Patient-Reported Outcomes Measurement Information System
Dynamic Tools to Measure Health Outcomes From the Patient Perspective

PHYSICAL FUNCTION

A brief guide to the PROMIS® Physical Function instruments:

ADULT	ADULT CANCER	PEDIATRIC	PARENT PROXY
PROMIS Bank v1.0 - Physical Function*	PROMIS-Ca Bank v1.0 – Physical Function*	PROMIS Pediatric Bank v1.0 – Mobility*	PROMIS Parent Proxy Bank v1.0 – Mobility*
PROMIS Short Form v1.0 – Physical Function 4a*	PROMIS-Ca Bank v1.1 – Physical Function	PROMIS Pediatric Bank v1.0 – Upper Extremity*	PROMIS Parent Proxy Bank v1.0 – Upper Extremity*
PROMIS Short Form v1.0-Physical Function 6a*		PROMIS Pediatric Short Form v1.0 – Mobility 8a*	PROMIS Parent Proxy Short Form v1.0 – Mobility 8a*
PROMIS Short Form v1.0-Physical Function 8a*		PROMIS Pediatric Short Form v1.0 – Upper Extremity 8a*	PROMIS Parent Proxy Short Form v1.0 – Upper Extremity 8a*
PROMIS Short Form v1.0 – Physical Function 10a*		PROMIS Pediatric Bank v2.0 – Mobility	PROMIS Parent Proxy Bank v2.0 – Mobility
PROMIS Short Form v1.0 – Physical Function 12a		PROMIS Pediatric Bank v2.0 – Upper Extremity	PROMIS Parent Proxy Bank v2.0 – Upper Extremity
PROMIS Short Form v1.0 – Physical Function 20a*		PROMIS Pediatric Short Form v2.0 – Mobility 8a	PROMIS Parent Proxy Short Form v2.0 – Mobility 8a
PROMIS Bank v1.0 – Physical Function for Samples with Mobility Aid Users		PROMIS Pediatric Short Form v2.0 – Upper Extremity 8a	PROMIS Parent Proxy Short Form v2.0 – Upper Extremity 8a
PROMIS Short Form v1.0 – Physical Function Samples with Mobility Aid Users 11a			
PROMIS Bank v1.1 - Physical Function*			
PROMIS Bank v1.2 – Physical Function*			
PROMIS Short Form v1.2 – Physical Function 6b*			
PROMIS Short Form v1.2 – Physical Function 8b*			
PROMIS Bank v1.2 – Mobility*			
PROMIS Bank v1.2 – Upper Extremity*			
PROMIS Bank v2.0 – Mobility*			
PROMIS Bank v2.1 - Mobility			
PROMIS Bank v2.0 - Physical Function			
PROMIS Short Form v2.0 – Physical Function 4a			
PROMIS Short Form v2.0 – Physical Function 6b			
PROMIS Short Form v2.0 – Physical Function 8b			
PROMIS Short Form v2.0 – Physical Function 10a			
PROMIS Short Form v2.0 – Physical Function 10b			
PROMIS Short Form v2.0 – Physical Function 20a			
PROMIS Short Form v2.0 – Physical Function 24a (PROMIS HAQ)			
PROMIS Bank v2.0 – Upper Extremity			
PROMIS Short Form v2.0 – Upper Extremity 7a			

*retired measure

ABOUT PHYSICAL FUNCTION

PROMIS Physical Function 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, such as running errands. A single Physical Function capability score is obtained from a short form. Each Physical Function instrument is appropriate for the adult general population and adults with chronic health conditions. The forms are universal rather than disease-specific. Each form assesses current function rather than function over a specified time period.

Physical Function 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). Adult instruments (18+) include: Physical Function, Mobility, Upper Extremity, Physical Function – Cancer, and Physical Function for Samples with Mobility Aid Users instruments. Pediatric and parent proxy instruments were developed for each Physical Function sub-domains of Mobility and Upper Extremity.

MOBILITY

Focuses on activities of physical mobility such as getting out of bed or a chair to activities such as running. The adult Mobility measures include selected items from the full Physical Function item bank.

UPPER EXTREMITY

Focuses on activities that require use of the upper extremity including shoulder, arm, and hand activities. Examples include writing, using buttons, or opening containers. The adult Upper Extremity measures include selected items from the full Physical Function item bank.

PHYSICAL FUNCTION FOR SAMPLES WITH MOBILITY AID USERS

This item bank and short form include screening items about one's ability to stand and walk. Based upon one's response, some items may be skipped. These measures are intended for samples that may include those who use mobility aids like wheelchairs. It is not restricted for use to only those that use mobility aids.

For complete list of all PROMIS definitions, go to: http://www.healthmeasures.net/explore-measurement-systems/promis/intro-to-promis/list-of-adult-measures

INTRODUCTION TO ASSESSMENT OPTIONS

There are two administration options for assessing Physical Function: short forms and computerized 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 (165 items in total in adult bank). Although items differ across respondents taking 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 CAT. This guide provides information on all Physical Function 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 physical function represented by all items in the item bank. When choosing between CAT and a 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.

Figure 1 illustrates the correlations (strength of relationship) of the full v1.0 Physical Function bank with CAT and with v1.0 short forms of varying length. The correlation of CAT scores with the full bank score is greater than a short form of any length. A longer CAT or longer short form offers greater correlation, as well as greater precision. When evaluating precision, not all questions are equally informative. The flexibility of CAT to choose more informative questions offers more precision.

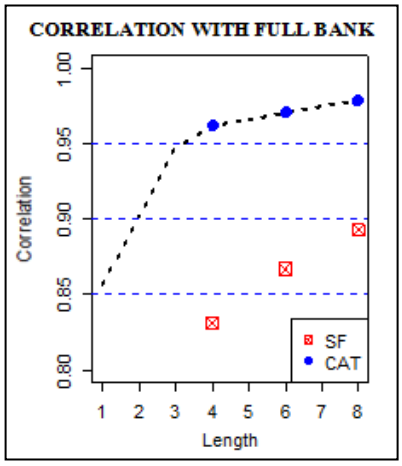

Figure 1

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.

Adult

The PROMIS adult Physical Function v1.0 item bank included 124 items. Later, during translation into multiple languages, some items were modified (e.g., metric equivalents to measurements such as “over 10 pounds/5kg” were added). These 19 modifications resulted in the creation of a v1.1 item bank. Later, v1.2 was created by eliminating three items due to restrictions in use. This also resulted in replacing items in two short forms. PROMIS short form v1.0 – Physical Function 6a was replaced by PROMIS short form v1.2 – Physical Function 6b. One item is different. PROMIS short form v1.0 – Physical Function 8a was replaced by PROMIS short form v1.2 – Physical Function 8b. One item is different. The Mobility v1.2 and Upper Extremity v1.2 banks include the modifications for improved translations. Calibrations are identical in v1.0, v1.1, and v1.2 adult measures. The PROMIS-Ca v1.0 measure was also replaced by a v1.1 with items removed due to restrictions in use.

