

## A New Zealand Information Subtest for the WAIS-R

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The aim of this study was to develop a WAIS-R Information Subtest suitable for use with New Zealand subjects. Eight American items in the WAIS-R scale were replaced with questions appropriate to New Zealanders. This new scale was standardized on 200 general hospital patients and demonstrated similar properties to the WAIS-R Information Subtest. It is hoped the development of this New Zealand standardized scale will encourage the use of the WAIS-R amongst New Zealand psychologists.

The Wechsler Adult Intelligence Scale (WAIS) was first published in 1955. It was developed from the original Wechsler-Bellevue Intelligence Scale which was one of the first attempts to provide an intelligence test designed specifically for adults. In the years following its publication, the WAIS came to be recognized as one of the best constructed and standardized psychological tests available (see Matarazzo, 1972; Zimmerman & Woo-Sam, 1973 for reviews).

In 1981, Wechsler published a revised version of the WAIS called the WAIS-R. This new test kept the original format of the WAIS with six verbal and five performance subscales, yielding separate Verbal and Performance I.Q.'s as well as a Full Scale I.Q. score. The content of the WAIS-R items was however updated and the order of some items modified to reflect changes in item difficulties. The whole test was restandardized on 1,880 Americans aged between 16 and 74.

The focus of the present research is on the Information subtest, one of the verbal subscales of the WAIS-R. The Information subtest is a series of 29 questions presented in order of ascending difficulty, as determined by the percentage of subjects passing each item in the standardization sample. Item content covers a wide range of general knowledge that adults presumably have had an opportunity to acquire in the American culture. Wechsler, however, made an effort to avoid questions of specialized or "academic" knowledge. In the 1981 revision, administration of the Information subscale was slightly changed and nine of the original WAIS items were replaced with more up-to-date questions.

However, the WAIS-R Information subtest contains items designed specifically for an

American population and some of these items would disadvantage New Zealand subjects. This problem has caused the use of the WAIS-R to be avoided by many local psychologists in favour of the original WAIS (Sisley & Field, 1986). Some psychologists have made their own ad hoc and unstandardized modifications to "American" items or prorated the Information score from the other verbal scale scores.

The difficulties caused by "American" Information scale questions have also been faced by Australian psychologists. In an attempt to modify the WAIS-R for Australian usage, ACER published an Australian adaptation of the WAIS-R (Australian Council for Educational Research, 1983). This involved replacement of the "American" questions with items more suited to an Australian population. These items included questions such as "Who was Ned Kelly?" and "In what direction would you travel if you went from Darwin to Adelaide?" The Australian items were trial tested on a sample of 377 Melbourne subjects, comprising of technical college students, apprentices, workers in a government department and members of a Melbourne over 60's club.

The Australian trial testing was mostly undertaken by group administrations of the test (de Lemos, 1983). Since the WAIS-R is designed for individual administration this created difficulties in scoring, as it "was not possible to follow-up incomplete or unclear responses by further questioning" (ACER, 1983). The group administration also meant that one item (Clothes) could not be given and analysis of the complete Australian scale was not possible.

While group administration may be more

Table 1: *Development Sample by Age and Sex*

Age group	Number in each age group by sex		
	Male	Female	Total
16 - 17	1	2	3
18 - 19	11	8	19
20 - 24	13	19	32
25 - 34	18	30	48
35 - 40	12	21	33
45 - 54	8	12	20
55 - 64	13	9	22
65 - 69	5	3	8
70 - 74	2	4	6
75 +	2	7	9

time efficient, it has clear disadvantages for the Information scale in terms of the fact individual items cannot be checked for understanding. Individual administration of the Information scale was therefore incorporated into the design of this study.

The aim of the present research was to

replace eight "American" items such as "How many senators are there in the U.S. Senate?", with items standardized on a New Zealand population. This paper reports the development of an Information subtest suitable for use with New Zealand subjects that has similar properties to the American WAIS-R subtest.

## Method

### Subjects

The subjects were 200 patients in Waikato Hospital medical, surgical and obstetric wards. Subjects were only included in the study if their medical condition was thought by the Ward Charge Nurse not to hamper their performance. Patients were not included if they had suffered a head injury. Overall, 115 (57.5%) of the subjects were female and 85 male. Ages ranged from 16 to 84 with a mean age of 38.92 (S.D. = 17.91). The age distribution of the sample is shown in Table 1.

