A RURAL VS URBAN NORMATIVE STUDY OF THE CHICAGO EARLY ASSESSMENT

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ABSTRACT

The Chicago EARLY Asessment Test was developed, normed, and validated in inner city Chicago. It was designed to predict children ages three to five years-old with learning disabilities. The EARLY Assessment screens for deficiencies in gross motor, fine motor, language, visual discrimination and memory skills.

This study screened 44 children in the rural community of Big Rapids, Michigan. The purpose was to establish whether the established norms for the EARLY could be used to assess children in a rural community.

A Chi-squared test of goodness of fit was performed comparing the expected frequency, based on the norms in the EARLY manual, to the observed frequency. The analysis shows that the established norms were adequate for both urban and rural populations with one exception. There was a statistically significant difference in the children ages 4.7-5.0 years old in the areas of both language and visual discrimination. In these areas our subjects scored almost exclusively in the 80-100 percentile when compared to the EARLY Norms.

INTRODUCTION:

"Children with special learning disabilities exhibit a disorder in one or more of the basic psychological processes involved in understanding or using spoken or written languages. These may be manifested in disorders of listening, thinking, talking, reading, writing, spelling or arithmetic... They do not include learning problems which are due primarily to visual, hearing, or motor handicaps, to mental retardation, emotional disturbance, or to environmental disadvantage."5

Children with normal intelligence often mask learning disabilities by avoiding the specific tasks. It is these children who usually have specific areas of learning disabilities that remain undetected. These specific areas would not likely be uncovered in a normal classroom setting.2

Several preschool developmental tests have been formulated to help predict what areas or in which children certain areas may be a problem. One of the tests is the Chicago EARLY Program (EARLY Assessment and Remediation LaboratorY), which focuses on identification and remediation. The assessment is a fifteen minute evaluation, easily given by preschool teachers, which helps to identify children who will later have learning disabilities. With the results of the screening the teacher can obtain information on each child in specific learning areas. Also, if a deficit in a certain area is apparent the teacher has some basis with which to refer the child.2

In order for a system like this to work, assessment and remediation must go together. It is useless to determine a child's ability if there are no remediation programs available to help that child. Likewise, it is impossible to provide appropriate remediation unless some uniform testing is done to predict those that need help.2 In Chicago the EARLY also has a program for remediation of assessed learning disablities.4 Remediation, however, is beyond the scope of this paper.

The EARLY is designed to predict those children, ages three to five, who may have learning disabilities.4 An expert in the field, Barton White, states that "identifying five to six year olds may be too late for effective remediation".5 The EARLY has been developed, field tested, and validated with approximately 2,000 Chicago preschoolers. By breaking the skill areas into five major components a child who may seem normal in all aspects may also be identified as having a specific area of learning disability.

The target skills emphasized in the EARLY are associated with pre-reading and pre-writing. Two important components are necessary in identifying children, who will later have difficulty in reading and/or writing, these are: input and output. Input is how the child receives the information, either auditory or visually. Output is how the child responds to indicate

understanding of information that is received, either verbally or by motor response.3

The three skill areas represented are: Body Image/Gross Motor, Perceptual Motor, and Language. Body Image/Gross Motor includes both motor and language activities and is therefore considered a precursor to the next two skill areas. The perceptual motor activities deal with fine motor and/or visual discrimination skills. This area contains those activities such as distinguishing between colors, shapes, sizes, familiar objects, matching and even arithmetic. The Language activities are aimed at developing communication skills. This area emphasizes both receptive (comprehension) language as well as expressive (speaking) language.3

The EARLY has been found to have excellent concurrent validity when compared with a much longer battery of tests. EARLY reliability studies were done on approximately 160 three and four year olds enrolled in Chicago public school pre-kindergarten programs. The data from these were used to calculate coefficient alphas for the total test as well as the five subtests. The norming sample is representative of any large urban area such as Chicago. Both sexes are represented equally, and the sample includes children who had preschool experience as well as those who did not.4

A longitudinal study was performed on 1889 children, of these: 54% were black, 30% white, 11% hispanic, and 5% were of other persuasion. These percentages reflected the racial makeup of the school systems in Chicago. The black children are proportionately over-represented and whites are under-represented.4

The Chicago EARLY is based solely from a study on Chicago children and, as such, has been normed for an urban population. Our study was based on children from a rural community, in name Big Rapids, Michigan. We set out to prove that the norms for the EARLY could also be used outside of the inner city to predict learning disabilities.