The Physical Function item bank v2.0 has 165 items. All item parameters were changed to match the Rose et al. (2014) publication. New items were added from three sources: 1) Global06 was added from the PROMIS Global-10; 2) 35 items were added from the PASTOR (Pain Assessment Screening Tool and Outcomes Registry) project; and 3) eight items originally excluded from v1.0 were re-introduced because they had acceptable measurement properties once the PASTOR items were added. One of PASTOR’s subprojects developed new content to measure “elite” physical function. Finally, two items were substituted out for similarly-worded items with better measurement properties. The Mobility v2.0 item bank was also updated to match the Rose et al. (2014) item calibrations, but no new content was added to it.

The Mobility v2.1 item bank consists of 44 items, all of which are from the PROMIS Physical Function v2.0 item bank. Items include content that require lower extremities (e.g., walking, climbing stairs). There are more items in Mobility v2.1 than in the earlier Mobility v2.0 item bank. Consequently, it covers a wider range of function including both lower and higher levels of mobility. Scores obtained from Mobility v2.1 and Mobility v2.0 are

comparable. However, because the range of function covered by v2.1 is larger, individual scores at the very high and very low end may be different. Version 2.1 is recommended over v2.0.

Scores across PROMIS Physical Function versions can be compared to each other. On a set of common items (between v1.2 and v2.0) we observed a maximum difference in an impaired sample of ¼ T-score point using old and new parameters. That could rise to 1 T-score point in rare circumstances. Thus the Physical Function scores on v1.0, v1.1, v1.2, and v2.0 are comparable.

Scores across PROMIS Upper Extremity versions cannot be compared to each other. When the item bank was revised to v2.0, additional items were added to the item bank and all of them were re-calibrated so that the scores reflect only upper extremity function, whereas the v1.2 items were calibrated to reflect overall physical function. All items included in the v1.2 item bank are also included in the v2.0 item bank. For users interested in comparing scores over time and desiring to switch Upper Extremity versions, we recommend rescoring the v1.2 administrations via HealthMeasures Scoring Service (https://www.assessmentcenter.net/ac_scoringservice) using the v2.0 calibrations. This will treat the previous administrations as a custom short form from the v2.0 item bank and allow score comparability over time.

Concurrently, the Upper Extremity v2.0 item bank was revised. Additional items that were sufficiently related to upper extremity function were added, allowing creation of a 46-item bank and a 7-item short form. This item bank was also moved to its own metric to improve measurement properties for individuals with known or suspected upper extremity limitations (though it remains centered on the USA general population). All Upper Extremity items continue to appear in the overall Physical Function v2.0 item bank, but with different calibrations.

Pediatric and Parent Proxy
For Pediatric and Parent Proxy Mobility and Upper Extremity function, v2.0 measures 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 as is the item content on short forms.

Rose, M., Bjorner, J.B., Gandek, B., Bruce, B., Fries, J.F., & Ware Jr, J.E. (2014). The PROMIS Physical Function Item Bank Was Calibrated to a Standardized Metric and Shown to Improve Measurement Efficiency. Journal of Clinical Epidemiology, 67(5), 516-526. http://dx.doi.org/10.1016/j.jclinepi.2013.10.024

SHORT FORM DIFFERENCES

Adult Profile Short Forms
There are 6 Physical Function short forms for adults; three (4a, 6b, and 8b) are included in the PROMIS Profiles. Items in the 4a, 6b, and 8b short forms were selected based on rankings using two psychometric criteria: 1) maximum interval information; and 2) CAT simulations. Item rankings were similar for both criteria. For the maximum interval criterion, each item information function was integrated (without weighting) for the interval from the mean to 2 SDs worse than the mean. For the CAT simulations, responses to all items in each bank were generated using a random sample of 1,000 simulees drawn separately for each bank (centered on 1.0 SD worse than the general population mean). Items were rank ordered based on their average administration rank over the simulees. Content experts reviewed the items and rankings and made cuts of 4, 6, and 8 items. For each domain, 8-items, 6-items, and 4-items have been selected so that the items are nested/overlap (e.g., the 8-item form is the 6-item form plus two additional items). The 4a, 6b, and 8b short forms can be administered with

short forms of similar length from other domains (Depression, Pain Interference, Fatigue, Sleep Disturbance and Ability to Participate in Social Roles and Activities) as part of a PROMIS Profile (see PROMIS-29, 43, or 57 Profile v2.0), though they can also be administered individually.

Other Adult Short Forms

Starting with the PROMIS pool of universal physical function items, members of the PROMIS-Cancer team created a PROMIS Physical Function Cancer item bank using cancer-specific focus groups, expert reviewers and large-scale field-testing. The PROMIS-Cancer team subsequently selected 10 candidate items from this bank for a short form that were reviewed by multidisciplinary panels of clinical experts working in oncology (consisting of psychologists, nurses, physicians, and pharmacists). All of these items were confirmed to be clinically relevant for use in assessment of patient concerns regarding physical function, particularly in terms of content coverage and identifying cases in need of intervention. Items in PROMIS Physical Function Short Form 10b assess universal physical function. That is, no item refers to specifically to cancer. The measure is appropriate for use across chronic conditions.

The original adult short forms (10a and 20a) were constructed by the domain team with a focus on representing the range of the trait and also representing the content of the item bank. Domain experts reviewed short forms to give input on the relevance of each item. Each domain group worked independently. Psychometric properties and clinical input were both used and likely varied in importance across domains.

The PROMIS Short Form v2.0 – Physical Function 24a (PROMIS HAQ) includes PROMIS items that are analogous to the Health Assessment Questionnaire Disability Index (HAQ-DI). The original developer of the HAQ-DI, James F. Fries, MD, was also the principal investigator who led the development of the PROMIS physical function measures for adults. Original HAQ items, in improved form, were incorporated into the PROMIS Physical Function v1.0 item bank. Scores from the original HAQ cannot be compared to PROMIS scores – they use different metrics. However, there is a table that can convert scores from the HAQ-DI to the PROMIS metric on the PROsetta Stone website (www.prosettastone.org).

Pediatric and Parent Proxy Short Forms

There are two 8-item Pediatric and two 8-item Parent Proxy short forms, one pediatric and one parent proxy each for Mobility and Upper Extremity. Items were selected based on content and psychometric characteristics.

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., 4-item short form).

SELECTING THE PHYSICAL FUNCTION FOR SAMPLES WITH MOBILITY AID USERS INSTRUMENTS

The Physical Function for Samples with Mobility Aid Users instruments are intended for samples in which some participants utilize mobility aids such as wheelchairs. There are two screening questions that ask about one's ability stand and to walk. Based on responses to the screening items, the following questions are tailored. Specifically, if an individual is not able to walk or stand, items in the item bank asking about being able to walk specific distances or jog are not eligible for administration in the CAT. Likewise, short forms will have

respondents skip not applicable items. Note that this is not a bank intended only for those who use mobility aids. No items ask specifically about mobility aid use.

PROMIS ADULT CANCER MEASURES

PROMIS-Cancer (PROMIS-Ca) measures (Physical Function, Fatigue, Pain Interference, Depression and Anxiety) were developed under the PROMIS Cancer Supplement (CaPS) grant from NCI. The measures are highly similar to PROMIS measures. Some banks include unique items. In rare instances, a shared item uses different item-level calibrations in each bank.

