THE ALSPAC STUDY

F09 FILE

Focus @ 9

At around 9.5 years

Prepared by

The ALSPAC Study Team

Documentation giving frequencies, background and instructions for use.

Last updated for version 4c of the RELEASE file.

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CONTENTS

1. Organisation of Focus @ 9

1.1. Space and Time for Observations

More than 13,600 eligible participants were available to be contacted during the course of Focus@9. Experience with F@7 and Focus at 8 suggested that 55% - 60% of those might come. Children were invited in groups of eight per half day 5 days a week from 18.1.01 – 11.1.03. Between Jan and August 2002 we ran double clinics for most of the time in order to have sufficient capacity to see all the children.

A variety of different observations with specialised equipment and trained assessors were undertaken with children moving from one observation to another. The most practical way to do this, given an estimated 3 hours of observations, was to divide the time available into units of 20 minutes and sub-units of 10 minutes (see diagram.) There were then 8 different orders in which the tests were carried out in each half-day. The order followed by each child was recorded to ensure that any order effect can be established and adjusted for if necessary.

In order to see the 8 children in a half day in each of the two clinics, as shown on the diagram, 7 rooms in each one are necessary plus an extra room for the body scanner. This room was used for half of the 20min Measuring session and was situated between the two other Measuring rooms. When two clinics were running concurrently, the second started 10mins later than the first so that the children entered the scanning room in turns. This was the solution to the problems of cost and space associated with having a scanner in both of the clinics. The child visited the phlebotomist twice, one hour apart, and each time for 10 minutes.

Overleaf: Figure 1.1: Schematic representation of testing 16 children per day in each of the 2 separate clinics, the letters represent the sessions as known within the clinics:

LF/OAE Lung function and otoacoustic emissions

F Fitness

H Hearing

W More WORD

S Stories

M Measuring

B_1 Blood – anaesthetic cream put on

B_2 Blood – Blood taken

Child	1	2	3	4	5	6	7	8
App't time	9.20	9.20	9.30	9.40	9.40	9.40	9.40	9.50
9.30	LF/OAE	H_1						
9.40			B_1					
9.50	F	LF/OAE	H_1	M	W	S	B_1	
10.00								B_1
10.10		F	LF/OAE	B_1	M	W	H_1	S
10.20	B_1							
10.30	S		F	H_1	B_1	M	LF/OAE	W
10.40		B_1						
10.50	W	S		LF/OAE	H_1	B_1	F	M
11.00			B_2					
11.10	M	W	S	F	LF/OAE	H_1	B_2	
11.20								B_2
11.30		M	W	B_2	F	LF/OAE	S	H_1
11.40	B_2							
11.50	H_1	B_2	M	S		F	W	LF/OAE
12.00					B_2			
12.10				W	S	B_2	M	F
12.20								
12.30								
12.40								
Likely to leave	12.20	12.10	12.20	12.40	12.40	12.30	12.40	12.40

Child	9	10	11	12	13	14	15	16
App't time	13.20	13.20	13.30	13.40	13.40	13.40	13.40	13.50
13.30	LF/OAE	H_1						
13.40			B_1					
13.50	F	LF/OAE	H_1	M	W	S	B_1	
14.00								B_1
14.10		F	LF/OAE	B_1	M	W	H_1	S
14.20	B_1							
14.30	S		F	H_1	B_1	M	LF/OAE	W
14.40		B_1						
14.50	W	S		LF/OAE	H_1	B_1	F	M
15.00			B_2					
15.10	M	W	S	F	LF/OAE	H_1	B_2	
15.20								B_2
15.30		M	W	B_2	F	LF/OAE	S	H_1
15.40	B_2							
15.50	H_1	B_2	M	S		F	W	LF/OAE
16.00					B2			
16.10				W	S	B_2	M	F
16.20								
16.30								
16.40								
Likely to leave	16.20	16.10	16.20	16.40	16.40	16.30	16.40	16.40

1.2. Other Space Requirements

The parents are invited to bring their children. They often also bring siblings. Both clinics therefore shared a reception room with activities for siblings as well as for the study children, and a kitchen area in which to prepare drinks and refreshments for the families. This room was less than an ideal size for the double clinic, but the crowding was minimized by the two clinics starting 10mins apart.

1.3. Creating the Atmosphere

Mothers (fathers or other carers) bring their children to be tested voluntarily. The children are not ill, and they do not get treatment. The child is brought to help with research which aims to make children healthier in the future. It is vital therefore that the families find the visit enjoyable and are prepared to return again and again, and that they encourage their friends to do so. The only benefit to the child was that his/her vision, hearing and haemoglobin levels were screened and any potential problems identified to the parent, along with any case of significant spinal curvature ($\geq 7^{o}$) or high blood pressure ($\geq$140/90).

Staff have been selected who have a warm and understanding approach as well as the skills required for their role. Initial and on-going training and supervision ensure the standards are maintained.

All letters, forms and questionnaires which are sent to children and parents are written in a friendly and sympathetic way, and a similar approach is taken in telephone conversations. Every effort is made to accommodate the parents' wishes as to times and dates of appointments if those originally offered are inconvenient, and understanding is shown when parents have difficulties. Parents are sent a letter for the child's teacher asking for leave of absence for the visit, and also one for the employer asking for leave of absence for the parent to accompany the child.

If a child does not arrive for an appointment the family receives a friendly telephone call or letter expressing concern that there may have been a problem and offering another appointment.

Because of the way in which the sessions interlink with one another it has been shown to be important to have a number of rules that will ensure that no one child or session can upset the system. The following are therefore integral to the way in which the study proceeds:

a) A 3-minute turn-round time in each session so that a '20-minute' session actually means 17 minutes, a '40-minute' session means 37 minutes.

b) Anyone arriving late misses the first session they were scheduled for and goes on to the second, or misses part of the content of a longer first session.

c) If the clinic is running late, testers try to reduce what is attempted in the session.

d) If the morning sessions threaten to overrun with any child, the last session, or part of the session may be missed out.

1.4. Definition of the Study Sample

We regard as eligible all children born to mothers resident in the former Avon area at the time they were born with the expected dates of delivery between 1.4.91 and 31.12.92. All children were invited to Focus @ 9 regardless of where they currently lived. They were invited to attend at about age 9½ .

1.5. Twins, Triplets and Quadruplets

Each member of a multiple pregnancy was given an appointment, and generally treated in the same way as singletons provided enough carers accompanied them. If less than one carer per child comes, then a member of staff was provided to ensure that each child was accompanied to all sessions except More WORD and Stories where the child always went in alone.

1.6. Repeated Sampling

Random error in the measurement of exposures weakens associations between possible explanatory variables and disease (De Clerk *et al,* 1989, Phillips & Davey Smith, 1993). Such errors may arise as a result of observer, subject or instrument variability. Attempts were made to limit such variability as much as possible through staff training, strict protocols for recording measurements, and regular quality control assessments. In addition, to allow assessment of and adjustment for regression dilution bias in analysis, 3% of the study were invited back for repeat measures at 9½ between 2 –6 weeks of the initial examination in all but the More WORDS and Stories sessions. The learning effect of doing these measures would invalidate repeats in these sessions.

Data from these repeat visits may be used to conduct sensitivity analyses using a variety of techniques for assessing and correcting measurement error (Bashir & Duffy, 1997).

Children in particular slot numbers were invited back, providing that they still lived within the old Avon area. The families are allocated to slot numbers randomly. The slots used were those in which the child went to W and S at either the beginning or end of the visit so that the family did not have an unnecessary wait. In the event 3.0% (n=233) returned for a second visit (see section 2.3).

1.7. The Child's Booklet

In advance of the 9-year visit, each child was sent a booklet which included descriptions of each test, with space for 'results', stickers or other input from each assessment. The child was asked to bring the booklet to the clinic. See Appendix 1.

1.8. Children with Special Needs

It is envisaged that some children with special needs will find some of the tests difficult at any Focus visit. All parents are asked if they think their child will have difficulties with any of the activities. If so, they are telephoned by a member of staff with responsibility for families with special needs to discuss whether a visit to the clinic is feasible; if not, then other possibilities for assessment are discussed. If they would like to come, modifications to the visit or to particular measures are discussed. If necessary extra staff or specialists such as signers for the deaf are brought in for the visit.

1.9 The Clinic Site

The location of Focus@9 changed in January '02. The original site was the Lower Ground floor of Hampton House. The Hearing room there was not soundproof but a soundproof booth was used for the audiometry. No specific problems were found with the other rooms.

In January '02 the visit was moved to the Focus Centre (the old Children's Hospital out- patient department). It is important to note that there was a problem with one room in which the WORD sessions were held. It was very small, windowless and poorly ventilated. It was also easy to hear voices between that room and the larger Stories room next door. A fan was kept on in the small room during sessions which had the added benefit of masking the sound of voices and increased the feeling of privacy. Individual researchers may therefore want to take into account 'room' in their analyses. It was recorded for every session.

F9009 Clinic Site: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Hampton House	3344	43.3	43.3	43.3
	2 Focus Centre	4375	56.6	56.7	100.0
	Total	7719	99.9	100.0	
Missing	-1 Missing	6	.1		
Total		7725	100.0		

1.10 Child Behaviour

At the end of every test session each tester rated the child on a number of behaviour attributes during that session. These are as follows:

- Cooperative
- Shy
- Fidgety
- Active
- Attention problem
- Responsiveness
- Unusual child behaviour
- Avoidance of eye contact
- Tics
- Rocking
- Asked odd questions
- Made personal comments
- Making faces
- Made odd noises
- Talking to self
- Swearing
- Other unusual behaviour

2. Invitation and Attendance

2.1. Eligibility

Families were eligible to be invited to Focus @ 9 if, on the ALSPAC database, they were flagged as:

1) Child alive,
2) Address not recorded as unknown,
3) Participating in the study (Not having refused the whole study; these families may have refused questionnaires).

In addition a number of 'new cases' were also invited to attend (see section 2.4).

2.2. Invitation and Attendance

The parents of the children who were eligible to be invited to Focus @ 9 were sent an initial letter, explaining about Focus @ 9. These were sent three months before the ideal date of attendance for the child (i.e. when they were 9 ½). Parents were asked to return a form giving their personal details (such as the child's name and which school they attended) and indicating whether they would like to come or not. If no response to the initial letter was received within 3 weeks a postal reminder was sent. If there was still no response after a further 2 weeks, the names were referred and some were contacted by phone or personal visit. After approximately three months, those still on the referral lists, who had not been contacted were sent a 'last-chance' letter.

A number of families did not receive an initial letter but did have appointments made for them. For example, friends and colleagues may have told them about Focus @ 7 and as a result they contacted us expressing an interest in attending before we had the opportunity to contact them.

The families who were flagged on the ALSPAC database as not receiving any questionnaires were still invited to attend Focus @ 9 but were sent a slightly different initial letter.

For the people who did not respond to the first invitation we frequently had no confirmation that they were still at the address we had used which may affect future follow-up.

A slightly different system was used for those families who were living a distance away from the clinic. If the time taken for a family to travel to Focus @ 9 was deemed to be more than two hours (making it difficult for the family to do the visit in a day), that family was given a special invitation letter at an earlier stage (four months before the child's ideal attendance date) than the rest of the cohort. This gave them the opportunity to coordinate their Focus @ 9 visit with one to Bristol for other reasons, such as visiting relatives.

Using the 13971 children alive at 1 year of age (i.e. excluding the 'new cases') as the baseline for attendance to focus @ 9, a total of 1810 (13%) were no longer eligible, using the definition in section 2.1 and were therefore not approached. Of those eligible, 3586 (29.5%) did not respond to the initial letter, despite follow-up (it is likely that many of these had moved away and had not yet informed us of their new details). 845 (6.9%) responded to the initial letter stating that they did not want to attend Focus @ 9. 324 had appointments made for them but failed to attend on the day.

Reason Child did not attend: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 not eligible for invite	1810	27.3	27.3	27.3
	2 Invited/no response	3586	54.0	54.0	81.3
	3 Invited/refused	845	12.7	12.7	94.0
	4 Appt made, DNA	324	4.9	4.9	98.9
	6 Appt made, clinic ended	76	1.1	1.1	100.0
	Total	6641	100.0	100.0	

A total of 7725 children attended the Focus @ 9 clinic, it is important to note that this includes 408 'new cases'.

In addition, there were 76 families who were willing to come but were unable to do so before the clinic finished.

2.3. Re-invites

It was originally anticipated that approximately 3% of attendees would come back for a second visit to check reliability. A total of 233 (3.0%) children did so. In order to be eligible to be asked to return the families had to live locally, went through their first visit in a standard order (this order had to be repeated at the second visit) and most importantly they had to have enjoyed themselves!

The data collected during the child's second visit is not held on the release file, however, there is a flag which indicates those children who returned for such a visit (F9030).

F9030 Child returned as a reinvite: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	233	3.0	3.0	3.0
	2 No	7492	97.0	97.0	100.0
	Total	7725	100.0	100.0	

Please note the difference between reinvites and revisits (see section 2.8).

2.4. New Cases

When preparing for the Focus @ 9 visit, it was decided that all those who were eligible for ALSPAC but who, for one reason or another had not been included to date should be invited to join. There were a number of reasons for this – 1) it was seen that this may give a handle on some of the children that had been missed from the original study, 2) word of mouth indicated that there were a number of children who felt that it was unfair that they could have been part of the study and were not, 3) it seemed beneficial in regard to relations with the general public.

The child health database was therefore searched for all children born to mothers resident in Avon who would have been eligible for the study. Thus, we did not rely on the dates of birth but rather on the expected dates of birth as near as we could get them. A letter then went out to the 3000 or so identified, inviting them to take part. It was recognised that the addresses we were using were old, and we only confined ourselves to children who we believed according to records were still living in the Avon area.

It is important to note, regarding the enrolment of these new cases, that it is very likely that we have biological samples for them and we will be able to abstract obstetric information. Their inclusion will allow to a certain extent a comparison of the study children who have been part of ALSPAC from birth and earlier with those who have not – particularly looking at features of the child's outcomes. In the event 408 new cases attended Focus @ 9.

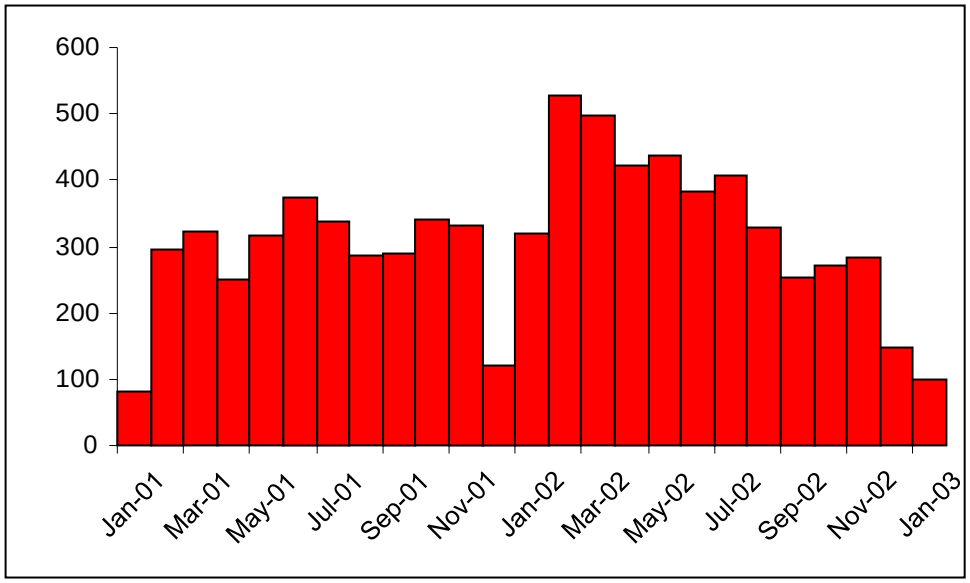
A variable is included on the release file flagging those cases who are new to ALSPAC (F9010).

F9010 Child is new case: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	408	5.3	5.3	5.3
	2 No	7317	94.7	94.7	100.0
	Total	7725	100.0	100.0	

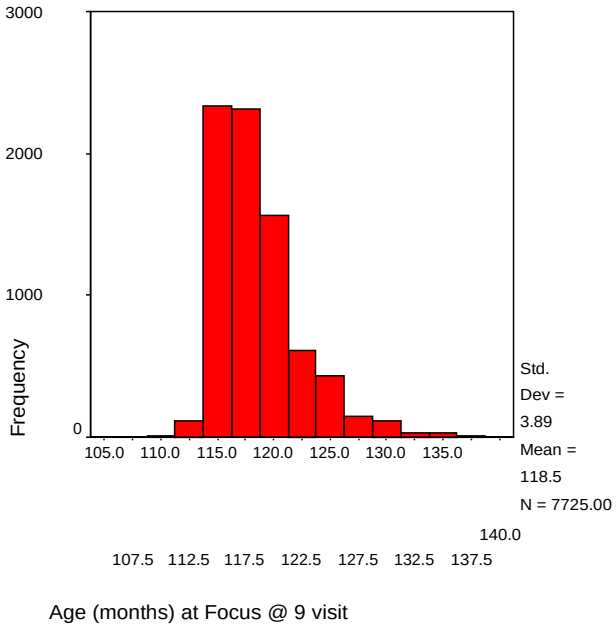
2.5. Month and year of attendance

The Focus @ 9 clinics ran from January 2001 through till January 2003. Month and year of visit are included on the release files (F9001 and: F9002 respectively). The chart below shows the attendance throughout this period.



2.6. Age at attendance

The age of the child at attendance was calculated from the date of the visit and the child's date of birth. This is included on the release files in days (F9003a), weeks (F9003b) and months (F9003c), enabling the user to be as accurate as they choose. The chart below shows the distribution of age in months. The long upper tail (children attending at around 9 years old) is due to new cases who attended their visit at the end of the clinic. It took several months to determine whether new cases were indeed eligble, information for many was sparse and for example, we had to ensure the child was still alive.



2.7 Session Order

The order in which the child went through the sessions was recorded by the receptionist, this was based on the grid number that the child followed (see Figure 1.1). If the order had to be changed for any reason the new order was recorded. Variables have been calculated to indicate the first session that the child did, the second and so on (please see: F9020 to: F9027). This may help researchers to determine whether any previous sessions had an effect on the child's performance or behaviour in a later session.

2.8 Revisits

In the event that a child did not complete their visit they were offered the chance to return on another day to go through the sessions they may have missed. This included cases where the DXA machine was not working. Flags have been calculated to indicate these children (F9004) and details of which sessions they returned for are given in: F9005.

F9004 Child came back for revisit to complete sessions: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	202	2.6	2.6	2.6
	2 No	7523	97.4	97.4	100.0
	Total	7725	100.0	100.0	

F9005 Sessions Child revisited to complete: F@7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Measures	181	2.3	93.3	93.3
	2 Hearing	8	.1	4.1	97.4
	3 Fitness	2	.0	1.0	98.5
	12 Measures & Hearing	2	.0	1.0	99.5
	14 Measures & Samples	1	.0	.5	100.0
	Total	194	2.5	100.0	
Missing	-2 No revisit	7531	97.5		
Total		7725	100.0		

Additional age, month and year have been provided for these revisits (F9006a-c,: F9007 and: F9008).

Please note the difference between revisit and reinvite (section 2.3).

