



# PHYSICAL ACTIVITY MEASURE DIFFERENCES

A brief guide to differences between the PROMIS® Physical Activity instruments:

PEDIATRIC	EARLY CHILDHOOD PARENT-REPORT	PARENT PROXY
PROMIS Pediatric Item Bank v1.0 – Physical Activity PROMIS Pediatric Short Form v1.0 – Physical Activity 4a PROMIS Pediatric Short Form v1.0 – Physical Activity 8a	PROMIS Early Childhood Parent-Report Scale v1.0 – Physical Activity 7a	PROMIS Parent Proxy Item Bank v1.0 – Physical Activity PROMIS Parent Proxy Short Form v1.0 – Physical Activity 4a PROMIS Parent Proxy Short Form v1.0 – Physical Activity 8a

## ABOUT PHYSICAL ACTIVITY

The Pediatric and Parent Proxy instruments measure self-reported capability rather than actual performance of physical activities. This includes the functioning of one’s upper extremities (dexterity), lower extremities (walking or mobility), and central regions (neck, back), as well as instrumental activities of daily living.

The Early Childhood Parent-Report scale assesses general physical activity behaviors and associated intensity and physiological symptoms.

Physical Activity instruments are available for pediatric self-report (ages 8-17), for parents serving as proxy reporters for their child (youth ages 5-17) or for their very young child (ages 1-5).

## INTRODUCTION TO ASSESSMENT OPTIONS

There are two administration options for assessing Physical Activity: short forms and computer adaptive tests (CATs). 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 (10 items each for pediatric and parent proxy banks). Although items differ across respondents taking CATs, 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 Physical Activity short form and CAT instruments.

CAT: A minimum number of items (5 for peds and parent proxy CATs) must be answered in order to receive a score for the Physical Activity 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 4.0 for peds and parent proxy CATs), or the participant has answered the maximum number of questions (12), whichever occurs first.



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 physical activity 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.

## **SELECTING A SHORT FORM**

There are 2 pediatric and 2 parent proxy Physical Activity short forms. Items were selected based on content and psychometric characteristics.

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 (e.g., 8-item 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., 4-item short form).

### **Early Childhood Parent-Report Form**

The PROMIS Early Childhood Parent Report Scale v1.0 - Physical Activity 7a instrument contains 7 items and assesses a child's general physical activity behaviors and associated intensity and physiological symptoms. The first 5 items are used to create a Physical Activity T-score, and the remaining 2 items are individually scored using the response options. The measure is conceptually aligned to the PROMIS Parent Proxy Physical Activity instrument for children ages 5-17.

### **Parent Proxy Report Versus Early Childhood Parent-Report Measures**

The PROMIS Parent Proxy measures are for parents to report on their children ages 5 to 17. The PROMIS Early Childhood Parent-Report measures are for parents to report on their children ages 1 to 5. In both cases, the parent provides his or her perspective about the child's physical activity. Scores from PROMIS Parent Proxy and PROMIS Early Childhood Parent-Report measures are calibrated and normed with different, age-appropriate reference populations and therefore are on different metrics. Scores from one should not be compared to scores on the other. For parents of 5-year-old children, either the PROMIS Parent Proxy or the PROMIS Early Childhood Parent-Report measure can be used. In general, for longitudinal research and/or on-going clinical follow-up, using the measure that aligns with the majority of the time frame with which the child will be studied is recommended. For example, if the measure is administered at child age 1 year through child age 5, using the PROMIS Early Childhood Parent-Report is recommended. If the child will be studied across in both early childhood and beyond age 5, switching to the PROMIS Parent Proxy measure is necessary.

## **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 at 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 positively-worded concepts like Physical Activity, a T-score of 60 is one SD better than average. By comparison, a Physical Activity T-score of 40 is one SD worse than average.

## STATISTICAL CHARACTERISTICS

There are four key features of the score for Physical Activity:

- **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.