- PROMIS-Ca Bank v1.1 - Physical Function contains 45 items, 33 of which are also in PROMIS Bank v2.0 - Physical Function.
- PROMIS-Ca Bank v1.0 - Fatigue contains 54 items, all of which are from PROMIS Bank v1.0 - Fatigue.
- PROMIS-Ca Bank v1.0 - Anxiety contains 22 items; 20 items from PROMIS Bank v1.0 - Anxiety, and 2 items unique to CaPS in which cancer specific calibrations were used: EDANX09 & EDANX39.
- PROMIS-Ca Bank v1.0 - Depression item bank contains 30 items; 23 items are from PROMIS Bank v1.0 - Depression and 7 items unique to CaPS in which cancer specific calibrations were used: EDANG09, EDANG29, EDDEP02, EDDEP12, EDDEP16, EDDEP38 & EDDEP55.
- PROMIS-Ca Bank v1.1 - Pain Interference contains 35 items; 32 items from PROMIS Bank v1.1 - Pain Interference v1.1 and 3 items unique to CaPS in which cancer specific calibrations were used: PAININ4, PAININ15 & PAININ30.

PROMIS-Cancer (PROMIS-Ca) measures were developed by having content experts review the adult PROMIS item banks for anxiety, depression, fatigue, pain interference, and physical function. Items were selected through expert consensus and informed by focus groups and cognitive interviews with cancer patients. Multidisciplinary clinical input was obtained to ensure content coverage and the relevance of PROMIS items to patients' cancer and/or cancer treatment experiences. Items' psychometric properties were reviewed when applicable. Next, calibration testing was conducted with cancer patients with different diagnoses and treatments. Data were analyzed to identify if items performed differently in people with cancer than people with other chronic conditions or in the general population. In most cases, PROMIS calibrations ("PROMIS Wave 1") were retained. In rare cases where differential item functioning was identified, calibrations for that item were revised for when that item is used in the PROMIS-Ca item bank. For items that exist only in a PROMIS-Ca item bank, new calibrations were created by using a fixed parameter linking strategy. This set of calibrations is named "Cancer" in the HealthMeasures Scoring Service and Assessment Center.

A fixed parameter linking approach was taken because of the additional analyses that were conducted to evaluate the differences between the PROMIS item bank and the PROMIS-Ca item bank. The measures produce slightly different scores. This difference was determined to be so small that comparing scores from a PROMIS measure and PROMIS-Ca measure is acceptable. Because the PROMIS measures have demonstrated validity across diverse patient populations, are linked with other PRO measures (i.e., PROsetta Stone), and have continued to be improved through item bank expansion (e.g., PROMIS Physical Function item bank v2.0), it is recommended to use the general population PROMIS calibrations when assessing individuals with cancer.

SELECTING A PEDIATRIC OR PARENT PROXY INSTRUMENT

In selecting whether to use the pediatric versus 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?

Some PROMIS Parent Proxy instruments (Anxiety, Depressive Symptoms, Fatigue, Mobility, Pain Interference, Peer Relationships) have two calibration samples – "Parent Proxy" and "Parent Proxy Without Local Dependence." The former (Parent Proxy) 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. The items without calibrations are enemy items. That is, a dyad or triad of items was identified in which there are psychometric reasons to only administer one of those items to a given respondent. For example, item Pf1mobil1r and Pf1mobil3r are enemy items. A participant should only see one of these items in a CAT.

The PROMIS Pediatric v2.0 Upper Extremity instrument also includes two calibration samples – "Pediatric" and "Pediatric Without Local Dependence." The Pediatric Without Local Dependence calibration sample is selected as the default. It does not include calibrations for enemy items.

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_scoringservice) or a data collection tool that automatically calculates scores (e.g., Assessment Center, 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.

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 4-item form, the lowest possible raw score is 4; the highest possible raw score is 16 (see all short form scoring tables 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_scoringservice) to generate a final score.

Within the PROMIS v1.0 Pediatric Upper Extremity 8-item short form, there are two items (3880R2 and 3881R1) with collapsed response categories. These items have response options scored as 3=With no trouble, 2=With a little trouble, 1=With some trouble, 0=With a lot of trouble, 0=Not able to do. This scoring should be

implemented prior to summing up all responses. The PROMIS v2.0 Pediatric Upper Extremity short form has already made this modification to response scores in the PDF version of the measure.

A small number of items within the PROMIS Physical Function measures for adults (and in fact for other item banks as well) there are collapsed response categories. That is, two response options are associated with the same score (e.g., 1=Unable to do, 1=With much difficulty, 2=With some difficulty). This is not an error. Use the response scores that are included in the respondent-ready measure PDFs in HealthMeasures.net Search & View Measures.

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 Physical Function 4a short form v2.0, a raw score of 10 converts to a T-score of 34.4 with a standard error (SE) of 2.3 (see scoring table for the 4a v2.0 short form in Appendix 1). Thus, the 95% confidence interval around the observed score ranges from 29.9 to 38.9 (T-score $\pm$ (1.96*SE) or 34.4 $\pm$ (1.96*2.3).

PROMIS HAQ: The PROMIS Short Form v2.0 - Physical Function 24a (PROMIS-HAQ) includes 24 items. Of these, 21 items contribute to a PROMIS Physical Function T-score. The first 20 items are from PROMIS Bank v2.0 – Physical Function. The PROMIS Global06 item was originally developed to be part of the PROMIS Global Health scale but was also adopted into the PROMIS Physical Function item bank. Consequently, it has item level calibrations that can contribute to the PROMIS Physical Function T-score. To use the table in this scoring manual that converts a raw response score sum to a PROMIS T-score, sum the raw response scores for the first 21 items in the 24a (PROMIS HAQ) short form. Like other short forms, all items must be answered in order to use the scoring table. If there is missing data, utilize the HealthMeasures Scoring Service. Three items from the short form do not contribute to a summary score. Global03 (In general, how would you rate your health), PFScreen (statement about use of mobility aids), and Global07 (How would you rate your pain on average) all use raw response scores only. No T-score or other summary score is produced. Their response scores should not be summed with the response scores from the Physical Function items.

CAT: A minimum number of items (4 for adult and adult cancer CATs and 5 for peds and parent proxy CATs) must be answered in order to receive a score for Physical Function 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. CAT will continue until either the standard error drops below a specified level (on the T-score metric 3.0 for adult and adult cancer CATs and 4.0 for peds and parent proxy CATs), or the participant has answered the maximum number of questions (12), whichever occurs first.

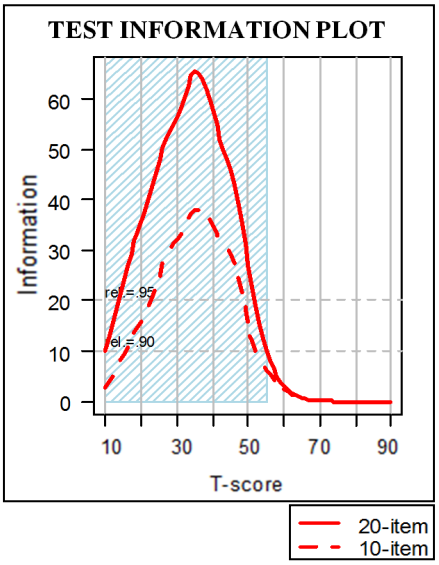

Figure 2

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 positively-worded concepts like Physical Function, Mobility, and Upper Extremity function, a T-score of 60 is one SD better than average. By comparison, a Physical Function T-score of 40 is one SD worse than average.

