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An assessment of the nonverbal test of cognitive skills for use with hearing impaired children

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Central Institute for the Deaf

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Introduction:

Having an accurate measure of a hearing impaired child's intelligence or cognitive abilities, is essential to recommendations made concerning the child's future. Intelligence test information is important when arranging for placement within a particular class group, or when considering what to expect of a child within a given classroom situation. Cognitive abilities influence decisions on whether to place a child in an oral or Total Communication program, and in eventual mainstreaming decisions. Although testing is only one facet of total assessment, it is a crucial factor. Decisions are constantly being made based on the results of intelligence testing of hearing impaired childen. Therefore it is imperative that one have a high level of confidence in the measures used and the results obtained.

Part of the difficulty in selecting an appropriate test of intelligence is in formulating a basic definition of intelligence and in determining exactly what one wants to measure. Any test constructed to measure intelligence will obviously be affected by one's definition of the concept. No one sees intelligence. Instead it is something we infer from observing the different ways in which people behave (Salvia/Ysseldyke). Theorists interested in defining intelligence come from different fields of study, and view the task from different perspectives, similar to the three blind men describing the elephant.

Some are primarily interested in the biological aspects of

intelligence, how one species differs from another. Some define intelligence with an emphasis on its motivational characteristics. Still others focus on the environmental influence of intelligence (Sternberg & Detterman). Obviously there are many different dimensions of intelligence, and no one test can sample all of these behaviors. J.P. Guilford noted in his research that there were one hundred and twenty types of mental ability. Even so, certain common qualities are reflected in the definitions espoused by various learning theorists.

Both Binet and Wechsler emphasized the quality of adaptation. Anne Anastasi of Fordham University reitterated this when she said," Intelligence is not an entity within the organism but a quality of behavior. Intelligent behavior is essentially adaptive, insofar as it represents effective ways of meeting the demands of a changing environment." Higher order thinking, problem solving, reasoning, and decision making, are also abilities that are common to many definitions. J.P. Das of the University of Alberta sees intelligence as the sum of all cognitive processes, including planning, decision making, coding of information, and selective sustained attention. Like Wechsler he emphasized the global nature of intelligence. Douglas Detterman of Case Western Reserve equated intelligence with "that set of measures which predicts academic achievement." Still others have said that intelligence is what intelligence tests measure.

Beyond the problem of defining intelligence then is the dilemma of choosing a valid and reliable test, one that actually measures what it purports to measure, and one that is consistant,

both from one taking to another and internally. Although no test can measure all of the aspects of intelligence, it is imperative that the test accurately measure those factors that it has deemed necessary to the construct. One must also remember that "an intelligence test is not a pure measure of innate capacity, but reflects experience as well as potential, education as well as aptitude (Leona Tyler)."

Perhaps all these difficulties were best summed up by Carolyn Compton when she said,"No other area of assessment has caused so much controversy as the area of intelligence testing, or IQ tests. Debates rage over such topics as the meaning of intelligence, use of IQ tests as predictors of school achievement, the cultural biases of standard IQ tests and the interpretation (or misinterpretation) of IQ scores. There may never be any widespread agreement about whether IQ tests should be given, what they measure, or what they mean, but they continue to be used regularly in the field of special education."

Comptons cautions are particularly appropriate when selecting an intelligence test for use with hearing impaired children. One must not confuse the scores on a verbal IQ test with any measure of a hearing impaired childs intelligence. Instead it is a measure of his facility or lack thereof, with the English language. The test is a comparison of that childs achievement with the ability of a hearing child. Since most hearing impaired children lag behind hearing children in language development it is impossible to test their mental ability using a verbal test , or a test with verbal instructions. To measure intelligence in a hearing impaired population one must choose a

wide range performance test and eliminate language bias. The hearing impaired scores on these tests must be similar to those of a hearing population and one must be relatively sure that one test is measuring the same thing as the other. These tests also should have hearing impaired norms so that a particular child ~~child~~ or group of children could be compared to other children of that age.

Traditionally, the scores of hearing impaired children have been similar to hearing children on the WISC R performance subtests. Occasionally, however, there is a low level of confidence in a given result. In this instance, since there is not an alternate form of the Wechsler, it becomes important to have another test measure to corroborate or refute the prior test results. The Non Verbal Test of Cognitive Skills was hoped to be a suitable instrument in these situations where a second opinion was needed.

Development:

The Nonverbal Test of Cognitive Skills was devised by G. Orville Johnson and Herbert F. Boyd at the University of South Florida in 1981. The test was designed for use with five to thirteen year olds, to measure "those characteristics essential to academic learning," in an effort to predict future academic success. Johnson and Boyd were careful to point out that the test was but a sample of one facet of intelligence. They saw their test as a measurement of the ability to "acquire knowledge or ideas, to perceive and become informed, to reason and problem solve." Although this definition coincides with several previously stated interpretations of intelligance, Johnson and Boyd refrained from the use of he term "intelligence". They opted instead for the term "cognitive skills".

The test manual indicates that there are numerous strengths of the test and it merits a thorough study. Unlike some previously designed performance tests, the NTCS samples several performance tasks instead of just one. Next it is easy to learn and to administer. As many of the subtests are culled from various well known performance tests, they are familiar to experienced psychologists. The test materials are very durable and are contained in a light weight sturdy case. Administration time is between thirty and forty-five minutes. The test is totally nonverbal, including the pantomimed instructions, and purports to have high interest value for "hard to test" children. Because it is given individually, there is

ample opportunity to observe the child's test taking behavior, to add to ones assessment of his general learning style. Finally according to the manual, the test correlates well with academic achievment. For all these reasons especially it's nonverbal nature this test looked to be ideal for use with hearing impaired children.

The normative group for the NTCS included 849 children in grades K-7. As the hearing level of these subjects was not mentioned one assumes them to have normal hearing. When possible entire clases were tested. However, when the necessary permission slip was missing, children were chosen at random to fill the quotas. An attempt was made to balance the population according to the 1980 census figures. Because of a preponderance of scores from the southwest, each of these scores was weighted, and counted as only 2/3. In addition there was socieo-economic data available for only half of the group. The sample was roughly balanced as to race. Data at the extreme ends of the test had to be extrapolated because of the few scores at each of these ages. As a result of these difficulties, the authors labeled these norms preliminary, and cautioned the need for setting up local guidelines. Also because there was no information given on the hearing of the children and no hearing impaired norms the applicability of this test for use with hearing impaired children has not been determined.

In terms of reliability, a retest was given to seven children from each class. These forty-nine children were selected at random, and were tested within three months of the initial test. About one third were tested by the same examiner.

The mean raw score of NTCS 2 was 1.12 points higher than NTCS 1. The correlation between the first and second testing was .95. Internal consistency was tested by applying Coefficient Alpha to all 849 original scores. This coefficient proved to be .88.

Validity information was presented based on achievement test age equivalents and the NTCS Cognitive Skills Age. The achievement tests used were "Comprehensive Test of Basic Skills", "Metropolitan Readiness Test", Stanford Achievement Test", and Iowa Test of Basic Skills". Correlations detailed by grade ranged between .41 and .65, and they averaged .55. See figure 1.

Tasks:

1. Paper Folding
   A six inch square of paper is folded successively into triangles, first one fold, then two, then three.
2. Cube Building
   The child copies patterns that the examiner creates with blocks, ranging from a three cube tower to a ten cube stair.
3. Figure Identification
   The child must match a certain geometric shape to the corresponding figure. See figure 2.
4. Figure Completion
   The child is expected to pick from amongst several geometric shapes, that shape which completes a target figure. See figure 3.
5. Figure Discrimination
   The task is to point to the different shape amongst four identical figures. See figure 4.
6. Figure Drawing
   The child is asked to copy a line, circle, square, triangle, asterisk, and diamond from a given sample.
7. Figure Memory
   The object is to draw, from memory, several shapes which are presented briefly and then hidden. See figure 5.
8. Picture Completion I- What's Missing
   The child points to the missing portion in several drawings. See figure 6.
9. Picture Completion II-Function
   The task is to point to that small picture which completes the larger drawing. See figure 7.
10. Color Patterns
    Using multi-colored cubes, the child must recreate a pattern presented on a card.
11. Knox Cubes
    Here the child imitates a tapping sequence presented by the examiner. See figure 8.
12. Dominoes
    This is an imitation task using domino patterns. See figure 9.
13. Tapping
    A tapping pattern is presented by the examiner, and repeated by the child. The taps alternate between the the cubes and either the childs or the examiners side of the table. See figure 10.
14. Figure Association
    This is a coding task where the child associates one symbol with another, and must draw the correct symbol paired with its companion symbol. See figure 11.