In Figure 1, the two horizontal lines each represent a degree of internal consistency reliability (i.e., .90 or .95) typically regarded as sufficient for an accurate individual score. The shaded gray region marks the range of the scale where measurement precision is comparable to the reliability of .90 for the item bank, the 8-item and the 4-item form (represented by the black line, the red line and the green line, respectively).

Figure 1 also tells us where on the scale the form is most informative based upon the T-score: the item bank is more informative than the 8-item form, which is more informative than the 4-item form.

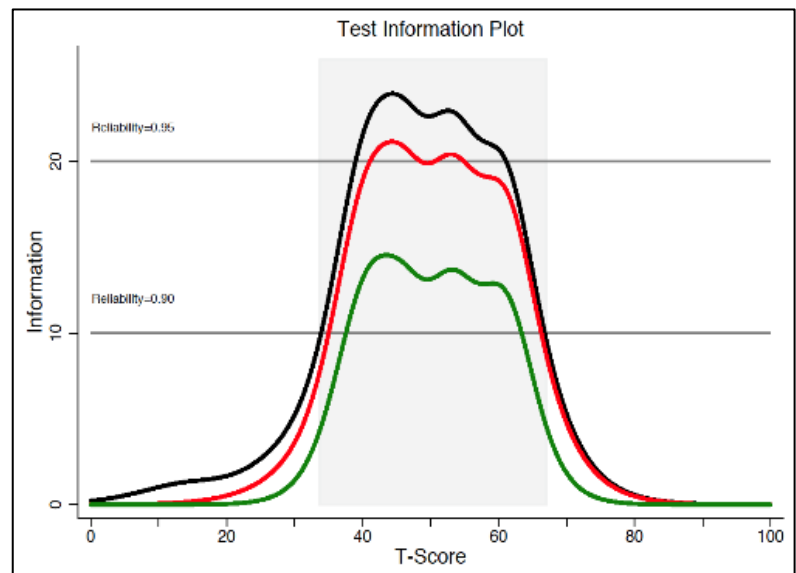


Figure 1

The dotted horizontal line in Figure 2 represent a 0.70 degree of internal consistency reliability typically regarded as sufficient for an accurate individual score for the Early Childhood Parent-Report item bank. The shaded blue region marks the range of the scale where measurement precision is comparable to the reliability of .70 for the form

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

**Early Childhood Parent-Report Scale Test Information Plot**

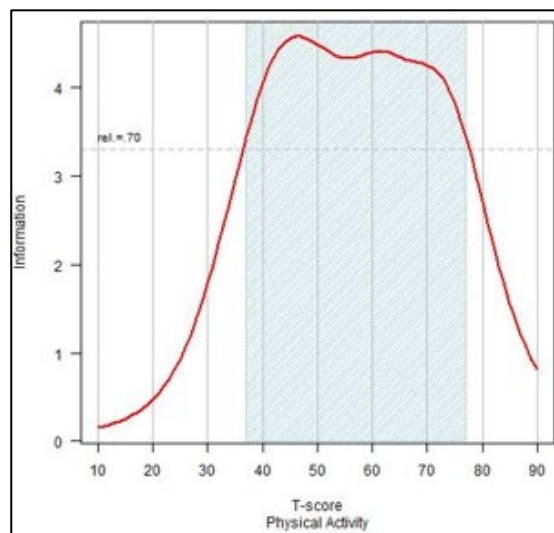


Figure 2

### PREVIEW OF SAMPLE ITEM

Figure 3 is an excerpt from the paper version of the Parent Proxy 8-item short form. This is the paper version format used for all Physical Activity instruments. It is important to note that the CAT is not available for paper administration, though PDFs are available to review all included items.

In the past 7 days...		No days	1 day	2-3 days	4-5 days	6-7 days
PAC_M_008_PXR1	How many days did your child exercise or play so hard that his/her body got tired? .....	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5
PAC_M_105_PXR1	How many days did your child exercise <u>really hard</u> for 10 minutes or more? .....	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5

Figure 3

### 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/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\\_scoringervice](https://www.assessmentcenter.net/ac_scoringervice)).