2.9 Biases in attendance

Table 2.9.1 gives an indication of the differences in the demographic characteristics of those children who attended Focus @ 9 compared to the remaining ALSPAC sample who did not attend who were a) All those alive at 1 year and b) Still active in the study at the time of invitation The 408 new cases have not been included here since the majority of information is not available for these cases (leaving 7317 cases for comparison)

Table 2.9.1: Differences in characteristics of Focus @ 9 attendees compared to non-attendees

	Attendees (n=7317)	Non-attendees alive at 1 year (n=6654)	Non-attendees, active at time of invite (n=4831)
Gender			
Boy	3629 (49.6%)	3585 (53.9%)	2631 (54.4%)
Girl	3688 (50.4%)	3067 (46.1%)	2205 (45.6%)
		χ^2=25.76 (p<0.0001)	χ^2=26.90 (p<0.0001)
Maternal education			
< O level	1580 (22.4%)	2144 (39.9%)	1579 (39.0%)
O level	2476 (35.1%)	1824 (34.0%)	1421 (35.1%)
A level or higher	2992 (42.5%)	1399 (26.1%)	1049 (25.9%)
		χ^2=544.60 (p<0.0001)	χ^2=441.66 (p<0.0001)
Maternal age			
< 20	239 (3.3%)	763 (11.5%)	488 (10.1%)
21-24	891 (12.2%)	1441 (21.7%)	983 (20.3%)
25-29	2889 (39.5%)	2510 (37.7%)	1879 (38.9%)
30-34	2429 (33.2%)	1427 (21.4%)	1093 (22.6%)
35+	869 (11.9%)	513 (7.7%)	393 (8.1%)
		χ^2=752.67 (p<0.0001)	χ^2=504.63 (p<0.0001)
Housing tenure			
Owner-occupier	5860 (82.7%)	3702 (62.4%)	2860 (65.5%)
Council/HA	680 (9.6%)	1397 (23.5%)	981 (22.5%)
Other	548 (7.7%)	834 (14.1%)	527 (12.1%)
		χ^2=696.76 (p<0.0001)	χ^2=467.65 (p<0.0001)
Ethnicity of child			
White	6652 (96.0%)	4820 (93.6%)	3685 (94.3%)
Non-white	277 (4.0%)	332 (6.4%)	221 (5.7%)
		χ^2=39.90 (p<0.0001)	χ^2=15.79 (p<0.0001)
Mean maternal age	29.04 (sd=4.6)	26.85 (sd=5.1)	27.13 (sd=5.0)
		t=26.71 (p<0.0001)	t=21.69 (p<0.0001)
Mean birthweight	3409 (sd=566)	3371(sd=568)	3383 (sd=553)
		t=4.06 (p<0.0001)	t=2.60 (p=0.009)
Mean gestation	39.44 (sd=1.9)	39.41 (sd=1.9)	39.41 (sd=1.9)
		t=0.83 (p=0.408)	t=0.97 (p=0.333)

It can be seen that a significantly greater proportion of children with higher educated and older mothers attended Focus @ 9 as did those living in owner-occupied housing. A slightly smaller proportion of boys attended compared to non-attendees as did non-white children. Children who attended also had a slightly higher mean birthweight. There was no difference in mean gestation.

3. THE DATA AND OBSERVATIONS

For each session a variable has been created which indicates whether or not the child began that session, with a further variable giving reasons why this may not have happened wherever possible. The remaining documentation details the data collected in each session indicating the methods used, recommendations for using the data and frequencies of the key variables.

Within each session, specifically designed data sheets are used to record the data. The datasheets are filed into folders and sent for double-keying on a weekly basis. The folders are returned with an electronic version of the data. A member of the research computing team performs a variety of error checks on the data and error reports are sent to the Focus teams responsible for that data. Corrections are made and an unclean file is made available to a member of the statistics team, who performs the final stage of the cleaning process.

Comments recorded on the data sheet are keyed separately, anonymised by the research computing team and sent to the appropriate member of staff for coding. The codes only are then matched to the main dataset and incorporated into the final data file.

There is a standard variable naming system throughout Focus @ 9:

Variables relevant to the whole session are named: F9***, where *** is a three digit number. The remaining data is named according to the datasheet it was collected on using the format: F9xx***, where xx is a two letter abbreviation for that datasheet (e.g. ms for measures) and

*** is again a 3 digit number. This system ensures that every variable is uniquely defined.

For ease of use, wherever possible, consistency is maintained in naming variables, both between and within Focus visits. For example: F9xx004 represents the tester within each session and F7MS010 is height measured at F@7 while: F9MS010 is height measured at F@9.

Release file version history

Release version 3b – October 2008 (Partial Update)

- The DXA scan data has been processed and is now included in the updated release file.
- Due to extension of direct access to ALSPAC data to non-ALSPAC staff and in order to comply with guidance issued in 1996 by the ALSPAC Law & Ethics Committee regarding the confidentiality of multiple pregnancies, 3 records for triplet and quadruplet pregnancies were removed. The sample size has therefore dropped from 7725 to 7722. Note that the frequency tables in this documentation have not been updated, other than the new data for the DXA scans.

Release version 4a – March 2018

- Derivations for scoliosis measures [*f9dx300* to *f9dx323*], fitness measures [*f9ft500* and*: F9ft501*], developmental dyslexia [*f9sn800* to *F9sn802*] and otoacoustic emissions [*faoa300* to *faoa339*] are now included in the updated release file.
- Raw lung function (spirometry) and raw fitness session data are available. Please contact ALSPAC. Descriptions of the sessions are detailed in Sections 3.7 and 3.8.
- The description in Section 3.6.5. Otoacoustic emissions was updated with more current information including the protocol.
- The description of Section 3.1.5 DXA scan was updated with the description and summary statistics

- Some batch changes were made to all variable labels: replacing F@9 with : F9, Ch with Child etc.
- The Oakhill reading section has been removed.

Release version 4b – May 2019

- String and date variables have been removed from this file and replaced with numeric variables. As all the previous string/date variables were time data, these have been split into separate 'hour' and 'minutes' variables. The affected variables are: f9ms002, f9mw002, f9sa002, f9sa053, f9sa066 and f9sn002. These original variables have been dropped, and replaced with time in hours (previous variable name, but now ending in 'a' – e.g., f9ms002a, for the starting hour of the measures session) and time in minutes (previous variable name, but now ending in 'b' – e.g., f9ms002b, for the starting minute of the measures session).

Release version 4c – June 2019

- Height, weight and BMI z-scores based on 1990 British Growth Reference charts have been derived (using the 'zanthro' function in Stata) and added to the release file. Variables are: f9ms200 (for height); f9ms201 (for weight); and f9ms202 (for BMI).

3.1.1 Anthropometric Measures

F9MS001 Child Started Measures session: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	7262	94.0	94.0	94.0
	2 Yes, not completed	452	5.9	5.9	99.9
	3 No	11	.1	.1	100.0
	Total	7725	100.0	100.0	

F9MS001A Reason Child did not do Measuring session: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2 Ch left early	8	.1	.1	.1
	10 Did session	7716	99.9	99.9	100.0
	Total	7724	100.0	100.0	
Missing	-1 Missing	1	.0		
Total		7725	100.0		

F9MS004 Measures tester: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	365	4.7	4.7	4.7
	2	676	8.8	8.8	13.5
	3	227	2.9	2.9	16.4
	4	664	8.6	8.6	25.0
	5	89	1.2	1.2	26.2
	6	745	9.6	9.7	35.9
	7	450	5.8	5.8	41.7
	8	613	7.9	7.9	49.6
	9	373	4.8	4.8	54.5
	10	635	8.2	8.2	62.7
	11	348	4.5	4.5	67.2
	12	953	12.3	12.4	79.6
	13	311	4.0	4.0	83.6
	14	330	4.3	4.3	87.9
	15	935	12.1	12.1	100.0
	Total	7714	99.9	100.0	
Missing	-9 Did not do measures	11	.1		
Total		7725	100.0		

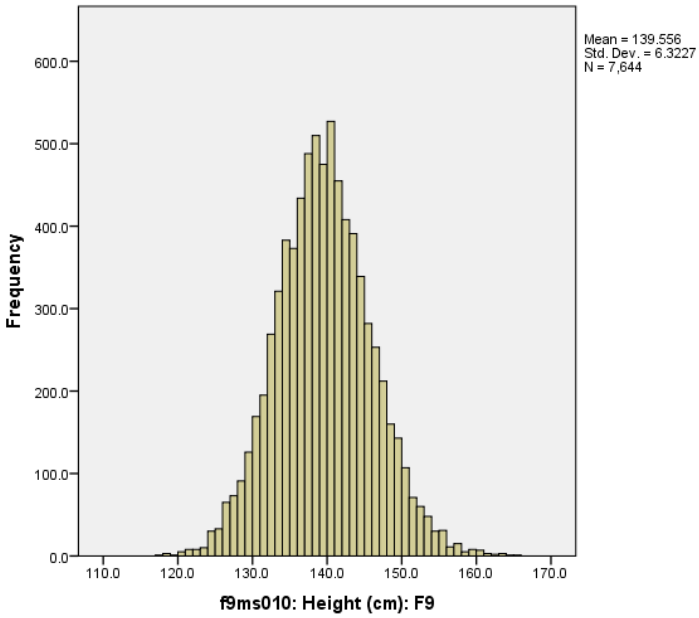
As far as possible all children were measured in their underclothes with their shoes removed.

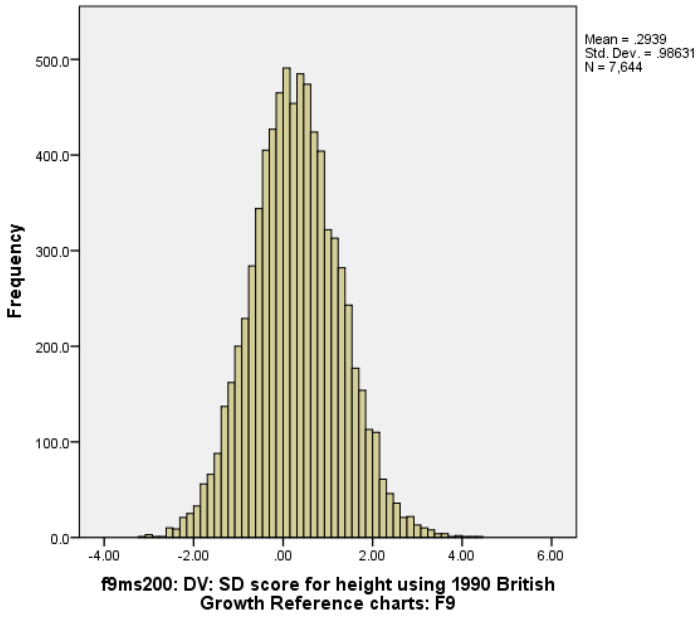
For all measurements taken, the tester recorded any difficulties that may have affected accuracy such as: child had difficulty keeping still; whether the child had an intricate hairstyle or whether the child was partly clothed.

Height

Height was measured to the last complete mm using the Harpenden Stadiometer. Children were positioned with their feet flat and heels together, standing straight so that their heels, calves, buttocks and shoulders came into contact with the vertical backboard of the stadiometer. The headboard was lowered down the backboard until it touched the child's head and a 1 Kg weight was placed on the headboard to ensure head contact and to minimise the effect of hair thickness. The child was asked to relax their shoulders and stretch up but keeping their heels in contact with the ground. Any problems with measuring were noted (F9MS011).

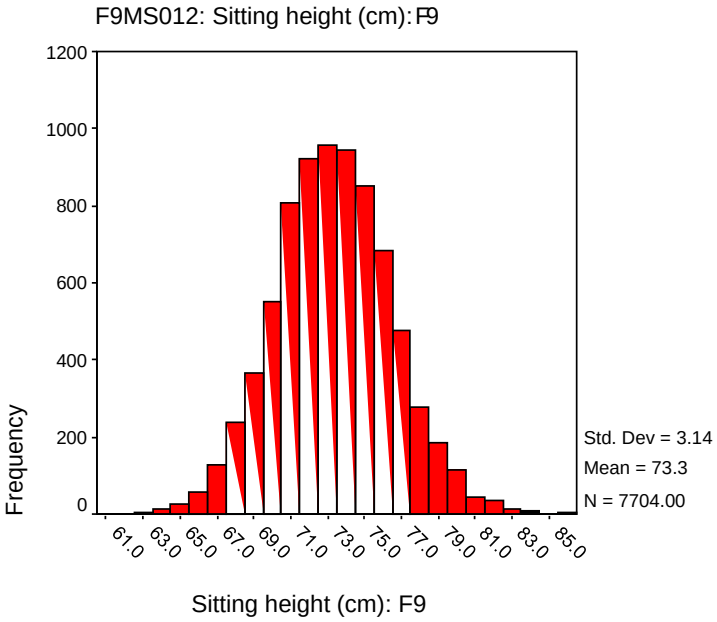
It should be noted that when comparing data from Focus@9 with that obtained from Focus10+ there were clear errors for 64 children who had appeared to shrink over time. On investigation it was discovered that these children all attended Focus@9 in the same week and it has been assumed that there was a problem with the stadiometer for that week (there were no such errors for sitting height). As such these cases have been put to missing for height and indicated in: F9MS011.





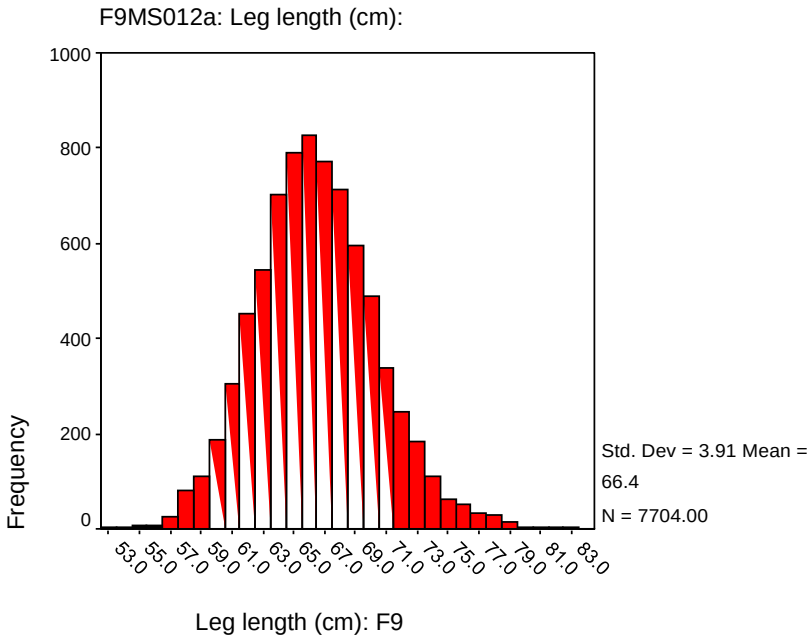
Sitting Height

Sitting height was measured using the Harpenden sitting height table anthropometer to the last complete mm. The child was positioned on the table with back straight and thighs horizontal. Feet were supported on the footrest so that the knees were at right angles. The same process was used to take the measure, as described above. Any problems with measuring were noted (F9MS013).



Leg length

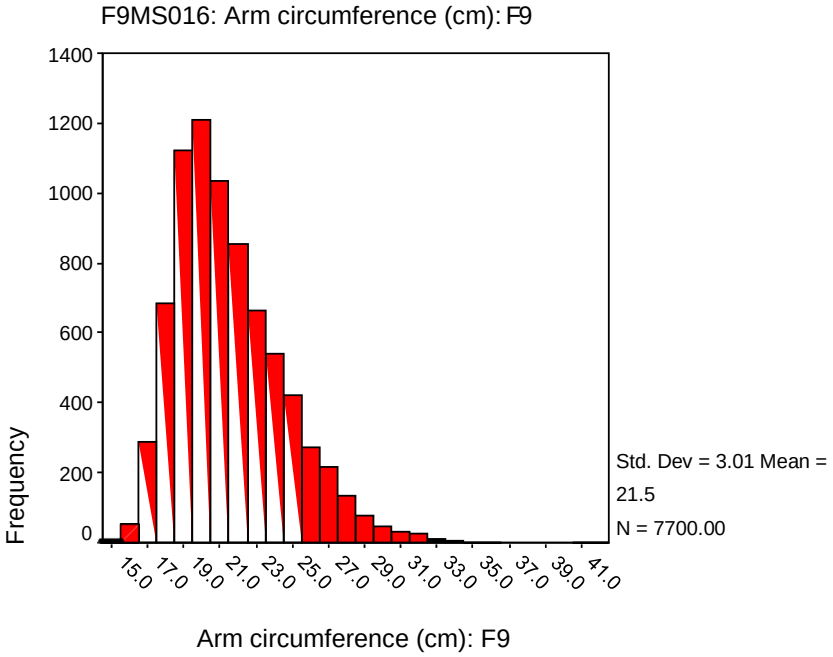
Leg length was calculated as the difference between height and sitting height: F9MS010-F9MS012



All circumferences were measured to the nearest mm using the Harpenden anthropometric tape.

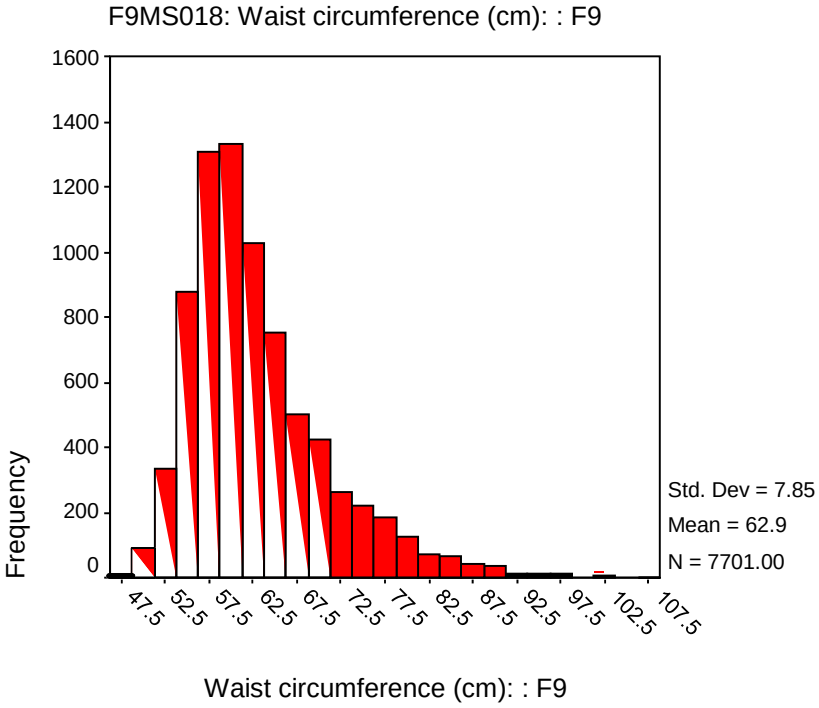
Arm Circumference

The left arm was flexed to a right angle and the circumference was measured to the nearest mm, midway between the process of the acromion of the scapula and the olecranon process of the elbow, keeping the tape taut but not tight. Any problems with measuring were noted (F9MS017).



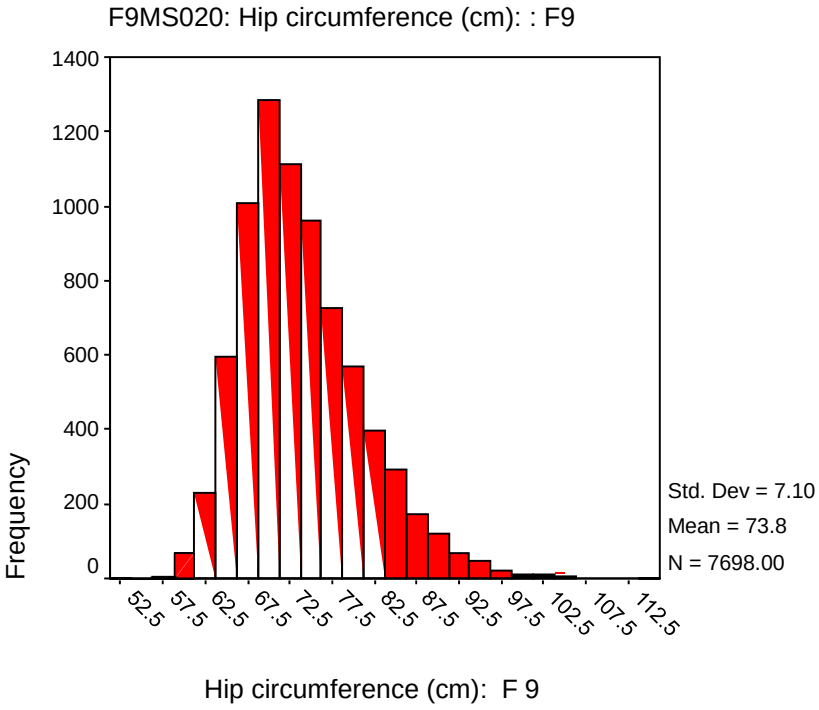
Waist Circumference

Waist circumference was measured to the nearest mm at the minimum circumference of the abdomen between the iliac crests and the lowest ribs, the tape was kept perpendicular to the long axis of the body, touching the skin but not compressing the tissue. Any problems with measuring were noted (F9MS019).