Subjects:

Subjects were chosen at random from the primary and middle school classes at Central Institute for the Deaf. An attempt was made to test several children at each age level. Twenty-five children ranged in age from 63 months to 155 months. There were 15 boys and 10 girls. Average Hearing Level ranged from 50 dB to 130 dB in the better ear. The mean Hearing Level for the group was 92 dB in the better ear. All children were tested in the morning by the same examiner. Retests were done on 12 children with time elapsed ranging from 2 months to 18 months and averaging 14.3 months.

Results:

Reliability coefficients were obtained using the test-retest method. The Pearson r formula was used to estimate the stability of the scores over time. This coefficient for the thirteen retests using the Cognitive Skill Index(CSI)was .76. See figure 12. The test-retest results show a decrease in the mean CSI from 102.36 to 101.3 at the second testing. Finding a probability of .51 on a paired T test indicates, however, that this is a chance happening, and not a significant change.See figure 14.

Validity information was obtained by comparing the CSI of

the NTCS with the latest existing scores on either the "CID Pre-School Performance Scale (CIDPPS)", the "Wechsler Preschool and Primary Scale of Intelligence (WPPSI)", or the "Wechsler Intelligence Scale for Children-Revised (WISC-R)". The correlation for NTCS 1 was .779, and for NTCS 2 was .72. FIG. 13 The mean of scores on NTCS 1 was 102.36, with a standard deviation of 16.25 and a range of 58. The mean of scores on NTCS 2 was 101.3, with a standard deviation of 17.79 and a range of 51.

Discussion:

Several limitations of the NTSC became apparent as the study progressed The test manual was occasionally very difficult to follow. Directions for some of the pantomimed instructions were very confusing for both examiner and child. Scores on each subtest had no relevance by themselves. Having spent thirty to forty-five minutes administering the test it would have been very helpful to have information beyond the total score. In addition the final score was not a derived score, but a number based on the outmoded concept of mental age. Also the authors method of validating the test was inappropriate. Raw scores which change with age were correlated with achievement age scores perhaps giving a higher correlation than could be obtained from their sample by using the CSI and intelligence test measures.

Robert J. Sternberg reviewing the NTCS for "Buros Mental Management" "found the examiners manual to be full of unsupported and probably unsupportable statements." He also noted that the nomative sample of 849 children was inadequuate, and not representative of the U.S. population. Sylvia Rosenfield, also in "Buros", took issue with the fact that although the test was designed for use with special populations, no validity information was presented for these groups. Specifically lacking was any validity information on children with cultural or linguistic difficulties or children with hearing impairments.

Conclusions:

After this preliminary study it seems that its limitations notwithstanding, the NTCS warrants a further look with a larger sample and a larger retest group. The test-retest reliability on this small group was .76, a very acceptable coefficient (Cronbach). The validity coefficient on the first test was .779 and on the second test was .72. Cronbach states that typical validity coefficients on typically accepted tests range from .45 to .77. Furthermore he says that "it is unusual for a validity coefficient to rise above .60 though that is far from perfect prediction (Cronbach 1970 p.153)." The correlations on this study of the NTCS with this sample can therefore be considered exceptionally good. If future studies with larger samples and retest groups continue to provide correlations that are acceptable, then the NTCS would definately be a useful tool for the limitted context in which we have envisioned it.

Bibliography

Sternberg, Robert J.and Douglas K. Detterman. What Is Intelligence?:Contemporary Viewpoints on Its Nature and Definition. Norwood, New Jersy: Ablex Pub.Corp.,1986.

Salvia, John and James E. Ysseldyke. Assessment In Special and Remedial Education. Boston: Houghton Mifflin, 1985.

Graham, John R. and Roy S. Lily. Psychological Testing: Englewood Cliffs, New Jersy: Prentis-Hall Inc., 1984.

Compton, Carolyn. A Guide to 75 Tests for Special Education. Belmont, California: David S. Lake Pub., 1984.

Cohen, Daniel. Intelligence What Is It?; New York, New York: M. Evans and Company, Inc., 1974.

Tyler, Leona E.. Tests and Measurements. Englewood Cliffs, New Jersy:Prentis-Hall Inc., 1971.

Zieziula, Frank R.. Assessment of Hearing Impaired People: A Guide for Selecting Psychological Educational and Vocational Tests: Washington D.C.: Gallaudet College Press, 1982.

Pintner, Rudolph. Intelligence Testing:New York, New York: Henry Holt and Company, 1927.

Cronbach,Lee J.. Essentials of Psychological Testing. New York, New York: Harper & Row, 1970.

TABLE 6.3

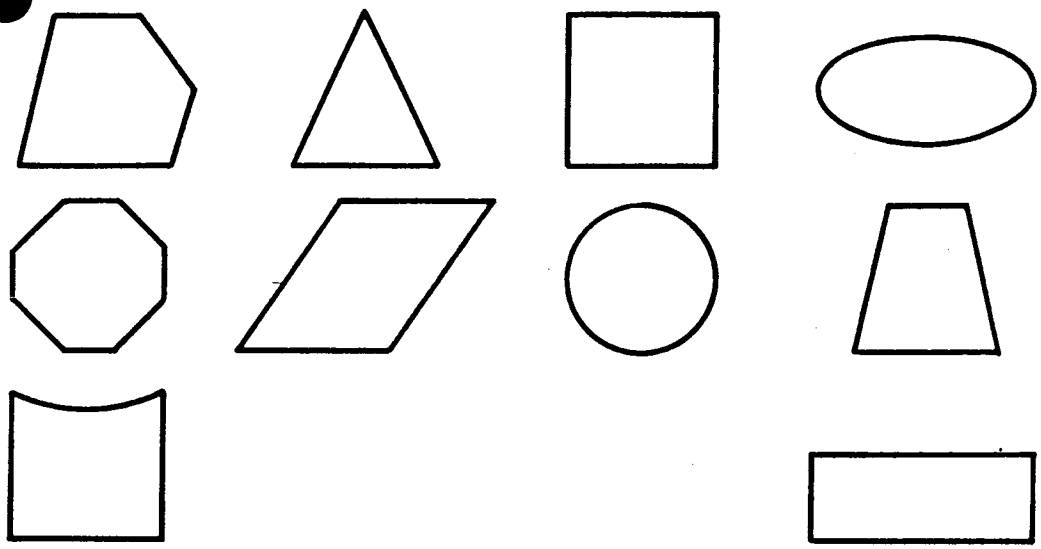
Correlations between Achievement Test Composite Scores and NTCS

Grade	N	Achievement Test	Correlation
K	40	CTBS[1]	.50
K	26	Metropolitan[2]	.65
1	40	CTBS	.56
1	30	SAT[3]	.41
2	41	CTBS	.60
2	16	SAT	.64
2	26	SAT	.46
3	42	CTBS	.65
3	25	SAT	.47
4	49	CTBS	.55
4	20	ITBS[4]	.50
5	56	CTBS	.55
6	59	CTBS	.68

[1] *Comprehensive Test of Basic Skills*
[2] *Metropolitan Readiness Test*
[3] *Stanford Achievement Test*
[4] *Iowa Tests of Basic Skills*

