



ANGER

A brief guide to the PROMIS® Anger instruments:

ADULT	PEDIATRIC	PARENT PROXY
PROMIS Item Bank v1.0 – Anger*	PROMIS Pediatric Scale v2.0 – Anger 9a	PROMIS Parent Proxy Item Scale v2.0 – Anger
PROMIS Item Bank v1.1 – Anger	PROMIS Pediatric Short Form v2.0 – Anger 5a	PROMIS Parent Proxy Short Form v1.0 – Anger 5a*
PROMIS Short Form v1.1 – Anger 5a	PROMIS Pediatric Scale v1.1 – Anger 5a*	
PROMIS Short Form v1.0 – Anger 5a*	PROMIS Pediatric Short Form v1.0 – Anger 6a*	
PROMIS Short Form v1.0 – Anger 8a*		

*Retired measures

ABOUT ANGER

The PROMIS Anger item banks assess self-reported angry mood (irritability, frustration), negative social cognitions (interpersonal sensitivity, envy, disagreeableness), and efforts to control anger. Often associated with episodes of frustration that impede goal-directed behavior, anger is marked by attitudes of hostility and cynicism. Specific components relate to verbal and non-verbal evidence of anger. Physical aggression items are not included. The anger short forms are universal rather than disease-specific. All assess anger over the past seven days.

Anger instruments are available for adults (ages 18+), pediatric self-report (ages 8-17) and for parents serving as proxy reporters for their child (youth ages 5-17).

INTRODUCTION TO ASSESSMENT OPTIONS

There are two administration options for assessing anger: short forms and computerized adaptive test (CAT). When administering a short form, instruct participants to answer all of the items (i.e., questions or statements) presented. With a CAT, participant responses guide the system’s choice of subsequent items from the full item bank (22 items in total for adults). Although items differ across respondents taking a CAT, scores are comparable across participants.

Some administrators may prefer to ask the same question of all respondents or of the same respondent over time, to enable a more direct comparability across people or time. In these cases, or when paper administration is preferred, a short form would be more desirable than a CAT. This guide provides information on all anger short form and CAT instruments.

Whether one uses a short form or CAT, the score metric is Item Response Theory (IRT), a family of statistical models that link individual questions to a presumed underlying trait or concept of anger represented by all items in the item bank. When choosing between a CAT and short form, it is useful to consider the demands of computer-based assessment, and the psychological, physical, and cognitive burden placed on respondents as a result of the number of questions asked.



VERSION DIFFERENCES

Some PROMIS domains have multiple versions of instruments (i.e. v1.0, v1.1, v2.0). 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, 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 anger, the v1.0 item bank had items removed and it became the v1.1 item bank. The short form remained unchanged. Calibrations remained unchanged. For pediatric and parent proxy anger, v2.0 replaced v1.0. The v2.0 measures 1) changed from using response scores of 0-4 to use 1-5 (item IDs amended with an “r”) and 2) added new items (item IDs start with 7000). The calibrations between v1.0 and v2.0 are identical. A pediatric v1.1 item bank existed briefly – it eliminated one items from the original v1.0 bank.

DIFFERENCES IN CURRENTLY AVAILABLE SHORT FORMS

Selecting a Short Form

In selecting between short forms, the difference is instrument length. The reliability and precision of the short forms within a domain is highly similar. If you are working with a sample in which you want the most precise measure, select the longest short form. If you have little room for additional measures but really wanted to capture something as a secondary outcome, select one of the shorter instruments (e.g., 5-item short form).

SELECTING A PEDIATRIC OR PARENT PROXY INSTRUMENT

In selecting whether to use the pediatric or parent proxy instrument for this domain, it is important to consider both the population and the domain which you are studying. Pediatric self-report should be considered the standard for measuring patient-reported outcomes among children. However, circumstances exist when the child is too young, cognitively impaired, or too ill to complete a patient-reported outcome instrument. While information derived from self-report and proxy-report is not equivalent, it is optimal to assess both the child and the parent since their perspectives may be independently related to healthcare utilization, risk factors, and quality of care.

WHICH CALIBRATION SAMPLE SHOULD I USE?