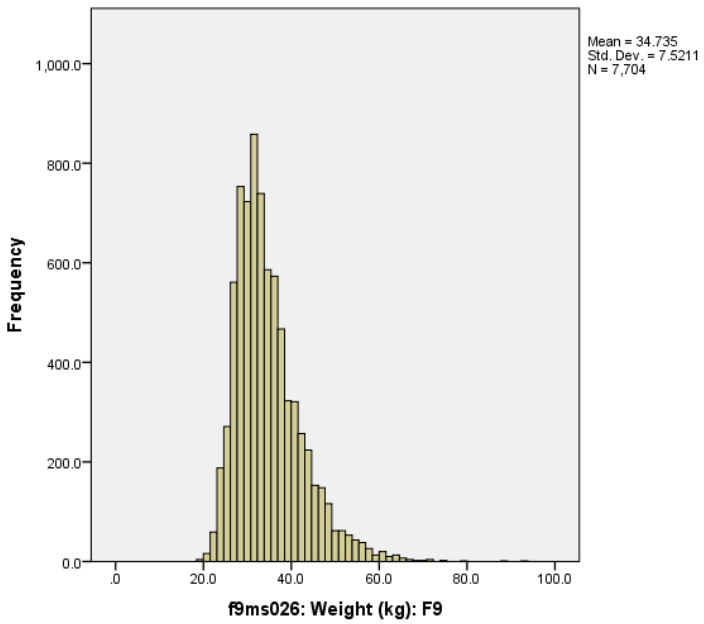
Hip Circumference

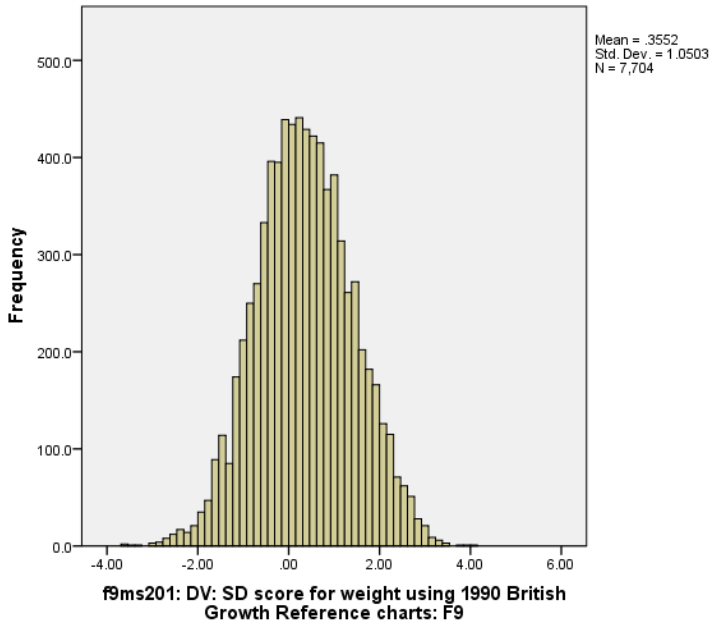
Hip circumference was measured to the nearest mm at the point of maximum circumference around the child's hips/buttocks, again with the tape kept perpendicular to the long axis of the body segment. The measurement was done over the child's pants. Any problems with measuring were noted (F9MS021).



3.1.2 Weight and Bioelectrical Impedance

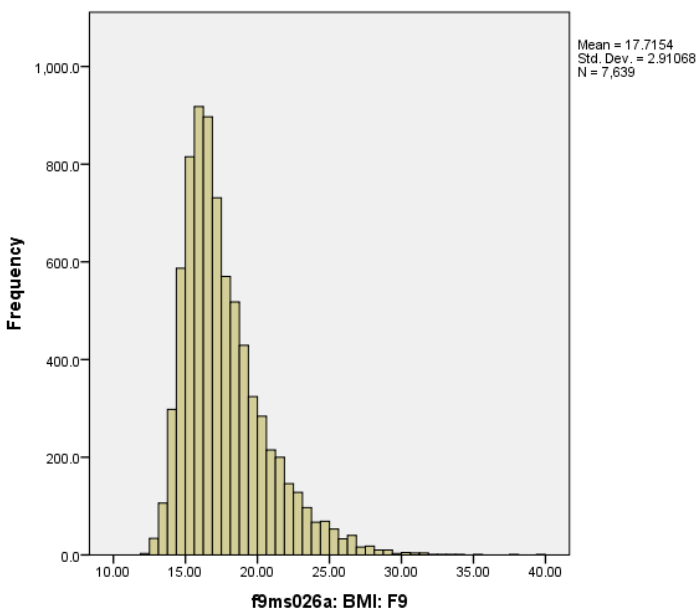
Both were measured using the Tanita Body Fat Analyser (Model TBF 305). The child was encouraged to pass urine (see F7MS029) and undress to their underclothes. 'Female Standard' was entered into the machine for all children and their height was entered to the nearest cm. The child stepped onto the measuring platform which had been wiped with disinfecting alcohol and positioned so that both feet were located in parallel with the toe and heel in contact with their respective electrodes. Measurement was completed when the weight and fat ratio readings were fixed and the buzzer beeped. Weight was measured to the nearest 50g. Any problems with measuring were noted (F9MS027).

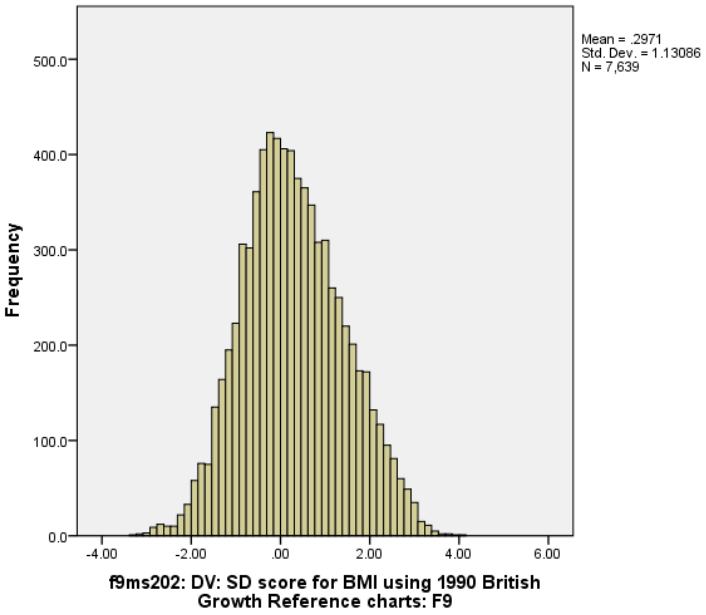




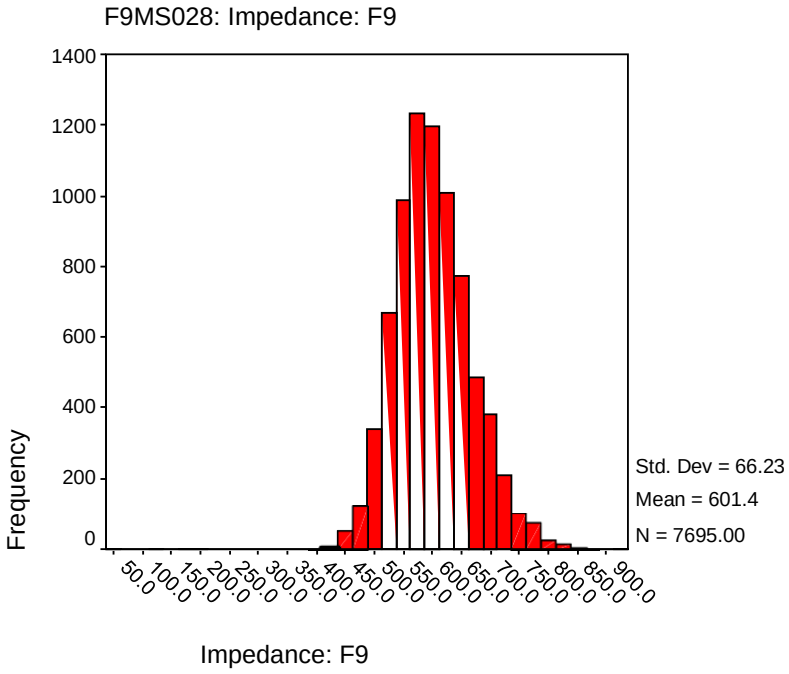
Body Mass Index

BMI (Kg/m^2) was calculated as: F9MS026 / $(F9MS010/100)^2$.





Note, that there were a handful of *extremely* low impedance values (n=5). These were checked against the DXA data and it was felt that they were obvious errors (not in keying), as such they have been set to missing.



3.1.3 Scoliosis

As part of the measurements session, a scoliometer (Orthopaedic Systems Inc, Haywood, California) was used to measure the axial trunk inclination (ATI) in a forward bending position. The child was asked to bend forward slowly with their arms straight and palms together until the trunk was horizontal and the measurement was made. If a rotational deformity was noted at any level, the scoliometer was placed gently across the spine at different positions, perpendicular to the long axis, until the maximum ATI was read and recorded (Murrell, 1993).

F9MS030 Scoliometer measure: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	1221	15.8	15.9	15.9
	1	2462	31.9	32.0	47.9
	2	2217	28.7	28.9	76.8
	3	1036	13.4	13.5	90.3
	4	472	6.1	6.1	96.4
	5	182	2.4	2.4	98.8
	6	34	.4	.4	99.2
	7	27	.3	.4	99.6
	8	12	.2	.2	99.7
	9	7	.1	.1	99.8
	10	5	.1	.1	99.9
	11	4	.1	.1	99.9
	12	2	.0	.0	100.0
	14	2	.0	.0	100.0
	Total	7683	99.5	100.0	
Missing	-9 Did not do measures	11	.1		
	-1 Missing	31	.4		
	Total	42	.5		
Total		7725	100.0		

If any child was found to have an ATI ≥ 7^{o} the parent was given a letter to pass to their GP which recommended surveillance (F9MS032).

The DXA Scoliosis Method (DSM)

Derivations for identifying scoliosis from a DXA scan (Taylor *et. al.,* 2013) are available for both the F9 and TF3 clinics. The derivations can be found within the DXA section of the measurement chapter for each clinic.

3.1.4 Flexural Dermatitis

Flexural dermatitis is poorly demarcated erythema with surface changes which can be fine scaling, vesicles, oozing, crusting or lichenification. It was measured according to the ISAAC protocol (Strachan & Williams, 1995) as part of the measurements session.

Observers noted the presence of any flexural dermatitis > 1 cm in diameter in *any* of the following areas: around the eyes, the sides or front of the neck, in front of the elbows, behind the knees or in front of the ankles. The anthropometry team were trained to carry out these observations by Professor Hywell Williams, University of Nottingham.

Area	Variable label	Yes (%)	No (%)
Any	F9MS033	601 (7.8%)	7101 (92.2%)
Eyes	F9MS035	77 (1.0%)	7625 (99.0%)
Neck	F9MS036	86 (1.1%)	7616 (98.9%)
Elbows	F9MS037	414 (5.4%)	7288 (94.6%)
Knees	F9MS038	327 (4.2%)	7375 (95.8%)
Ankles	F9MS039	78 (1.0%)	7624 (99.0%)

3.1.5 Whole Body DXA Scan

A Lunar prodigy narrow fan beam densitometer was used to perform a whole body DXA scan where bone content, lean and fat masses are measured. The procedure was clearly explained to the child and parent and parental consent was obtained before proceeding. The child was asked to lie on the Prodigy couch (in light clothing without any metal fastenings), with the parent sitting at least a metre away to comply with the IRMER legislation. The child's height, weight, date of birth, gender and ethnicity (if appropriate) were entered into the computer and the machine was started. The arm of the machine moved over the child and two sources of X-ray scan the child. The child was reassured throughout the scan and encouraged to keep as still as possible.

Once complete, the tester examined the scan to ensure its quality and a picture of the skeleton part of the scan was printed out and given to the child to keep (please see Appendix 3 for an example printout from the DXA scan.

If an unusual feature (such as an irregular bone mass) appeared on the DXA scan it was agreed that a second copy of the scan picture was printed and passed to the team leader to forward to Jon Tobias at the BRI, he would then contact the family if he felt it was necessary. The family would be reassured that the scanner can't be used to diagnose bone diseases. In the event, however, no families were contacted.

A daily QA was performed using the calibration block in accordance with the manufacturer's recommendations. The radiation protection supervisor or deputy scanned a spine phantom weekly.

For various reasons the DXA scan could not be performed during the original visit (e.g. machine broken, lack of time, no parent present to give permission), in these cases the child was invited to return to have their scan done. A variable has been created to indicate this (F9MS055). Please see section 2.8 for information on the Month, year and age of the revisit. Heights and weights were re-recorded during this second visit (F9MS056 &: F9MS057).

The measurer made any relevant comments which may have affected the accuracy of the measurements. These are recorded in variables: F9MS100 and: F9MS101.

f9dx001 Scan: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 1st visit - only one scan	7141	92.5	96.0	96.0
	1 1st visit - first scan	122	1.6	1.6	97.6
	3 Revisit	172	2.2	2.3	99.9
	4 Re-invite	6	.1	.1	100.0
	Total	7441	96.4	100.0	
Missing	-9 Did not do measures	9	.1		
	-2 Scan not attempted	272	3.5		
	Total	281	3.6		
Total		7722	100.0		

f9dx002b Date of scan - month: F9 – not shown

f9dx002c Date of scan - year: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2001	3166	41.0	42.7	42.7
	2002	4152	53.8	55.9	98.6
	2003	103	1.3	1.4	100.0
	Total	7421	96.1	100.0	
Missing	-9 Did not do measures	9	.1		
	-2 Scan not attempted	272	3.5		
	-1 No valid scan data	20	.3		
	Total	301	3.9		
Total		7722	100.0		

F9dx003: Time of Scan: F9 – not shown

f9dx004 Keyed Gender: F9

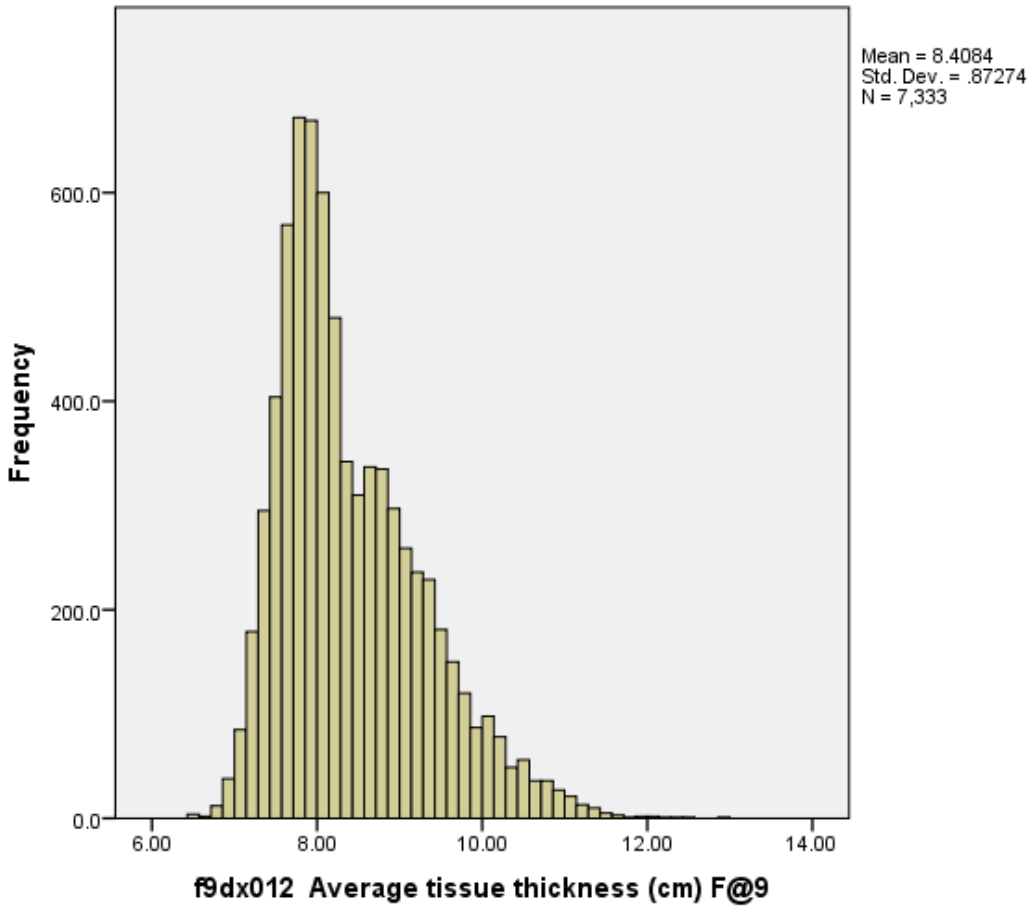
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Male	3645	47.2	49.0	49.0
	2 Female	3796	49.2	51.0	100.0
	Total	7441	96.4	100.0	
Missing	-9 Did not do measures	9	.1		
	-2 Scan not attempted	272	3.5		
	Total	281	3.6		
Total		7722	100.0		

Descriptive Statistics

	N	Min	Max	M	SD
f9dx006 Keyed height (cm): F9	7441	38.8	165.1	139.626	6.6554
f9dx007 Corrected Height (cm): F9	7441	117.5	165.1	139.671	6.3810
f9dx008 Keyed weight (Kg): F9	7441	2.0	135.0	34.880	7.8305
f9dx009 Corrected Weight (Kg): F9	7441	19.2	93.8	34.799	7.5341
f9dx010 DV: DXA weight (Kg): F9	7333	18.8	78.1	34.374	7.3542

f9dx011 Scan mode F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Standard	3065	39.7	41.3	41.3
	Thin	4356	56.4	58.7	100.0
	Total	7421	96.1	100.0	
Missing	Did not do measures	9	.1		
	Scan not attempted	272	3.5		
	No image	20	.3		
	Total	301	3.9		
Total		7722	100.0		



f9dx013 Scan artefacts F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Normal	7159	92.7	97.6	97.6
	Minor artefact	123	1.6	1.7	99.3
	Head artefact	41	.5	.6	99.9
	Head & Minor artefact	10	.1	.1	100.0
	Total	7333	95.0	100.0	
Missing	Did not do measures	9	.1		
	Scan not attempted	272	3.5		
	No valid scan data	108	1.4		
	Total	389	5.0		
Total		7722	100.0		

f9dx014 Reanalysis Y/N F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	6729	87.1	91.8	91.8
	No	604	7.8	8.2	100.0
	Total	7333	95.0	100.0	
Missing	Did not do measures	9	.1		
	Scan not attempted	272	3.5		
	No valid scan data	108	1.4		
	Total	389	5.0		
Total		7722	100.0		

f9dx015a Acquisition software F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3.10	629	8.1	8.5	8.5
	3.10.026	6792	88.0	91.5	100.0
	Total	7421	96.1	100.0	
Missing	Did not do measures	9	.1		
	Scan not attempted	272	3.5		
	No valid scan data	20	.3		
	Total	301	3.9		
Total		7722	100.0		

f9dx015b Analysis software F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3.10	629	8.1	8.5	8.5
	3.10.026	5	.1	.1	8.5
	7.51.008	6787	87.9	91.5	100.0
	Total	7421	96.1	100.0	
Missing	Did not do measures	9	.1		
	Scan not attempted	272	3.5		
	No valid scan data	20	.3		
	Total	301	3.9		
Total		7722	100.0		

f9dx018 Reasons for missing data F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Normal	7333	95.0	95.1	95.1
	No parental consent	255	3.3	3.3	98.4
	No child consent	17	.2	.2	98.6
	No image	20	.3	.3	98.9
	Major artefact	45	.6	.6	99.4
	Major movement	4	.1	.1	99.5
	Partial scan	27	.3	.4	99.8
	Major positioning error	6	.1	.1	99.9
	Skeletal irregularity	6	.1	.1	100.0
	Total	7713	99.9	100.0	
Missing	Did not do measures	9	.1		
Total		7722	100.0		

f9dx019 DV: Incorrect scan mode F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Correct scan mode	7079	91.7	96.5	96.5
	Thin used incorrectly	106	1.4	1.4	98.0
	Standard used incorrectly	148	1.9	2.0	100.0
	Total	7333	95.0	100.0	
Missing	Did not do measures	9	.1		
	Scan not attempted	272	3.5		
	No valid scan data	108	1.4		
	Total	389	5.0		
Total		7722	100.0		

DXA Scan Descriptive Statistics (f9dx101 to: F9dx229)