FIGURE 1

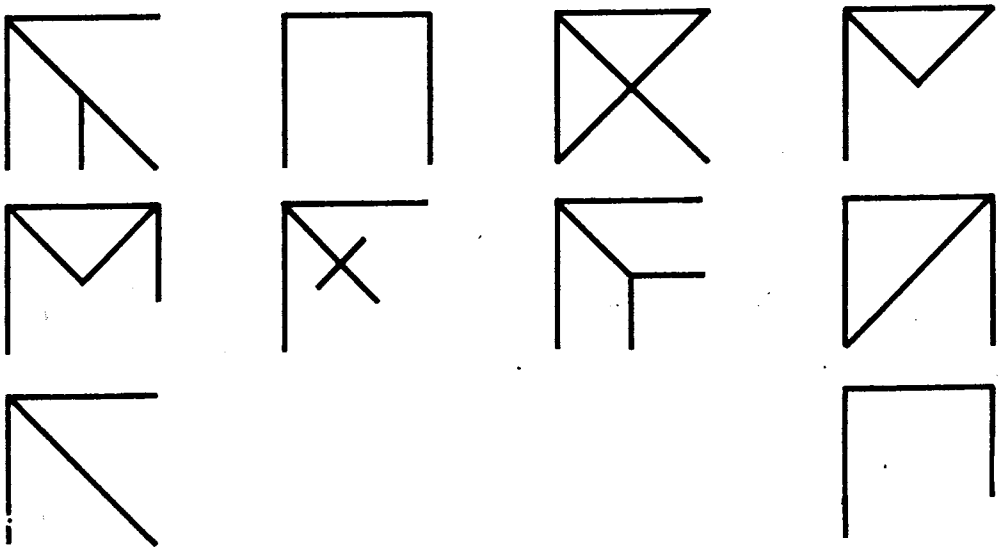
Child



Examiner

Figure Identification Card A

Child

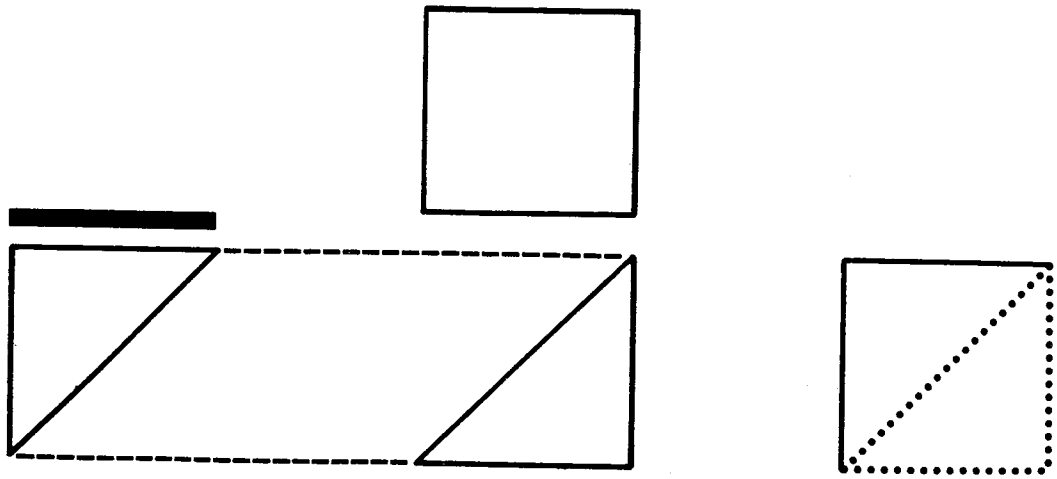


Examiner

Figure Identification Card B

FIGURE 2

Child



Examiner

Figure Completion/Demonstration Card A

Child

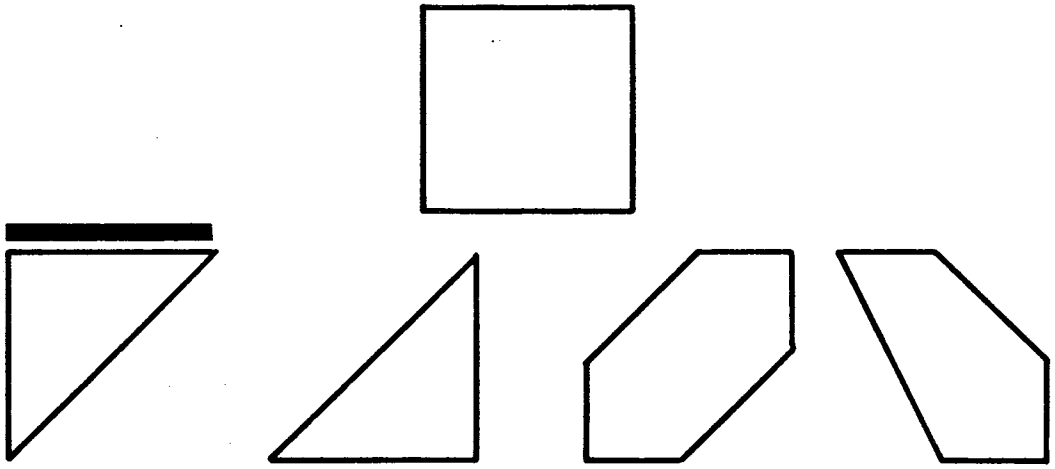


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Figure Completion/Demonstration Card B

