



Teaching students quantitative methods using resources from the British Birth Cohorts

Assessment of Cognitive Development through Childhood

Cohort members completed many assessments during childhood that capture different aspects of their cognitive development at different ages. This document, **CognitiveAssessmentQuestions.doc**, focuses on reading and mathematics only, summarising the different reading and mathematics assessments sat by the cohort members of the 1958 National Child Development Study (NCDS) and the different reading assessments sat by the 1970 British Cohort Study (BCS70) in their childhood. It includes:

- 1) A short description of the reading and mathematics assessments sat at each age.
- 2) Examples of how the questions have been presented to the cohort members in the questionnaires over the years.

1. Reading and Maths assessments in NCDS and BCS70

The 1958 National Child Development Study

NCDS age 7 (1965)

- **Southgate Reading Test** - a test of word recognition and comprehension particularly suited to identifying poor readers. In the test the children were given a picture/drawing and a list of five words. They had to put a circle round the word that correctly described the picture. There were 30 items in the test. *Southgate, V (1962) Southgate Group Reading Tests: Manual of Instructions. University of London Press*
- **Problem Arithmetic Test** - there were 10 questions for children to work out in the test. *Pringle, M.K, Butler, N, and Davie, R (1966) 11,000 Seven Year Olds. Longman, in association with National Children's Bureau.*

NCDS age 11 (1969)

- **Reading Comprehension Test** –constructed by the National Foundation for Educational Research in England and Wales (NFER) specifically for use in this study¹. There were 35 items in the test and 20 minutes in which to complete the test.
- **Arithmetic/Mathematics Test** - again constructed by NFER especially for use in this study. There were 40 items in the test.

NCDS age 16 (1974)

- **Reading Comprehension Test** - the same test as used at 11 but this time only 10 minutes were allowed to complete the 35 item exercise.
- **Mathematics Test** - devised at the University of Manchester and originally intended for use in an NFER study of comprehensive schools. There were 31 items and 45 minutes in which to complete the test.

The 1970 British Cohort Study

BCS70 age 5 (1975)

- **The English Picture Vocabulary Test (EPVT)** - the aim of this test was to assess early English language development and understanding. Children were asked to identify which picture out of four corresponded to a test word. For example, if the test word read out by the interviewer was 'ball', one of the four pictures presented to the child would be of a ball. The child had to point to the picture of the ball to be awarded 1 point for a correct answer. There were 56 items in the assessment. The assessment was stopped when the child made five mistakes in a run of eight consecutive items. *Brimer, M. A., & Dunn, L. M. (1962). English Picture Vocabulary Test. Bristol: Education Evaluation Enterprises.*

BCS70 age 10 (1980)

- **The Shortened Edinburgh Reading Test.** Children were asked to complete a variety of tasks including matching words to pictures - selecting the incorrect word in a sentence - matching answers to questions - extracting information from a picture - answering questions after reading some text - understanding

¹ Tests which are unreferenced have not been published.

the meaning of words - putting sentences in the correct order. There were 66 items and the child received 1 point for each correct answer. *Hodder and Stoughton (1979). The Shortened Edinburgh Reading Test. Kent: Hodder and Stoughton Educational Ltd*

BCS70 age 16 (1986)

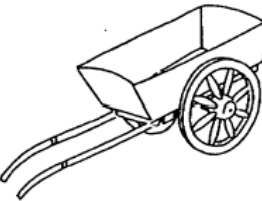



- **Vocabulary Test** - a test to assess reading and understanding. Cohort members were asked to read a word and then select another word that meant the same or nearly the same from a list of five words. There were 75 words in the test and they were given 15 minutes to complete the exercise. *Closs, S. J. (1976). APU Vocabulary Test (multiple choice format, 1986). Kent: Hodder and Stoughton Educational Ltd*

2. Examples of how questions were presented in the questionnaires

a) NCDS Questionnaires

NCDS 1965: Age 7 (paper questionnaire)