	N	Minimum	Maximum	Mean	Std. Deviation
f9dx101: Left Arm - bone mass (g) F9	7333	24.06	137.43	59.5574	13.03720
f9dx102: Left Arm - fat mass (g) F9	7333	34.18	2380.06	391.7013	274.76788
f9dx103: Left Arm - lean mass (g) F9	7333	554.97	2405.49	1177.4107	218.42507
f9dx104: Right Arm - bone mass (g) F9	7333	24.86	138.02	59.5815	12.82137
f9dx105: Right Arm - fat mass (g) F9	7333	33.00	2190.92	383.5712	262.88581
f9dx106: Right Arm - lean mass (g) F9	7333	597.57	2169.51	1160.8845	206.92560
f9dx107: Arms - bone mass (g) F9	7333	48.92	265.83	119.1390	25.54778
f9dx108: Arms - fat mass (g) F9	7333	67.17	4200.30	775.2724	536.74372
f9dx109: Arms - lean mass (g) F9	7333	1211.13	4509.39	2338.2952	418.92309
f9dx110: Left Leg - bone mass (g) F9	7333	87.68	500.98	223.2129	49.17714
f9dx111: Left Leg - fat mass (g) F9	7333	217.67	7552.12	1921.8446	1021.86676
f9dx112: Left Leg - lean mass (g) F9	7333	2297.11	7855.24	4170.0198	640.45100
f9dx113: Right Leg - bone mass (g) F9	7333	100.74	509.95	225.4012	49.12170
f9dx114: Right Leg - fat mass (g) F9	7333	208.02	7445.41	1919.0736	1018.69310
f9dx115: Right Leg - lean mass (g) F9	7333	2345.18	7797.09	4166.3024	640.16602
f9dx116: Legs - bone mass (g) F9	7333	190.10	1010.93	448.6141	97.97858
f9dx117: Legs - fat mass (g) F9	7333	425.69	14775.45	3840.9182	2039.32907
f9dx118: Legs - lean mass (g) F9	7333	4656.74	15652.34	8336.3223	1273.61852
f9dx119: Left Trunk - bone mass (g) F9	7333	65.61	384.90	164.2765	34.98945
f9dx120: Left Trunk - fat mass (g) F9	7333	179.01	9580.61	1746.0949	1261.91356
f9dx121: Left Trunk - lean mass (g) F9	7333	3455.26	9896.96	5585.5072	768.25169
f9dx122: Right Trunk - bone mass (g) F9	7333	73.50	387.03	162.4829	35.53625
f9dx123: Right Trunk - fat mass (g) F9	7333	178.87	10111.23	1716.4635	1253.80653
f9dx124: Right Trunk - lean mass (g) F9	7333	3352.88	10260.79	5471.1570	764.06884
f9dx125: Trunk - bone mass (g) F9	7333	141.68	757.65	326.7594	69.46943
f9dx126: Trunk - fat mass (g) F9	7333	357.89	19584.80	3462.5584	2513.76076
f9dx127: Trunk - lean mass (g) F9	7333	6958.88	20157.75	11056.6641	1506.58538
f9dx128: Total Left - bone mass (g) F9	7333	310.17	1199.41	615.9854	107.02782
f9dx129: Total Left - fat mass (g) F9	7333	551.99	20159.16	4314.6738	2592.77135
f9dx130: Total Left- lean mass (g) F9	7333	7878.55	22072.90	12395.7942	1651.00350
f9dx131: Total Right - bone mass (g) F9	7333	298.99	1179.13	605.9085	106.79568
f9dx132: Total Right - fat mass (g) F9	7333	547.69	19485.43	4260.1052	2565.53547
f9dx133: Total Right - lean mass (g) F9	7333	7399.66	21033.11	12181.3355	1637.06082
f9dx134: Total Body - bone mass (g) F9	7333	618.96	2333.63	1221.8939	205.68832
f9dx135: Total Body - fat mass (g) F9	7333	1108.47	39644.59	8574.7790	5156.29488
f9dx136: Total Body - lean mass (g) F9	7333	15642.08	42704.45	24577.1297	3237.00900
f9dx201: Head - BMD (g/cm2) F9	7333	1.06	2.16	1.5742	.14079
f9dx202: Head - BMC (g) F9	7333	194.29	478.06	327.3814	39.19902
f9dx203: Head - area (cm2) F9	7333	154.48	300.17	207.7555	13.59829
f9dx204: Arms - BMD (g/cm2) F9	7333	.49	.87	.6539	.04332
f9dx205: Arms - BMC (g) F9	7333	48.92	265.83	119.1390	25.54778
f9dx206: Arms - area (cm2) F9	7333	98.17	337.52	180.9728	29.93515
f9dx207: Legs - BMD (g/cm2) F9	7333	.63	1.30	.9014	.08075
f9dx208: Legs - BMC (g) F9	7333	190.10	1010.93	448.6141	97.97858
f9dx209: Legs - area (cm2) F9	7333	283.97	816.61	493.1098	69.95051
f9dx210: Trunk - BMD (g/cm2) F9	7333	.53	.91	.6959	.04502
f9dx211: Trunk - BMC (g) F9	7333	141.68	757.65	326.7594	69.46943
f9dx212: Trunk - area (cm2) F9	7333	259.88	881.29	466.1693	74.50879
f9dx213: Ribs - BMD (g/cm2) F9	7333	.47	.73	.5764	.03491
f9dx214: Ribs - BMC (g) F9	7333	42.10	299.87	108.5781	26.75066
f9dx215: Ribs - area (cm2) F9	7333	83.71	428.33	187.5612	40.92569
f9dx216: Pelvis - BMD (g/cm2) F9	7333	.60	1.20	.8310	.07202
f9dx217: Pelvis - BMC (g) F9	7333	53.56	279.69	125.9613	27.06709
f9dx218: Pelvis - area (cm2) F9	7333	85.25	267.02	150.3174	21.88891
f9dx219: Spine - BMD (g/cm2) F9	7333	.51	1.08	.7138	.06336
f9dx220: Spine - BMC (g) F9	7333	39.54	224.55	92.2199	20.27406
f9dx221: Spine - area (cm2) F9	7333	69.52	239.00	128.2907	20.19309
f9dx222: Total - BMD (g/cm2) F9	7333	.71	1.13	.9024	.05161
f9dx223: Total - BMC (g) F9	7333	618.96	2333.63	1221.8939	205.68832
f9dx224: Total - area (cm2) F9	7333	877.05	2156.60	1348.0074	168.98768
f9dx225: DV: Total body BMC adjusted for area (g) F9	7333	999.11	1495.02	1221.8975	55.11237
f9dx226: DV: Total body less Head - BMD (g/cm2) F9	7333	.57	1.03	.7782	.05476
f9dx227: DV: Total body less Head - BMC (g) F9	7333	409.43	1933.12	894.5125	185.09364
f9dx228: DV: Total body less Head - area (cm2) F9	7333	679.38	1966.27	1140.2519	165.04363
f9dx229: DV: Total body less Head BMC adjusted for area (g) F9	7333	742.54	1132.92	894.5242	39.72101

The DXA Scoliosis Method (DSM)

DSM was developed by Dr Emma Clark and Hilary Taylor in the Musculoskeletal Research Unit, University of Bristol and funded by a research grant from the British Scoliosis Research Foundation.

The DSM method, development, evaluation and validation has been published in the peer-reviewed journal:

Taylor HJ, Harding I, Hutchinson J, Nelson I, Blom A, Tobias JH, Clark EM (2013) 'Identifying scoliosis in population-based cohort: Development and validation of a novel method based on total body DXA scans'. *Calcified Tissue International.* 92(6):539-547

These derivations are available in this clinic and again when participants were about 15.5 years old, during the Teen Focus 3 (TF3) clinic.

To use scoliosis as a binary variable it is recommended that the variable: F9*dx316* (size of largest curve on the scan taken at the: F9 clinic) is used. It is categorised into either ≥6° or ≤6°, or ≥10° or ≤10°. For further information please contact Dr. Emma Clark at emma.clark@bristol.ac.uk.

f9dx300 Child is in: F9 scoliosis set: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	7295	94.5	100.0	100.0
Missing	-101 Missing	427	5.5		
Total		7722	100.0		

f9dx301 Child is in both: F9 and TF3 scoliosis sets: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes, in both	4501	58.3	100.0	100.0
Missing	-101 Missing	3221	41.7		
Total		7722	100.0		

f9dx302 DV: Spinal position grading and regraded: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 perfect	4082	52.9	55.9	55.9
	2 slightly_imperfect	2022	26.2	27.7	83.6
	3 position	1102	14.3	15.1	98.7
	4 scoliosis	94	1.2	1.3	100.0
	Total	7300	94.5	100.0	
Missing	-101 Missing	422	5.5		
Total		7722	100.0		

f9dx303 DV: 3 part coding for spinal position grading: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 normal spine	6104	79.0	83.6	83.6
	2 position	1102	14.3	15.1	98.7
	3 likely scoliosis	94	1.2	1.3	100.0
	Total	7300	94.5	100.0	
Missing	-101 Missing	422	5.5		
Total		7722	100.0		

f9dx304 DV: 4 part coding for spinal position grading: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 normal spine	6104	79.0	83.6	83.6
	2 position	874	11.3	12.0	95.6
	3 possible position	228	3.0	3.1	98.7
	4 likely scoliosis	94	1.2	1.3	100.0
	Total	7300	94.5	100.0	
Missing	-101 Missing	422	5.5		
Total		7722	100.0		

f9dx305 Angle has been measured: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes, measured	317	4.1	100.0	100.0
Missing	-101 Missing	7405	95.9		
Total		7722	100.0		

f9dx306 Child with scoliosis not measured due to artifact: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Not measured	5	.1	100.0	100.0
Missing	-101 Missing	7717	99.9		
Total		7722	100.0		

f9dx307 DV: A1 apex location of the most cephalad curve on the scan: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 thoracic	254	3.3	80.1	80.1
	2 thoraco-lum	44	.6	13.9	94.0
	3 lumbar	18	.2	5.7	99.7
	4 lumbro-sac	1	.0	.3	100.0
	Total	317	4.1	100.0	
Missing	-101 Missing	7405	95.9		
Total		7722	100.0		

f9dx308 DV: A1 apex direction of the most cephalad curve on the scan: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 left	244	3.2	77.0	77.0
	1 right	73	.9	23.0	100.0
	Total	317	4.1	100.0	
Missing	-101 Missing	7405	95.9		
Total		7722	100.0		

f9dx309 DV: A2 apex location of the first curve below the most cephalad curve: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3 lumbar	37	.5	97.4	97.4
	4 lumbro-sac	1	.0	2.6	100.0
	Total	38	.5	100.0	
Missing	-101 Missing	7684	99.5		
Total		7722	100.0		

f9dx310 DV: A2 apex direction of first curve below the most cephalad curve: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 left	15	.2	39.5	39.5
	1 right	23	.3	60.5	100.0
	Total	38	.5	100.0	
Missing	-101 Missing	7684	99.5		
Total		7722	100.0		

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
f9dx311 DV: Angle-size of the most cephalad curve: F9	317	2	28	7.57	2.440
f9dx312 DV: Angle-size of the first curve below the most cephalad curve: F9	38	2	17	7.47	2.719

f9dx313 Number of curves on the scan: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 no curve	6978	90.4	95.7	95.7
	1 single curve	279	3.6	3.8	99.5
	2 double curve	38	.5	.5	100.0
	Total	7295	94.5	100.0	
Missing	-101 Missing	427	5.5		
Total		7722	100.0		

f9dx314 DV: Most cephalad curve in size categories (degrees): F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 <5	14	.2	4.4	4.4
	2 >=5 <10	257	3.3	81.1	85.5
	3 >=10 <20	45	.6	14.2	99.7
	4 >=20 <30	1	.0	.3	100.0
	Total	317	4.1	100.0	
Missing	-101 Missing	7405	95.9		
Total		7722	100.0		

f9dx315 DV: First curve below most cephalad curve in size categories: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 <5	4	.1	10.5	10.5
	2 >=5 <10	26	.3	68.4	78.9
	3 >=10 <20	8	.1	21.1	100.0
	Total	38	.5	100.0	
Missing	-101 Missing	7684	99.5		
Total		7722	100.0		

Descriptive Statistics

	N	Min	Max	M	SD
f9dx316 DV: Size of largest curve on the scan: F9	317	2	28	7.63	2.444

f9dx317 DV: Location of the largest curve on the scan: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 thoracic	244	3.2	77.0	77.0
	2 thoraco-lum	44	.6	13.9	90.9
	3 lumbar	28	.4	8.8	99.7
	4 lumbro-sac	1	.0	.3	100.0
	Total	317	4.1	100.0	
Missing	-101 Missing	7405	95.9		
Total		7722	100.0		

f9dx318 DV: Direction of largest curve on the scan: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 Left	238	3.1	75.1	75.1
	1 Right	79	1.0	24.9	100.0
	Total	317	4.1	100.0	
Missing	-101 Missing	7405	95.9		
Total		7722	100.0		

f9dx319 DV: Location of largest single curves (and double curve category): F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 thoracic	217	2.8	68.5	68.5
	2 thoraco-lum	44	.6	13.9	82.3
	3 lumbar and lumbro-sac	18	.2	5.7	88.0
	4 >single	38	.5	12.0	100.0
	Total	317	4.1	100.0	
Missing	-101 Missing	7405	95.9		
Total		7722	100.0		

f9dx320 DV: Size of largest curve, in categories (degrees): F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 <5	12	.2	3.8	3.8
	2 >=5 <10	255	3.3	80.4	84.2
	3 >=10 <20	49	.6	15.5	99.7
	4 >=20 <30	1	.0	.3	100.0
	Total	317	4.1	100.0	
Missing	-101 Missing	7405	95.9		
Total		7722	100.0		

f9dx321 DV: Binary scoliosis variable (refer to categories in: F9spgr4): F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 No Scoliosis (Cat 1,2)	6978	90.4	95.6	95.6
	1 Scoliosis (cat 3,4)	322	4.2	4.4	100.0
	Total	7300	94.5	100.0	
Missing	-101 Missing	422	5.5		
Total		7722	100.0		

f9dx322 DV: Child has scoliosis with a 5° cut-off for scoliosis definition: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 No Scoliosis (5 degree)	6990	90.5	95.8	95.8
	1 Scoliosis (5 degree)	305	3.9	4.2	100.0
	Total	7295	94.5	100.0	
Missing	-101 Missing	427	5.5		
Total		7722	100.0		

f9dx323 DV: Child has scoliosis with a 10° cut-off for scoliosis definition: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 No Scoliosis (10 degree)	7245	93.8	99.3	99.3
	1 Scoliosis (10 degree)	50	.6	.7	100.0
	Total	7295	94.5	100.0	
Missing	-101 Missing	427	5.5		
Total		7722	100.0		

3.2 Acne

Children were examined for acne as part of the measurements session and hence have the same tester (F9MS004) and were examined in the same room (F9MS006). Dr Giles Dunnill from the BRI, Bristol, advised the staff.

Ideally, the children were examined dressed only in their underclothes after they had been weighed. If the child preferred some clothes could be put back on. The following sites on the body were examined:

- Face
- Chest
- Back and shoulders And
  in addition
- Other (e.g. upper arms, buttocks, thighs)

The following elements of acne were recorded as being present (Few, Moderate, Many) or not on each of the 3 main sites:

- Seborrhea: Excessive secretion of sebum (oil)
- Open comedones: Blackheads
- Closed comedones: Whiteheads
- Red papules: Larger raised spots (no pus)
- Pustules: Spots filled with pus
- Nodules: Hardened lumps
- Fine superficial/atrophic macular scars
- Deep ice pick scars
- Hypertrophic scars
- Keloid (raised) scars
- Any pigmentary change in the skin (purple/brown)

Summary variables have been created to indicate any presence.

Table 3.2.1: Proportion of children with each acne variant present at each site

	Face	Chest	Back/shoulders
Seborrhea	240 (3.1%)	2 (0.01%)	7 (0.1%)
Open comedones	341 (4.4%)	2 (0.01%)	2 (0.01%)
Closed comedones	1087 (14.1%)	10 (0.1%)	11 (0.1%)
Red papules	288 (3.7%)	10 (0.1%)	6 (0.1%)
Pustules	28 (0.4%)	1 (0.01%)	2 (0.01%)
Nodules	-	-	-
Fine/Superficial scars	1 (0.01%)	2 (0.01%)	2 (0.01%)
Deep ice pick scars	-	-	-
Keloid scars	-	-	-
Hypertrophic scars	-	-	-
Pigmentary change	-	-	-

*Variables are named as follows
Face: F9AC021 to: F9AC031; Chest: F9AC041 to F9AC051;
Back/shoulders: F9AC061 to: F9AC071

If any acne variants were present on any of the three main sites the severity was recorded, according to the "Acne Grading Guide" (O'Brien, 1998) as trivial; mild; moderate or severe (F9AC032, F9AC052, F9AC072 for face, chest and back/shoulders respectively).

F9AC032 Face acne - Severity Grade: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Trivial	1296	16.8	91.3	91.3
	2 Mild	117	1.5	8.2	99.5
	3 Moderate	7	.1	.5	100.0
	Total	1420	18.4	100.0	
Missing	-2 Nothing present	6283	81.5		
	-1 Missing	2	.0		
	Total	6285	81.6		
Total		7705	100.0		

F9AC052 Chest acne - Severity Grade: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Trivial	14	.2	70.0	70.0
	2 Mild	3	.0	15.0	85.0
	3 Moderate	3	.0	15.0	100.0
	Total	20	.3	100.0	
Missing	-2 Nothing present	7647	99.2		
	-1 Missing	38	.5		
	Total	7685	99.7		
Total		7705	100.0		

F9AC072 Back acne - Severity Grade: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Trivial	14	.2	58.3	58.3
	2 Mild	8	.1	33.3	91.7
	3 Moderate	2	.0	8.3	100.0
	Total	24	.3	100.0	
Missing	-2 Nothing present	7643	99.2		
	-1 Missing	38	.5		
	Total	7681	99.7		
Total		7705	100.0		

Any acne was recorded if it was present on any of the other sites (F9AC080) and where:

F9AC080 Acne on any other sites: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	31	.4	.4	.4
	2 No	7672	99.6	99.6	100.0
	Total	7703	100.0	100.0	
Missing	-1 missing	2	.0		
Total		7705	100.0		

Upper arms (F9AC081); n=30
Buttocks (F9AC082); n=2 Thighs (F9AC083); n=3

Finally, the examiner recorded any presence of acne variants (F9AC090) in the form of:

- Excoriée: Picked and scratched lesions
- Fulminons: Ulceration/joint pains/fever
- Conglobata: Connecting nodules
- Sandpaper acne

F9AC090 Any Acne Variants present: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	9	.1	.1	.1
	2 No	7696	99.9	99.9	100.0
	Total	7705	100.0	100.0	

Excoriée (F9AC091); n=4
Fulminons (F9AC092); n=0
Conglobata (F9AC093); n=0
Sandpaper acne (F9AC094); n=4

3.3 Reading, Spelling and Self-Perception of Reading and Maths

This session, known as the More Word session by staff (as a follow-on from the word session at Focus@7) took approximately 20 minutes and was carried out by trained psychologists and speech therapists.

The session comprised two reading tasks involving real words and non-words, a spelling task and posting task assessing the child's self perception of their reading and maths ability.

F9MW001 Child Started Word session: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	6948	89.9	89.9	89.9
	2 Yes, not completed	718	9.3	9.3	99.2
	3 No	59	.8	.8	100.0
	Total	7725	100.0	100.0	

F9MW001A Reason Child did not do Word session: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 No staff	4	.1	.1	.1
	2 Ch left early	16	.2	.2	.3
	4 Ch refused	4	.1	.1	.3
	6 Ch arrived late	13	.2	.2	.5
	8 Ch not able	3	.0	.0	.5
	10 Did session	7666	99.2	99.5	100.0
	Total	7706	99.8	100.0	
Missing	-1 Missing	19	.2		
Total		7725	100.0		

At the start of the session the tester recorded whether the child was accompanied by an adult [they were encouraged to enter the session alone] (F9MW010) and whether the child wore glasses (F8MW015).

