

Footprints in Time

Who Am I?

and

Renfrew Word Finding Vocabulary Test

Report on Wave 6 Data
B cohort



The Australian Council for Educational Research

Who Am I? and Renfrew Word Finding Vocabulary Test

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BACKGROUND

This report presents the results of administration of the *Who Am I?* and the *Renfrew Word Finding Vocabulary Test* for the LSIC Wave 6 data collection in 2013.

Who Am I? is a developmental assessment that requires the child to write their name, copy shapes, write letters, numbers and words in a small booklet, with simple instructions and encouragement from the interviewer. *Who Am I?* is not language dependent and is suitable for children with limited English. The assessment takes about 10 minutes to complete and is suitable for preschool children and children in the first two years of school.

The *Renfrew Word Finding Vocabulary Test* assesses children's expressive vocabulary (compared, for instance, with the *Peabody Picture Vocabulary Test*, which is a test of receptive vocabulary). It assesses the extent to which pictures of objects, arranged in order of difficulty, can be named correctly. Most of the objects illustrated have no alternative names, so the responses of children can be quickly measured. The assessment contains 50 line-drawn pictures and is suitable for children aged 3-9 years.

The *Renfrew Word Finding Vocabulary Test* and *Who Am I?* assessments are being used as part of *Footprints in Time*, which is the name given to the *Longitudinal Study of Indigenous Children* (LSIC) managed by the Department of Social Services. LSIC works with Aboriginal and Torres Strait Islander families from sites in Australia seeking their consent to participate in annual interviews to help better understand what impacts on their children's lives over time. LSIC especially explores how Aboriginal and Torres Strait Islander children can be better supported to grow up strong and resilient, regardless of location.

The study is overseen by a specially formed Steering Committee chaired by Professor Mick Dodson (Chair of Indigenous Studies, Australian National University), which has mandated that LSIC must be designed and conducted so that it has the acceptance and support of Aboriginal and Torres Strait Islander communities and of participating families.

LSIC uses a number of assessments of children's development. In the cognitive domain, *Who Am I?* and the *Renfrew Word Finding Vocabulary Test* are being used to assess processes that underlie the learning of early literacy and numeracy skills.

The *Who Am I?* and *Renfrew* tests were administered to the K cohort of the LSIC sample in 2008, 2009 and 2010 (Waves 1-3) to monitor early literacy and numeracy. In Wave 4 (2011), there was a need to replace these measures of school readiness with different assessments that were more appropriate for the age of the children. The B cohort began their participation in LSIC in Wave 4 and were introduced to the *Who Am I?* and *Renfrew* tests with the intention of replicating the administration process that was implemented with the K cohort. This report describes results of the

third administration of the *Who Am I?* and *Renfrew* tests to the B cohort. The cohort primarily included 5½-6½ year olds in Wave 6, although data were collected from some children who fell outside of this age range.

A trial to assess the usefulness of *Who Am I?* for administration to Aboriginal and Torres Strait Islander children was conducted in 2007. The instrument was found to be satisfactory, although some modifications were made to it. These included deleting some of the items (Numbers, Letters, Words, Sentence) in *Who Am I?* for the Wave 1 stage. Retention of the copying items (Name, Circle, Cross, Square, Triangle, Diamond) was recommended and this recommendation was adopted. From Wave 2, Numbers, Letters, Words and Sentences were incorporated in administered to children. This was implemented for both the K and B cohort administrations of the *Who Am I?*

The *Who Am I?* and the *Renfrew Word Finding Vocabulary Test* were administered to children primarily by Aboriginal and Torres Strait Islander Research Administration Officers (RAOs). The *Who Am I?* was scored by one person at ACER who is experienced in marking this developmental assessment. Children's responses to the *Renfrew Word Finding Vocabulary Test* were recorded in situ in an electronic database by the RAOs. Subsequently, a researcher at ACER recoded responses so that articulation errors or minor corruptions or substitutions were scored as correct.