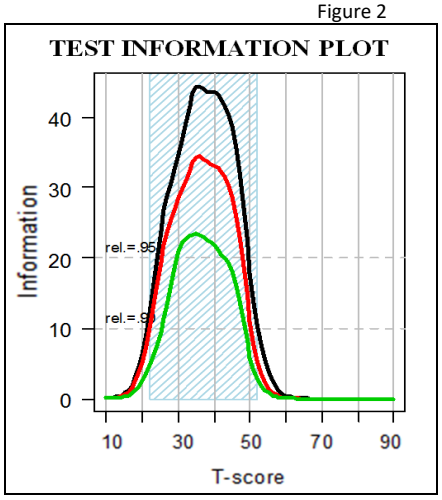

Figure 3

STATISTICAL CHARACTERISTICS

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

- **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 2 (v1.0 adult 10a and v1.0 adult 20a short form), the two dotted 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 blue region marks the range of the scale where measurement precision is comparable to the reliability of .90 for the 20-item form. Figure 2 also tells us where on the scale the forms are most informative based upon the T-score: the 20-item form is more informative than the 10-item form, and the 20-item form offers sufficient reliability over a wider range of T-scores than the 10-item form.

Figure 3 (v1.0 Adult 4a, 6a & 8a short forms) also tells us where on the scale the form is most informative based upon the T-score: the 8-item form is more informative than the 6-item form, which is more informative than the 4-item form. See additional test information figures for Pediatric and Parent Proxy instruments in Appendix 3.

PREVIEW OF SAMPLE ITEM

Figure 4 is an excerpt from the paper version of the v2.0 adult item bank. This is the paper version format used for all Physical Function instruments. It is important to note, CAT is not available for paper administration.

		Without any difficulty	With a little difficulty	With some difficulty	With much difficulty	Unable to do
PFA19r1	Are you able to run or jog for two miles (3 km)?	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
PFA20	Are you able to cut your food using eating utensils?	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1

Figure 4

FREQUENTLY ASKED QUESTIONS (FAQ)

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) 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 the item bank. This can be scored using the Scoring Service (https://www.assessmentcenter.net/ac_scoringservice).

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.

Q: Can I compare adult PROMIS Physical Function v1.2 and v2.0 scores if the calibrations changed?
Across versions, a user can compare Physical Function. That is, if you utilized v1.0, v1.1, or v1.2 Physical Function in a study and replaced it with v2.0 Physical Function, the scores from all versions are comparable. In our analyses, the difference between versions is less than 0.5 T-score points which we consider negligible.

However, across versions you cannot compare Upper Extremity scores. For Upper Extremity, the scoring system has been moved off of the generic Physical Functioning metric and onto its own metric. Accordingly, to compare Upper Extremity- v1.2 to the v2.0 CAT or short form would require rescoring the v1.2 items to the v2.0 metric using HealthMeasures Scoring Service https://www.assessmentcenter.net/ac_scoringservice.

APPENDIX 1-SCORING TABLES

Adult v2.0 - Physical Function 4a		
Short Form Conversion Table		
Raw Summed Score	T-score	SE*
4	22.5	4.0
5	26.6	2.8
6	28.9	2.5
7	30.5	2.4
8	31.9	2.3
9	33.2	2.3
10	34.4	2.3
11	35.6	2.3
12	36.7	2.3
13	37.9	2.3
14	39.2	2.4
15	40.5	2.4
16	41.9	2.5
17	43.5	2.6
18	45.5	2.8
19	48.3	3.3
20	57.0	6.6
*SE = Standard Error on T-score metric		

Adult v2.0 – Physical Function 6b		
Short Form Conversion Table		
Raw Summed Score	T-score	SE*
6	21.0	3.8
7	25.0	2.7
8	27.1	2.4
9	28.8	2.2
10	30.1	2.1
11	31.3	2.0
12	32.3	2.0
13	33.2	1.9
14	34.2	1.9
15	35.0	1.9
16	35.9	1.9
17	36.8	1.9
18	37.6	1.9
19	38.5	1.9
20	39.3	1.9
21	40.2	1.9
22	41.2	1.9
23	42.1	1.9
24	43.2	2.0
25	44.3	2.0
26	45.6	2.2
27	47.1	2.3
28	48.9	2.7
29	51.3	3.0
30	59.0	6.2
*SE = Standard Error on T-score metric		

Adult v2.0 – Physical Function 8b		
Short Form Conversion Table		
Raw Summed Score	T-score	SE*
8	20.3	3.7
9	23.9	2.5
10	26.0	2.2
11	27.5	2.1
12	28.8	2.0
13	29.8	1.9
14	30.8	1.8
15	31.7	1.8
16	32.5	1.7
17	33.2	1.7
18	34.0	1.7
19	34.7	1.7
20	35.4	1.6
21	36.1	1.6
22	36.7	1.6
23	37.4	1.6
24	38.1	1.6
25	38.8	1.6
26	39.5	1.6
27	40.1	1.6
28	40.8	1.6
29	41.6	1.7
30	42.3	1.7
31	43.1	1.7
32	43.9	1.7
33	44.7	1.8
34	45.7	1.8
35	46.7	1.9
36	47.8	2.1
37	49.2	2.3
38	50.8	2.6
39	53.0	3.0
40	60.1	5.9
*SE = Standard Error on T-score metric		

Adult v2.0 – Physical Function 20a

Short Form Conversion Table

RS	TS	SE	RS	TS	SE
20	9.2	3.2	60	32.7	1.3
21	11.7	2.5	61	33.1	1.4
22	13.2	2.3	62	33.5	1.4
23	14.3	2.1	63	33.9	1.4
24	15.3	2.0	64	34.4	1.4
25	16.2	1.9	65	34.8	1.3
26	16.9	1.9	66	35.1	1.3
27	17.6	1.8	67	35.5	1.3
28	18.3	1.8	68	35.9	1.4
29	18.9	1.7	69	36.3	1.4
30	19.5	1.7	70	36.8	1.4
31	20.1	1.7	71	37.2	1.3
32	20.6	1.7	72	37.6	1.3
33	21.2	1.6	73	38.0	1.3
34	21.7	1.6	74	38.4	1.4
35	22.2	1.6	75	38.8	1.4
36	22.6	1.6	76	39.3	1.4
37	23.1	1.6	77	39.7	1.4
38	23.6	1.6	78	40.2	1.4
39	24.1	1.5	79	40.6	1.4
40	24.5	1.5	80	41.1	1.5
41	24.9	1.5	81	41.6	1.5
42	25.4	1.5	82	42.1	1.5
43	25.8	1.5	83	42.6	1.5
44	26.2	1.5	84	43.1	1.5
45	26.7	1.5	85	43.7	1.6
46	27.1	1.4	86	44.2	1.6
47	27.5	1.4	87	44.8	1.6
48	27.9	1.4	88	45.4	1.7
49	28.3	1.5	89	46.1	1.7
50	28.7	1.5	90	46.8	1.8
51	29.2	1.4	91	47.5	1.8
52	29.6	1.4	92	48.3	1.9
53	30.0	1.4	93	49.2	2.1
54	30.3	1.4	94	50.3	2.2
55	30.7	1.4	95	51.5	2.5
56	31.2	1.4	96	53.0	2.8
57	31.6	1.4	97	54.9	3.3
58	32.0	1.4	98	57.0	3.6
59	32.4	1.3	99	62.7	5.7