F9MW010 Parent accompanied Child - More word F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 No	7588	98.2	99.4	99.4
	2 Yes, Child request	28	.4	.4	99.7
	3 Yes, Parent request	6	.1	.1	99.8
	4 Y, Ch & Parent request	14	.2	.2	100.0
	6 All request	1	.0	.0	100.0
	Total	7637	98.9	100.0	
Missing	-9 Did not do word	59	.8		
	-1 Missing	29	.4		
	Total	88	1.1		
Total		7725	100.0		

*NB: All refers parent, child and tester

F9MW015 Child wore glasses during session - More word F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	710	9.2	9.3	9.3
	2 No	6928	89.7	90.7	100.0
	Total	7638	98.9	100.0	
Missing	-9 Did not do word	59	.8		
	-1 missing	28	.4		
	Total	87	1.1		
Total		7725	100.0		

F9MW004 More word tester F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	6	.1	.1	.1
	2	372	4.8	4.9	4.9
	3	110	1.4	1.4	6.4
	4	128	1.7	1.7	8.0
	5	533	6.9	7.0	15.0
	6	128	1.7	1.7	16.7
	7	81	1.0	1.1	17.7
	8	368	4.8	4.8	22.5
	10	500	6.5	6.5	29.0
	11	62	.8	.8	29.8
	12	112	1.4	1.5	31.3
	13	98	1.3	1.3	32.6
	14	339	4.4	4.4	37.0
	15	273	3.5	3.6	40.6
	16	208	2.7	2.7	43.3
	17	153	2.0	2.0	45.3
	18	378	4.9	4.9	50.2
	19	215	2.8	2.8	53.0
	20	296	3.8	3.9	56.9
	21	40	.5	.5	57.4
	22	190	2.5	2.5	59.9
	23	452	5.9	5.9	65.8
	24	224	2.9	2.9	68.7
	25	202	2.6	2.6	71.3
	26	53	.7	.7	72.0
	27	468	6.1	6.1	78.1
	28	305	3.9	4.0	82.1
	29	399	5.2	5.2	87.3
	30	266	3.4	3.5	90.8
	31	78	1.0	1.0	91.8
	32	12	.2	.2	92.0
	33	116	1.5	1.5	93.5
	34	501	6.5	6.5	100.0
	Total	7666	99.2	100.0	
Missing	-9 Did not do word	59	.8		
Total		7725	100.0		

3.3.1 Reading

This was assessed by asking the child to read out loud ten real words, followed by ten non- words. Both the words and non-words were selected form a larger selection of words taken from research conducted by Terezinha Nunes and others in Oxford (Nunes, Bryant & Olsson, 2003). The two sets of words were specifically chosen for Focus@9 by Nunes and Peter Bryant.

The test-retest reliability of the word reading is 0.8, and has a correlation of 0.847 with the Schonell Word Reading Task (Schonell & Goodacre, 1971) and 0.814 with the word spelling given 4 months later. The non-word reading task has a test-retest reliability of 0.730 and a correlation of 0.73 and 0.77 with the reading and spelling tasks, respectively, given four months later. Neither of the word lists give a skewed distribution in this age group. (Nunes, personal communication).

3.3.1.1 Reading –Real words

F9MW020 Reading task started: More word F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	7657	99.1	99.9	99.9
	2 No	9	.1	.1	100.0
	Total	7666	99.2	100.0	
Missing	-9 Did not do word	59	.8		
Total		7725	100.0		

The tester had a booklet containing all the words and non-words. For the real words the child was shown each word in turn and asked to read the words out loud. The tester recorded whether the child read each word correctly or incorrectly or whether the child refused to read it out or said don't know without attempting to read it. The words and frequencies are shown in Table 3.3.1.1

Table 3.3.1.1 Frequency of responses to the Real word reading task (n=7657)

Variable name	Word	Correct	Incorrect	Child stopped prem.	Missing
F9MW021	Huge	6752 (88.2%)	888 (11.6%)	-	1
F9MW022	Dishonest	6196 (81.0%)	1288 (16.8%)	2	2
F9MW023	Union	5244 (68.5%)	2102 (27.5%)	3	-
F9MW024	Site	6929 (90.6%)	705 (9.2%)	7	1
F9MW025	Fated	4877 (63.8%)	2660 (34.8%)	8	9
F9MW026	Misheard	6599 (86.3%)	973 (12.7%)	10	9
F9MW027	Native	6026 (78.8%)	1435 (18.8%)	11	2
F9MW028	Cuter	3234 (42.3%)	4371 (57.2%)	12	1
F9MW029	Unusual	6815 (89.2%)	688 (9.0%)	12	1
F9MW030	Taped	4747 (62.2%)	2872 (37.6%)	12	13

The tester recorded whether the child understood the task (F9MW040), the child's attempt at the task (F9MW041), whether the task was stopped prematurely (F9MW042) and if so, which item they stopped at (F9MW043).

Two final reading scores for the real words have been derived, computed as the sum of the number of items (F9MW021 to: F9MW030) the child read/responded to correctly. The first score (F9MW031) excludes all children who stopped the task prematurely (n=12). The second score (F9MW032) includes the scores for these children and assumes that they would not have got any more points for the test had they continued, i.e. they would not have refused to answer, replied 'don't know' or guessed incorrectly.

F9MW031 Reading Score, incl those stopped prem: More word F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	155	2.0	2.0	2.0
	1	147	1.9	1.9	3.9
	2	166	2.1	2.2	6.1
	3	210	2.7	2.7	8.9
	4	335	4.3	4.4	13.2
	5	442	5.7	5.8	19.0
	6	615	8.0	8.0	27.0
	7	836	10.8	10.9	38.0
	8	1289	16.7	16.8	54.8
	9	1714	22.2	22.4	77.2
	10	1748	22.6	22.8	100.0
	Total	7657	99.1	100.0	
Missing	-9 Did not do word	59	.8		
	-2 Did not start task	9	.1		
	Total	68	.9		
Total		7725	100.0		

F9MW032 Reading Score, excl those stopped prem: More word F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	144	1.9	1.9	1.9
	1	146	1.9	1.9	3.8
	2	166	2.1	2.2	6.0
	3	210	2.7	2.7	8.7
	4	335	4.3	4.4	13.1
	5	442	5.7	5.8	18.9
	6	615	8.0	8.0	26.9
	7	836	10.8	10.9	37.9
	8	1289	16.7	16.9	54.7
	9	1714	22.2	22.4	77.1
	10	1748	22.6	22.9	100.0
	Total	7645	99.0	100.0	
Missing	-9 Did not do word	59	.8		
	-3 Stopped prem	12	.2		
	-2 Did not start task	9	.1		
	Total	80	1.0		
Total		7725	100.0		

3.3.1.2 Reading – Non-words

F9MW050 Nonword Reading task started: More word F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	7643	98.9	99.7	99.7
	2 No	23	.3	.3	100.0
	Total	7666	99.2	100.0	
Missing	-9 Did not do word	59	.8		
Total		7725	100.0		

The tester explained to the child that they would be shown some made-up words. It was emphasised that because they were made-up the child would not recognise them as real words. The child was asked to try to read all the words in the way that they thought they should be read, even if they were guessing (Table 3.3.1.2a shows the non-words together with their correct pronunciation).

Table 3.3.1.2a Non-words and their correct pronounciations

Variable name	Word	Pronounciation
F9MW051	Duter	'dewter' NOT 'dutter'
F9MW052	Mishammer	'miss-hammer' NOT 'mish-hammer'
F9MW053	Loker	'lowker' NOT 'locker / looker'
F9MW054	Amazive	'amayzive' NOT 'amazyve / amma-ziv'
F9MW055	Daper	'daper' NOT 'dapper'
F9MW056	Uningest	'uningest' NOT 'uni-gest'
F9MW057	Disheat	'diss-heat' NOT 'dish-eat / dish-heat'
F9MW058	Sofe	'sophe/soaff' NOT 'soff / sov / soff-e / soff-ay'
F9MW059	Unishaped	'uni-shaped' NOT 'unshaped / unis-haped / unni-shaped'
F9MW060	Smape	'smape' NOT 'smap'

The tester recorded whether the child pronounced the word correctly or incorrectly or said that they didn't know without attempting to read it. The tester recorded 'partly correct' if the child split the word into the appropriate syllables correctly but mispronounced the word in some other way (note: the tester recorded the way in which the child mispronounced the word on the data sheet). Table 3.3.1.2b overleaf shows the frequencies for each non-word.

Table 3.3.1.2b Frequency of responses to the non-word reading task

Variable name	Word	Correct	Partly correct	Incorrect	Don't know/ Refused	Child stopped prem.	Missing
F9MW051	Duter	3863 (50.6%)	10 (0.1%)	3719 (48.7%)	49 (0.6%)	-	2
F9MW052	Mishammer	5504 (72.1%)	237 (3.1%)	1797 (23.5%)	101 (1.3%)	1	3
F9MW053	Loker	2964 (38.8%)	5 (0.1%)	4634 (60.7%)	35 (0.5%)	3	2
F9MW054	Amazive	4594 (60.2%)	64 (0.8%)	2833 (37.1%)	144 (1.9%)	6	2
F9MW055	Daper	3695 (48.4%)	4 (0.1%)	3904 (51.1%)	30 (0.4%)	8	2
F9MW056	Uningest	2039 (26.7%)	2036 (26.7%)	3316 (43.4%)	242 (3.2%)	8	2
F9MW057	Disheat	5444 (71.3%)	266 (3.5%)	1848 (24.2%)	72 (0.9%)	11	2
F9MW058	Sofe	4757 (62.4%)	7 (0.1%)	2818 (36.9%)	47 (0.6%)	12	2
F9MW059	Unishaped	1353 (17.7%)	54 (0.7%)	6056 (79.4%)	167 (2.2%)	12	1
F9MW060	Smape	5535 (72.6%)	9 (0.1%)	2003 (26.3%)	79 (1.0%)	12	5

The tester recorded whether the child understood the task (F9MW070), the child's attempt at the task (F9MW071), whether the task was stopped prematurely (F9MW072) and if so, which item they stopped at.

Two final reading scores for the non-words have been derived, computed as the sum of the number of items (F9MW051 to: F9MW060) the child read/responded to correctly. The first score (F9MW061) excludes all children who stopped the task prematurely (n=12). The second score (F9MW062) includes the scores for these children and assumes that they would not have got any more points for the test had they continued, i.e. they would not have refused to answer, replied 'don't know' or guessed incorrectly.

F9MW061 Nonword Reading Score, incl those stopped prem: More word F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	318	4.1	4.2	4.2
	1	394	5.1	5.2	9.3
	2	547	7.1	7.2	16.5
	3	728	9.4	9.5	26.0
	4	901	11.7	11.8	37.8
	5	1049	13.6	13.7	51.5
	6	1063	13.8	13.9	65.4
	7	1089	14.1	14.2	79.7
	8	889	11.5	11.6	91.3
	9	536	6.9	7.0	98.3
	10	129	1.7	1.7	100.0
	Total	7643	98.9	100.0	
Missing	-9 Did not do word	59	.8		
	-2 Did not start task	23	.3		
	Total	82	1.1		
Total		7725	100.0		

F9MW062 Nonword Reading Score, excl those stopped prem: More word F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	306	4.0	4.0	4.0
	1	394	5.1	5.2	9.2
	2	547	7.1	7.2	16.3
	3	728	9.4	9.5	25.9
	4	901	11.7	11.8	37.7
	5	1049	13.6	13.7	51.4
	6	1063	13.8	13.9	65.4
	7	1089	14.1	14.3	79.6
	8	889	11.5	11.6	91.3
	9	536	6.9	7.0	98.3
	10	129	1.7	1.7	100.0
	Total	7631	98.8	100.0	
Missing	-9 Did not do word	59	.8		
	-3 Stopped prem	12	.2		
	-2 Did not start task	23	.3		
	Total	94	1.2		
Total		7725	100.0		

3.3.1 Spelling

F9MW080 Spelling task started: More word F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	7640	98.9	99.7	99.7
	2 No	26	.3	.3	100.0
	Total	7666	99.2	100.0	
Missing	-9 Did not do word	59	.8		
Total		7725	100.0		

The child was given a series of fifteen words to spell, the format used during the word session at Focus@7 was replicated at Focus@9: For each word, the member of staff first read the word out loud on it's own to the child, then within a specific sentence incorporating the word and finally alone again. The child was asked to write down the spelling of the word even if he or she thought they were just guessing. The tester recorded whether the child got each spelling correct or incorrect or whether the child didn't attempt the spelling because they did not know it (Table 3.4.2 shows the frequencies). The tester recorded which hand the child wrote with (F9MW103) and whether he/she had an immature pencil grip (F9MW102).

The words were chosen specifically for this age group by Nunes and Bryant. Some spellings were repeated from Focus@7 (Marked with an * in Table 3.3.2).

Table 3.3.2 Frequency of responses to the Spelling task (n=7640)

Variable name	Word	Correct	Incorrect	Don't Know/ Refused	Missing
F9MW081	Smoke	7045 (92.2%)	588 (7.7%)	6 (0.1%)	1
F9MW082	Called *	6912 (90.5%)	711 (9.3%)	13 (0.2%)	4
F9MW083	Election	4505 (59.0%)	2968 (38.9%)	157 (2.1%)	10
F9MW084	Kissed *	6959 (91.1%)	672 (8.8%)	6 (0.1%)	3
F9MW085	White	6715 (88.0%)	890 (11.7%)	27 (0.4%)	8
F9MW086	Baseball *	5595 (73.3%)	2000 (26.2%)	35 (0.5%)	10
F9MW087	Madness *	5890 (77.2%)	1711 (22.4%)	31 (0.4%)	8
F9MW088	Slide	6934 (90.8%)	692 (9.1%)	7 (0.1%)	7
F9MW089	Emotion	4012 (52.6%)	3466 (45.4%)	154 (2.0%)	8
F9MW090	Graceful	3847 (50.4%)	3741 (49.0%)	41 (0.5%)	11
F9MW091	Magician	1687 (22.1%)	5738 (75.2%)	201 (2.6%)	14
F9MW092	Brought*	5741 (75.3%)	1859 (24.4%)	24 (0.3%)	16
F9MW093	Pavement	5010 (65.7%)	2580 (33.8%)	38 (0.5%)	12
F9MW094	Richness	6197 (81.3%)	1376 (18.0%)	52 (0.7%)	15
F9MW095	Electrician	828 (10.9%)	6623 (87.0%)	164 (2.2%)	25

* also asked at Focus@7

A spelling score was created (F9MW097), Number of words spelt correctly, calculated simply as the number of words the child spelt correctly.

This first score included the scores of those children who stopped the task prematurely assuming that they would not have got any more points for the test (i.e. they would have refused to answer, responded don't know or guessed each item incorrectly). A second score was created which excluded those who stopped prematurely (F9MW098).

F9MW097 Spelling Score, incl those stopped prem: More word F9'

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	125	1.6	1.6	1.6
	1.00	86	1.1	1.1	2.8
	2.00	131	1.7	1.7	4.5
	3.00	145	1.9	1.9	6.4
	4.00	171	2.2	2.2	8.6
	5.00	208	2.7	2.7	11.3
	6.00	280	3.6	3.7	15.0
	7.00	368	4.8	4.8	19.8
	8.00	438	5.7	5.7	25.5
	9.00	646	8.4	8.5	34.0
	10.00	720	9.3	9.4	43.4
	11.00	1030	13.3	13.5	56.9
	12.00	1120	14.5	14.7	71.6
	13.00	1049	13.6	13.7	85.3
	14.00	656	8.5	8.6	93.9
	15.00	467	6.0	6.1	100.0
	Total	7640	98.9	100.0	
Missing	-9.00 Did not do word	59	.8		
	-2.00 Did not start task	26	.3		
	Total	85	1.1		
Total		7725	100.0		

F9MW098 Spelling Score, excl those stopped prem: More word F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	116	1.5	1.5	1.5
	1.00	86	1.1	1.1	2.6
	2.00	129	1.7	1.7	4.3
	3.00	145	1.9	1.9	6.2
	4.00	171	2.2	2.2	8.5
	5.00	208	2.7	2.7	11.2
	6.00	280	3.6	3.7	14.9
	7.00	368	4.8	4.8	19.7
	8.00	438	5.7	5.7	25.4
	9.00	646	8.4	8.5	33.9
	10.00	720	9.3	9.4	43.3
	11.00	1030	13.3	13.5	56.8
	12.00	1120	14.5	14.7	71.5
	13.00	1049	13.6	13.8	85.3
	14.00	656	8.5	8.6	93.9
	15.00	467	6.0	6.1	100.0
	Total	7629	98.8	100.0	
Missing	-9.00 Did not do word	59	.8		
	-3.00 Stopped prem	11	.1		
	-2.00 Did not start task	26	.3		
	Total	96	1.2		
Total		7725	100.0		

3.3.3 Self perception of reading and maths

F9MW110 Self perception task started: More word F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	7580	98.1	98.9	98.9
	2 No	86	1.1	1.1	100.0
	Total	7666	99.2	100.0	
Missing	-9 Did not do word	59	.8		
Total		7725	100.0		

The reading measure was adapted by Nunes from Tunmer and Chapman's self perception measure (Tunmer & Chapman, 1997, 2002, 2003). The same posting format used for several tasks at Focus@8 was adopted, whereby children post their responses in a confidential manner into different postboxes according to their self-perception. The reliability score of these self-perception items is 0.9 and they correlate 0.97 with the full scale (Nunes, personal communication).

Eight questions were also used to assess self-perception in maths. The questions were adapted from the Mathematics Scale of the Self-Description Questionnaire (Marsh, 1998).

Two additional questions were including asking about drawing and music in school. These were included as a check for the child's consistency in posting.

The task was conducted using postboxes and envelopes. Each envelope corresponded to a single item, comprising two statements, one in blue writing and one in red. For example, "Some children are interested in reading" (in *blue*) and "other children are not interested in reading" (in *red*). All the statements are shown in Table 3.3.3.1a, with the corresponding variable names. There were two postboxes, one blue and one red, and on each postbox there were two slots "sort of true for me" and "really true for me". The tester read each statement aloud and the child had to decide whether they were more like the children in the blue writing or the red (and consequently whether to post in the blue or the red box) and then whether the relevant statement was "sort of true for them" or "really true for them" and consequently which slot to post the envelope through in the relevant coloured box).