The PROMIS parent proxy instruments have two calibration samples – parent proxy and parent proxy without Local Dependence. The former includes calibrations for all items. This is the default calibration sample. If you aren't sure which calibration sample to use, utilize this one. The Parent Proxy without Local Dependence does not include calibrations for some items. When using the Scoring Service, use the default calibration sample (e.g., “Parent Proxy”). Other calibration samples may exist from past research.



SCORING THE INSTRUMENT

Short Forms: 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_scoring-service) or a data collection tool that automatically calculates scores (e.g., Assessment CenterSM, 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.

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 adult 5-item form, the lowest possible raw score is 5; the highest possible raw score is 25 (see all current and retired short form scoring tables in Appendices 1 and 2). **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_scoring-service) to generate a final score.

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 Anger 5a short form, a raw score of 10 converts to a T-score of 48.4 with a standard error (SE) of 3.3 (see scoring table for the 5a short form in Appendix 1). Thus, the 95% confidence interval around the observed score ranges from 41.9 to 54.9 (T-score \pm (1.96*SE) or $48.4 \pm (1.96*3.3)$).

CAT: A minimum number of items (4 for adult and 5 for peds and parent proxy CATs) must be answered in order to receive a score for the Anger CAT. 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 (on the T-score metric 3.0 for adult CATs and 4.0 for peds and parent proxy CATs), or the participant has answered the maximum number of questions (12), whichever occurs first.

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. You can read more about the calibration and centering samples at HealthMeasures.net in the [Interpret PROMIS](#) section. 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 anger, a T-score of 60 is one SD worse than average. By comparison, an anger T-score of 40 is one SD better than average.

STATISTICAL CHARACTERISTICS

There are four key features of the score for anger:

- **Reliability:** The degree to which a measure is free of error. It can be estimated by the internal consistency of the responses to the measure, or by correlating total scores on the measure from two time points when there has been no true change in what is being measured (for z-scores, reliability = $1 - SE^2$).
- **Precision:** The consistency of the estimated score (reciprocal of error variance).
- **Information:** The precision of an item or multiple items at different levels of the underlying continuum (for z-scores, information = $1/SE^2$).
- **Standard Error (SE):** The possible range of the actual final score based upon the scaled T-score. For example, with a T-score of 52 and a SE of 2, the 95% confidence interval around the actual final score ranges from 48.1 to 55.9 (T-score $\pm (1.96*SE) = 52 \pm 3.9 = 48.1$ to 55.9).

The final score is represented by the T-score, a standardized score with a mean of 50 and a standard deviation (SD) of 10.

Figure 1 is a sample of the statistical information available in Assessment Center for the adult Anger CAT.

More information is available at www.HealthMeasures.net.

Scaling Model Used For Calibration		Graded Response Model									
Total Number of Items		29									
Sample	N	Alpha Reliability									
PROMIS Wave 1 Full Bank	858	0.96									
Score Distributions											
	Mean	SD	P5	P10	P25	P50	P75	P90	P95		
Raw	49.36	16.55	29.00	32.00	36.86	46.00	59.00	71.00	81.15		
Scale	47.19	9.43	27.91	34.89	41.27	47.30	53.64	58.54	62.33		
										Min	Max
Scale Score	10.0	20.0	30.0	40.0	50.0	60.0	70.0	80.0	90.0	27.8	80.6
SE	2.50	1.20	.50	.20	.20	.20	.20	.20	.30		
Reliability	.00	.00	.74	.94	.97	.97	.97	.97	.93		

Figure 1

PREVIEW OF SAMPLE ITEM

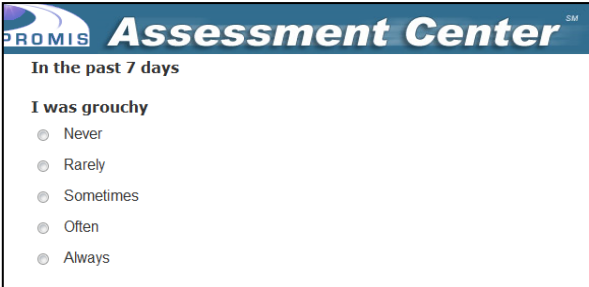


Figure 2

Figure 2 shows an adult anger item from the full item bank as it would appear to a study participant during data collection in Assessment Center. Several formats for presenting the items are available for computer-based administration through Assessment Center.