SAMPLE CHARACTERISTICS

Table 1 provides a breakdown of age, gender, and Level of Relative Isolation (LORI) characteristics for the children in the LSIC B cohort in Wave 6 that completed the *Who Am I?* and/or the *Renfrew Word Finding Vocabulary Test*. Age groupings were designed, where possible, to match those created for the K cohort in Wave 3; however, this was not possible with the youngest and oldest age brackets. The distribution of age in months had moved such that the youngest age bracket had to be shortened and the oldest age bracket had to be expanded.

Table 1 LSIC Wave 6 (B cohort): Numbers of children by age, gender, and region who attempted *Who Am I?* and the *Renfrew Word Finding Vocabulary Test*

	Who Am I		Renfrew	
	No.	%	No.	%
Age (months)				
57-60 ¹	5	0.7	3	0.5
61-69	166	24.6	153	25.4
70-72	121	18.0	112	18.6
73-79	283	42.0	255	42.3
80-86	81	12.0	67	11.1
87-94 ²	18	2.7	13	2.2
Gender				
Male	337	50.0	306	50.7
Female	337	50.0	297	49.3
LORI³				
None	200	30.0	179	29.9
Low	318	47.7	293	49.0
Moderate/High/Extreme	148	22.2	126	21.1
Total	674	100	603	100

WHO AM I?

The overall reliability (Cronbach's Alpha)⁴ for the *Who Am I?* items was .87, which was the same as the reliability reported for the Longitudinal Study of Australian Children (LSAC) cohort of children aged four years in 2003/4. It was also similar to the rating obtained for the K cohort in Wave 2 (.85). For analyses of the WAI data, as the youngest age group reported in Table 1 only contained five children, it was merged with the second group to create a 57-69 months age group. Table 2 shows descriptive statistics for the six hundred and seventy four children who attempted the *Who Am I?*. The table shows the basic statistics for the five age groups of children that were created for the B cohort, Wave 6 sample.

The maximum possible score on the modified *Who Am I?* is 44.

¹ The youngest child in the sample was 57 months so the youngest group began at this age level rather than at 48 months as it had in the K cohort, Wave 3 report.

² The last age grouping was modified as there were five children that fell outside the age bracket of the age groupings created for the K cohort, Wave 3 report.

³ An indicator developed in the Western Australian Aboriginal Child Health Survey. The level of relative isolation (LORI) is an extension of the 18-point ARIA (Accessibility/Remoteness Index of Australia) called ARIA++. Please note that eight children that attempted the *Who Am I?* and five children that attempted the *Renfrew* had missing LORI data.

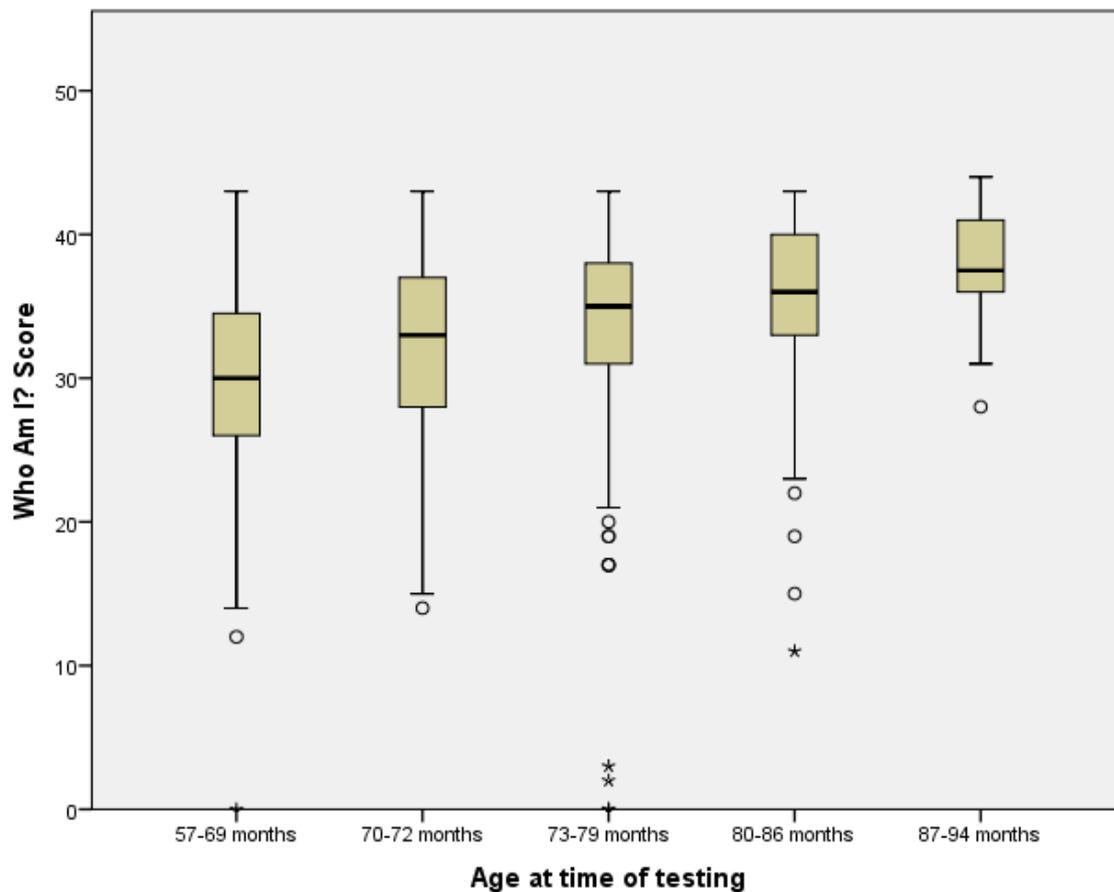
⁴ Cronbach's Alpha is a measure of the reliability of a test, based on its internal consistency.

