2.6	33	51.4	2.6
13	27.0	2.9	34	52.5	2.7
14	29.1	3.0	35	53.7	2.6
15	31.0	3.0	36	54.6	2.4
16	32.9	3.0	37	55.5	2.4
17	34.5	2.9	38	56.4	2.6
18	35.9	2.9	39	57.6	2.7
19	37.3	2.9	40	58.7	2.6
20	38.6	2.7	41	59.7	2.3
21	39.6	2.5	42	60.6	2.4
22	40.6	2.5	43	61.7	2.7
23	41.6	2.7	44	63.1	2.9
24	42.8	2.7	45	64.6	2.9
25	43.8	2.5	46	66.2	3.1
26	44.7	2.3	47	68.1	3.5
27	45.5	2.4	48	80.0	N/A
28	46.5	2.6			
*SE = Standard Error on T-score metric					
Marginal reliability of the scaled scores for summed scores = 0.92771					

APPENDIX 3 – CROSSWALK BETWEEN PEDIATRIC AND PARENT PROXY V1.0 T-SCORES AND PEDIATRIC AND PARENT PROXY GENPOP V3.0 T-SCORES

Table 1. PROMIS Pediatric Pain Behavior: Crosswalk between v1.0 T-scores and GenPop v3.0 T-scores

PROMIS Pediatric Pain Behavior T-Score		PROMIS Pediatric Pain Behavior T-Score	
v1.0	v3.0 GenPop	v1.0	v3.0 GenPop
25	41.0	63	77.5
26	48.5	64	77.5
27	48.6	65	77.5
28	48.9	66	77.5
29	49.4	67	77.5
30	51.0	68	77.5
31	52.0	69	77.5
32	53.0	70	77.5
33	54.0	71	77.5
34	54.6	72	77.5
35	55.0	73	82.0
36	55.5		
37	56.0		
38	57.0		
39	58.0		
40	58.0		
41	58.9		
42	60.0		
43	60.7		
44	61.3		
45	62.0		
46	62.8		
47	63.7		
48	64.3		
49	64.9		
50	65.5		
51	66.2		
52	66.9		
53	67.7		
54	68.5		
55	69.5		
56	70.2		
57	71.0		
58	72.0		
59	72.0		
60	72.8		
61	73.2		
62	73.3		

Table 2. PROMIS Parent Proxy Pain Behavior: Crosswalk between v1.0 T-scores and GenPop v3.0 T-scores

PROMIS Parent Proxy Pain Behavior T-Score		PROMIS Parent Proxy Pain Behavior T-Score	
v1.0	v3.0 GenPop	v1.0	v3.0 GenPop
14	41.0	52	68.4
15	46.5	53	68.8
16	47.8	54	69.2
17	48.9	55	69.5
18	49.9	56	70.3
19	50.7	57	71.3
20	51.6	58	72.0
21	52.2	59	74.0
22	52.8	60	74.0
23	53.3	61	74.0
24	54.0	62	74.0
25	54.5	63	74.0
26	55.0	64	74.0
27	55.7	65	74.0
28	55.9	66	76.0
29	56.3	67	78.0
30	56.9	68	78.0
31	57.3	69	78.0
32	57.8	70	78.0
33	58.8	71	78.0
34	59.3	72	78.0
35	59.5	73	78.0
36	60.2	74	80.0
37	60.6		
38	61.1		
39	61.6		
40	62.1		
41	62.9		
42	63.4		
43	63.7		
44	64.4		
45	65.0		
46	65.4		
47	66.0		
48	66.5		
49	66.9		
50	67.5		
51	68.1		