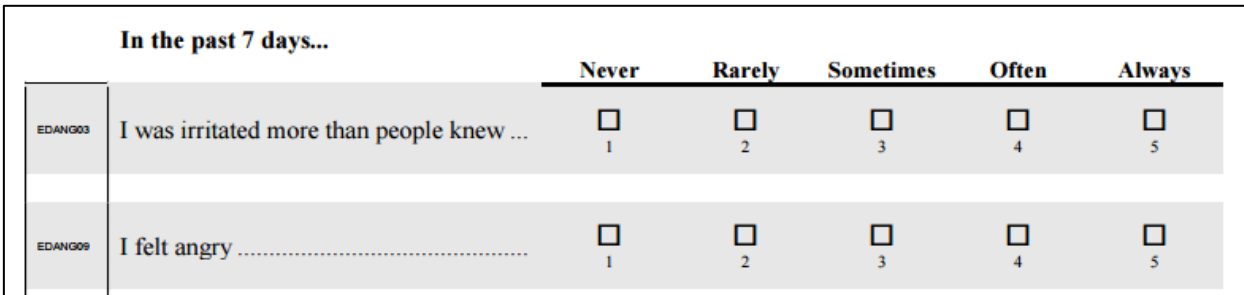


Figure 3

Figure 3 is an excerpt from the paper version of the adult five-item short form. This is the paper version format used for all anger instruments. It is important to note, CAT is not available for paper administration.



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: Do I need to register with PROMIS to use these instruments?

No.

Q: Are these instruments available in other languages?

Yes! Look at the HealthMeasures website (<http://www.healthmeasures.net/explore-measurement-systems/promis/intro-to-promis/available-translations/117-available-translations>) for current information on PROMIS translations.

Q: Can I make my own short form?

Yes, custom short forms can be made by selecting any items from an item bank. This can be scored using the Scoring Service (https://www.assessmentcenter.net/ac_scoring-service).

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

It is recommended that you use the most recent version available which can be identified as the instrument with the highest version number

Anger 5a - Adult v1.0/1.1		
<i>Short Form Conversion Table</i>		
Raw Summed Score	T-score	SE*
5	32.9	5.3
6	38.1	4.0
7	41.3	3.7
8	44.0	3.5
9	46.3	3.4
10	48.4	3.3
11	50.6	3.3
12	52.7	3.2
13	54.7	3.2
14	56.8	3.2
15	58.8	3.2
16	60.8	3.3
17	62.9	3.2
18	65.0	3.2
19	67.2	3.2
20	69.4	3.3
21	71.7	3.3
22	74.1	3.3
23	76.8	3.4
24	79.6	3.4
25	82.9	3.5
*SE = Standard Error on T-Score		

Anger 5a - Pediatric v2.0		
<i>Short Form Conversion Table</i>		
Raw Summed Score	T-score	SE*
5	31.5	5.9
6	36.4	5.2
7	39.7	5.0
8	42.5	4.8
9	45.2	4.7
10	47.6	4.7
11	49.9	4.7
12	52.1	4.6
13	54.2	4.6
14	56.3	4.6
15	58.3	4.6
16	60.3	4.6
17	62.3	4.6
18	64.3	4.5
19	66.3	4.5
20	68.4	4.5
21	70.5	4.5
22	72.6	4.5
23	74.9	4.6
24	77.5	4.7
25	80.3	4.7
*SE = Standard Error on T-Score		

Anger 5a - Parent Proxy** v2.0		
<i>Scale Conversion Table</i>		
Raw Summed Score	T-score	SE*
5	29.0	5.0
6	34.0	4.0
7	38.0	4.0
8	41.0	4.0
9	44.0	4.0
10	47.0	4.0
11	50.0	4.0
12	53.0	4.0
13	55.0	4.0
14	58.0	4.0
15	61.0	4.0
16	63.0	4.0
17	66.0	4.0
18	68.0	4.0
19	70.0	4.0
20	73.0	4.0
21	75.0	4.0
22	77.0	4.0
23	80.0	4.0
24	82.0	4.0
25	85.0	4.0
*SE = Standard Error on T-score		