Table 3.3.3.1a: Statements shown on each envelope

No.	Statement 2 (Blue)	Statement 1 (Red)	Variable name
1	Some children find it easy to understand the stories they read in class	Other children find it hard to understand the stories they read in class	F9MW111
2	Some children don't enjoy doing maths work	Other children do enjoy doing maths work	F9MW112
3	Some children feel happy when they are reading	Other children don't feel happy when they are reading	F9MW113
4	Some children think they read well in class	Other children think they don't read well in class	F9MW114
5	Some children find maths work hard	Other children find maths work easy	F9MW115
6	Some children don't like reading stories with lots of words in them.	Other children do like reading stories with lots of words in them.	F9MW116
7	Some children get bad marks in maths.	Other children get good marks in maths	F9MW117
8	Some children do like doing drawing at school	Other children don't like doing drawing at school	F9MW118
9	Some children are not interested in maths	Other children are interested in maths	F9MW119
10	Some children are not interested in reading	Other children are interested in reading	F9MW120
11	Some children look forward to maths	Other children don't look forward to maths	F9MW121
12	Some children learn things quickly in maths	Other children don't learn things quickly in maths	F9MW122
13	Some children don't look forward to reading	Other children do look forward to reading	F9MW123
14	Some children are better at reading than others	Other children are not so good at reading	F9MW124
15	Some children don't enjoy music at school	Other children do enjoy music at school	F9MW125
16	Some children like maths	Other children don't like maths	F9MW126
17	Some children feel they are bad at reading	Other children feel they are good at reading	F9MW127
18	Some children are good at maths	Other children are not good at maths	F9MW128

Table 3.3.3.1b: Frequency of responses to self-perception reading questions (n=7580)

Variable name	Blue, really	Blue, sort of	Red, sort of	Red, really	Missing
F9MW111	3792 (50.1%)	2576 (34.0%)	894 (11.8%)	309 (4.1%)	8
F9MW112	1811 (23.9%)	1474 (19.5%)	1729 (22.8%)	2560 (33.8%)	6
F9MW113	3533 (46.9%)	2672 (35.3%)	954 (12.6%)	396 (5.2%)	5
F9MW114	2298 (30.4%)	3297 (43.5%)	1429 (18.9%)	547 (7.2%)	9
F9MW115	862 (11.4%)	1479 (19.5%)	2500 (33.0%)	2730 (36.1%)	9
F9MW116	1229 (16.2%)	1580 (20.9%)	2124 (28.0%)	2640 (34.9%)	7
F9MW117	483 (6.4%)	1040 (13.7%)	3137 (41.5%)	2904 (38.4%)	16
F9MW118	4761 (62.9%)	1699 (22.4%)	656 (8.7%)	453 (6.0%)	11
F9MW119	938 (12.4%)	1278 (16.9%)	2220 (29.3%)	3130 (41.4%)	13
F9MW120	818 (10.8%)	1220 (16.1%)	2104 (27.8%)	3427 (45.3%)	11
F9MW121	2533 (33.5%)	2337 (30.9%)	1492 (19.5%)	1224 (16.2%)	14
F9MW122	2437 (32.2%)	2928 (38.7%)	1591 (21.0%)	611 (8.1%)	13
F9MW123	993 (13.1%)	1453 (19.2%)	2195 (29.0%)	2923 (38.6%)	16
F9MW124	2723 (36.0%)	3257 (43.1%)	1158 (15.3%)	424 (5.6%)	18
F9MW125	1287 (17.0%)	1264 (16.7%)	1886 (24.9%)	3125 (41.3%)	18
F9MW126	3416 (45.2%)	2049 (27.1%)	1102 (14.6%)	997 (13.2%)	16
F9MW127	563 (7.4%)	1197 (15.8%)	2932 (38.8%)	2866 (37.9%)	22
F9MW128	3304 (43.7%)	2906 (38.5%)	908 (12.0%)	439 (5.8%)	23

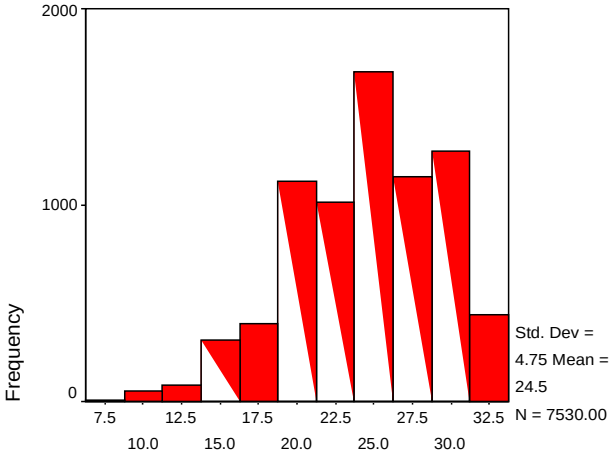
To ease the use of the data, we have relabeled the variables as follows: Blue,

Really true for me=Yes, really like me
Blue, Sort of true for me=Yes, a bit like me Red,
Sort of true for me=No, not really like me Red,
Really true for me=No, not at all like me

Summary variables were created for each item (with a suffix –a) determining whether the envelopes were posted into the blue post-box or the red one, irrespective of which slot. In a very small minority of cases it was not clear whether the child had posted the envelope into the 'really' or 'sort of' slot in the blue and red boxes (for example, the tester found the envelopes wedged in between when they went to remove them. For the purposes of the summary variables these have been recoded to blue or red as appropriate

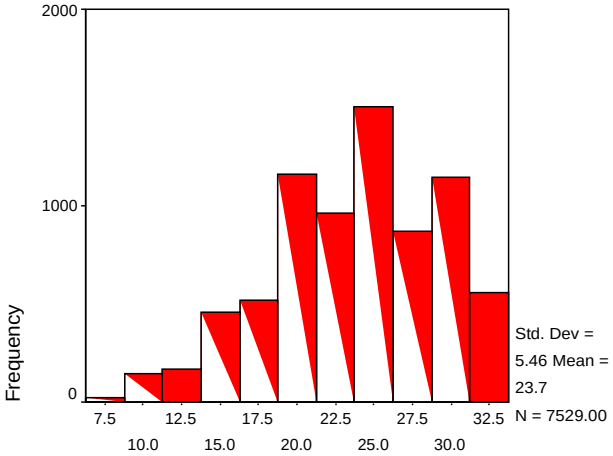
For the calculation of the reading and maths self-perception scores, items 1, 3, 4, 11, 12, 14, 16 and 18 were recoded so that 1=4, 2=3, 3=2, 4=1. Reading self-perception (F9MW) was calculated by summing scores for items 1, 3, 4, 6, 10, 13, 14 and 17 and maths self-perception (F9MW) was calculated by summing scores for items 2, 5, 7, 9, 11, 12, 16 and 18. A higher score indicates a more positive self-perception.

F9MW130: Self perception Reading score: More word F9



Self perception Reading score: More word F9

F9MW131: Self perception Maths score: More word F9



Self perception Maths score: More word F9

After the posting task was complete the tester recorded whether the child appeared confused with the task (FMW150) and the child's attempt at the task (F9MW151).

F9MW150 Self perception - Confusion with task: More word F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	215	2.8	2.9	2.9
	2 No	7313	94.7	97.1	100.0
	Total	7528	97.4	100.0	
Missing	-9 Did not do word	59	.8		
	-2 Did not start task	86	1.1		
	-1 Missing	52	.7		
	Total	197	2.6		
Total		7725	100.0		

F9MW151 Self perception - Ch's attempt at task: More word F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Good	7378	95.5	98.1	98.1
	2 Medium	128	1.7	1.7	99.8
	3 Poor	14	.2	.2	100.0
	Total	7520	97.3	100.0	
Missing	-9 Did not do word	59	.8		
	-2 Did not start task	86	1.1		
	-1 Missing	60	.8		
	Total	205	2.7		
Total		7725	100.0		

Most children appeared to have posted their answers appropriately (as recorded in: F9MW153). A small minority of children (n=18), however, posted all their answers into the blue slot, regardless of whether the relevant statement was positive or negative. It is highly unlikely that these children's answers are reliable. These children are indicated by the variable: F9MW156.

F9MW153 Self perception - Child posted appropriately: More word F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	5904	76.4	80.1	80.1
	2 No	192	2.5	2.6	82.7
	3 Query	532	6.9	7.2	89.9
	4 Cant say	746	9.7	10.1	100.0
	Total	7374	95.5	100.0	
Missing	-9 Did not do word	59	.8		
	-2 Did not start task	86	1.1		
	-1 Missing	206	2.7		
	Total	351	4.5		
Total		7725	100.0		

Finally, the tester recorded whether they felt the child had answered truthfully to the items (F9MW152).

F9MW152 Self perception - Answers appeared truthful: More word F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	6389	82.7	86.6	86.6
	2 No	31	.4	.4	87.0
	3 Query	236	3.1	3.2	90.2
	4 Cant say	723	9.4	9.8	100.0
	Total	7379	95.5	100.0	
Missing	-9 Did not do word	59	.8		
	-2 Did not start task	86	1.1		
	-1 Missing	201	2.6		
	Total	346	4.5		
Total		7725	100.0		

Written comments by the tester made during the session have been coded and a list of the variables available is below:

F9MW930 Comments: Child lacked confidence: More word F9
F9MW931 Comments: Lack of time: More word F9
F9MW932 Comments: External distractons: More word F9
F9MW933 Comments: Difficult behaviour: More word F9
F9MW934 Comments: Special needs: More word F9
F9MW935 Comments: Child Tired: More word F9
F9MW936 Comments: Child bored: More word F9
F9MW937 Comments: Child was slow at tasks: More word F9
F9MW938 Comments: Child rushed: More word F9
F9MW939 Comments: Child had difficulty understanding tasks: More word F9
F9MW940 Comments: Child found tasks difficult: More word F9
F9MW941 Comments: Child unwell: More word F9

3.4 Story: reading skills and comprehension

The Story session originally started with the Oakhill assessment, but problems were identified early on and after successful piloting the Neale Analysis of Reading Ability was used in its place. 587 children started the Oakhill (data not released) compared to 6959 who started the Neale. For those children who clearly struggled with the story task (i.e. stopped within a couple of minutes) the tester gave the child a sentence decision task (see section 3.4.2).

3.4.1: Neale

The revised Neale Analysis of Reading Ability (NARA II) (Neale, 1997) was used to assess the child's reading skills and comprehension.

NARA II is suitable for children between the ages of 6 and 12 with a standard assessment time of 20 minutes. It was administered by trained psychologists using Form II.

F9SN001 Child Started Story (Neale) session: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	6959	90.1	97.5	97.5
	3 No	179	2.3	2.5	100.0
	Total	7138	92.4	100.0	
Missing	-9 Did Oakhill	587	7.6		
Total		7725	100.0		

F9SN001A Reason Child did not do Story Neale session: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 No staff	49	.6	.6	.6
	2 Ch left early	28	.4	.4	1.0
	4 Ch refused	3	.0	.0	1.0
	5 Sessions overran	3	.0	.0	1.1
	6 Ch arrived late	57	.7	.7	1.8
	8 Ch not able	2	.0	.0	1.8
	9 Did Oakhill	587	7.6	7.6	9.5
	10 Did session	6959	90.1	90.5	100.0
	Total	7688	99.5	100.0	
Missing	-1 Missing	37	.5		
Total		7725	100.0		

F9SN004 Story tester F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	370	4.8	5.3	5.3
	2	485	6.3	7.0	12.3
	3	102	1.3	1.5	13.8
	4	73	.9	1.0	14.8
	5	549	7.1	7.9	22.7
	6	152	2.0	2.2	24.9
	7	72	.9	1.0	25.9
	8	281	3.6	4.0	29.9
	10	400	5.2	5.7	35.7
	11	40	.5	.6	36.3
	12	139	1.8	2.0	38.3
	13	82	1.1	1.2	39.4
	14	334	4.3	4.8	44.2
	15	257	3.3	3.7	47.9
	16	191	2.5	2.7	50.7
	17	152	2.0	2.2	52.9
	18	228	3.0	3.3	56.1
	19	160	2.1	2.3	58.4
	20	275	3.6	4.0	62.4
	21	34	.4	.5	62.9
	22	117	1.5	1.7	64.6
	23	486	6.3	7.0	71.5
	24	248	3.2	3.6	75.1
	25	178	2.3	2.6	77.7
	26	20	.3	.3	78.0
	27	518	6.7	7.4	85.4
	28	229	3.0	3.3	88.7
	29	340	4.4	4.9	93.6
	30	237	3.1	3.4	97.0
	31	79	1.0	1.1	98.1
	33	131	1.7	1.9	100.0
	Total	6959	90.1	100.0	
Missing	-9 Did not do story N	766	9.9		
Total		7725	100.0		

The testing took place in a quiet room, free from distractions and interruptions wherever possible, parents were asked not to accompany their child into the testing room in order to minimize this.

The child was put at ease and the test was introduced and explained to them.

F9SN006 Room - Story: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yellow	2322	30.1	54.1	54.1
	2 Green	1969	25.5	45.9	100.0
	Total	4291	55.5	100.0	
Missing	-9 Did not do story N	766	9.9		
	-2 Not collected Vers 1	2668	34.5		
	Total	3434	44.5		
Total		7725	100.0		

F9SN010 Parent accompanied Child - Story F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 No	6880	89.1	99.3	99.3
	2 Yes, Child request	9	.1	.1	99.5
	3 Yes, Parent request	10	.1	.1	99.6
	4 Y, Ch & Parent request	26	.3	.4	100.0
	7 Y, All request	2	.0	.0	100.0
	Total	6927	89.7	100.0	
Missing	-9 Did not do story N	766	9.9		
	-1 Missing	32	.4		
	Total	798	10.3		
Total		7725	100.0		

*NB: All refers parent, child and tester

Format of the test

The child was first given a practice story; the same structure for testing was used for this and all subsequent test passages. A booklet was used from which the child read each passage (these were illustrated), the child was asked to read the passage, they were then asked a series of questions about the content of the story they had just read.

If a child wore glasses they were encouraged to wear them throughout the session.

F9SN015 Child wore glasses during session - Story F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	636	8.2	9.2	9.2
	2 No	6296	81.5	90.8	100.0
	Total	6932	89.7	100.0	
Missing	-9 Did not do story N	766	9.9		
	-1 Missing	27	.3		
	Total	793	10.3		
Total		7725	100.0		

F9SN015A Info on glasses - Story F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Had tinted glasses for dyslexia	10	.1	9.9	9.9
	2 Forgot/chose not to wear	91	1.2	90.1	100.0
	Total	101	1.3	100.0	
Missing	-9 Did not do story N	766	9.9		
	-1 Not commented	6858	88.8		
	Total	7624	98.7		
Total		7725	100.0		

The tester recorded the time (in seconds) it took the child to read the passage. Any errors made by the child during reading were noted on the data sheet. The child was prompted by the tester if they:

a. Mispronounced a word;
b. Substituted a word;
c. Refused to say a word;
d. Made an addition (only if it altered the meaning of the story);
e. Made an omission;
f. Reversed a word.

All inaccuracies were recorded on the datasheet, transcribed directly on to the passage – the precise categorization of the child's error was then performed once the child had left the room as necessary. (note that hesitations, repetitions and self-correction by the child were not classed as errors). See Table 3.5.1a overleaf for details of variable names – frequencies for these individual items are not included in the documentation.

Administration of the test was done as per the manual instructions: If the child made more than 17 errors on the practice passage, the tester did not ask the child the comprehension questions and the tester moved straight on to the level one story.

All other children moved on to the level two story unless the tester felt that they had particular difficulty with reading the practice passage.

If the child made two or fewer errors on the level two story the tester moved on to level three. If, however, the child made 3 or more errors on level two, the comprehension questions were administered but the tester moved down to the level one story (only moving on to level three if the child completed level one within the permissible number of errors).

For the remaining test passages the child was not asked the comprehension questions if they made more than 16 errors (20 on level six) and the session was ended.

At the end of the session the tester had an informal chat with the child, asking them which story they preferred, responding with positive interest to their choices.
If a child had made a lot of errors on a passage the tester always emphasized that they tested children older than then and were constantly praised and encouraged.

The comprehension questions were asked as soon as the child had finished reading. For each question the child was given 10 to 12 seconds to respond. They were allowed to refer back to the text to assist them.

Table 3.4.1a Variables collected for each story

Information collected	PRACTICE	STORY 1	STORY 2	STORY 3	STORY 4	STORY 5	STORY 6
Child started to read the story	F9SN020	F9SN120	F9SN220	F9SN320	F9SN420	F9SN520	F9SN620
Comprehension questions asked	F9SN021	F9SN121	F9SN221	F9SN321	F9SN421	F9SN521	F9SN621
Stopped story prematurely	F9SN022	F9SN122	F9SN222	F9SN322	F9SN422	F9SN522	F9SN622
Question stopped on	F9SN023	F9SN123	F9SN223	F9SN323	F9SN423	F9SN523	F9SN623
Time taken to read story	F9SN024	F9SN124	F9SN224	F9SN324	F9SN424	F9SN524	F9SN624
Comprehension Question 1	F9SN025	F9SN125	F9SN225	F9SN325	F9SN425	F9SN525	F9SN625
Comprehension Question 2	F9SN026	F9SN126	F9SN226	F9SN326	F9SN426	F9SN526	F9SN626
Comprehension Question 3	F9SN027	F9SN127	F9SN227	F9SN327	F9SN427	F9SN527	F9SN627
Comprehension Question 4	F9SN028	F9SN128	F9SN228	F9SN328	F9SN428	F9SN528	F9SN628
Comprehension Question 5	F9SN029	F9SN129	F9SN229	F9SN329	F9SN429	F9SN529	F9SN629
Comprehension Question 6	F9SN030	F9SN130	F9SN230	F9SN330	F9SN430	F9SN530	F9SN630
Comprehension Question 7	-	-	F9SN231	F9SN331	F9SN431	F9SN531	F9SN631
Comprehension Question 8	-	-	F9SN232	F9SN332	F9SN432	F9SN532	F9SN632
Total no. comp questions correct	F9SN035	F9SN135	F9SN235	F9SN335	F9SN435	F9SN535	F9SN635
No. mispronounciations	F9SN040	F9SN140	F9SN240	F9SN340	F9SN440	F9SN540	F9SN640
No. substitutions	F9SN041	F9SN141	F9SN241	F9SN341	F9SN441	F9SN541	F9SN641
No. refusals	F9SN042	F9SN142	F9SN242	F9SN342	F9SN442	F9SN542	F9SN642
No. additions	F9SN043	F9SN143	F9SN243	F9SN343	F9SN443	F9SN543	F9SN643
No. omissions	F9SN044	F9SN144	F9SN244	F9SN344	F9SN444	F9SN544	F9SN644
No. reversals	F9SN045	F9SN145	F9SN245	F9SN345	F9SN445	F9SN545	F9SN645
Total no. errors	F9SN046	F9SN146	F9SN246	F9SN346	F9SN446	F9SN546	F9SN646
Accuracy Score	F9SN047	F9SN147	F9SN247	F9SN347	F9SN447	F9SN547	F9SN647
Child read confidently	F9SN050	F9SN150	F9SN250	F9SN350	F9SN450	F9SN550	F9SN650
Child referred to text	F9SN051	F9SN151	F9SN251	F9SN351	F9SN451	F9SN551	F9SN651
Child used finger/bookmark	F9SN052	F9SN152	F9SN252	F9SN352	F9SN452	F9SN552	F9SN652

A derived variable has been created denoting the total number of test passages (not including the practice story) that the child read (F9SN700).

F9SN700 No. test stories read by child: Story F9

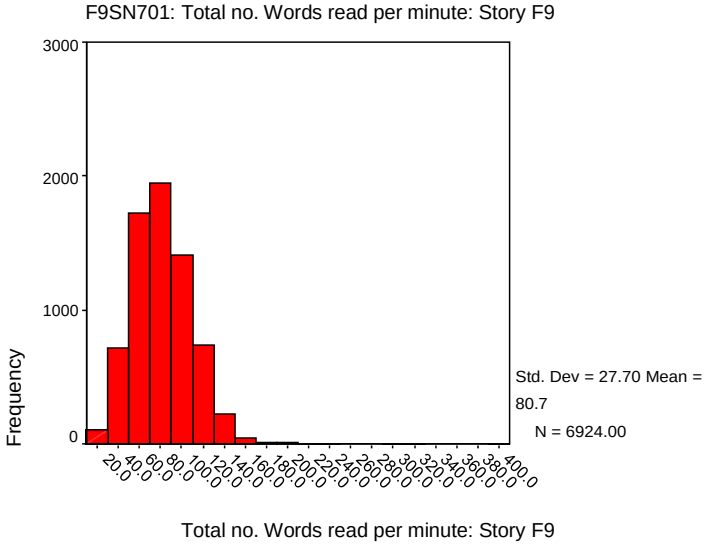
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	16	.2	.2	.2
	1.00	26	.3	.4	.6
	2.00	129	1.7	1.9	2.5
	3.00	709	9.2	10.2	12.6
	4.00	1348	17.4	19.4	32.0
	5.00	4686	60.7	67.3	99.4
	6.00	45	.6	.6	100.0
	Total	6959	90.1	100.0	
Missing	-9.00 Did not do story N	766	9.9		
Total		7725	100.0		

Total Raw Scores

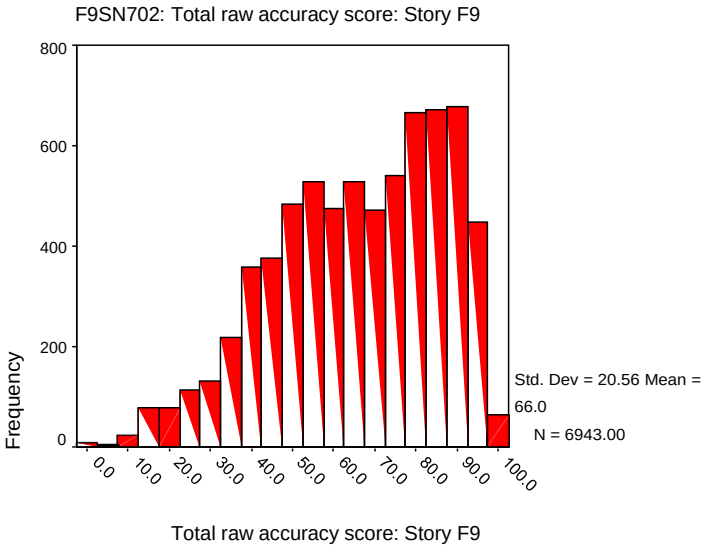
Using the times taken for the child to read each passage, a *raw rate* score was computed for each child (F9SN701). This was based on only those passages actually read where no more than 16 errors were made (20 for passage 6) and was created as follows:

$$\text{Rate of words read per minute} = \frac{\text{Total no. words read}}{\text{Total time taken (secs)}} \times 60$$

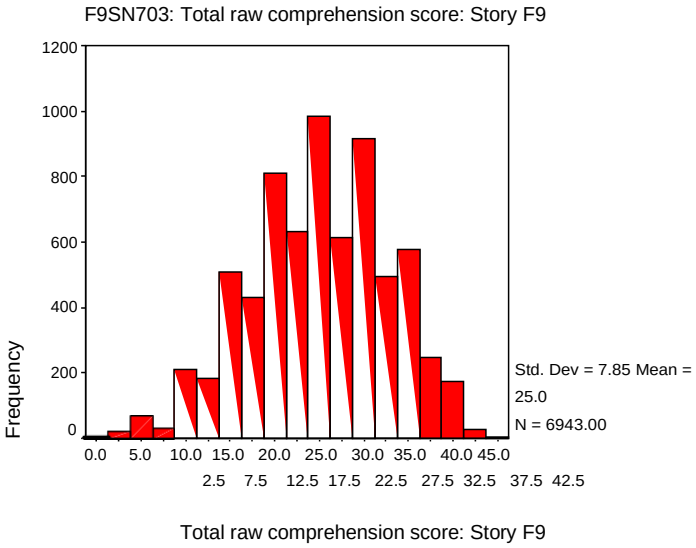
If the permissible number of errors was exceeded for the final passage read by the child the time and number of words for that passage were not included in the calculation.



