



# PAIN BEHAVIOR MEASURE DIFFERENCES

A brief guide to differences between 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 Item Bank v1.1 – Pain Behavior*	PROMIS Pediatric Bank GenPop v3.0 – Pain Behavior (screen-to-CAT)	PROMIS Parent Proxy Bank GenPop v3.0 – Pain Behavior (screen-to-CAT)
PROMIS Short Form v1.1 – Pain Behavior 7a*	PROMIS Pediatric Short Form GenPop v3.0 – Pain Behavior 8a	PROMIS Parent Proxy Short Form GenPop v3.0 – Pain Behavior 8a
PROMIS Item Bank v1.0 – Pain Behavior*	PROMIS Pediatric Item Bank v1.0 – Pain Behavior*	PROMIS Parent Proxy Item Bank v1.0 – Pain Behavior*
PROMIS Short Form v1.0 – Pain Behavior 7a*	PROMIS Pediatric Short Form v1.0 – Pain Behavior 8a*	PROMIS Parent Proxy Short Form v1.0 – Pain Behavior 8a*

\*Retired measure

## ABOUT PAIN BEHAVIOR

The PROMIS Pain Behavior item banks measure self-reported external manifestations of pain: behaviors that typically indicate to others that an individual is experiencing pain. These actions or reactions can be verbal or nonverbal, and involuntary or deliberate. They include observable displays (sighing, crying), pain severity behaviors (resting, guarding, facial expressions, and asking for help), and verbal reports of pain. The Pain Behavior short form is universal rather than disease-specific. It assesses pain behavior over the past seven days.

Pain Behavior instruments are available for adults (ages 18+).

## INTRODUCTION TO ASSESSMENT OPTIONS

There are three administration options for assessing Pain Behavior: a short form, a scale, and a computer adaptive test (CAT). A short form is a subset of items from a larger set (i.e., item bank). A scale is the complete set of available items. When administering a short form or scale, instruct participants to answer all of the items (i.e., questions or statements) presented. With CAT, participant responses guide the system’s choice of subsequent items from the full item bank (20 items in total). 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 or scale would be more desirable than a CAT. This guide provides information on all Pain Behavior short forms, scales, and CAT instruments.

CAT: A minimum number of items (e.g., 4) must be answered in order to receive a score for 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. CATs 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, see below.

CAT versus Short Form: 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 pain behavior 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, 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.

### Adult

There are multiple versions of the Adult PROMIS Pain Behavior Item Bank. The v1.1 Item Bank includes the same items as v1.0 items but uses revised item-level calibrations. The v2.0 Item Bank is the most current bank and the preferred version. There are 20 items in the v2.0 item bank. Six of the v2.0 items are from the v1.0/v1.1 item bank but use a revised item ID (e.g., PAINBE28 → PAINBE28r) and response scores were slightly revised (i.e., "Had no pain" does not contribute to the final measure score). 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. Scores from v1.0 should not be compared with v1.1 or v2.0 measures.

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.

### Adult CAT Stopping Rules:

PROMIS Item Bank v2.0 – Pain Behavior stopping Rules:

- Minimum number of items administered = 4
- Stop when one of these occurs:
  - 10 items are administered OR
  - Standard error is below 0.3 on the theta metric (3.0 on the T-score metric)

### Pediatric and Parent Proxy

#### Changes from v1.0 to GenPop v3.0

- The GenPop v3.0 Pediatric and Parent Proxy measures replaced the v1.0 measures.
  - 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.
- The GenPop v3.0 measures were re-normed. This means that the scores produced by v3.0 measures are NOT equivalent to scores from older measures (i.e., v1.0).



- The v1.0 measures were developed with U.S. children sampled from a combination of the general population and those with chronic conditions. This means a v1.0 T-score of 50 is based on the mean of a sample comprised of a mix of children from the general population AND children with chronic conditions. The re-normed v3 GenPop measures are now purely based on a sample from the general pediatric population. This makes interpreting a PROMIS score easier as it is referencing just the general population. The use of “GenPop” (general population) is used to convey the difference in metrics between v3.0 and earlier versions of the measures.
- Earlier versions of the PROMIS Pediatric and Parent Proxy measures can be converted to the v3.0 GenPop metric. Instructions are included in the Pain Behavior Scoring Manual.
- No items were revised between the v1.0 and GenPop v3.0 Pain Behavior measures.

#### **Pediatric and Parent Proxy CAT Stopping Rules:**

- Measures named “Bank” are administered by default as computer adaptive tests.
- CATs with the same version number (e.g., v3.0, v3.0 screen-to-CAT) are based on the same item bank but use different stopping rules.

PROMIS Pediatric Bank GenPop v3.0 – Pain Behavior and PROMIS Parent Proxy Bank GenPop v3.0 – Pain Behavior stopping rules:

- Minimum number of items administered = 4
- Stop when one of these occurs:
  - 8 items are administered OR
  - Standard error is below 0.3 on the theta metric (3.0 on the T-score metric) OR
  - Standard error changes by less than 0.01 on the theta metric (0.1 on the T-score metric)

PROMIS Pediatric Bank GenPop v3.0 – Pain Behavior (screen-to-CAT) and PROMIS Parent Proxy Bank GenPop v3.0 – Pain Behavior (screen-to-CAT) stopping rules:

- If the responses to the first two items are both the “healthiest” responses, then stop.
- If the responses to the first two items are NOT the “healthiest” responses, proceed with the PROMIS Pediatric or Parent Proxy Bank GenPop v3.0 – Pain Behavior CAT stopping rules.

## **SHORT FORM DIFFERENCES**

### **Adult Short Forms**

The v1.0 and v1.1 measures included one adult short form. Items were selected based on content and psychometric characteristics.

The v2.0 measure is available as an item bank or a scale. An item bank is intended to be administered as a computer adaptive test or a subset of items can be selected to create a custom fixed length short form. The v2.0 scale is identical to the item bank. That is, it contains all 20 items. The scale is intended to be administered in its entirety.

### **Pediatric and Parent Proxy Short Forms**

There is one Pediatric and one Parent Proxy short form. Items were selected based on content and psychometric characteristics.

## 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.

## 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. 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. By comparison, a Pain Behavior T-score of 40 is one SD better than average.

## STATISTICAL CHARACTERISTICS

There are four key features of the score for Pain Behavior:

- **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.

More information is available at [HealthMeasures.net](http://www.healthmeasures.net).

## PREVIEW OF SAMPLE ITEM

Figure 1 is an excerpt from the paper version of the Adult v2.0 scale. This is the paper version format used for all Pain Behavior instruments. It is important to note, CAT is not available for paper administration.

In the past 7 days...		Had no pain	Never	Rarely	Sometimes	Often	Always
PAINBE2Br	When I was in pain I squirmed .....	<input checked="" type="checkbox"/> X	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PAINBE3r	When I was in pain I grimaced .....	<input checked="" type="checkbox"/> X	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

Figure 1

## FREQUENTLY ASKED QUESTIONS (FAQs)

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

Review the HealthMeasures website at [www.healthmeasures.net](http://www.healthmeasures.net).

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>) 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](https://www.assessmentcenter.net/ac_scoring-service)).