METHODS:

The Chicago EARLY Developmental Test was given to forty-four preschool children between the ages of three and five. The children tested were from three different pre-schools in the community. All of the pre-schools are involved in developmental programs with the children. The racial makeup of the children tested reflected the rural community in that 90.90% were white, 6.82% black, and 2.27% were oriental. The age groups of the children were broken down in the same manner as the EARLY. The ages and number of children tested are as follows:

AGE(years)	Number of Children
3.0-3.6	10
3.7-4.0	8
4.1-4.6	11
4.7-5.0	15

The evaluation was given to each child in its entirety (see Figure 1). The assessment sheets were scored as is required in the EARLY manual. Data was entered in a computer software statistical program. The individual scores were compared to the established norms in the EARLY manual (Table 1a-d). A Chi-squared test goodness of fit was used in comparing the expected frequency, of a child falling within a given percentile, and the observed frequency (Table 2).

RESULTS:

By using the Chi-squared test of goodness of fit with a significance number of 0.05 we were able to determine any significant differences between our data (Table 2) and the EARLY.

The following formulas were used in accordance with the data in Table 2:

$$X^2=(O - E)^2/E$$

O=observed frequency
E=expected frequency

$$df=(row - 1)(column - 1)$$

df=degrees of freedom

No statistically significant difference was found in all categories and age groups except in the age group 4.7-5.0 years old. In both language and visual discrimination, in this age

group, our subjects scored almost exclusively in the 80-100 percentile when compared to the EARLY norms.

DISCUSSION:

As stated above, the data from Table 2 were analyzed and the only statistically significant difference found was in the age group 4.7-5.0. In areas of both language and visual discrimination our subjects scored almost exclusively in the 80-100 percentile when compared to the EARLY norms.

Although not statistically significant, in all ages a trend was seen in the areas of language and visual dicrimination. The children represented in our study scored consistently in the higher percentiles when compared with the norms from the EARLY.

As the children get closer to school age they seem to do better in all areas. In the areas of Gross Motor, Fine Motor and Memory our subjects were comparative with the norms set by the Chicago EARLY. The Language and Visual Discrimination scores show a rapid increase toward the 100 percentile as the children get closer to school age.

Due to our limited number of subjects the difference between the observed frequency and the expected frequency was small, therefore, Chi-squared would have more statistical value if more subjects were screened.

As hypothesized, we find that the norms for the EARLY can be used to predict learning disabilites in rural as well as urban communities with one exception; the norms do not hold true for the oldest children's language and visual discrimination subscales.

REFERENCES:

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FIGURE 1

Chicago EARLY ASSESSMENT
Score Sheet

CHILD'S NAME _____

ITEM (Circle each child's response. Do not skip any items.)		Score within Each Skill Area: Gross Motor	Fine Motor	Language	Visual Discrim	Memory
1. TIPTOE	refuses / on heels / flat feet / tiptoes less than 4 steps / more than 4 steps 0 1 1 2 3					
2. WALKING ON A LINE	refuses / 3 or more steps off / 1-2 steps off / Perfectly 0 1 2 3					
3. HOPPING	refuses / stands on 1 ft. 2 secs. / takes one hop 0 1 2 2 or more hops not in square / 2 or more hops inside square 2 3					
4. THROWING	refuses / too hard or at floor / with fair accuracy 0 1 2					
CATCHING	refuses / closes eyes / not reach for bag / uses only one hand 0 1 1 1 tries but not catch any / catches one / catches 2 or 3 2 3 4					
5. COPYING DESIGNS	refuses / circle 0 1 2 / cross 0 1 2 0 (See scoring criteria.) (Add scores.)					
6. PARALLEL LINES	refuses / none correct / dog-bone / squirrel-tree / bird-nest 0 0 1/0 + 1/0 + 1/0 =					
7. BLOCKS-BRIDGE	refuses / incorrect / base blocks touch / correct 0 1 2 3					
8. NUMBER CONCEPTS	none correct / can give 1 block / 2 blocks / 3 blocks 0 1 2 3					
9. COLORS	none correct / red / yellow / green / blue N/P N/P N/P N/P 0 2/1 2/1 2/1 2/1					
10. DIRECTIONS	refuses / block in bag only / gives bag only / block in box only 0 1 2 2 both correct / other _____ 4 (See scoring criteria.)					
11. PREPOSITIONS	neither correct / under / on 0 1/0 + 1/0 =					
12. COUNTING	refuses / counts correctly to _____ 0 (0-2)=1; (3-5)=2; (6-10)=3; (11-15)=4; (Above 15)=5					
13. MATCHING SYMBOLS	none t 7 x a v h m all 0 (Add total correct.) 7					
14. PUZZLES	none scissors (2-piece) / car (3-piece) / dog (4-piece) 0 1/0 + 1/0 + 1/0 =					
15. RECALL WORDS	refuses / girl-cat / candy-boat / ear-penny-red house-baby-milk-chair (See scoring criteria.)					
16. SORTING SHAPES	refuses / sorts all imperfectly 0 1 sorts 1 box correctly, others mixed / sorts perfectly 2 3					
17. BIG	refuses / 0-3 correct / 4-5 correct / all correct 0 1 2 3					
18. RECEPTIVE VOCABULARY	none / apple / book / house / flag / leaf / spoon / all 0 (Add total correct.) 6					
19. ACTION IN PICTURES	none / walking / sleeping / falling / eating / running / all 0 (Add total correct.) 5					
20. FUNCTION OF OBJECTS	none / cook on / cut with / sweep with / 0 all drive in / write with / drink out of / 6 (Add total correct.)					
21. BODY PARTS	none / ears / mouth / neck / knee / elbow / all 0 (Add total correct.) 5					
22. EXPRESSIVE VOCABULARY	none / truck / window / shirt / bed / tree / phone / brush / all 0 (Add total correct.) 7					
23. COMPREHENSION	sleepy? _____ 2 / 1 / 0 hungry? _____ 2 / 1 / 0 (Add the two scores.) (See scoring criteria.)					
		5 scores	3 scores	6 scores	3 scores	5 scores
	TOTAL SCORE FOR EACH SKILL AREA:					
	EQUIVALENT PERCENTILE RANGE:					