Table 2 Basic statistics on the *Who Am I?* LSIC Wave 6 (B cohort)

Age (months)	Number of Children	Mean Score	Standard Deviation ⁵	Std Error of Mean ⁶
57-69 months	171	29.7	6.8	0.5
70-72 months	121	32.2	5.7	0.5
73-79 months	283	33.7	6.4	0.4
80-86 months	81	35.4	6.2	0.7
87-94 months	18	37.8	4.2	1.0

Results in Table 2 clearly show the developmental progression associated with the *Who Am I?* tasks – older children had higher mean scores.

The spread of scores for the five age groups is shown in Figure 1 (box plot⁷). The pattern illustrated mirrors that presented in Table 2 – proficiency on the *Who Am I?* increased with age. While most age groups had a similar spread of scores, the 87-94 month group was smaller; however, this group also had the smallest number of children. Two children scored the maximum of 44 and twelve children scored 43. Only three children scored zero.

**Figure 1** Box plot of *Who Am I?* scores for five age groups, LSIC Wave 6 (B cohort)

⁵ The standard deviation (SD) is a measure of the distribution of the scores.

⁶ The standard error of the mean is a measure of how far the sample mean is likely to be from the true population mean. The standard error is related to the sample size. As sample size increases, the standard error tends to decrease.

⁷ The box plot graphically depicts groups of numerical data through five number summaries: the smallest observation (sample minimum), lower quartile, median, upper quartile, and largest observation (sample maximum). The box plot also indicates which observations might be considered outliers.

Table 3 shows the individual item results for the B cohort, Wave 6 sample. The maximum possible score for each item was four. Drawing a circle, cross or square tended to be the tasks that children found easier to accomplish. The Sentence task, added to the B cohort administration of the *Who Am I?* in Wave 5, was more difficult for children to complete followed by the Words and Draw Me tasks.

Table 3 LSIC Wave 6 (B cohort) results on individual items in *Who Am I?*

Task	Mean Statistic	Std. Deviation	Std Error of Mean
Name	3.2	0.8	0.03
Circle	3.7	0.6	0.02
Cross	3.7	0.6	0.02
Square	3.6	0.7	0.03
Triangle	3.4	0.8	0.03
Diamond	2.8	1.0	0.04
Draw Me	2.4	0.8	0.03
Numbers	3.0	0.8	0.03
Letters	3.0	1.0	0.04
Words	2.3	1.3	0.05
Sentence	1.6	1.5	0.06

Table 4 provides information about the percentage of children who scored 0, 1, 2, 3, or 4 on each item. Scores in the upper range (3-4) were obtained by more than fifty percent of children in the sample for all except the Draw Me, Words and Sentence tasks. For the Draw Me and Words tasks, scores tended to be in the mid range (2-3). Close to half of the sample had difficulty writing a sentence, however, almost all children could write their name.