**All scoring tables are based on default Parent Proxy calibrations.



Anger 9a - Pediatric v2.0		
<i>Short Form Conversion Table</i>		
Raw Summed Score	T-score	SE*
9	29.5	5.4
10	33.7	4.7
11	36.3	4.4
12	38.6	4.2
13	40.5	4.0
14	42.3	3.8
15	43.9	3.7
16	45.4	3.7
17	46.9	3.6
18	48.2	3.6
19	49.6	3.5
20	50.9	3.5
21	52.1	3.5
22	53.4	3.5
23	54.6	3.5
24	55.8	3.5
25	57.0	3.5
26	58.2	3.5
27	59.4	3.5
28	60.6	3.5
29	61.8	3.5
30	63.0	3.5
31	64.1	3.5
32	65.3	3.5
33	66.5	3.4
34	67.7	3.4
35	69.0	3.4
36	70.2	3.4
37	71.4	3.4
38	72.7	3.5
39	74.1	3.5
40	75.5	3.5
41	77.0	3.6
42	78.6	3.7
43	80.3	3.7
44	82.1	3.7
45	84.0	3.4

*SE = Standard Error on T-score



APPENDIX 2 – SCORING TABLES FOR RETIRED MEASURES

Anger 8a - Adult v1.0		
<i>Short Form Conversion Table</i>		
Raw Summed Score	Scale Score	SE*
8	32.4	5.2
9	37.3	3.8
10	40.2	3.4
11	42.5	3.1
12	44.4	3.0
13	46.0	2.9
14	47.6	2.8
15	49.1	2.7
16	50.5	2.7
17	51.8	2.6
18	53.1	2.6
19	54.4	2.6
20	55.7	2.6
21	56.9	2.6
22	58.2	2.6
23	59.4	2.6
24	60.7	2.6
25	61.9	2.6
26	63.2	2.6
27	64.5	2.6
28	65.7	2.6
29	67.0	2.6
30	68.3	2.6
31	69.6	2.6
32	70.9	2.6
33	72.3	2.6
34	73.7	2.6
35	75.1	2.6
36	76.7	2.6
37	78.3	2.7
38	80.2	2.8
39	82.3	3.1
40	85.2	3.5

*SE = Standard Error on T-score



Anger 5a - Pediatric v1.1		
<i>Short Form Conversion Table</i>		
Raw Summed Score	Scale Score	SE*
0	31.5	5.9
1	36.4	5.2
2	39.7	5.0
3	42.5	4.8
4	45.2	4.7
5	47.6	4.7
6	49.9	4.7
7	52.1	4.6
8	54.2	4.6
9	56.3	4.6
10	58.3	4.6
11	60.3	4.6
12	62.3	4.6
13	64.3	4.5
14	66.3	4.5
15	68.4	4.5
16	70.5	4.5
17	72.6	4.5
18	74.9	4.6
19	77.5	4.7
20	80.3	4.7
SE* = Standard Error on T-Score		

Anger 6a - Pediatric v1.0		
<i>Short Form Conversion Table</i>		
Raw Summed Score	Scale Score	SE*
0	31.0	5.8
1	36.0	5.1
2	39.0	4.9
3	42.0	4.7
4	44.0	4.6
5	46.0	4.5
6	49.0	4.4
7	51.0	4.4
8	52.0	4.3
9	54.0	4.3
10	56.0	4.3
11	58.0	4.3
12	60.0	4.3
13	61.0	4.3
14	63.0	4.3
15	65.0	4.2
16	66.0	4.2
17	68.0	4.2
18	70.0	4.2
19	72.0	4.2
20	73.0	4.3
21	75.0	4.3
22	78.0	4.5
23	80.0	4.6
24	83.0	4.9
*SE = Standard Error on T-score		

Anger 5a - Parent Proxy v1.0		
<i>Short Form Conversion Table</i>		
Raw Summed Score	T-score	SE*
0	29.0	5.0
1	34.0	4.0
2	38.0	4.0
3	41.0	4.0
4	44.0	4.0
5	47.0	4.0
6	50.0	4.0
7	53.0	4.0
8	55.0	4.0
9	58.0	4.0
10	61.0	4.0
11	63.0	4.0
12	66.0	4.0
13	68.0	4.0
14	70.0	4.0
15	73.0	4.0
16	75.0	4.0
17	77.0	4.0
18	80.0	4.0
19	82.0	4.0
20	85.0	4.0
*SE = Standard Error on T-score		