RS = Raw Score
TS = T-score
SE = Standard Error on T-score metric

Adult v1.0 – Physical Function 12a

Short Form Conversion Table for People Who Can Walk (answered 12 items)

Raw Summed Score	Scale Score	SE*	Raw Summed Score	Scale Score	SE*
12	13.3	3.3	37	37.8	1.7
13	16.1	2.9	38	38.5	1.7
14	18.1	2.7	39	39.2	1.7
15	19.6	2.5	40	39.9	1.7
16	20.9	2.4	41	40.6	1.7
17	22.1	2.3	42	41.3	1.8
18	23.1	2.3	43	42.0	1.8
19	24.1	2.2	44	42.8	1.8
20	25.1	2.2	45	43.5	1.9
21	26.0	2.2	46	44.3	1.9
22	26.8	2.1	47	45.2	2.0
23	27.7	2.1	48	46.1	2.0
24	28.5	2.1	49	47.0	2.1
25	29.3	2.0	50	47.9	2.2
26	30.0	2.0	51	48.9	2.2
27	30.8	2.0	52	50.0	2.3
28	31.5	1.9	53	51.1	2.5
29	32.3	1.9	54	52.4	2.6
30	33.0	1.9	55	53.8	2.9
31	33.7	1.9	56	55.8	3.6
32	34.4	1.8	57	57.3	3.7
33	35.1	1.8	58	59.5	4.1
34	35.8	1.8	59	61.7	4.5
35	36.5	1.8	60	66.1	5.8
36	37.1	1.7			

*SE = Standard Error on T-score metric

Adult v1.0 – Physical Function 12a

Short Form Conversion Table for People Who Cannot Walk (answered 6 items)

Raw Summed Score	Scale Score	SE*
6	13.8	3.5
7	16.8	3.1
8	19.0	2.9
9	20.7	2.8
10	22.3	2.7
11	23.7	2.7
12	25.0	2.6
13	26.2	2.6
14	27.4	2.6
15	28.6	2.6
16	29.8	2.6
17	31.0	2.6
18	32.2	2.6
19	33.4	2.6
20	34.6	2.6
21	35.9	2.6
22	37.3	2.7
23	38.8	2.7
24	40.4	2.8
25	42.2	3.0
26	44.7	3.7
27	46.9	3.9
28	49.8	4.2
29	52.8	4.4
30	59.9	6.5

*SE = Standard Error on T-score metric

Adult v1.0 - Respondents Who Can Walk 25 Feet 11a (answered 11 items)									
Summary Score	Theta Score	SD (Theta)	T-Score	Estimated Proportion	Summary Score	Theta Score	SD (Theta)	T-Score	Estimated Proportion
11	-3.81	0.32	11.90	0.00007	34	-1.86	0.2	31.40	0.00394
12	-3.56	0.28	14.40	0.0001	35	-1.8	0.2	32.00	0.00444
13	-3.39	0.26	16.10	0.00014	36	-1.74	0.2	32.60	0.00499
14	-3.27	0.25	17.30	0.00019	37	-1.68	0.2	33.20	0.00561
15	-3.15	0.24	18.50	0.00023	38	-1.62	0.2	33.80	0.0063
16	-3.06	0.23	19.40	0.00029	39	-1.56	0.21	34.40	0.00708
17	-2.97	0.22	20.30	0.00035	40	-1.49	0.21	35.10	0.00797
18	-2.89	0.22	21.10	0.00042	41	-1.43	0.21	35.70	0.00898
19	-2.82	0.21	21.80	0.0005	42	-1.36	0.21	36.40	0.01015
20	-2.74	0.21	22.60	0.00059	43	-1.29	0.22	37.10	0.01151
21	-2.67	0.21	23.30	0.00069	44	-1.22	0.22	37.80	0.0131
22	-2.6	0.21	24.00	0.00081	45	-1.14	0.23	38.60	0.01501
23	-2.54	0.2	24.60	0.00094	46	-1.06	0.24	39.40	0.01734
24	-2.47	0.2	25.30	0.00109	47	-0.97	0.25	40.30	0.02023
25	-2.41	0.2	25.90	0.00125	48	-0.88	0.26	41.20	0.02382
26	-2.35	0.2	26.50	0.00144	49	-0.77	0.28	42.30	0.02865
27	-2.29	0.2	27.10	0.00164	50	-0.64	0.31	43.60	0.03557
28	-2.22	0.2	27.80	0.00187	51	-0.46	0.4	45.40	0.04722
29	-2.16	0.2	28.40	0.00213	52	-0.36	0.37	46.40	0.05582
30	-2.1	0.2	29.00	0.00242	53	-0.2	0.39	48.00	0.07547
31	-2.04	0.2	29.60	0.00274	54	0.04	0.41	50.40	0.12106
32	-1.98	0.2	30.20	0.0031	55	0.79	0.67	57.90	0.44923
33	-1.92	0.2	30.80	0.0035					

Adult v1.0 - Respondents Who Cannot Walk 25 Feet (answered 8 items)				
Raw Summed Score	**Theta Score**	**SD (Theta)**	**T-Score**	**Estimated Proportion**
8	-3.78	0.32	12.2	0.00008
9	-3.52	0.29	14.8	0.00012
10	-3.35	0.27	16.5	0.00017
11	-3.21	0.26	17.9	0.00022
12	-3.1	0.25	19	0.00029
13	-2.99	0.25	20.1	0.00037
14	-2.9	0.24	21	0.00047
15	-2.81	0.24	21.9	0.00058
16	-2.72	0.24	22.8	0.00071
17	-2.63	0.23	23.7	0.00087
18	-2.55	0.23	24.5	0.00106
19	-2.47	0.23	25.3	0.00129
20	-2.39	0.23	26.1	0.00155
21	-2.31	0.23	26.9	0.00187
22	-2.24	0.23	27.6	0.00224
23	-2.16	0.23	28.4	0.00267
24	-2.08	0.24	29.2	0.00318
25	-2	0.24	30	0.00379
26	-1.92	0.24	30.8	0.00451
27	-1.84	0.24	31.6	0.00536
28	-1.75	0.25	32.5	0.00638
29	-1.67	0.25	33.3	0.00761
30	-1.58	0.26	34.2	0.00912
31	-1.48	0.27	35.2	0.01101
32	-1.38	0.28	36.2	0.01342
33	-1.27	0.3	37.3	0.01658
34	-1.15	0.32	38.5	0.02084
35	-1.01	0.36	39.9	0.02695
36	-0.79	0.49	42.1	0.03768
37	-0.75	0.4	42.5	0.04442
38	-0.57	0.41	44.3	0.0558
39	-0.29	0.44	47.1	0.1187
40	0.59	0.72	55.9	0.59009