Reading Test (examples)

<p>21.</p>  <p>coát <u>cart</u> card catch kite</p>	<p>26.</p>  <p>soldiers saucer scratch screams <u>scissors</u></p>
<p>22.</p>  <p>kind clang crying sing <u>king</u></p>	<p>27.</p>  <p>shame chin cane <u>chain</u> shone</p>

Arithmetic Test (examples)

Child's Name _____

1. Peter had 4 toy cars and he bought 2 more. How many toy cars did he have altogether?
_____ toy cars

2. A man had 8 books and he lost 3 of them. How many books did he have left?
_____ books

3. How many socks are there in 4 pairs?
_____ socks

4. If ice creams cost 3d. each, how many can I buy for 1s.?
_____ ice creams

5. How many inches are there in 2 feet?
_____ inches

NCDS 1969: Age 11 (paper questionnaire)

Reading Test (also used at age 16) (first and last 5 questions)

Can you read the words in the next line?

A BIRD LAYS ITS EGGS IN A (POND, STREAM, CLOUD, HOUSE, NEST).

The word NEST has a line under it because it is the right word to complete the sentence; all the others are wrong.

Here is another:

BREAD IS MADE FROM (WOOD, FLOUR, GRASS, STONE, SALT).

FLOUR is the right word so a line has been put under it.

NOW GO THROUGH THE SENTENCES BELOW AND PUT A LINE UNDER THE RIGHT WORD IN EACH ONE.

IF YOU ARE NOT QUITE SURE OF AN ANSWER, UNDERLINE THE WORD WHICH YOU THINK IS MOST LIKELY TO BE RIGHT.

1. The child went to get some sea-water in her (basket, bucket, pipe, castle, beach).
2. Cats usually like eating (eggs, fish, cabbage, kittens, water).
3. About a week after (ordering, receiving, emptying, managing, upsetting) this letter, I had a telegram from my brother.
4. You can arrange a (money, summer, journey, job, weather) through a travel agent.
5. Although I had run all the way, I reached the shop just after it had shut and I felt very (annoyed, relieved, rejected, hopeless, doubtful).

31. Having had her expectations so much raised, it was very (realistic, discrediting, uplifting, disconcerting, discriminating) to have them suddenly shattered.
32. A strong gale had been blowing all night and the (following, ensuing, much, causing, destroying) damage in the garden took John several days to repair.
33. Whilst self-restraint is a praiseworthy quality which one should try to cultivate, it runs as much danger of being exaggerated as its (counterpart, equal, quality, virtue, denial), the free expression of personal feelings and emotions.
34. It took three men to (refrain, prohibit, restrain, catch, restrict) the youth from rushing into the burning shed to rescue his pet dog.
35. The boss firmly denied any accusation of discrimination; he claimed that the policies of his firm were not dictated by (shareholders, prejudice, incrimination, accusations, profits).

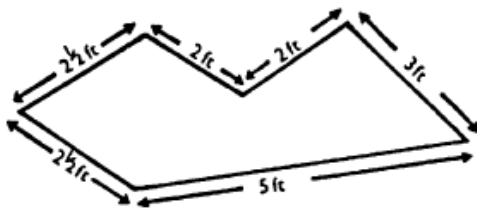
Arithmetic/Mathematics Test (examples)

Add (+)

$$\begin{array}{r} 967 \\ + 154 \\ \hline \end{array}$$

Subtract (-)

$$\begin{array}{r} 6841 \\ - 5952 \\ \hline \end{array}$$



What is the distance all the way round this figure?

.....feet

In both series of numbers below a number is missing. Fill in the missing numbers.

5, 10, 20, 26, 36, 43, 53,

7, 14, 16, 8, 6, 18, 21, 7, 4, 16,

What fraction of this rectangle is shaded?



(.....)