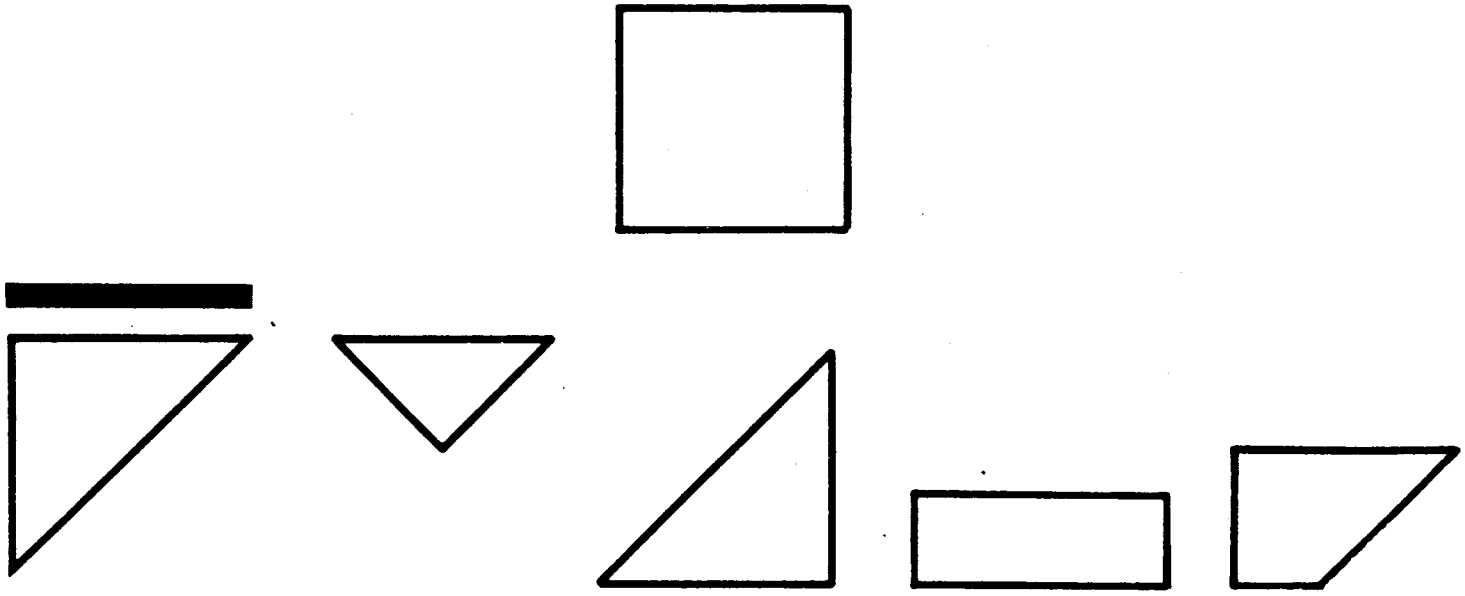


FIGURE 3

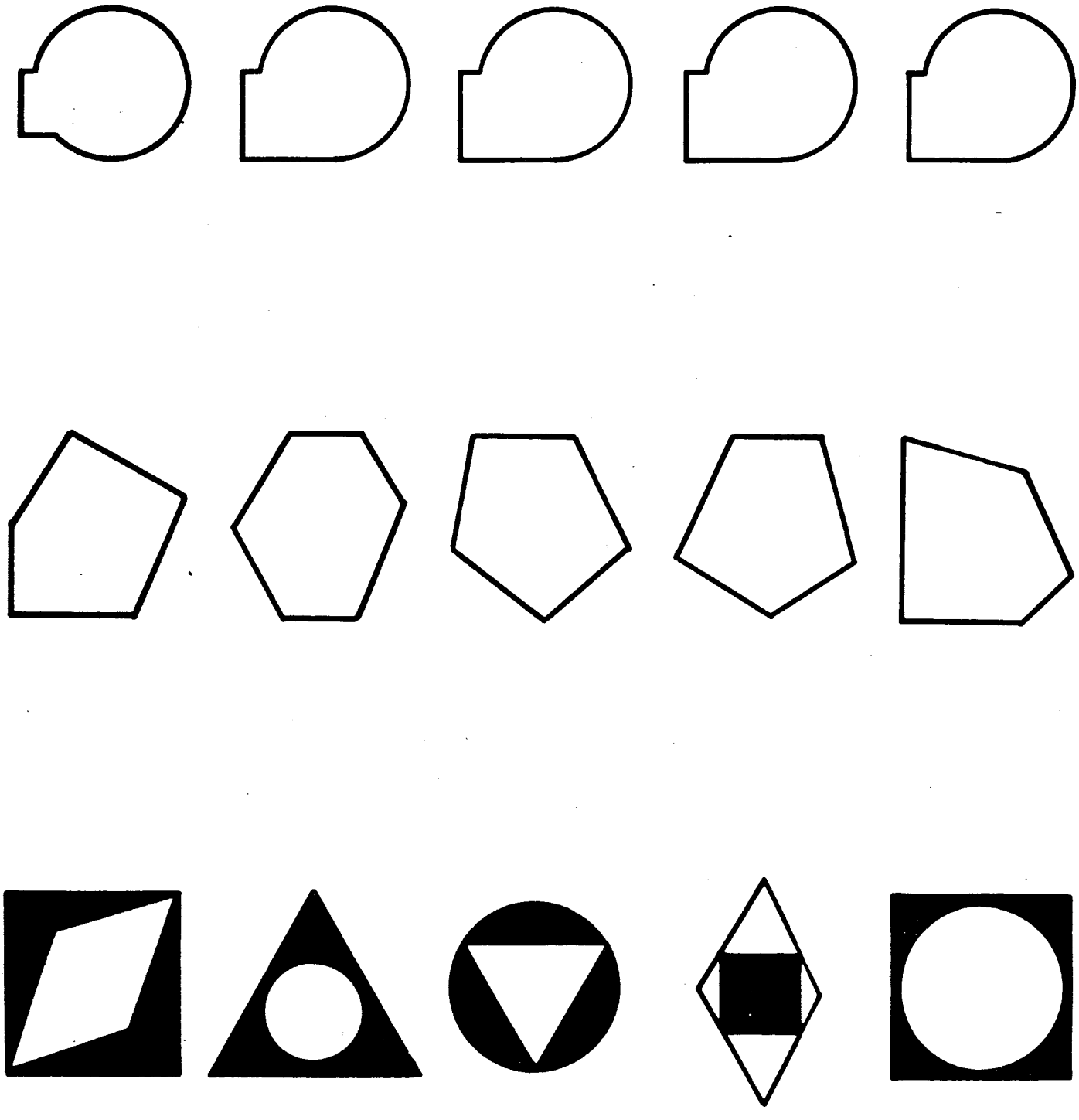
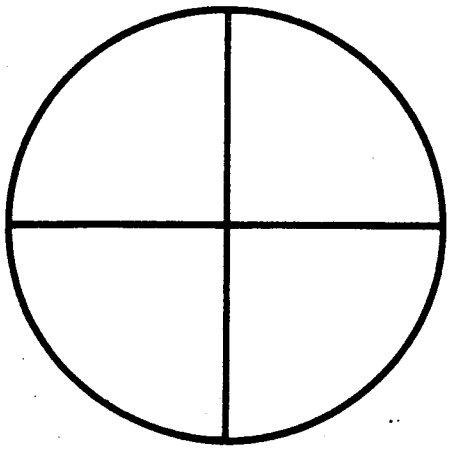
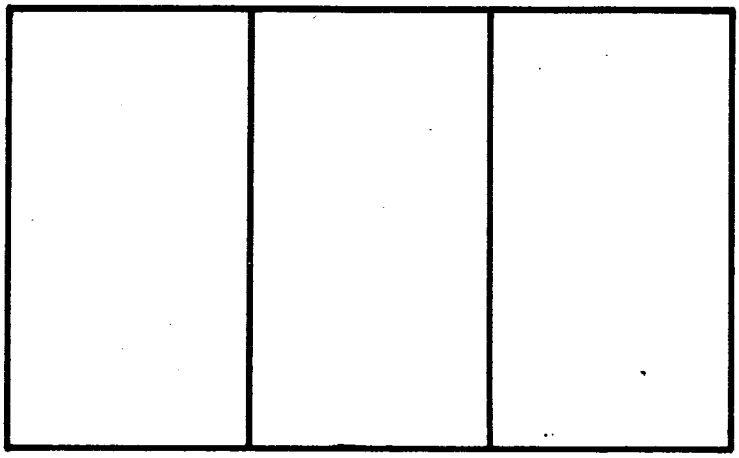


FIGURE 4





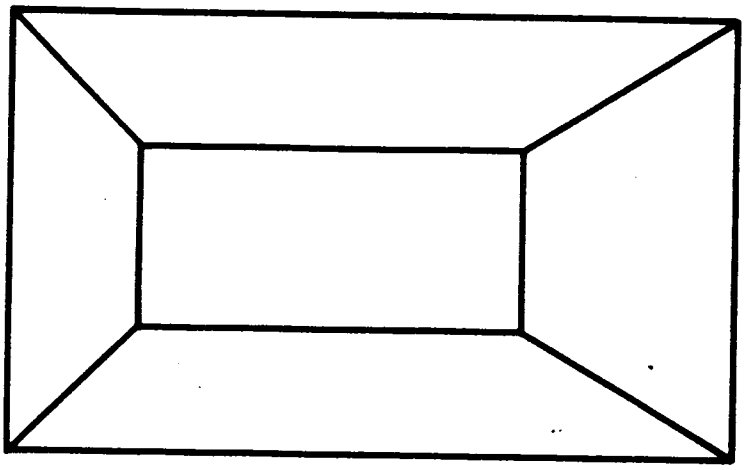
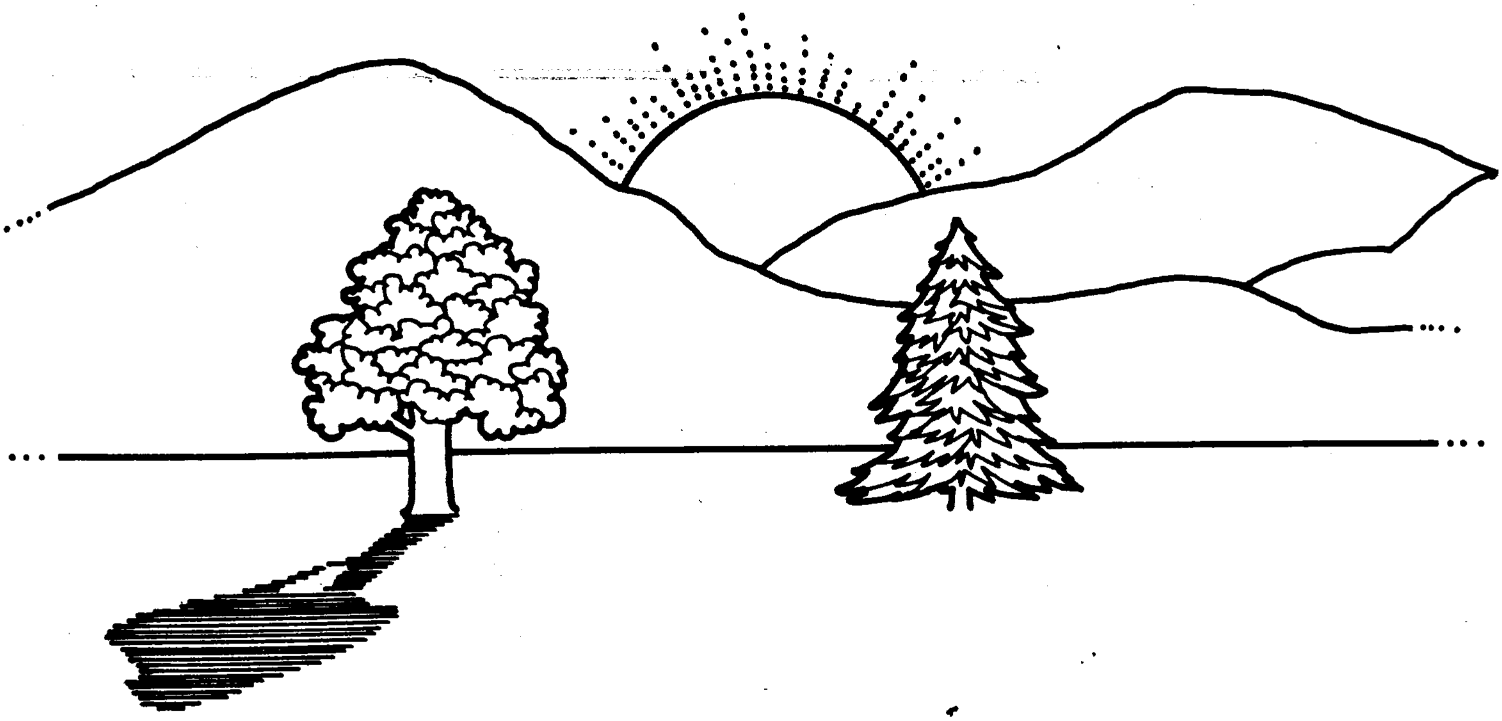