Table 4 LSIC Wave 6 frequencies (%)⁸ of scores (0-4) for individual items in *Who Am I?*

Task	Score				
	0	1	2	3	4
Name	2	1	10	51	36
Circle	1	0	1	27	71
Cross	1	1	1	28	71
Square	1	1	3	31	64
Triangle	1	1	7	36	55
Diamond	3	2	32	34	29
Draw Me	4	2	46	44	4
Numbers	2	3	12	62	22
Letters	6	2	11	53	28
Words	17	4	31	29	20
Sentence	44	2	10	39	5

In Table 5, the basic statistics for children's *Who Am I?* results are considered according to their Level of Relative Isolation (LORI). Of the three categories reported in the table, most children lived in areas of low isolation.

⁸ Note: all percentages were rounded to the nearest whole number therefore some cumulative percentages for a task do not equal 100.

Table 5 Basic statistics on *Who Am I?* by Level of Relative Isolation, LSIC Wave 6

Level of Isolation	Number of Children	Mean Score	Standard Deviation	Std Error of Mean
None	200	34.0	6.3	0.4
Low	318	32.8	7.0	0.4
Moderate/High/Extreme	148	30.5	5.9	0.5

Children living in areas of no isolation had the highest scores on the *Who Am I?* A One-Way Independent Samples Analysis of Variance (ANOVA)⁹ was conducted to see if there was a statistically significant difference between children's performance on the *Who Am I?* according to their level of isolation. The results showed that there was a statistically significant main effect of this factor on performance, $F(2, 663) = 12.3, p < .001$ ¹⁰.

RENFREW WORD FINDING VOCABULARY TEST

Table 6 shows the basic statistics for the six hundred and three children who attempted the *Renfrew Word Finding Vocabulary Test*. The table shows the basic statistics for the five age groups of children within the sample.

Table 6 Basic statistics on the *Renfrew Word Finding Vocabulary Test* for age groups, LSIC Wave 6

Age (months)	Number of Children	Mean Score	Standard Deviation	Std Error of Mean
57-69 months	156	28.4	8.1	0.7
70-72 months	112	30.1	8.7	0.8
73-79 months	255	31.8	7.9	0.5
80-86 months	67	33.2	9.1	1.1
87-94 months	13	33.9	4.4	1.2

The maximum possible score on the *Renfrew Word Finding Vocabulary Test* is 50. As they had for the *Who Am I?*, scores showed that older children were more proficient on the *Renfrew Word Finding Vocabulary Test* with the difference between the two oldest age groups being minimal. The distribution of scores for the five age groups is shown in Figure 2. Generally, as age increased so did scores; however, the median of the eldest group (the group containing the smallest number of children) was slightly lower than the second eldest group. The spread of scores within each age group except the eldest group, was also quite large. One child scored the sample maximum of 49. The lowest total score was four.

⁹ ANOVA is a statistical test that measures whether or not the means of several groups are all equal.

¹⁰ As the LORI group sizes are unequal, this finding should be interpreted with caution.