NCDS 1974: Age 16 (paper questionnaire)

Mathematics Test (examples)

1. Which of the following numbers is a quarter of a million?
 - A. 25,250
 - B. 40,000
 - C. 4,000,000
 - D. 250,000
 - E. 2,500,000

2. Which of the following is not necessarily true of a parallelogram?
 - A. The opposite sides are parallel
 - B. The diagonals are equal
 - C. The diagonals bisect each other
 - D. The opposite sides are equal
 - E. The opposite angles are equal

Questions 28 - 31 are in the form of the statements printed below, each of which is correct, incorrect, imprecise or incomplete. If it is correct put a tick (✓) by it; if it is not, write out the correct statement next to it.

28. Area is length times breadth.

29. 12.3 inches, correct to 3 significant figures.

30. If $2x + 1 = 0$, then $x = \frac{1}{2}$.

31. In $\triangle ABC$, $AB + BC > AC$.

b) BCS70 Questionnaires

BCS70 1975: Age 5 (paper questionnaire)

English Picture Vocabulary Test (EPVT)

C English Picture Vocabulary Test
(Survey Version)

The Test

Each page of the "English Picture Vocabulary Test Series of Plates" (EPVT booklet) contains four different pictures numbered 1, 2, 3, 4, one of which is a picture of a test word to be found on the score sheet for this test. The object of the test is for the child to identify the pictures, which correspond to the test words. The test words become harder as the test progresses. Do not attempt the test with non English-speaking children.

Test words (Pages 1 to 56)

1 <input type="checkbox"/> <input type="checkbox"/> drum	15 <input type="checkbox"/> <input type="checkbox"/> goat	29 <input type="checkbox"/> <input type="checkbox"/> barber	43 <input type="checkbox"/> <input type="checkbox"/> sole
2 <input type="checkbox"/> <input type="checkbox"/> time	16 <input type="checkbox"/> <input type="checkbox"/> peeping	30 <input type="checkbox"/> <input type="checkbox"/> wasp	44 <input type="checkbox"/> <input type="checkbox"/> walrus
3 <input type="checkbox"/> <input type="checkbox"/> fence	17 <input type="checkbox"/> <input type="checkbox"/> temperature	31 <input type="checkbox"/> <input type="checkbox"/> yawning	45 <input type="checkbox"/> <input type="checkbox"/> weapon
4 <input type="checkbox"/> <input type="checkbox"/> skiing	18 <input type="checkbox"/> <input type="checkbox"/> signal	32 <input type="checkbox"/> <input type="checkbox"/> captain	46 <input type="checkbox"/> <input type="checkbox"/> sentry
5 <input type="checkbox"/> <input type="checkbox"/> chicken	19 <input type="checkbox"/> <input type="checkbox"/> river	33 <input type="checkbox"/> <input type="checkbox"/> trunk	47 <input type="checkbox"/> <input type="checkbox"/> wailing
6 <input type="checkbox"/> <input type="checkbox"/> climbing	20 <input type="checkbox"/> <input type="checkbox"/> badge	34 <input type="checkbox"/> <input type="checkbox"/> argument	48 <input type="checkbox"/> <input type="checkbox"/> globe
7 <input type="checkbox"/> <input type="checkbox"/> leaf	21 <input type="checkbox"/> <input type="checkbox"/> hook	35 <input type="checkbox"/> <input type="checkbox"/> coin	49 <input type="checkbox"/> <input type="checkbox"/> valve
8 <input type="checkbox"/> <input type="checkbox"/> digging	22 <input type="checkbox"/> <input type="checkbox"/> whale	36 <input type="checkbox"/> <input type="checkbox"/> hive	50 <input type="checkbox"/> <input type="checkbox"/> plumage
9 <input type="checkbox"/> <input type="checkbox"/> teacher	23 <input type="checkbox"/> <input type="checkbox"/> acrobat	37 <input type="checkbox"/> <input type="checkbox"/> chemist	51 <input type="checkbox"/> <input type="checkbox"/> assistance
10 <input type="checkbox"/> <input type="checkbox"/> sewing	24 <input type="checkbox"/> <input type="checkbox"/> tweezers	38 <input type="checkbox"/> <input type="checkbox"/> funnel	52 <input type="checkbox"/> <input type="checkbox"/> carpenter
11 <input type="checkbox"/> <input type="checkbox"/> nest	25 <input type="checkbox"/> <input type="checkbox"/> submarine	39 <input type="checkbox"/> <input type="checkbox"/> insect	53 <input type="checkbox"/> <input type="checkbox"/> destruction
12 <input type="checkbox"/> <input type="checkbox"/> arrow	26 <input type="checkbox"/> <input type="checkbox"/> balancing	40 <input type="checkbox"/> <input type="checkbox"/> cutlery	54 <input type="checkbox"/> <input type="checkbox"/> spire
13 <input type="checkbox"/> <input type="checkbox"/> parachute	27 <input type="checkbox"/> <input type="checkbox"/> binocular	41 <input type="checkbox"/> <input type="checkbox"/> shears	55 <input type="checkbox"/> <input type="checkbox"/> reel
14 <input type="checkbox"/> <input type="checkbox"/> cobweb	28 <input type="checkbox"/> <input type="checkbox"/> ornament	42 <input type="checkbox"/> <input type="checkbox"/> exhausted	56 <input type="checkbox"/> <input type="checkbox"/> coast