Adult v2.0 Upper Extremity 7a		
Short Form Conversion Table		
Raw Summed Score	Scale Score	SE*
7	16.3	3.0
8	19.3	2.7
9	21.1	2.5
10	22.6	2.4
11	23.9	2.4
12	25.0	2.3
13	26.1	2.3
14	27.0	2.3
15	27.9	2.3
16	28.8	2.3
17	29.7	2.3
18	30.5	2.3
19	31.4	2.3
20	32.2	2.3
21	33.0	2.3
22	33.9	2.3
23	34.7	2.4
24	35.6	2.4
25	36.6	2.5
26	37.5	2.6
27	38.6	2.6
28	39.7	2.8
29	40.9	2.9
30	42.3	3.1
31	43.9	3.4
32	45.6	3.6
33	47.7	3.9
34	50.9	4.5
35	58.2	6.7
*SE = Standard Error on T-score metric		

Adult v2.0 – Physical Function 10a		
Short Form Conversion Table		
Raw Summed Score	T-score	SE*
10	13.5	3.6
11	16.6	2.8
12	18.3	2.7
13	19.7	2.5
14	20.9	2.4
15	22.1	2.3
16	23.1	2.2
17	24.1	2.2
18	25.0	2.1
19	26.0	2.0
20	26.9	2.0
21	27.7	1.9
22	28.6	1.9
23	29.4	1.9
24	30.2	1.8
25	31.0	1.8
26	31.8	1.8
27	32.5	1.8
28	33.3	1.7
29	34.0	1.7
30	34.8	1.7
31	35.5	1.7
32	36.3	1.7
33	37.0	1.7
34	37.8	1.7
35	38.5	1.8
36	39.3	1.8
37	40.1	1.8
38	40.9	1.9
39	41.7	1.9
40	42.6	1.9
41	43.5	2.0
42	44.4	2.1
43	45.5	2.1
44	46.6	2.3
45	47.9	2.5
46	49.4	2.8
47	51.2	3.2
48	53.4	3.6
49	55.8	3.9
50	61.9	5.9
*SE = Standard Error on T-score metric		

Adult v2.0 – Physical Function 10b		
Short Form Conversion Table		
Raw Summed Score	T-score	SE*
10	13.8	3.9
11	17.2	3.1
12	19.3	2.8
13	21.0	2.6
14	22.4	2.4
15	23.6	2.3
16	24.7	2.2
17	25.7	2.1
18	26.6	2.0
19	27.4	2.0
20	28.2	1.9
21	28.9	1.9
22	29.6	1.9
23	30.3	1.8
24	31.0	1.8
25	31.7	1.8
26	32.3	1.8
27	32.9	1.8
28	33.5	1.8
29	34.2	1.8
30	34.8	1.8
31	35.4	1.8
32	36.0	1.8
33	36.7	1.8
34	37.3	1.8
35	37.9	1.8
36	38.6	1.8
37	39.3	1.8
38	40.0	1.8
39	40.7	1.9
40	41.5	1.9
41	42.3	2.0
42	43.2	2.0
43	44.2	2.1
44	45.2	2.2
45	46.5	2.4
46	48.1	2.8
47	50.0	3.2
48	52.5	3.7
49	55.0	4.0
50	61.3	6.1
*SE = Standard Error on T-score metric		

Adult v2.0 Physical Function 24a (PROMIS HAQ)
Short Form Conversion Table

Raw Score	T-score	SE*	Raw Score	T-score	SE*	Raw Score	T-score	SE*
21	11.3	1.1	49	24.4	1.5	77	34	1.4
22	11.5	1.2	50	24.8	1.4	78	34.4	1.4
23	11.9	1.4	51	25.1	1.4	79	34.8	1.4
24	12.3	1.6	52	25.5	1.4	80	35.2	1.4
25	12.8	1.7	53	25.8	1.4	81	35.6	1.4
26	13.4	1.8	54	26.2	1.4	82	35.9	1.5
27	14	1.9	55	26.5	1.4	83	36.4	1.5
28	14.6	1.9	56	26.9	1.4	84	36.8	1.5
29	15.3	1.9	57	27.2	1.4	85	37.2	1.5
30	15.9	1.9	58	27.6	1.4	86	37.6	1.5
31	16.5	1.9	59	27.9	1.4	87	38.1	1.5
32	17.1	1.8	60	28.2	1.4	88	38.5	1.6
33	17.6	1.8	61	28.6	1.4	89	39	1.6
34	18.2	1.7	62	28.9	1.4	90	39.5	1.6
35	18.7	1.7	63	29.2	1.4	91	40.1	1.6
36	19.1	1.7	64	29.6	1.4	92	40.6	1.7
37	19.6	1.6	65	29.9	1.4	93	41.2	1.7
38	20.1	1.6	66	30.2	1.4	94	41.9	1.8
39	20.5	1.6	67	30.6	1.4	95	42.6	1.9
40	20.9	1.6	68	30.9	1.4	96	43.4	2
41	21.3	1.6	69	31.2	1.4	97	44.3	2.1
42	21.8	1.5	70	31.6	1.4	98	45.4	2.5
43	22.1	1.5	71	31.9	1.4	99	46.7	2.8
44	22.5	1.5	72	32.3	1.4	100	48.4	3.2
45	22.9	1.5	73	32.6	1.4	101	50.8	3.7
46	23.3	1.5	74	33	1.4	102	58.1	6.5
47	23.7	1.5	75	33.3	1.4			
48	24	1.5	76	33.7	1.4			

*SE = Standard Error on T-score metric

Pediatric v2.0 – Upper Extremity 8a		
Short Form Conversion Table		
Raw Summed Score	Scale Score	SE*
8	10	4
9	12	4
10	14	3
11	15	3
12	17	3
13	18	3
14	19	3
15	20	3
16	21	3
17	22	3
18	23	3
19	24	3
20	24	3
21	25	3
22	26	3
23	27	3
24	28	3
25	29	3
26	30	3
27	31	3
28	32	3
29	33	3
30	34	3
31	35	4
32	37	4
33	39	4
34	40	4
35	42	5
36	45	5
37	49	5
38	57	7
*SE = Standard Error on T-score metric		

Pediatric v2.0 – Mobility 8a		
Short Form Conversion Table		
Raw Summed Score	Scale Score	SE*
8	14	4
9	17	3
10	19	3
11	20	3
12	21	3
13	22	3
14	23	3
15	24	3
16	25	3
17	26	3
18	27	3
19	28	3
20	28	3
21	29	3
22	30	3
23	31	3
24	32	3
25	33	3
26	33	3
27	34	3
28	35	3
29	36	3
30	37	3
31	38	3
32	39	3
33	40	3
34	41	3
35	43	4
36	45	4
37	46	4
38	48	4
39	52	5
40	59	7
*SE = Standard Error on T-score metric		

Parent Proxy v2.0 – Upper Extremity 8a		
Short Form Conversion Table		
Raw Summed Score	Scale Score	SE*
8	13	3
9	16	3
10	17	3
11	18	2
12	19	2
13	20	2
14	21	2
15	22	2
16	22	2
17	23	2
18	24	2
19	24	2
20	25	2
21	25	2
22	26	2
23	26	2
24	27	2
25	28	2
26	28	2
27	29	2
28	30	2
29	30	2
30	31	2
31	32	2
32	33	2
33	34	3
34	35	3
35	37	3
36	38	4
37	40	4
38	42	4
39	45	5
40	55	8
*SE = Standard Error on T-score metric		

Parent Proxy v2.0 – Mobility 8a		
Short Form Conversion Table		
Raw Summed Score	Scale Score	SE*
8	14	4
9	17	3
10	20	3
11	21	3
12	22	3
13	23	2
14	24	2
15	25	2
16	26	2
17	27	2
18	27	2
19	28	2
20	29	2
21	29	2
22	30	2
23	31	2
24	31	2
25	32	2
26	33	2
27	33	2
28	34	2
29	35	2
30	35	2
31	36	2
32	37	2
33	38	3
34	39	3
35	40	3
36	42	4
37	43	4
38	45	4
39	48	4
40	56	7
*SE = Standard Error on T-score metric		

All scoring tables based on default Parent Proxy calibrations.

