Cognitive Development

I. Background Information

Measure/ Source:

- **Woodcock-Johnson Psycho-Educational Battery – Revised**
- Publisher: Riverside Publishing

Purpose of Measure:

As used in the Family and Child Experiences Survey (FACES): The set of individually administered tests is designed to assess the intellectual and academic development of individuals from preschool through adulthood. FACES used three subtests from the Achievement Battery that together constitute an "Early Development Skills" cluster. The cluster is comprised of the Letter-Word Identification, Applied Problems (Early Math Skills), and Dictation (Early Writing Skills) tests.

Population Measure Developed With:

- 2479 children in the FACES sample between the ages of 3 and 5.

- The FACES sample was randomly drawn from a stratified probability sample of 43 Head Start programs selected to represent the universe of Head Start programs in the 50 states, excluding migrant programs and American Indian programs.

	African American		White		Hispanic		Other		Total	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Male	**343**	**13.8**	**471**	**19.0**	**363**	**14.6**	**65**	**2.6**	**1242**	**50.1**
Female	**383**	**15.4**	**415**	**16.7**	**371**	**14.9**	**68**	**2.7**	**1237**	**49.9**
Total	**726**	**29.3**	**886**	**35.7**	**734**	**29.6**	**133**	**5.4**	**2479**	**100**

Key Constructs of Measure:

- **Letter-Word Identification.** The first five Letter-Word Identification items involve symbolic learning, or the ability to match a rebus (pictographic representation of a word) with an actual picture of the object. The remaining items measure children's reading identification skills in identifying isolated letters and words that appear in large type on the pages of the test book.

- **Applied Problems.** This subtest measures children's skill in analyzing and solving practical problems in mathematics. In order to solve the problems, the child must recognize the procedure to be followed and then perform relatively simple counting, addition or subtraction

operations. Because many of the problems include extraneous stimuli or information, the child must also decide which data to include in the count or calculation.

- **Dictation.** The first six items in this subtest measure prewriting skills, such as drawing lines and copying letters. The remaining items measure the child's skill in providing written responses when asked to write specific upper- or lower-case letters of the alphabet. Later parts of the test ask the child to write specific words and phrases, punctuation, and capitalization.

Norming of Measure (Criterion or Norm): Norm

II. **Administration of Measure**

Woodcock-Johnson Psycho-Educational Battery – Revised (Con't.)

Who is the Respondent to the Measure?:

The set of individually administered tests is designed to assess the intellectual and academic development of individuals from preschool through adulthood.

Who Administers Measure/ Training Required?:

Trained assessors. Training is required for the standardized administrative procedures of the Woodcock-Johnson-R.

Setting (e.g. 1 on1, group level, etc): 1 on 1

Cognitive Development

III. Functioning of Measure

Woodcock-Johnson Psycho-Educational Battery – Revised (Con't.)

Reliability:

Reports from "The Examiner's manual for the Woodcock-Johnson Psycho-Educational Battery-Revised" (Woodcock & Johnson, 1989):

Internal Consistency (Cronbach's Alpha)

- Composite score: Averages .96 for 2- to 4-year old range; .96 for k-12 range
- Letter-Word Identification scale score for preschool age children: averages .92
- Applied Problems scale score for preschool age children: averages .91
- Dictation scale score for preschool age children: averages .92

Reliability with FACES data (FACES administered Woodcock-Johnson scales only to children 4-years and older)

Internal Consistency (Cronbach's Alpha)

- Letter-Word Identification scale score: .84 (Spanish version: .75)
- Applied Problems scale score: .90 (Spanish version: .85)
- Dictation scale score: .77 (Spanish version: .77)

Test-Retest (6-9 month interim period)

- Letter-Word Identification scale score: .66 (Spanish version: .49)
- Applied Problems scale score: .70
- Dictation scale score: .61

Validity: For first cohort of FACES study (1997-1999), we conducted validity analyses for entire FACES battery, of which the Woodcock-Johnson subscales were a component. Two outcome variables were used in these analyses: ECLS-K Reading Scale and ECLS-K General Knowledge Scale.

WESTAT

1.) Predictive Validity:

- Correlation between Woodcock-Johnson subscale scores at end of Head Start year (spring 1998) and ECLS-K Reading scale scores at end of kindergarten year (spring 1999): Letter-Word - r = .55; Applied Problems - r = .52; Dictation - r = .42
- Correlation between Woodcock-Johnson subscale scores at end of Head Start year (spring 1998)and ECLS-K General Knowledge scale scores at end of kindergarten year (spring 1999): Letter-Word - r = .40; Applied Problems - r = .62; Dictation - r = .46
- In multivariate regression analyses with the scale scores from entire FACES battery at the end of Head Start year predicting ECLS-K Reading scores at end of kindergarten year, Letter-Word Identification task was the best predictor in the model (beta = .32). Applied Problems (beta = .16) and Dictation (beta = .14) tasks were both significant predictors as well.
- In multivariate regression analyses with the scale scores from entire FACES battery at the end of Head Start year predicting ECLS-K General Knowledge scores at end of kindergarten year, Applied Problems (beta = .09) and Dictation (beta = .11) tasks were significant predictors in this model.

2.) Concurrent Validity: (Letter-Word Identification scale was not included in Kindergarten battery due to its overlap with the ECLS-K Reading scale)

- Correlation between Woodcock-Johnson subscale scores and ECLS-K Reading scale scores at end of kindergarten year (spring 1999): Applied Problems - r = .62; Dictation - r = .64
- Correlation between Woodcock-Johnson subscale scores and ECLS-K General Knowledge scale scores at end of kindergarten year (spring 1999): Applied Problems - r = .59; Dictation - r = .48

Sensitivity to Environmental Variation (specify if intervention):

Woodcock-Johnson scores have been found to be associated with child disability status, language minority status, parental education level, and monthly family income (Zill, Resnick, McKey, Clark, Connell, Swartz, O'Brien, & D'Elio, 1998).

Concerns, Comments & Recommendations:

- In FACES, the Woodcock-Johnson subscales are part of a battery of tests used to assess school readiness in preschool children from low income families.

- Short, objective test with good validity and reliability.

- The Woodcock-Johnson battery is available in Spanish: Bateria Woodcock-Muñox Preubas de Aprovechamiento-Revisada.