FIGURE 5

PC4



PC7

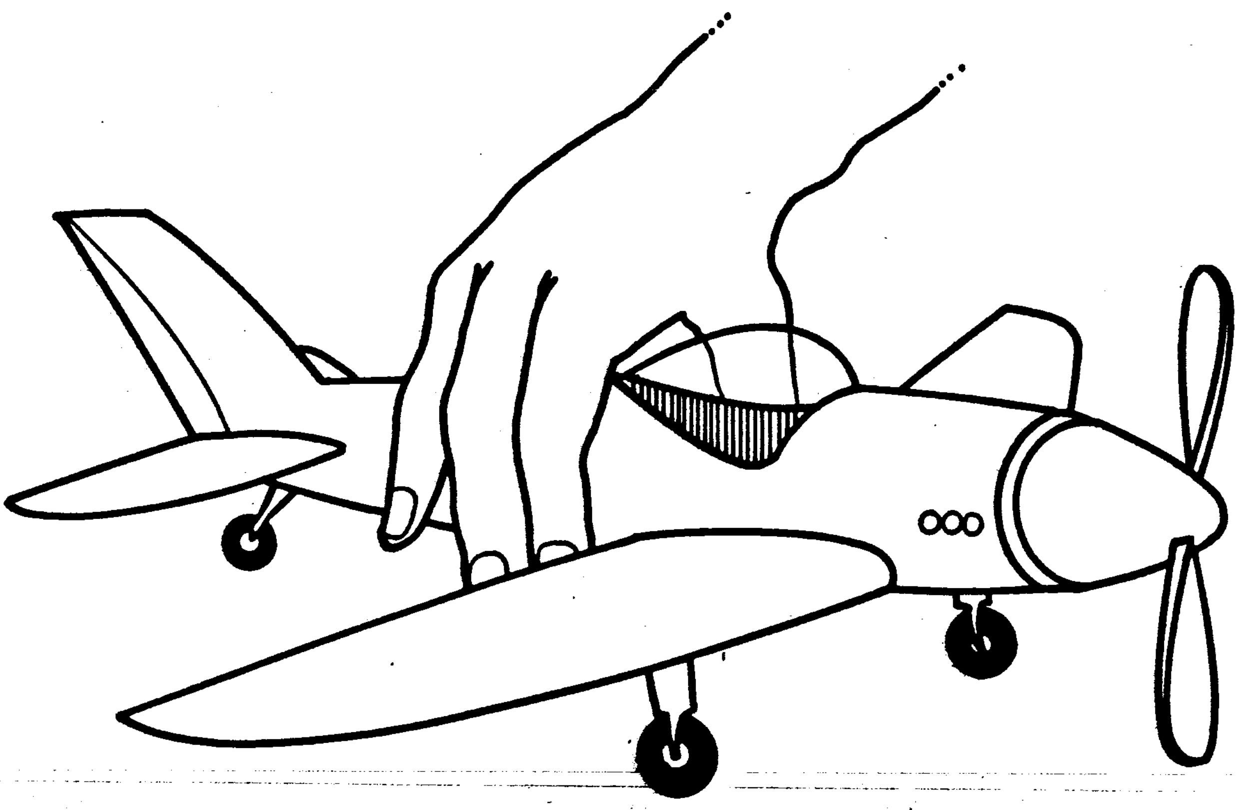
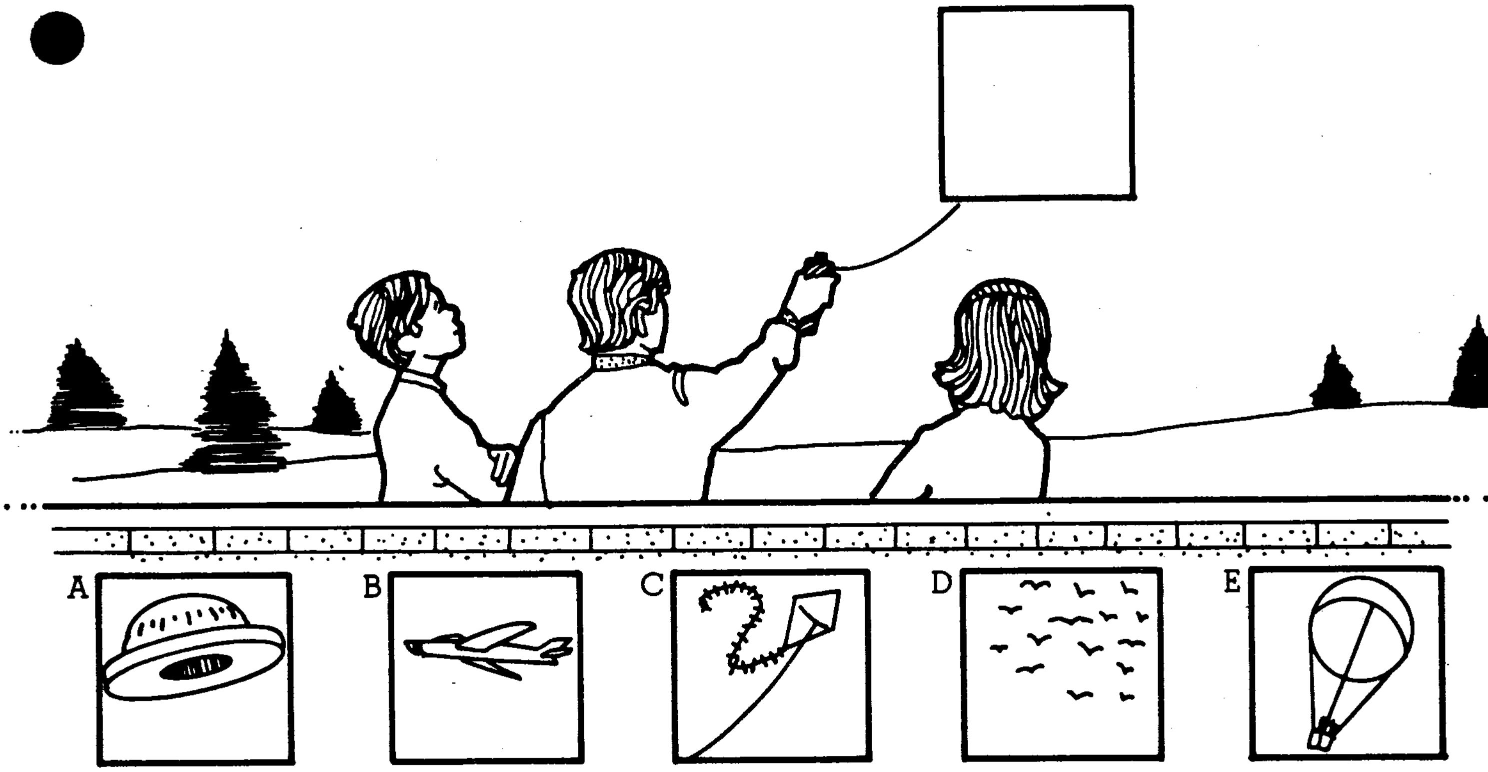