A *raw accuracy* score (F9SN702) was computed as the total number of errors made by the child in all the passages that they read, such that the higher the score the worse their accuracy.



A *raw comprehension* score (F9SN703) was obtained by summing the number of correct answers the child gave for each passage. If the permissible number of errors was exceeded for the final passage read by the child, the comprehension questions were not asked and so no score was given for that passage and hence not included in the calculation of the raw score.



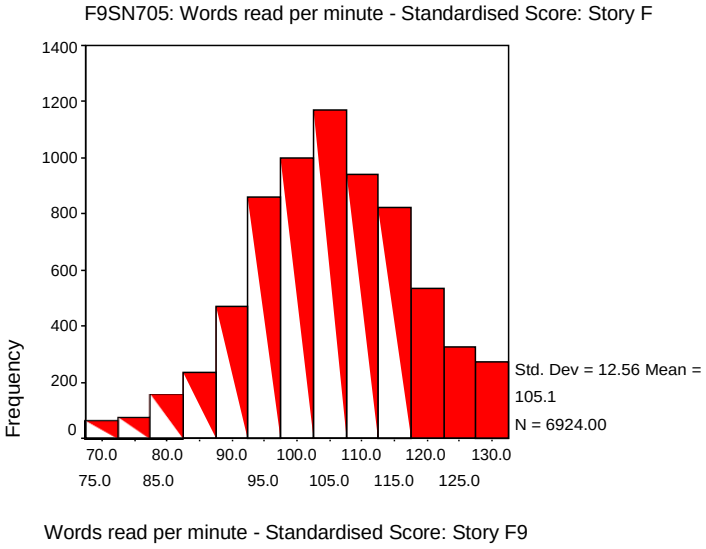
Total standardized scores

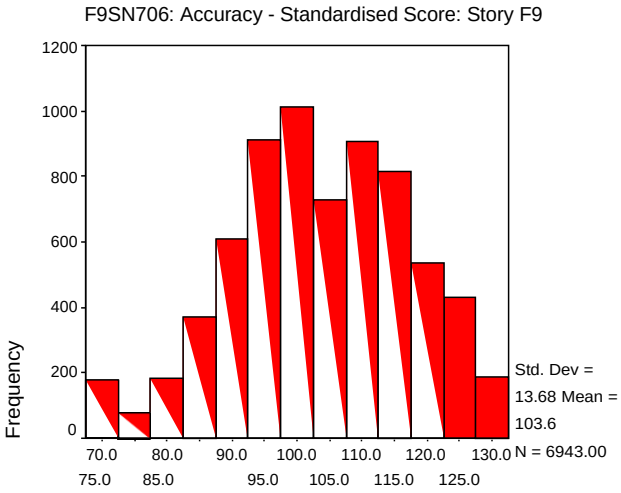
The standardization for Form 2 from the second Revised British Edition of NARA was performed in May to July 1997 on 1546 children (750 boys and 796 girls) in school years 1 to 7.

Using look up tables provided in the manual, two further sets of scores were derived as follows:

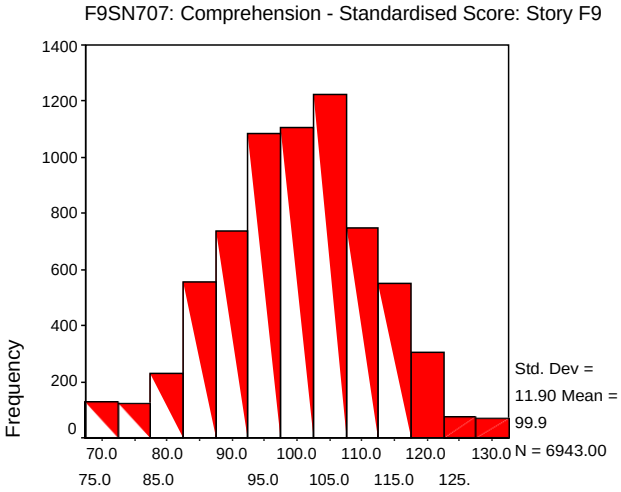
Rate, accuracy and comprehension scores standardized by age (F9SN705,: F9SN706,: F9SN707)

Equivalent reading ages for rate, accuracy and comprehension – the age at which a given a raw score was the average during the standardization process (F9SN705a,: F9SN706a,: F9SN707a).





Accuracy - Standardised Score: Story F9



3.4.1.1 Developmental Dyslexia

The definition of developmental dyslexia was devised by Julie Williams and Alan Emond. It is based on the accuracy component of the NARA II . The equivalent reading age based on the accuracy score is calculated from the NARA II manual and the difference between this and the actual age is calculated. Where the child's reading age is greater than or equal to 30 months (2.5 years) behind the actual age AND the child's IQ is greater than or equal to 85 the child is considered developmentally dyslexic. The measure of IQ is taken from the previous (F8) clinic [*f8ws112*].

Three derived variables are included. The first [*f9sn800*] is a binary measure to capture developmental dylexia. The following two are continuous measures that capture the expected reading age [*f9sn801*] and the discrepancy between this and the actual reading age [*f9sn802*].

f9sn800 DV: Developmental dyslexia: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00 Not dyslexic	7553	97.8	97.8	97.8
	1.00 Developmental dyslexia	169	2.2	2.2	100.0
	Total	7722	100.0	100.0	

Descriptive Statistics n=6940

	Minimum	Maximum	Mean	SD
f9sn801 DV: Expected reading age based on NARA II accuracy score: F9	72.00	154.00	125.4212	22.36106
f9sn802 DV: Age discrepancy between actual age and reading age: F9	-43.00	61.00	-6.7444	22.57907

In addition to the normal in-session behavioral variables, written comments by the tester have been coded and a list of the variables available is below:

f9sn950	Comments: Done Neale before: Story F9
f9sn951	Comments: Bad blood or other session: Story F9
f9sn952	Comments: External distraction: Story F9
f9sn953	Comments: Struggled with reading: Story F9
f9sn954	Comments: Lacked confidence: Story F9
f9sn955	Comments: Coding difficulties for tester: Story F9
f9sn956	Comments: Child or room hot or stuffy: Story F9
f9sn957	Comments: Lack of time - items omitted: Story F9
f9sn958	Comments: Child anxious/nervous/stressed: Story F9
f9sn959	Comments: Poor attention/lack of concentration: Story F9
f9sn960	Comments: Performance affected by shyness: Story F9
f9sn961	Comments: Child upset/ crying: Story F9
f9sn962	Comments: Child gave up easily: Story F9
f9sn963	Comments: Child tired: Story F9
f9sn964	Comments: Child bored: Story F9
f9sn965	Comments: Child rushed: Story F9
f9sn966	Comments: Difficulty understanding task: Story F9
f9sn970	Comments: Special needs: Story F9

3.4.2: Sentence Decision Task

For those children who clearly struggled with the story task (i.e. stopped within a couple of minutes) the tester gave the child a sentence decision task.

F9SD010 Sentence Decision started: Story F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes, with Neale	48	.6	.6	.6
	2 Yes, with Oakhill	564	7.3	7.5	8.1
	3 No	6934	89.8	91.9	100.0
	Total	7546	97.7	100.0	
Missing	-9 Did not do story session	179	2.3		
Total		7725	100.0		

The child was presented with a series of 39 sentences, some of them describing something that is true and some of them describing things that are false. The child was asked to read the sentence and place a tick or a cross next to the sentence if they felt that the sentence was true or false. The child was shown two examples that had already been completed and was then given a further four as a practise, the tester ensured that these were correct before the child moved on to the proper test. The sentences are shown in Table 3.5.2 (overleaf), together with the frequencies of the responses.

An overall score was calculated as the total number of sentences that the child judged correctly (F9SD060).

F9SD060 Sentence Decision, Overall score: Story F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20	1	.0	.2	.2
	33	1	.0	.2	.3
	36	1	.0	.2	.5
	37	25	.3	4.2	4.7
	38	96	1.2	16.0	20.6
	39	477	6.2	79.4	100.0
	Total	601	7.8	100.0	
Missing	-9 Did not do story session	179	2.3		
	-2 Did not do task	6934	89.8		
	-1 Missing	11	.1		
	Total	7124	92.2		
Total		7725	100.0		

Table 3.4.2: Sentences given in the task and frequencies of responses

Variable name	Sentence	Correct	Incorrect
F9SD020	Dogs can run	606 (99.0%)	6 (1.0%)
F9SD021	Birds have wings	610 (99.7%)	2 (0.3%)
F9SD022	Tables have teeth	611 (99.8%)	1 (0.2%)
F9SD023	Your feet are at the ends of your legs	601 (98.2%)	11 (1.8%)
F9SD024	Noses shine at night	606 (99.0%)	6 (1.0%)
F9SD025	Spoons have sharp teeth	609 (99.5%)	3 (0.5%)
F9SD026	Stones are hard	609 (99.7%)	2 (0.3%)
F9SD027	We see things with our noses	609 (99.7%)	2 (0.3%)
F9SD028	Stones grow on trees	609 (99.7%)	2 (0.3%)
F9SD029	Your toes are attached to your hands	610 (99.8%)	1 (0.2%)
F9SD030	When people get old their hair can turn grey	606 (99.2%)	5 (0.8%)
F9SD031	Birds wear shoes	611 (100.0%)	0
F9SD032	Fish can sing	603 (98.7%)	8 (1.3%)
F9SD033	Soldiers have teeth	583 (95.4%)	28 (4.6%)
F9SD034	When stones get old they get grey hair	608 (99.8%)	1 (0.2%)
F9SD035	Lions use sharp knives to cut things	604 (99.0%)	6 (1.0%)
F9SD036	Fish can swim	610 (100.0%)	0
F9SD037	Chairs are for sitting on	609 (99.8%)	1 (0.2%)
F9SD038	Dogs have two ears on their heads	600 (98.4%)	10 (1.6%)
F9SD039	Shoes are worn on feet	601 (99.7%)	2 (0.3%)
F9SD040	Lions have fins for swimming	600 (99.5%)	3 (0.5%)
F9SD041	Apples have wings	601 (99.7%)	2 (0.3%)
F9SD042	Buses have eyes	601 (99.7%)	2 (0.3%)
F9SD043	Lions have long tails	580 (96.2%)	23 (3.8%)
F9SD044	Noses can smell smoke	595 (98.7%)	8 (1.3%)
F9SD045	We use sharp knives to cut things	597 (99.0%)	6 (1.0%)
F9SD046	Your eyes are behind your knee	602 (99.8%)	1 (0.2%)
F9SD047	Knives have legs	603 (100.0%)	0
F9SD048	Birds have whiskers	599 (99.5%)	3 (0.5%)
F9SD049	Dogs have four legs	600 (99.7%)	2 (0.3%)
F9SD050	Onions have legs	600 (99.7%)	2 (0.3%)
F9SD051	Your nose is in the middle of your face	595 (99.0%)	6 (1.0%)
F9SD052	Chairs have ears	599 (99.7%)	2 (0.3%)
F9SD053	Owls have wings	599 (99.7%)	2 (0.3%)
F9SD054	Cats have small noses and whiskers	600 (99.8%)	1 (0.2%)
F9SD055	Cows eat grass	593 (98.7%)	8 (1.3%)
F9SD056	Rocks can run	598 (99.5%)	3 (0.5%)
F9SD057	Cars are made from cheese	599 (99.7%)	2 (0.3%)
F9SD058	Birds eat worms	597 (99.3%)	4 (0.7%)

Other items of information collected by the tester on this task are as follows:

F9SD070 Sentence Decision, Practise items correct: Story F9: F9SD071
Sentence Decision, Practise items understood: Story F9: F9SD072
Sentence Decision, Speed: Story: F9
F9SD073 Sentence Decision, Atttempt at task: Story: F9: F9SD074
Sentence Decision, Read for child: Story: F9: F9SD075 Sentence
Decision, Stopped at task no.: Story: F9: F9SD076 Sentence
Decision, Stopped prem by staff: Story: F9

3.5 Blood pressure, pulse and biological samples

F9SA001 Child Started Samples session: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	5453	70.6	70.6	70.6
	2 Yes, not completed	2216	28.7	28.7	99.3
	3 No	56	.7	.7	100.0
	Total	7725	100.0	100.0	

F9SA001A Reason Child did not do Samples session: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 No staff	46	.6	.6	.6
	2 Ch left early	3	.0	.0	.6
	4 Ch refused	3	.0	.0	.7
	6 Ch arrived late	1	.0	.0	.7
	10 Did session	7669	99.3	99.3	100.0
	Total	7722	100.0	100.0	
Missing	-1 Missing	3	.0		
Total		7725	100.0		

F9SA004 Samples tester: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	841	10.9	11.0	11.0
	2	1211	15.7	15.8	26.8
	3	2605	33.7	34.0	60.8
	4	589	7.6	7.7	68.5
	5	293	3.8	3.8	72.3
	6	89	1.2	1.2	73.5
	7	1237	16.0	16.2	89.6
	8	350	4.5	4.6	94.2
	10	443	5.7	5.8	100.0
	Total	7658	99.1	100.0	
Missing	-9 Did not do samples	67	.9		
Total		7725	100.0		

At the start of this session the tester determined whether the child had recently or currently had an infection and if so, how long ago (F9SA011 – frequency table overleaf), details were recorded as text and coded as: F9SA012 and: F9SA013. Also whether they were currently on any medication, details of these were also recorded as text and have been coded into variables: F9SA016 and: F9SA017 (data not shown).

F9SA010 Infection present/recent:samples: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	767	9.9	10.0	10.0
	2 No	6891	89.2	90.0	100.0
	Total	7658	99.1	100.0	
Missing	-9 Did not do samples	67	.9		
Total		7725	100.0		

F9SA015 Currently taking medication: samples: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	1188	15.4	15.5	15.5
	2 No	6469	83.7	84.5	100.0
	Total	7657	99.1	100.0	
Missing	-9 Did not do samples	67	.9		
	-1 Missing	1	.0		
	Total	68	.9		
Total		7725	100.0		

F9SA011 Infection - no. of days before visit: samples: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	242	3.1	33.2	33.2
	1	89	1.2	12.2	45.3
	2	99	1.3	13.6	58.9
	3	64	.8	8.8	67.7
	4	49	.6	6.7	74.4
	5	41	.5	5.6	80.0
	6	42	.5	5.8	85.8
	7	54	.7	7.4	93.2
	8	7	.1	1.0	94.1
	9	5	.1	.7	94.8
	10	9	.1	1.2	96.0
	11	4	.1	.5	96.6
	12	1	.0	.1	96.7
	13	1	.0	.1	96.8
	14	8	.1	1.1	97.9
	15	3	.0	.4	98.4
	16	2	.0	.3	98.6
	17	1	.0	.1	98.8
	22	1	.0	.1	98.9
	24	1	.0	.1	99.0
	27	1	.0	.1	99.2
	28	1	.0	.1	99.3
	29	1	.0	.1	99.5
	30	1	.0	.1	99.6
	31	1	.0	.1	99.7
	34	1	.0	.1	99.9
	36	1	.0	.1	100.0
	Total	730	9.4	100.0	
Missing	-9 Did not do samples	67	.9		
	-2 No infection	6891	89.2		
	-1 Missing	37	.5		
	Total	6995	90.6		
Total		7725	100.0		

3.5.1. Blood pressure

Both blood pressure and pulse rates were measured using a Dinamap 9301 Vital Signs Monitor. The child was first given a simple explanation of what would happen in the session using the analogy of an inflating balloon to explain the action of the cuff. Two cuffs were used depending on the size of the child's upper arm circumference (ideally the right arm was used): If < 23cm a small adult size cuff (blue in colour) was used and if ≥ 23cm an adult cuff (dark blue in colour) was used. A piece of cotton tubing was slid onto the child's arm to cushion it before the cuff was attached. The initial inflation was set to 130 mmHg. The child was asked to press 'start' on the machine. While it took the measurements, the tester asked the parent whether the child had recently or presently had an infection. If so, details were taken (see above). The parents were also asked about any medications the child was currently on and when they had last been taken. Two readings of systolic and diastolic blood pressure and pulse rates were recorded and the mean of each has been calculated. Also noted were the child's demeanour during the session, the time of the reading and the room temperature (data not shown for the two latter).

If the child's blood pressure was 140/90 or more the parents were given a letter to take to their GP.