BCS70 1980: Age 10 (paper questionnaire)

Reading Test (examples)

(EXAMPLE)

Why are you ~~been~~ late?

- I3008 1 Philip borrowed off my bicycle
- I3009 2 In the summer, we play in out the park
- I3010 3 I have just been on away holiday
- I3011 4 Why are your nose feet dirty?
- I3012 5 Give your ball needs blowing up

Read each of these sentences carefully. In each one, see if you know or can find the meaning of the hard word which is underlined. Look in the list below for an easier word to go in its place, and write it in the brackets at the end of the sentence.

- 1 She managed to reduce the amount she spent each week (cut I3027)
- 2 As he was speaking, someone interrupted with an angry remark (cut I3028)
- 3 The village was isolated by heavy falls of snow (cut I3029)
- 4 Time was short, so we had to exclude a visit to London (cut I3030)

cut open cut off

cut out cut away

cut down cut in

BCS70 1986: Age 16 (self-completion paper questionnaire)**Vocabulary Test (first and last 10 words)**

	(a)	(b)	(c)	(d)	(e)
1. BEGIN	ask	start	plain	over	away
2. AID	help	contrive	assent	manage	hurry
3. FOREST	grass	wood	sleep	grind	judge
4. QUICK	always	best	neat	sick	fast
5. REWARD	notice	golden	prize	stable	marine
6. ENQUIRE	betray	baffle	singers	occult	ask
7. CHASE	hunt	cost	lever	chair	gamble
8. MOAN	wail	profit	self	yield	low
9. WITNESS	observer	scramble	clean	serve	lawyer
10. ADVERTISE	magazine	cinema	publicise	blame	copy

66. PRETENTIOUS	sham	clever	concealed	showy	abusive
67. SENSUAL	clever	carnal	emotional	heretic	slandorous
68. PRINCIPLE	conviction	chief	smallest	corrosion	governor
69. ACQUIESCE	watery	concur	steal	quiet	glow
70. SUPINE	propensity	recumbent	eating	umbrage	suspect
71. UBIQUITOUS	omnipresent	perdition	adduce	muddy	viscous
72. PROSAIC	commonplace	flowery	laudable	poetical	spacious
73. ASCETIC	artistic	dissolute	austere	antipathetic	charlatan
74. APOSTATE	insufferable	monastic	exegesis	renegade	vicious
75. PUSILLANIMOUS	loud	living	timid	averse	correct