APPENDIX 2- SCORING TABLES FOR RETIRED MEASURES

Adult v1.0 – Physical Function 4a		
Short Form Conversion Table		
Raw Summed Score	T-score	SE*
4	22.9	3.9
5	26.9	2.7
6	29.1	2.4
7	30.7	2.2
8	32.1	2.2
9	33.3	2.1
10	34.4	2.1
11	35.6	2.1
12	36.7	2.1
13	37.9	2.2
14	39.1	2.2
15	40.4	2.2
16	41.8	2.3
17	43.4	2.4
18	45.3	2.6
19	48.0	3.1
20	56.9	6.7
*SE = Standard Error on T-score metric		

Adult v1.0 – Physical Function 6a		
Short Form Conversion Table		
Raw Summed Score	T-score	SE*
6	20.8	3.6
7	24.4	2.4
8	26.5	2.2
9	28.0	2.0
10	29.4	1.9
11	30.5	1.9
12	31.6	1.8
13	32.5	1.8
14	33.5	1.8
15	34.3	1.8
16	35.2	1.8
17	36.0	1.8
18	36.9	1.8
19	37.7	1.8
20	38.6	1.8
21	39.4	1.8
22	40.3	1.8
23	41.3	1.8
24	42.2	1.8
25	43.3	1.9
26	44.4	2.0
27	45.7	2.1
28	47.4	2.4
29	49.7	2.9
30	57.8	6.4
*SE = Standard Error on T-score metric		

Adult v1.0 – Physical Function 8a		
Short Form Conversion Table		
Raw Summed Score	T-Score	SE*
8	20.2	3.5
9	23.7	2.4
10	25.6	2.1
11	27.0	1.9
12	28.2	1.8
13	29.3	1.8
14	30.3	1.7
15	31.2	1.7
16	32.0	1.6
17	32.7	1.6
18	33.5	1.6
19	34.2	1.6
20	34.9	1.6
21	35.5	1.5
22	36.2	1.5
23	36.9	1.5
24	37.5	1.5
25	38.2	1.5
26	38.9	1.5
27	39.5	1.5
28	40.2	1.6
29	40.9	1.6
30	41.6	1.6
31	42.4	1.6
32	43.1	1.6
33	43.9	1.6
34	44.8	1.7
35	45.7	1.8
36	46.8	1.9
37	48.0	2.1
38	49.6	2.5
39	51.8	2.9
40	59.2	6.1
*SE = Standard Error on T-score metric		

Adult v1.0 – Physical Function 10a

Short Form Conversion Table

Raw Summed Score	T-score	SE*
10	14.1	3.3
11	17.0	2.8
12	18.7	2.7
13	20.1	2.5
14	21.3	2.4
15	22.4	2.3
16	23.4	2.2
17	24.4	2.2
18	25.3	2.1
19	26.2	2.0
20	27.1	2.0
21	28.0	1.9
22	28.8	1.9
23	29.6	1.9
24	30.4	1.8
25	31.2	1.8
26	32.0	1.8
27	32.7	1.7
28	33.5	1.7
29	34.2	1.7
30	35.0	1.7
31	35.7	1.7
32	36.4	1.7
33	37.2	1.7
34	37.9	1.7
35	38.7	1.7
36	39.4	1.7
37	40.2	1.8
38	41.0	1.8
39	41.8	1.8
40	42.6	1.8
41	43.5	1.9
42	44.4	2.0
43	45.4	2.0
44	46.4	2.2
45	47.7	2.4
46	49.1	2.6
47	50.8	3.0
48	53.0	3.4
49	55.3	3.7
50	61.7	5.9

*SE = Standard Error on T-score metric

Adult v1.0 – Physical Function 20a

Short Form Conversion Table

RS	TS	SE	RS	TS	SE
20	12.1	1.5	60	32.9	1.4
21	12.8	1.8	61	33.3	1.4
22	13.7	1.9	62	33.7	1.3
23	14.7	2.0	63	34.1	1.3
24	15.6	2.0	64	34.5	1.3
25	16.4	1.9	65	34.9	1.3
26	17.2	1.9	66	35.3	1.3
27	17.9	1.9	67	35.7	1.3
28	18.5	1.8	68	36.1	1.3
29	19.2	1.8	69	36.5	1.3
30	19.8	1.7	70	36.9	1.3
31	20.3	1.7	71	37.3	1.3
32	20.9	1.7	72	37.7	1.3
33	21.4	1.7	73	38.1	1.3
34	21.9	1.6	74	38.5	1.4
35	22.4	1.6	75	38.9	1.4
36	22.9	1.6	76	39.3	1.4
37	23.4	1.6	77	39.8	1.4
38	23.8	1.6	78	40.2	1.4
39	24.3	1.6	79	40.7	1.4
40	24.7	1.5	80	41.1	1.4
41	25.2	1.5	81	41.6	1.4
42	25.6	1.5	82	42.1	1.5
43	26.0	1.5	83	42.6	1.5
44	26.5	1.5	84	43.1	1.5
45	26.9	1.5	85	43.6	1.5
46	27.3	1.5	86	44.2	1.5
47	27.7	1.5	87	44.7	1.6
48	28.1	1.5	88	45.3	1.6
49	28.5	1.4	89	46.0	1.7
50	28.9	1.4	90	46.6	1.7
51	29.3	1.4	91	47.4	1.8
52	29.7	1.4	92	48.2	1.9
53	30.1	1.4	93	49.0	2.0
54	30.5	1.4	94	50.0	2.1
55	30.9	1.4	95	51.2	2.4
56	31.3	1.4	96	52.6	2.7
57	31.7	1.4	97	54.4	3.1
58	32.1	1.4	98	56.5	3.5
59	32.5	1.4	99	62.5	5.6

RS = Raw Score
TS = T-score
SE = Standard Error on T-score metric

Adult v1.2 – Physical Function 6b

Short Form Conversion Table

Raw Summed Score	T-score	SE*
6	21.6	3.6
7	25.4	2.6
8	27.5	2.3
9	29.1	2.1
10	30.4	2.0
11	31.5	1.9
12	32.5	1.9
13	33.4	1.8
14	34.3	1.8
15	35.1	1.8
16	36.0	1.8
17	36.8	1.8
18	37.6	1.8
19	38.5	1.8
20	39.3	1.8
21	40.2	1.8
22	41.1	1.8
23	42.1	1.8
24	43.1	1.9
25	44.2	1.9
26	45.4	2.0
27	46.8	2.2
28	48.7	2.6
29	50.9	2.9
30	58.7	6.2

