

Development of a Short Form of the Bayley Scales of Infant and Toddler Development, Third Edition, to Assess Children's Developmental Status in the National Children's Study

Louise O'Donnell

University of Texas Health Science Center-SA
Carol Andreassen, Kathryn Bojczyk, & Philip
Fletcher, Westat

Marsha Gerdes & Sofia Baglivo

Children's Hospital of Philadelphia

Susan Spieker & Thomas Burbacher

University of Washington

Research Goals

To create a measure of children's developmental status that will:

- serve as an anchor measure for comparison with other outcome measures in the National Children's Study
- evaluate the cognitive outcomes of at-risk children with negative exposure histories
- compare NCS children's outcomes to other studies of child development

Selecting a Measure

- Bayley Scales of Infant and Toddler Development, 3rd edition is the gold standard for child assessment.
- Measures 5 ADA domains: cognition, communication, motor, socio-emotional, and adaptive functioning
- Widely used and psychometrically robust
- Requires training; respondent burden is high
- Need to develop age-specific short forms

Goals of a Short Form

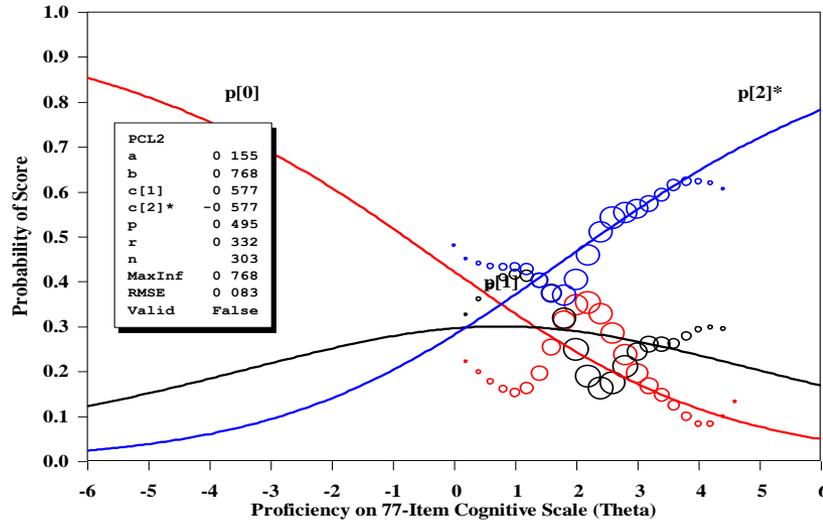
- Target ages 6-, 12-, 18-, 24- and 36-months
- Psychometrically rigorous and the equivalent of full Bayley administration
- Measure performance across the full ability distribution
- Simplify basal and ceiling rules (as a developmental test, children only receive age-appropriate items)
- Reduce burden to participants and data collectors
- Operational feasibility in the field

Procedures for Developing a Short Form

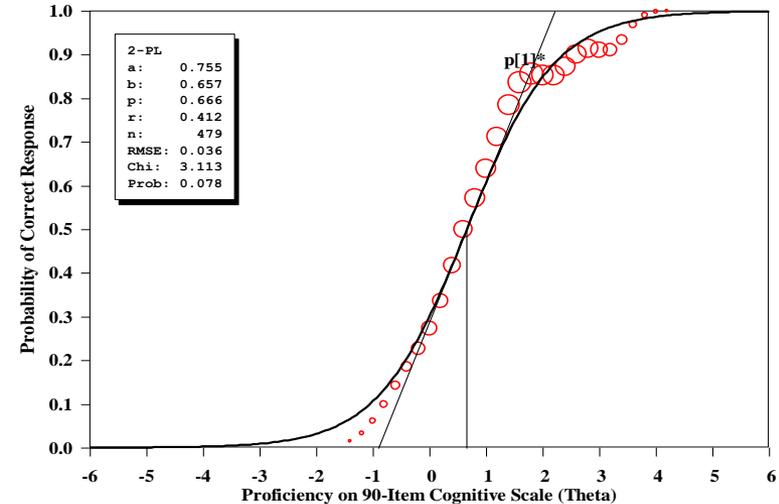
- Obtain publisher agreement to develop short form
- Obtain standardization data set from Bayley-3
- Conduct Item Response Theory (IRT) analysis on standardization data set to obtain item parameters (ability, discrimination, and adjustment for “guessing”)
- Conduct qualitative item review to eliminate cumbersome items & maximize operational ease

Eliminate Interdependent Items

Partial Credit: cg40cg45cg50: Finds hidden object / Finds hidden object (Reversed) / Finds hidden o

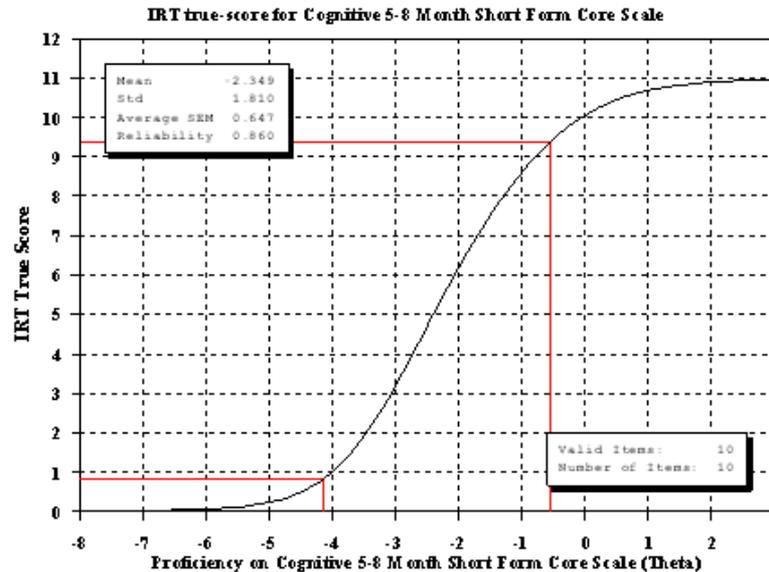


Constructed Response: cg40: Finds hidden object



Either create a partial item out of interdependent items or select just ONE and eliminate the rest

Streamlined Basal & Ceiling Rules



Example of basal and ceiling decision making process. Criteria set by the test characteristic curve are too liberal. Therefore, the basal decision rule for all of the age-specific short forms should include any score less than 3. The situation is entirely analogous for the ceiling decision rule but varies according to the number of items in the particular core item set. The general ceiling rule is any child scoring greater than $k - 3$ should receive the ceiling item set, where k is the total number-right possible on the core.

Item Response Theory Results

	IRT Forecast Reliabilities		
Target Age	Cognitive Scale	Language Scale	Motor Scale
6-Month	.93	.86	.94
12-Month	.94	.93	.90
18-Month	.94	.94	.89
24-Month	.94	.94	.90
36-Month	.92	.93	.90

Planned Standardization Study

- Four field sites: San Antonio, TX; Rockville, MD; Philadelphia, PA, and Washington state
- Sample design emulates 2010 American Community Survey (census) data
- Sample size: 1000+ includes test-retest sample
- Demographic questionnaires for primary caregivers

Questions