Table 2: *Percentage of Subjects Correctly Passing Information Subtest Items in Hospital, Original WAIS-R, and ACER Samples*

Order		Waikato Hospital Sample	Original WAIS-R Sample	ACER Australian Sample
1.	Ball	100	100	99
2.	Months	99.5	99	99
3.	Thermometer	97.5	99	91
4.	Flag	a 89.5	100	91
5.	Sun	87	91	83
6.	Weeks	86	84	85
7.	Florence	a 84.5		76
8.	Armstrong	82.5	83	62
9.	Labour	76	79	
10.	Hone Heke	a 75.5		
11.	NZPMS	a 73.5		
12.	Hamlet	72.5	72	80
13.	King	69.5	63	52
14.	Clothes	62.5	65	
15.	Wellington	a 60.5		
16.	Italy	60	66	79
17.	Brazil	59	77	66
18.	Leaves	a 56	b	
19.	Stalin	a 54.5		
20.	Baxter	a 53.5		
21.	Sahara	52.5	53	64
22.	Yeast	47	42	38
23.	Genesis	38	54	45
24.	Temperature	36.5	33	46
25.	Blood Vessels	29.5	30	32
26.	Koran	28	21	31
27.	Relativity	27	46	44
28.	Curie	26.5	26	27
29.	Faust	5.5	7	4

a New items

b Tested in 100 subjects only

Europeans comprised 87.5% of the total sample with Maoris making up 10.5% and other races 2%. The average number of years at secondary school was 2.96 (S.D. = 1.61).

#### Procedure

All subjects were administered the WAIS-R information subtest individually by a hospital clinical psychologist. Eight of the original WAIS-R American items were excluded and replaced by a number of experimental items generated by clinical psychology staff. The items excluded were: Flag, Presidents, Panama, Civil War, Earhart, Senators, Paris and Population.

#### Results

The items were ordered in terms of the percentage of subjects correctly passing each question. This resulted in some reordering from the original WAIS-R scale as some items, such as Brazil, were found to be more difficult by New Zealand subjects while others were slightly easier. The eight new items are marked in Table 2 and their scoring criteria appear in Appendix A. One of the new items (Leaves) was only administered to 100 subjects.

The equivalence of the Waikato Hospital Scale to the WAIS-R Information subtest was determined by comparing the mean percentage of subjects passing each item in the WAIS-R Information subtest and the Waikato Hospital Scale. For the WAIS-R this percentage was 61.76 and for the Waikato Hospital Scale it was 61.72. The equivalence of the Waikato Hospital Scale was further examined by comparing the mean and standard deviation in subjects aged 20 to 34. This age group comprised the reference group used by Wechsler to derive the scaled scores for all of the WAIS-R subtests. In this age group the Waikato Hospital Scale has a mean of 19.11 and a standard deviation of 5.89 ( $n = 50$ ). This closely matches the properties of the WAIS-R standardization sample. One standard deviation below the mean is given on the WAIS-R record form as 13 WAIS-R Information scale points and one standard deviation above the mean is 25 points.

In summary, both the mean percentage of subjects passing each item and the mean and standard deviation of the standardization sample, indicate the WAIS-R and Waikato Hospital Information Scales are of equivalent

difficulty. The Cronbach alpha of the hospital scale was .89 ( $n = 100$ ).

#### Discussion

This study presents an Information subtest for the WAIS-R suitable for use with New Zealand subjects. To date there has been no other attempt to develop a New Zealand version of this scale.

In the development of the subtest an effort was made to change the original format of the WAIS-R as little as possible and to avoid items of specialist knowledge. The eight new items are designed to reflect a general knowledge that most New Zealanders may have been able to acquire. Two arguably American items, Armstrong and King, are retained in the Waikato Hospital Scale. Both these items demonstrated similar levels of difficulty when compared with their ranking in the American standardization. Unlike the ACER trial testing, all the Information subtest items were individually administered.

While the setting for the present research was a large general hospital with a heterogeneous catchment population, the study is limited by the use of a purely hospital sample. It is hoped future research on the Waikato Hospital Scale will be conducted in other representative New Zealand samples.

Currently, psychologists in clinical practice have been restricted to either prorating Information scale scores, composing their own unstandardized items or persevering with the WAIS. The use of the Waikato Hospital Scale will enable psychologists to use an information scale with equivalent properties to the WAIS-R subtest. Further, it may facilitate the use of the more up-to-date WAIS-R as opposed to continued use of the original WAIS.

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## Appendix A

Item No.	Question	Acceptable Responses
4.	What are the colours of the New Zealand flag?	Red, white and blue.
7.	Who was Florence Nightingale?	Nurse . . . founder of the nursing profession . . . Nurse in the Crimean War.
10.	What was the Hone Heke famous for?	Maori warrior . . . Maori Chief . . . Maori warrior who cut down the flagpole at Russell.
11.	Name four people who have been Prime Ministers of New Zealand since 1950?	Any four of the following: Holland, Nash, Holyoake, Marshall, Kirk, Rowling, Muldoon, Lange.
15.	In what direction would you travel if you went from Wellington to Sydney?	West or Northwest (not North).
18.	What is the name given to trees that lose their leaves in winter?	Deciduous.
19.	Who was Joseph Stalin?	Russian leader . . . leader of Russian Communist Party.
20.	Who was James K. Baxter?	New Zealand poet . . . writer (founder or leader of commune on its own unacceptable)