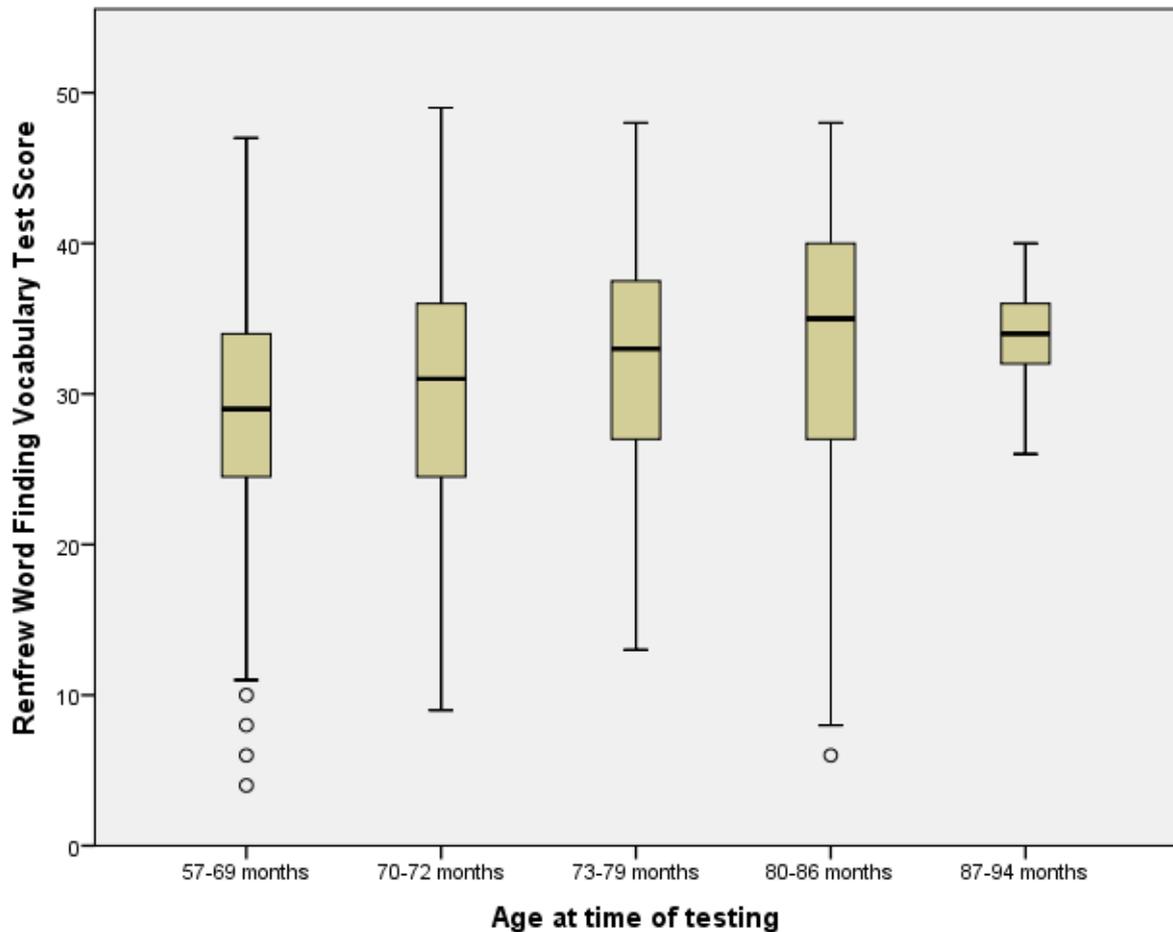


Figure 2 Box plot of *Renfrew Word Finding Vocabulary Test* scores for five age groups, LSIC Wave 6 (B cohort)

In the *Renfrew Word Finding Vocabulary Test* booklet (Renfrew, 1998), means are presented for particular age groupings. These same age groupings were constructed for the LSIC Wave 6, B cohort sample so that a comparison could be made. Table 7 shows these results for two age groups of boys and girls, and also for LSIC B cohort, Wave 6 boys and girls that fit within the age groupings required. Norm group data was consistently higher than the average scores achieved by LSIC boys and girls in the age groups created. Furthermore, LSIC scores consistently showed a greater spread around the mean. Consistent with the norm group data, girls had higher mean scores than boys within each age grouping.

Table 7 Boys and girls age equivalents for the *Renfrew Word Finding Vocabulary Test* – Wave 6 (B cohort)

Age (months)	Means (SD)	<u>LSIC</u> Mean (SD)	Means (SD)	<u>LSIC</u> Mean (SD)
	Boys	Boys	Girls	Girls
60-65	30.6 (6.56)	23.1 (8.8)	31.0 (5.83)	27.7 (6.5)
66-71	31.5 (4.32)	29.2 (8.2)	34.0 (4.98)	30.7 (8.8)

Note: No children fell into the youngest and second youngest age grouping available for the standardised Renfrew comparison (42-47 months and 48-53 months) and only three children fell into the 54-59 month group so data for these age groups are not published.