*SE = Standard Error on T-score metric

Adult v1.2 – Physical Function 8b

Short Form Conversion Table

Raw Summed Score	T-score	SE*
8	20.9	3.5
9	24.4	2.5
10	26.4	2.2
11	27.9	2.0
12	29.1	1.9
13	30.1	1.9
14	31.1	1.7
15	31.0	1.7
16	32.7	1.6
17	33.4	1.6
18	34.1	1.6
19	34.8	1.6
20	35.5	1.6
21	36.2	1.5
22	36.8	1.5
23	37.5	1.5
24	38.1	1.5
25	38.8	1.5
26	39.4	1.5
27	40.1	1.6
28	40.8	1.6
29	41.5	1.6
30	42.2	1.6
31	43.0	1.6
32	43.7	1.6
33	44.6	1.7
34	45.5	1.7
35	46.4	1.8
36	47.5	1.9
37	48.8	2.1
38	50.4	2.5
39	52.5	2.9
40	59.7	5.9

*SE = Standard Error on T-score metric

Pediatric v1.0 – Upper Extremity 8a		
Short Form Conversion Table		
Raw Summed Score	Scale Score	SE*
0	12.6	2.2
1	13.6	2.5
2	14.7	2.8
3	15.7	2.9
4	16.8	3.0
5	17.9	3.0
6	18.9	2.9
7	19.9	2.9
8	20.8	2.9
9	21.7	2.9
10	22.6	2.9
11	23.5	2.9
12	24.4	2.9
13	25.3	2.9
14	26.1	2.9
15	27.0	2.9
16	27.9	2.9
17	28.8	3.0
18	29.8	3.0
19	30.8	3.1
20	31.8	3.1
21	32.9	3.2
22	34.1	3.3
23	35.4	3.5
24	36.8	3.7
25	38.5	4.0
26	40.4	4.4
27	42.3	4.5
28	44.9	4.7
29	49.0	5.4
30	56.7	7.3
*SE = Standard Error on T-score metric		

Pediatric v1.0 – Mobility 8a		
Short Form Conversion Table		
Raw Summed Score	T-score	SE*
0	15.2	3.0
1	17.1	3.1
2	18.6	3.1
3	19.9	3.1
4	21.1	3.0
5	22.2	2.9
6	23.2	2.9
7	24.2	2.8
8	25.1	2.8
9	25.9	2.7
10	26.8	2.7
11	27.6	2.7
12	28.4	2.7
13	29.2	2.7
14	30.0	2.7
15	30.9	2.7
16	31.7	2.7
17	32.5	2.7
18	33.3	2.7
19	34.2	2.7
20	35.0	2.8
21	36.0	2.8
22	36.9	2.9
23	37.9	3.0
24	39.0	3.1
25	40.1	3.2
26	41.4	3.3
27	42.8	3.5
28	44.4	3.9
29	46.1	3.9
30	48.4	4.2
31	51.6	4.8
32	58.5	6.7
*SE = Standard Error on T-score metric		

Parent Proxy v1.0 – Upper Extremity 8a		
Short Form Conversion Table		
Raw Summed Score	Scale Score	SE*
0	13	3
1	16	3
2	17	3
3	18	2
4	19	2
5	20	2
6	21	2
7	22	2
8	22	2
9	23	2
10	24	2
11	24	2
12	25	2
13	25	2
14	26	2
15	26	2
16	27	2
17	28	2
18	28	2
19	29	2
20	30	2
21	30	2
22	31	2
23	32	2
24	33	2
25	34	3
26	35	3
27	37	3
28	38	4
29	40	4
30	42	4
31	45	5
32	55	8
*SE = Standard Error on T-score metric		

Parent Proxy v1.0 – Mobility 8a		
Short Form Conversion Table		
Raw Summed Score	Scale Score	SE*
0	14	4
1	17	3
2	20	3
3	21	3
4	22	3
5	23	2
6	24	2
7	25	2
8	26	2
9	27	2
10	27	2
11	28	2
12	29	2
13	29	2
14	30	2
15	31	2
16	31	2
17	32	2
18	33	2
19	33	2
20	34	2
21	35	2
22	35	2
23	36	2
24	37	2
25	38	3
26	39	3
27	40	3
28	42	4
29	43	4
30	45	4
31	43	4
32	56	7
*SE = Standard Error on T-score metric		

APPENDIX 3 – ADDITIONAL FIGURES

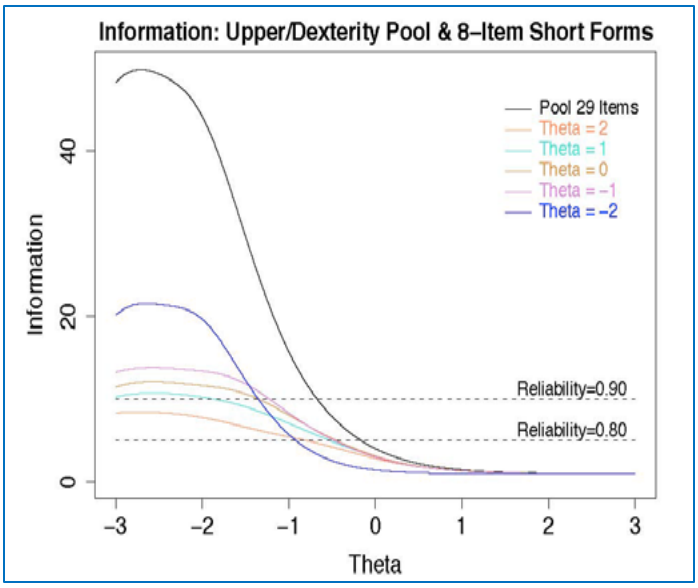

Figure 5 Pediatric Test Information Upper Extremity

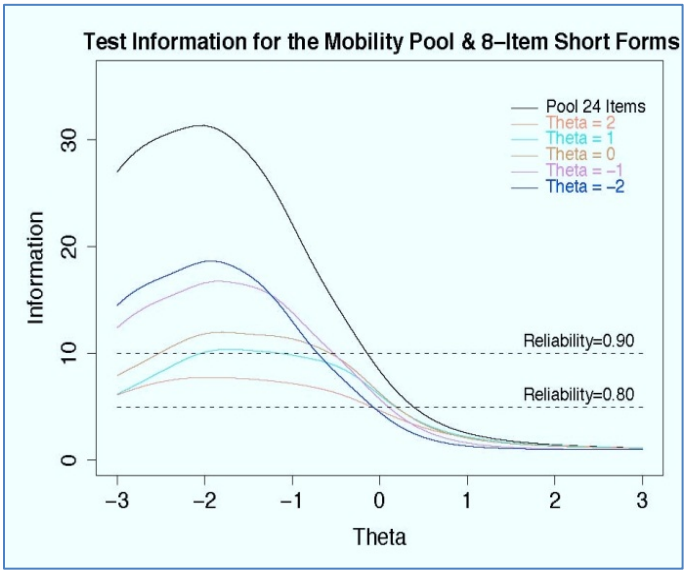

Figure 6 Pediatric Test Information Mobility