FIGURE 6

PC 12



PC 11

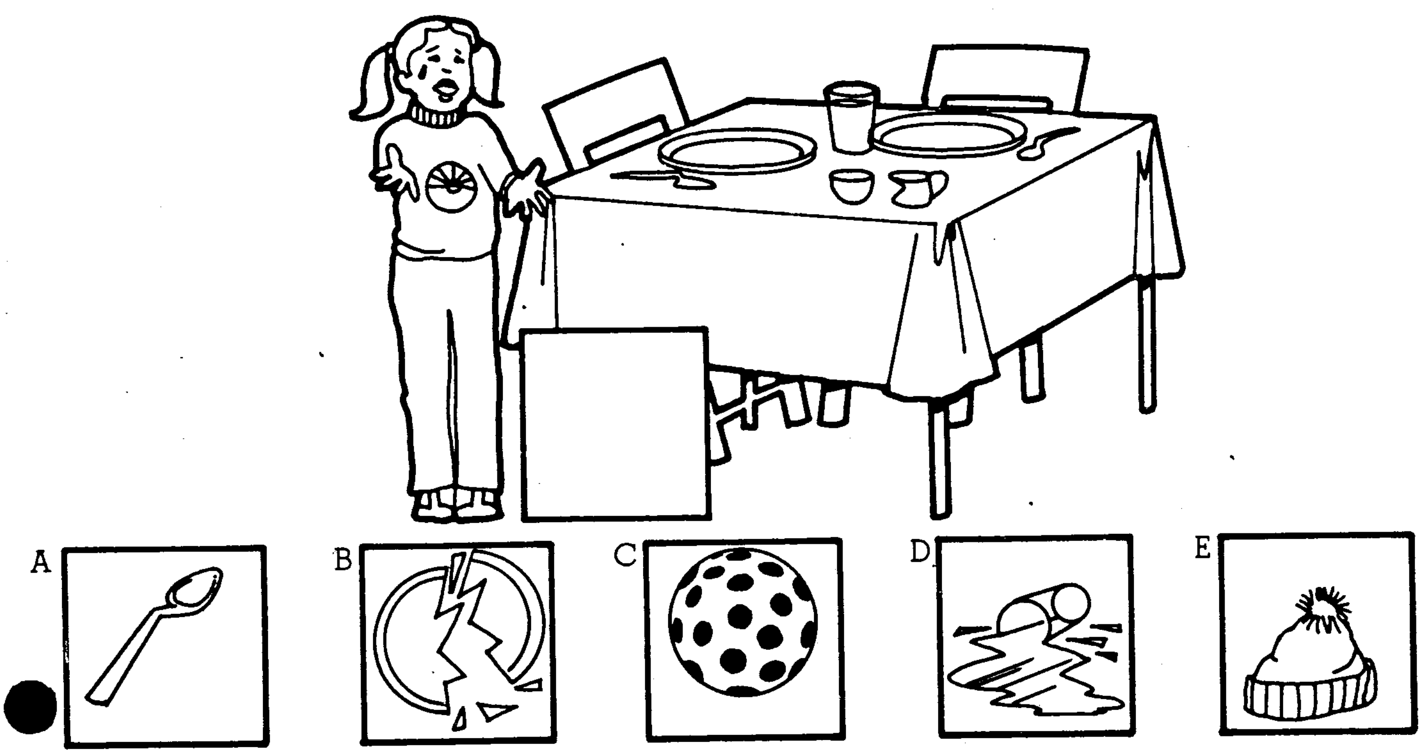
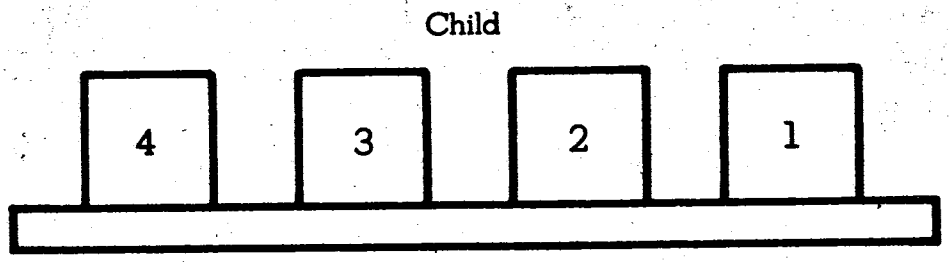


FIGURE 7

Four Cubes

1. Place before the child a set of four cubes mounted on a base.[4] Taking one of the single plain cubes in your left hand, say, "Watch!" and tap the row of cubes in sequence (1, 2, 3, 4 as shown in the illustration) at the rate of one per second. Place the cube in the child's preferred hand. Point to the set of cubes and say, "You do it!"

If the child is successful, repeat the test a second and, if necessary, a third time (two correct responses required). If the child is unsuccessful (does not tap the cubes, taps them out of sequence, or reverses the sequence), take his hand and tap the sequence correctly while repeating, "You do it!" Then repeat the test using the original directions and saying, "You do it!" If the child then responds correctly, repeat a third. time.



Knox Cubes for Four Cube Sequences

Then proceed to the succeeding test sequences:

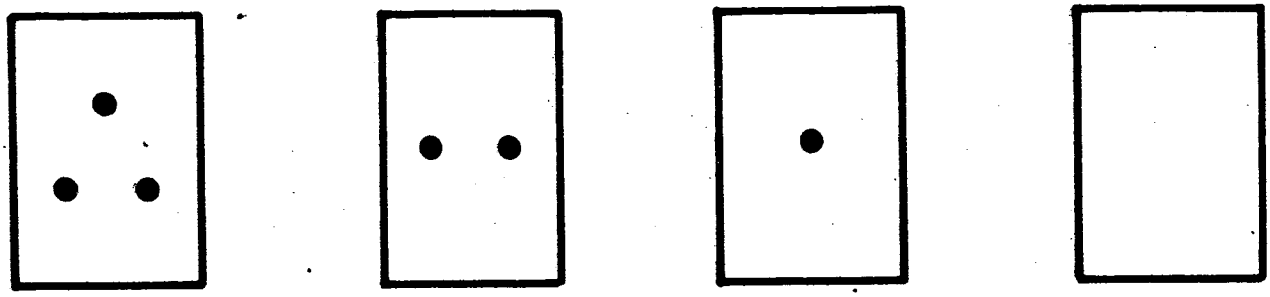
2. Simple Five: 1, 2, 3, 4, 1
1, 2, 3, 4, 3
1, 2, 3, 4, 2

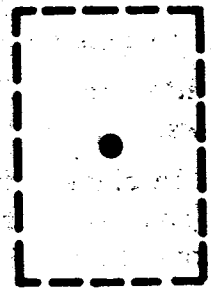
3. Complex Four: 1, 3, 2, 4
1, 4, 2, 3
1, 3, 4, 2

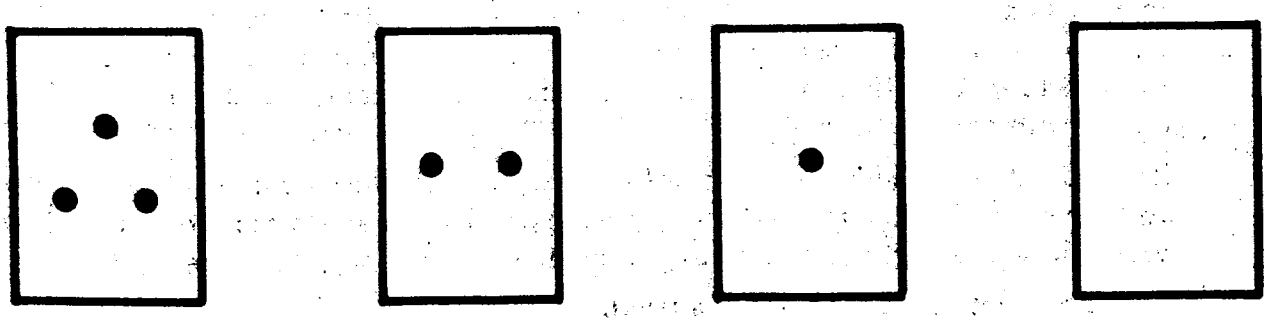
4. Complex Five: 1, 3, 2, 4, 3
1, 2, 4, 3, 4
1, 4, 3, 2, 4

FIGURE 8

Child







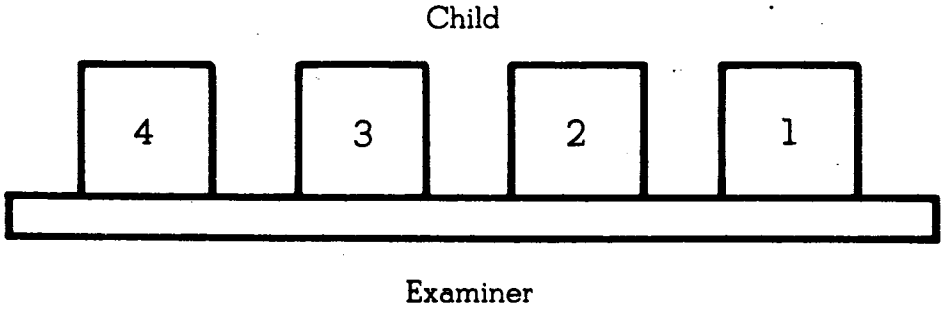
Examiner

Domino Card Demonstration

FIGURE 9

Four Cube Series

Place four cubes before the child. From your right to left, consider the cubes numbered in sequence 1, 2, 3, 4.