In Table 8, results for the *Renfrew Word Finding Vocabulary Test* are presented according to children's level of isolation. A One-way Analysis of Variance (ANOVA) was conducted to establish whether differences between mean scores for children living in these areas were statistically

significant. The results showed there was a statistically significant main effect of level of isolation on performance, $F(2, 595) = 79.36, p < 0.001^{11}$.

Table 8 Basic statistics on the *Renfrew Word Finding Vocabulary Test* by Level of Relative Isolation, LSIC Wave 6 (B cohort)

Level of Isolation	Number of Children	Mean Score	Standard Deviation	Std Error of Mean
None	179	34.1	6.6	0.5
Low	293	31.9	7.9	0.5
Moderate/High/Extreme	126	23.6	7.4	0.7

Table 9 presents the percentage of correct answers, and answers provided in another language, for each picture that formed part of the *Renfrew Word Finding Vocabulary Test*. Column 2 of the table shows words that were scored as correct despite articulation errors or minor corruptions or substitutions. Column 3 of the table provides examples of words that were not scored as correct with their response frequency given in parentheses. As observed in previous waves of data, more correct responses were reported for the naming of pictures presented earlier in the sequence. This is consistent with the design of the test wherein pictures are presented in order of difficulty.

¹¹ As the LORI group sizes are unequal, this finding should be interpreted with caution.

Table 9 Responses (frequencies) for items in the *Renfrew Word Finding Vocabulary Test*

Picture	Alternative Correct Word	Alternative Incorrect Word	Total Correct %	Alternative Word (Another Language) %
Cup	mug	--	99.8	--
Key	--	money (1)	99.8	--
Window	--	curtain (1), house (1)	99.5	--
Moon	--	sun (2), stars (1), sky (1)	98.2	0.2
Finger	pointer	hand (12), arm (1)	96.7	0.5
Snake	--	--	99.7	0.3
Kite	--	flag (5), curtain (1)	87.4	--
Duck	--	swan (4), bird (3), goose (2)	97.3	--
Clown	--	man (1), funny man (1)	85.9	0.2
Alligator/Crocodile	croc	--	98.5	0.3
Helicopter	chopper	aeroplane/airplane/plane (9)	95.7	--
Kangaroo	wallaby	--	99.5	0.2
Dice	--	game (3), blocks (1)	84.9	0.2
Snail	--	shell (3), seal (1), slug (1)	90.4	0.3
Scarecrow	--	scary man (5), person (3)	67.5	0.8
(Coat)hanger	hang up clothes, clothes hanger, hanger	hook (12), put clothes on (6), clothes (5)	48.1	--
Owl	--	bird (32), eagle (5), hawk (3)	78.8	1.2
Arrow	row	spear (25), stick (2)	72.8	--
Guitar	ukalae	--	97.5	--
Camel	cameo	animal (2), donkey (1)	77.1	--
Watering can	--	pot (7), water bucket (4), flower pot (5)	49.4	--
Mermaid	--	fish girl/girl fish (6), fish (2)	85.6	--
Caterpillar	itchy grub, moon grub, centipede, spit fires	worm (7), snail (3)	88.2	0.2

Continued

Picture	Alternative Correct Word	Alternative Incorrect Word	Total Correct %	Alternative Word (Another Language) %
Map	around the map	world (18), picture (12), earth, (11), Australia (6)	48.1	--
Drill	--	screwdriver (52), tool (9)	28.9	--
Necklace	--	beads (1), neck (1)	92.9	--
Jewels/Jewellery	--	earrings (13), bracelet (6)	51.7	--
Sleeve	arm of the shirt	shirt (6), arm (6), jumper (4)	52.9	--
Cuff	--	wrist (2)	2.5	--
Violin	fiddle	guitar (23), singing (2)	49.3	--
Bow	--	stick (52), to play the violin (6)	6.3	--
Binoculars	--	telescope (28), goggles (14), spy glass (8)	43.1	--
Pineapple	--	fruit (5), food (2)	74.1	--
Lighthouse	light tower, light castle	castle (43), house (14), tower (6)	52.7	--
Vegetables	--	fruit (11), carrots (5)	80.8	--
Parachute	paraship	air balloon/balloon (35), hot air balloon (10), kite (7)	39.5	--
Magnet	--	horse shoe (2), metal (2)	53.6	--
Anchor	--	hook (46), sinker (3), stops the boat (3)	33.3	--
Beehive	bee house, house for bees, bee home	house (11) , dog house (2)	66.8	--
Igloo	ice house, snow house, ig house	polar bear house/bear house (9), cave (7)	49.3	--
Screw	--	nail (99), screwdriver (8)	46.1	--
Microphone	mic	speaker (9), singing/singer/singing thing (7)	63.7	--
Saddle	caddle	seat (53), horse (13)	21.4	--
Spanner	wrench, shifter	tool (26), screwdriver (21)	20.9	--
Aerial	antenna	chimney (4), signal (2)	14.9	--
Racquet	--	bat/bat and ball (42), tennis/tennis bat (13)	54.4	--
Sling	--	bandage (33), broken arm (27), sore arm (10)	9.6	--
Compass	--	clock (129), time/timer (22) watch (8)	15.1	--
Thermometer	themeture	temperature (17), ruler (12), measure/measurer/ measures stuff/measuring (11)	10.6	--
Steeple/Spire	--	castle (44), church (42), house (21), tower (17)	2.7	--