Table 1a

EARLY NORMS IN PERCENTILES FROM MANUAL

3 years 0 months to 3 years 6 months

Raw Scores by Skill Area

Percentile Rank	Gross Motor	Fine Motor	Language	Visual Discrimination	Memory
lowest 10%	0 - 6	0 - 3	0 - 20	0 - 4	0 - 15
20%	7 - 8	4	21 - 25	5 - 6	16 - 17
30%	9	5	26 - 28	7	18 - 20
40%	10	6	29 - 30	8	21 - 22
50%	11	7	31	9	23 - 24
60%			32	10	25 - 27
70%	12	8	33		28
80%	13		34	11	29
90%	14	9	35	12	30
100%	15	10	36	13	31 - 33

* Based on 159 children, mean age 40.65 months

Table 1b

EARLY NORMS IN PERCENTILES FROM MANUAL

3 years 7 months to 4 years 0 months

Raw Scores by Skill Area

Percentile Rank	Gross Motor	Fine Motor	Language	Visual Discrimination	Memory
lowest 10%	0 - 7	0 - 4	0 - 21	0 - 5	0 - 15
20%	8 - 9	5	22 - 26	6 - 7	16 - 19
30%	10	6	27 - 29	8	20 - 21
40%	11	7	30	9	22 - 23
50%	12		31		24 - 25
60%		8	32	10	26 - 27
70%	13		33	11	28
80%		9	34		29
90%	14		35	12	30
100%	15	10	36	13	31 - 33

* Based on 592 children, mean age 45.36 months.

Table 1c

EARLY NORMS IN PERCENTILES FROM MANUAL

4 years 1 month to 4 years 6 months

Raw Scores by Skill Area

Percentile Rank	Gross Motor	Fine Motor	Language	Visual Discrimination	Memory
lowest 10%	0 - 9	0 - 5	0 - 25	0 - 7	0 - 18
20%	10 - 11	6 - 7	26 - 28	8	19 - 21
30%	12	8	29 - 30	9	22 - 24
40%			31 - 32		25 - 26
50%	13		33	10	27 - 28
60%		9		11	29
70%	14		34		30
80%			35	12	
90%					31
100%	15	10	36	13	32 - 33

* Based on 727 children, mean age 51.34 months.

Table 1d

EARLY NORMS IN PERCENTILES FROM MANUAL

4 years 7 months to 5 years 0 months

Raw Scores by Skill Area

Percentile Rank	Gross Motor	Fine Motor	Language	Visual Discrimination	Memory
lowest 10%	0 - 11	0 - 7	0 - 26	0 - 7	0 - 18
20%	12	8	27 - 29	8 - 9	19 - 22
30%	13		30 - 31		23 - 24
40%		9	32	10	25 - 26
50%			33		27 - 28
60%	14		34	11	29
70%					30
80%			35	12	31
90%					32
100%	15	10	36	13	33

* Based on 369 children, mean age 56.97 months.

Table 2

EXPECTED FREQUENCY VS OBSERVED FREQUENCY

Age Group (years)	Expected Frequency/ Percentile	Observed Frequency				
		Gross Motor	Fine Motor	Language	Visual Discrimination	Memory
3.0-3.6	5					
	0-50%	4	6	5	2	7
	60-100%	6	4	4	8	3
3.7-4.0	4					
	0-50%	3	4	1	0	4
	60-100%	5	4	7	8	4
4.1-4.6	5.5					
	0-50%	2	4	3	1	7
	60-100%	9	7	8	10	4
4.7-5.0	4.5					
	0-30%	5	3	0	1	0
	6					
	40-70%	4	3	2	0	8
	4.5					
	80-100%	6	9	13	14	7