Cube Sequence for Tapping

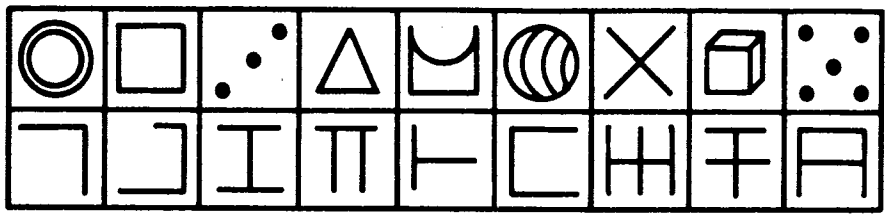
1. Take another cube in your hand[5] and after attracting the child's attention by saying, "Watch!" tap cube *one* (1), tap the table on the child's side (c); tap cube *two* (2), tap the table on the child's side (c); tap cube *three* (3), tap the table on the child's side (c); tap cube *four* (4), tap the table on the child's side (c):

1, c, 2, c, 3, c, 4, c

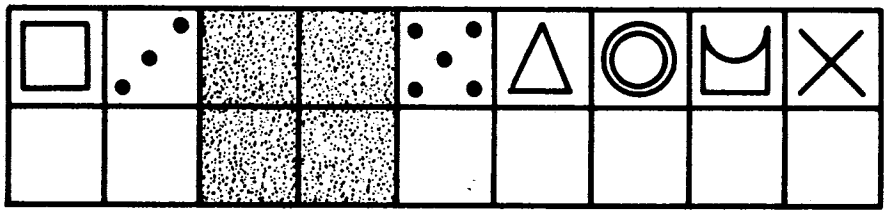
FIGURE 10

Subtest 14: FIGURE ASSOCIATION

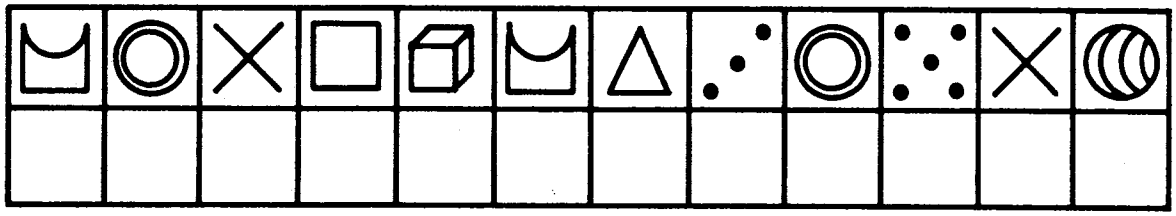
Symbol Identification

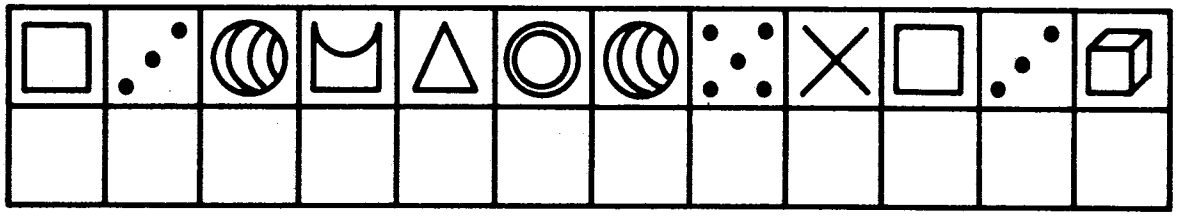


Demonstration and Practice



Test





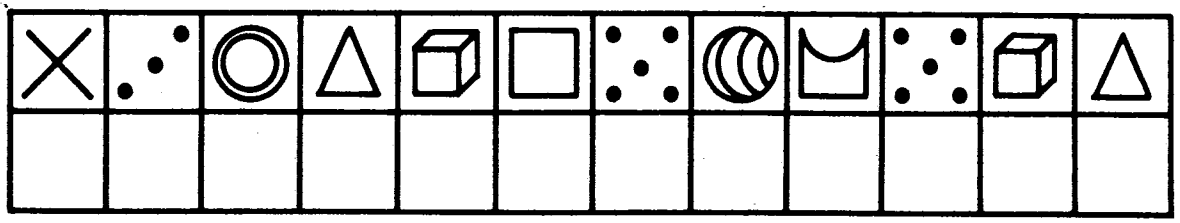


FIGURE 11

Corr. Coeff. X_1: NTCS-1 Y_1: PIQ

Count:	Covariance:	Correlation:	R-squared:
25	225.94	.779	.607

FIGURE 13

Corr. Coeff. X_1: NTCS2 Y_1: PIQ

Count:	Covariance:	Correlation:	R-squared:
13	202.846	.72	.519

Note: 12 cases deleted with missing values.

FIGURE 13

Corr. Coeff. X_1: NTCS-1 Y_1: NTCS2

Count:	Covariance:	Correlation:	R-squared:
13	187.596	.762	.58

Note: 12 cases deleted with missing values.

FIGURE 12

Paired t-Test X_1: NTCS-1 Y_1: NTCS2

DF:	Mean X - Y:	Paired t value:	Prob. (2-tail):
12	2.154	.673	.5134

Note: 12 cases deleted with missing values.

FIGURE 14.

Corr. Coeff. X_1: NTCS-1 Y_1: speech freq ave

Count:	Covariance:	Correlation:	R-squared:
25	57.693	.152	.023

	Name	CA-1	NTCS-1	CA2	NTCS2	PIQ	WIQ	PPSIQ	ELAPSED T	RS-1	RS-2	IQ-DIFF	SP FREQ AVE	RAW SC DIF
1	Delbrugge	63	109	78	123	105	105	109	15	43	76	14	100	33
2	Mueller	67	113	•	•	83	•	83	•	52	•	•	55	•
3	Chambl...	67	82	•	•	83	•	•	•	17	•	•	93	•
4	Ludvigsen	70	119	86	108	103	•	•	16	61	70	11	66	9
5	Thomas	71	80	•	•	78	•	•	•	24	•	•	63	•
6	Bodkin	72	99	74	125	100	100	90	2	46	69	26	80	23
7	Grimes	73	111	•	•	112	112	99	•	55	•	•	43	•
8	Hefner	74	130	•	•	131	131	130	•	94	•	•	130	•
9	DeFord	75	99	•	•	122	122	93	•	51	•	•	113	•
10	Stone	75	121	93	112	111	111	119	18	70	86	9	123	16
11	Erbar	86	95	•	•	101	•	101	•	58	•	•	80	•
12	McAfee	87	93	91	93	88	88	104	4	60	63	0	83	3
13	Wilcox	87	117	•	•	130	130	107	•	83	•	•	80	•
14	York	92	84	109	74	84	84	•	17	53	60	10	103	7
15	Brown	101	101	117	94	108	108	101	16	84	92	7	100	8
16	McFadden	109	95	125	84	85	85	•	16	85	84	11	120	1
17	Gratzer	111	99	•	•	101	101	103	•	92	•	•	50	•
18	Upton	111	89	128	75	87	87	•	17	80	74	14	113	6
19	Walker	118	122	135	113	129	129	•	17	114	118	9	113	4
20	Rucker	123	85	140	86	95	95	•	17	87	99	1	98	12
21	Hynes	131	111	147	116	129	129	110	16	117	131	5	108	14
22	Coons	132	129	•	•	111	111	•	•	127	•	•	113	•
23	Silva	133	117	151	114	121	121	•	18	119	163	3	86	44
24	Burdis	133	87	•	•	78	78	•	•	97	•	•	100	•
25	Letford	155	72	•	•	79	•	•	•	92	•	•	88	•

X_1: CA-1

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
96.64	26.932	5.386	725.323	27.868	25
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum Squared:**	**# Missing:**
63	155	92	2416	250890	0

1

X_2: NTCS-1

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
102.36	16.253	3.251	264.157	15.878	25
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum Squared:**	**# Missing:**
72	130	58	2559	268279	0

2

X_3: CA2

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
113.385	26.726	7.412	714.256	23.571	13
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum Squared:**	**# Missing:**
74	151	77	1474	175700	12

3

X_4: NTCS2

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
101.308	17.792	4.935	316.564	17.563	13
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum Squared:**	**# Missing:**
74	125	51	1317	137221	12

4

X_5: PIQ

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
102.16	17.846	3.569	318.473	17.469	25
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum Squared:**	**# Missing:**
78	131	53	2554	268560	0

5

X_6: WIQ

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
106.684	17.317	3.973	299.895	16.232	19
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum Squared:**	**# Missing:**
78	131	53	2027	221647	6

6

X_7: PPSIQ

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
103.769	12.153	3.371	147.692	11.711	13
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum Squared:**	**# Missing:**
83	130	47	1349	141757	12

7

X_8: ELAPSED T

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
14.538	5.206	1.444	27.103	35.809	13
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum Squared:**	**# Missing:**
2	18	16	189	3073	12

8

X_9: RS-1

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
74.44	29.089	5.818	846.173	39.077	25
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum Squared:**	**# Missing:**
17	127	110	1861	158841	0

9

X_{10}: RS-2

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
91.154	30.05	8.334	902.974	32.966	13
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum Squared:**	**# Missing:**
60	163	103	1185	118853	12

10

X_{11}: IQ-DIFF

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
9.231	6.76	1.875	45.692	73.229	13
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum Squared:**	**# Missing:**
0	26	26	120	1656	12

11

X_{12}: SP FREQ AVE

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
92.04	23.43	4.686	548.957	25.456	25
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum Squared:**	**# Missing:**
43	130	87	2301	224959	0

12

X_{13}: RAW SC DIF

Mean:	Std. Dev.:	Std. Error:	Variance:	Coef. Var.:	Count:
13.846	12.628	3.502	159.474	91.205	13
Minimum:	**Maximum:**	**Range:**	**Sum:**	**Sum Squared:**	**# Missing:**
1	44	43	180	4406	12