Relationship between scores on *Who Am I?* and the *Renfrew Word Finding Vocabulary Test*

Six hundred and three children had scores on both the *Who Am I?* and the *Renfrew Word Finding Vocabulary Test*. There was a weak, positive correlation between these two scores ($r = .27, p < .001$). Separate correlation coefficients were computed for the three levels of isolation for children who had scores on both *Who Am I?* and the *Renfrew Word Finding Vocabulary Test*. There were also weak, positive correlations between the two scores for children in easily accessible areas ($r = .24, p < .01$), in areas of low isolation ($r = .20, p < .01$) and in areas of moderate/high/extreme isolation ($r = .25, p < .01$).

Comments

Replicating a pattern found in every wave for both B and K cohorts, the performance of the B cohort at Wave 6 on the *Who Am I?* and the *Renfrew Word Finding Vocabulary Test* followed a developmental pattern typical of children of this age. During this wave of data collection as in previous waves, it was easier for children to perform the developmentally simpler tasks (e.g., copying circle) than the developmentally more difficult tasks (e.g. writing a sentence) in the *Who Am I?* They were also more proficient at naming pictures at the beginning of the *Renfrew* sequence of pictures than pictures later in the sequence. The developmental pattern was more pronounced for *Who Am I?* results, which is consistent with the task's purpose of assessing motor and spatial skills that are expected to improve with age. The *Renfrew Word Finding Vocabulary Test* was not designed to be administered on multiple occasions or measure growth over time in expressive vocabulary. As such, the impact of practice effects on the *Renfrew Word Finding Vocabulary Test* following LSIC children's first exposure to the test should be considered when reviewing their results.

Repeating these assessments for the B cohort over time, as was also done for the K cohort and within the age parameters of the assessments, can provide a valuable picture of children's development over time. For instance, copying tasks (a feature of the *Who Am I?*) have been shown to be strongly associated with subsequent progress at school, are valid across different cultural groups, and provide a reliable measure of developmental level at the time of the assessment. The *Renfrew Word Finding Vocabulary Test* assesses a child's ability to accurately describe images as portrayed in the 50 pictures contained in the assessment. This ability is one aspect of the general ability to communicate one's ideas clearly and to understand the communication of others, which are vital pre-requisite skills to learning in the classroom. A child's strength or weakness in expressive language can be identified when we ask the child to ask and answer questions, describe images, articulate thoughts and ideas and respond appropriately to the communication of other people. Both the *Who Am I?* and the *Renfrew Word Finding Vocabulary Test* can also provide feedback to parents and communities to help support children's transition from home to school as well as providing important information to teachers about the skills that new students are bringing to the classroom.

Children in the Wave 6, B cohort were from a wide age range. This should be considered when interpreting results, particularly given that the *Who Am I?* is a developmental assessment. This wide age range means that children were in a variety of education settings (pre-school to early primary school), which should also be taken into account in relation to their performance.

Acknowledgements

Who am I? assessments were scored and coded by Catherine Underwood of ACER. Renfrew assessments were coded by Elle Vainoras of ACER.

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