13

Figure 12

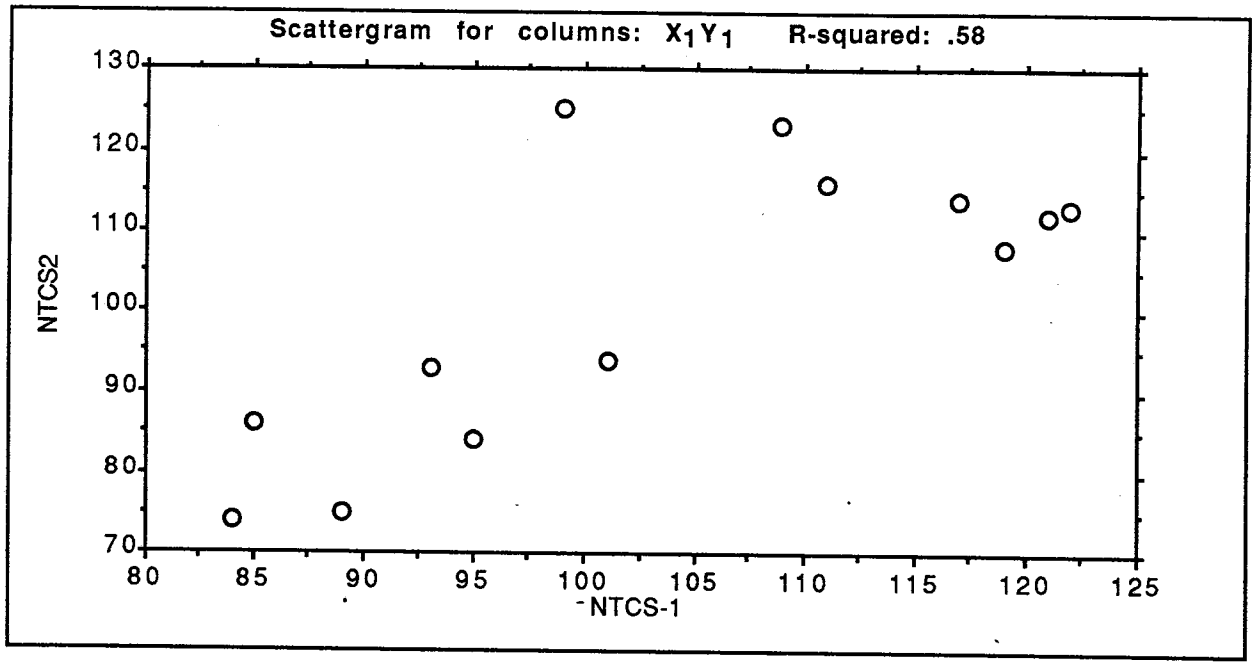
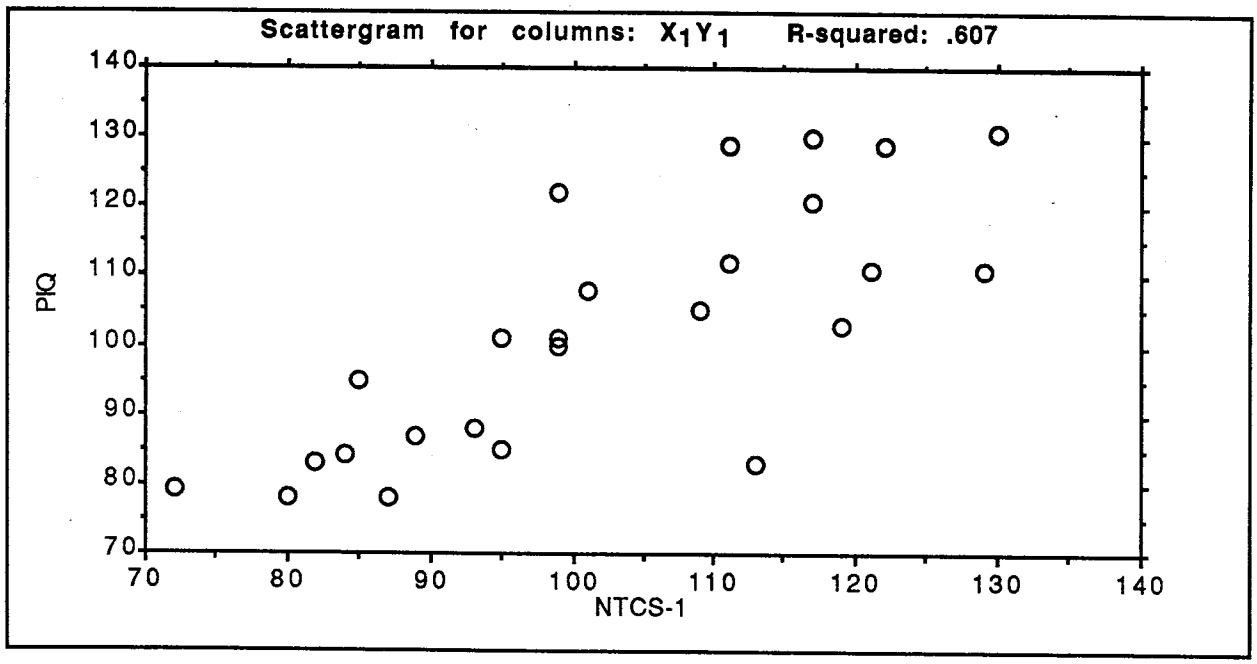
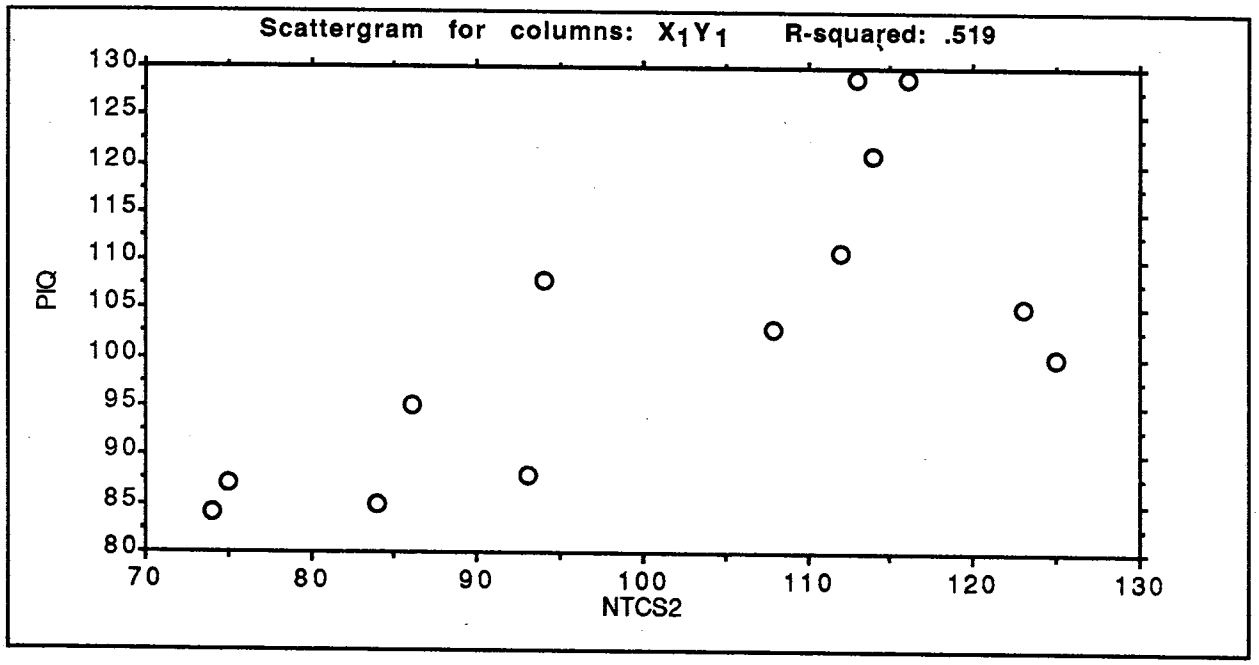

Scattergram for columns: X1 Y1 R-squared: .58
NTCS2
130
120
110
100
90
80
70
80
85
90
95
100
105
110
115
120
125
NTCS-1

Figure 2


Scattergram for columns: X1Y1 R-squared: .607
PIQ
NTCS-1
140
130
120
110
100
90
80
70
70
80
90
100
110
120
130
140


Scattergram for columns: X1Y1 R-squared: .519
PIQ
NTCS2
130
125
120
115
110
105
100
95
90
85
80
70
80
90
100
110
120
130