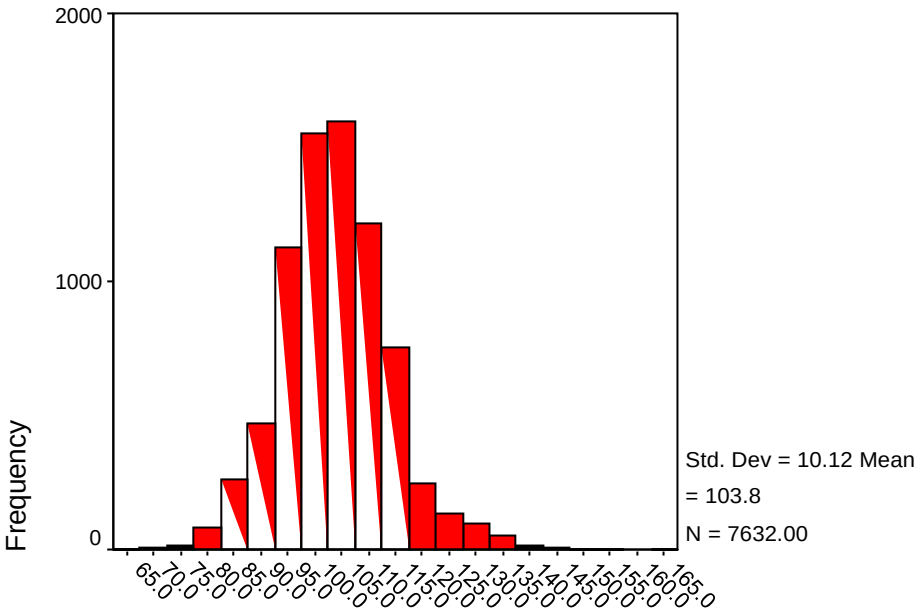
F9SA020 BP/pulse result obtained: samples: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	7634	98.8	99.7	99.7
	2 No	24	.3	.3	100.0
	Total	7658	99.1	100.0	
Missing	-9 Did not do samples	67	.9		
Total		7725	100.0		

F9SA020A Reason for BP/pulse not done: samples: F9

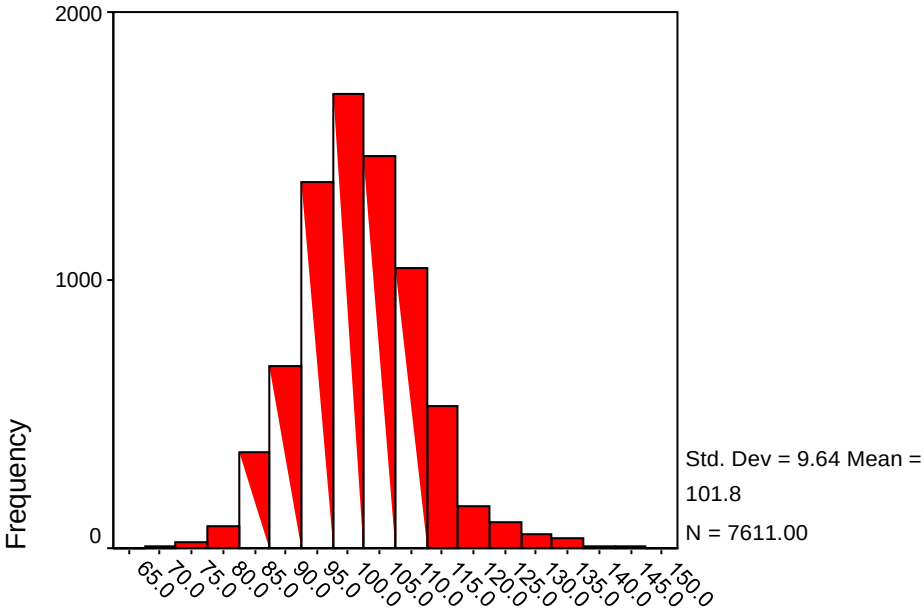
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Child refused	23	.3	95.8	95.8
	2 Machine not working	1	.0	4.2	100.0
	Total	24	.3	100.0	
Missing	-9 Did not do samples	67	.9		
	-2 Done	7634	98.8		
	Total	7701	99.7		
Total		7725	100.0		

F9SA021a: BP systolic 1: samples: F9

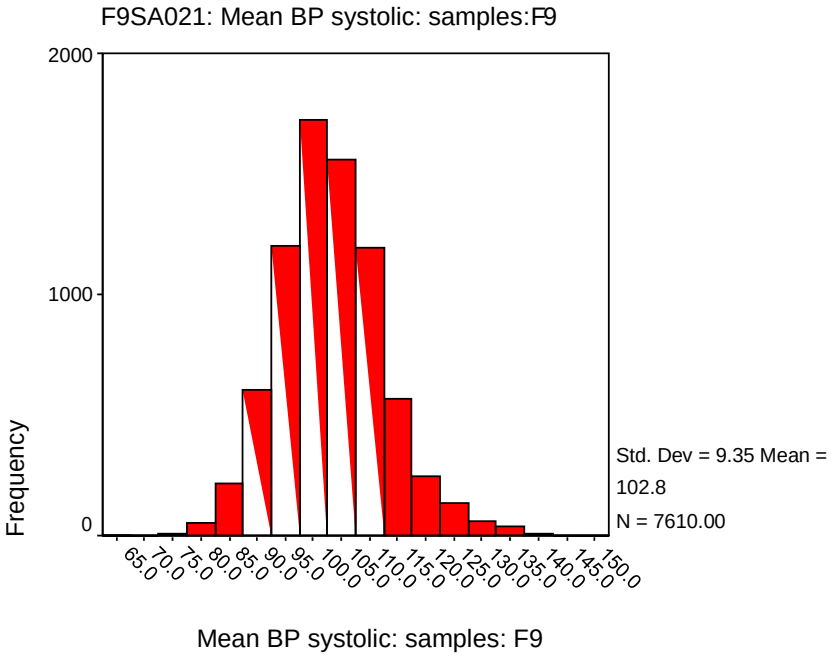


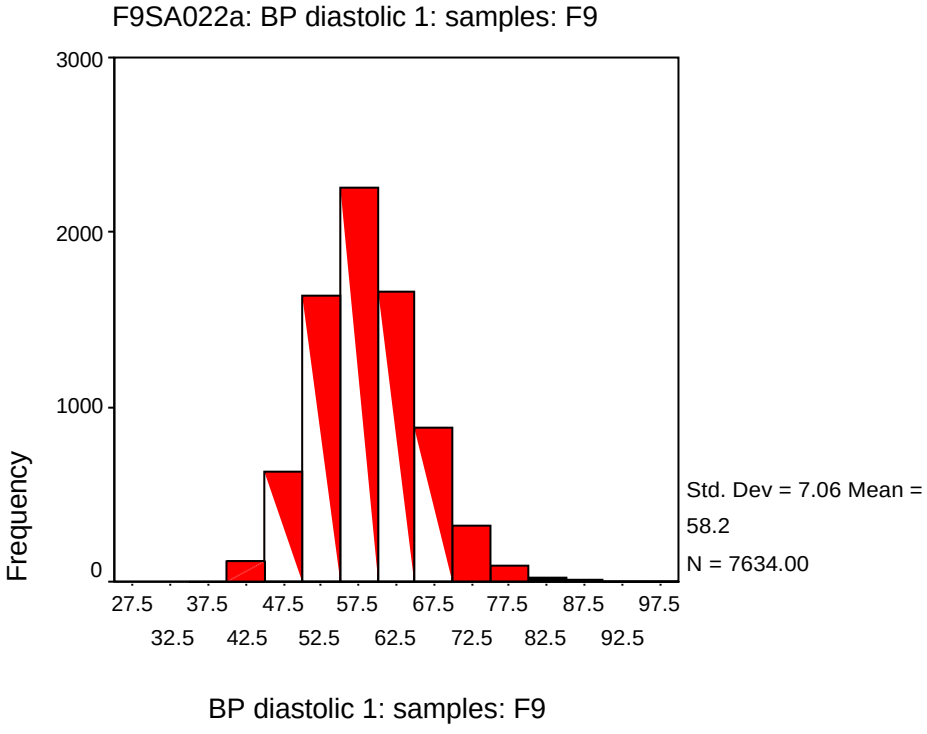
BP systolic 1: samples: F9

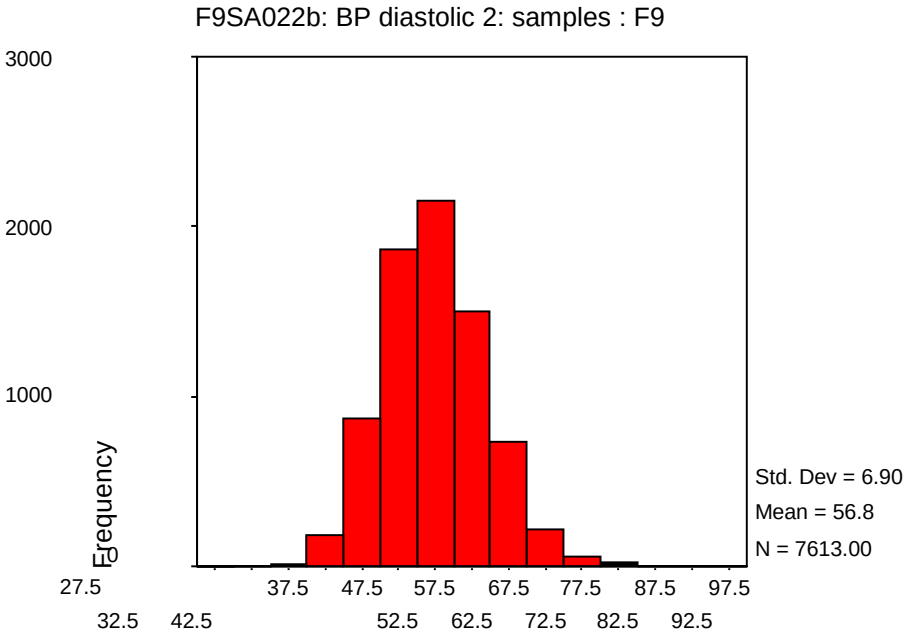
F9SA021b: BP systolic 2: samples: F9



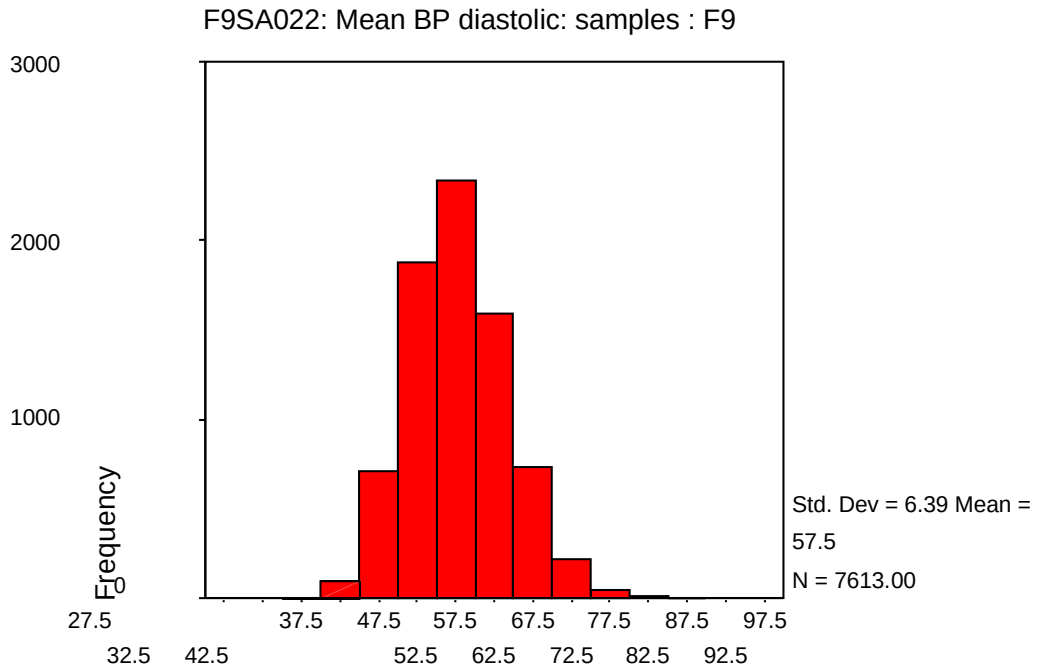
BP systolic 2: samples: F9


F9SA021: Mean BP systolic: samples:F9
2000
1000
0
Frequency
65.0
70.0
75.0
80.0
85.0
90.0
95.0
100.0
105.0
110.0
115.0
120.0
125.0
130.0
135.0
140.0
145.0
150.0
Std. Dev = 9.35 Mean =
102.8
N = 7610.00
Mean BP systolic: samples: F9


F9SA022a: BP diastolic 1: samples: F9
3000
2000
1000
0
Frequency
27.5
32.5
37.5
42.5
47.5
52.5
57.5
62.5
67.5
72.5
77.5
82.5
87.5
92.5
97.5
Std. Dev = 7.06 Mean =
58.2
N = 7634.00
BP diastolic 1: samples: F9

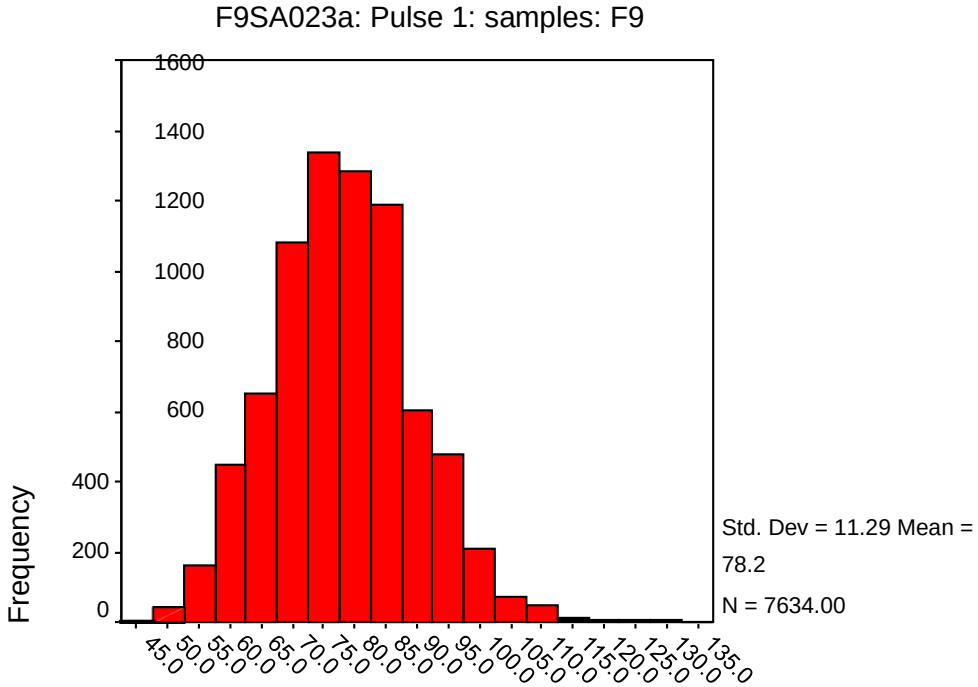


BP diastolic 2: samples: F9

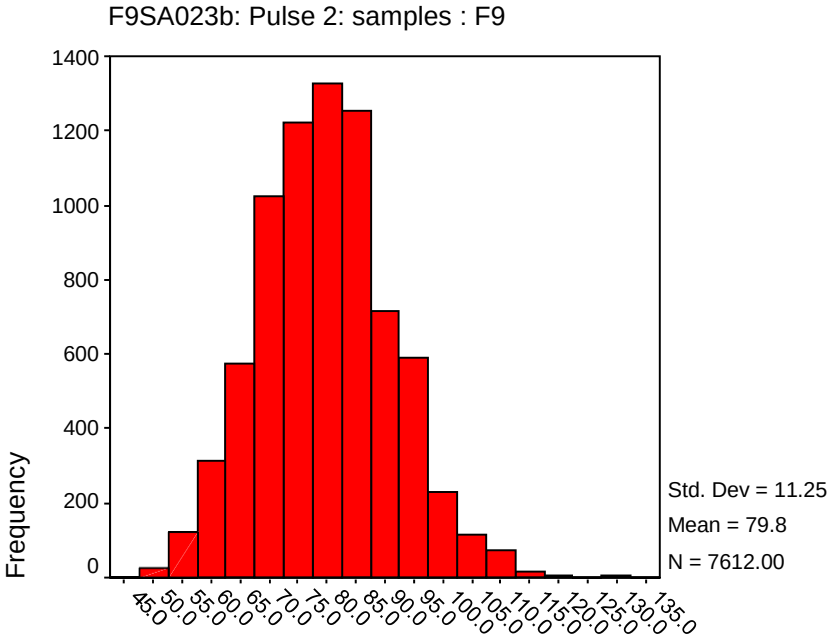


Mean BP diastolic: samples : F9

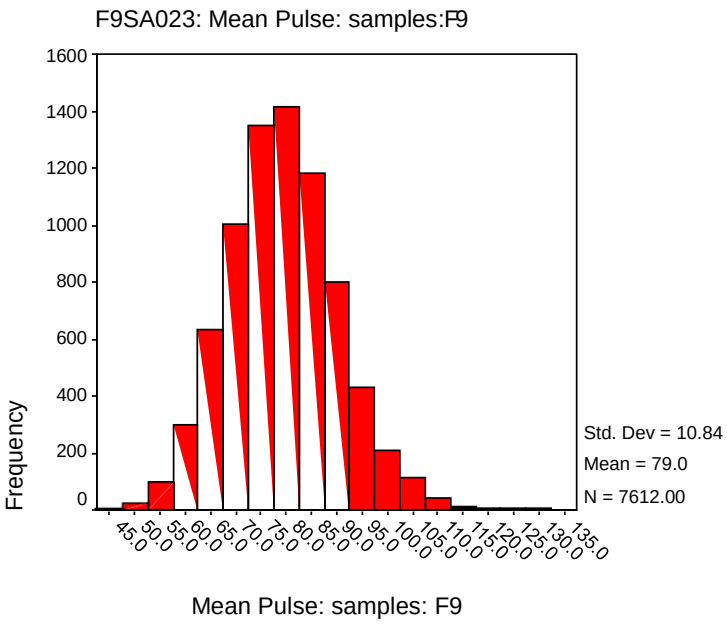
3.5.2. Pulse rate



Pulse 1: samples: F9



Pulse 2: samples: F9



The tester recorded the following information :

F9SA027: Child's demeanour during
BP/pulse: F9SA028: Room temp
F9SA029: Which arm used
BP/pulse: F9SA030: Which
cuff used BP/pulse

3.5.3. Biological samples

Note was made of any infections or treatments current in the child (acute infection is known to affect ferritin levels), and of medications being used to treat them.

It is recognised that taking blood from children for research purposes is very different from taking it from sick children where the sample is essential to their care. For this study it was mandatory to:

- Obtain the mother's or father's informed consent in writing before the sample was taken
- Have the child's willingness to undergo the procedure
- Ask the parent(s) to say if they wanted the blood-taker to stop taking the blood at any time (this removed some of the anxiety from both parents and staff)
- Stop if the child asks the blood-taker to do so, or if the child became distressed

Staff were trained by the existing team of highly experienced blood-takers before working under their supervision. Permission was obtained from the parent for venepuncture while the child's blood pressure was being taken. After blood pressure had been recorded and providing consent was obtained, the tester gently explained the procedure and the use of EMLA (local anaesthetic) cream to the child. If any child (or parent) refused or objected at any stage, no further attempt was made to obtain a sample. Two samples were taken, one for general biochemical tests (taken in an orange tube) and one to be used for immortalized cell lines (yellow tube). Separate consent was obtained for each.

F7SA050 Parents gave consent for blood taking: samples F@7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	7236	87.2	88.2	88.2
	2 No	966	11.6	11.8	100.0
	Total	8202	98.9	100.0	
Missing	-9 Did not do samples	62	.7		
	-1 missing	33	.4		
	Total	95	1.1		
Total		8297	100.0		

Parents were asked several questions to determine whether it was appropriate to take blood, if the parent answered yes to any of the following questions blood was not taken (unfortunately the numbers for these were not recorded):

1. Is your child allergic to local anaesthetic?
2. Has your child recently used or been given a local anaesthetic or related medicines?
3. Is your child taking any medication containing sulphonamides?
4. Is your child anaemic?
5. Does your child suffer from any clotting or bleeding disorders?
6. Does your child suffer from epilepsy?

The taking of blood was performed in two ten minute slots. In the first slot a vein was located using a torniquet and 2.5g of EMLA was applied by the blood-taker at least 60 minutes before the blood was taken. The time of application was recorded. The child also selected a video to watch in the second session. Watching the video distracted the child as the sample was taken.

F7SA051 EMLA cream applied: samples F@7

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	7059	85.1	86.2	86.2
	2 No	1129	13.6	13.8	100.0
	Total	8188	98.7	100.0	
Missing	-9 Did not do samples	62	.7		
	-1 missing	47	.6		
	Total	109	1.3		
Total		8297	100.0		

If EMLA cream was not applied, the tester recorded why (F9SA052).

In the second samples slot, if the child was happy to continue and 60 minutes had elapsed since the EMLA cream was applied, the cream was removed and the area was tested to reassure the child that their skin was numb. A torniquet was applied and vein located. A butterfly needle was inserted once the child was settled watching their chosen video. Two vacutainers of blood were taken: as explained above. Once obtained the orange tube for biochemical tests was labeled, placed in a poly bag and stored in a fridge; the yellow tube for cell lines was stored at room temperature.

Blood Attempted	Variable label	Yes	No
Small red tube	F9SA060	5880 (71.4%)	2355 (28.6%)
Large red tube	F9SA061	5666 (68.8%)	2569 (31.2%)
White tube	F9SA062	5522 (67.1%)	2713 (32.9%)

The tester recorded any reasons why blood was not taken or difficulties in obtaining blood (F9SA064).

Technicians from the laboratory nearby, in the Institute of Child Health visited the clinics twice daily to collect the blood samples.

3.6 Hearing

f9hs001 Child Started Hearing session: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	7228	93.6	93.6	93.6
	2 Yes, not completed	250	3.2	3.2	96.8
	3 No	247	3.2	3.2	100.0
	Total	7725	100.0	100.0	

f9hs001a Reason Child did not do Hearing session: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 No staff	201	2.6	2.6	2.6
	2 Ch left early	4	.1	.1	2.7
	3 Computer/machine failure	3	.0	.0	2.7
	6 Ch arrived late	2	.0	.0	2.7
	8 Ch not able	1	.0	.0	2.7
	10 Did session	7478	96.8	97.3	100.0
	Total	7689	99.5	100.0	
Missing	-1 Missing	36	.5		
Total		7725	100.0		

Audiological technicians and staff specifically trained in audiology carried out the audiometry and otoacoustic emission tests in a sound treated room or booth. All equipment was regularly calibrated, and the equipment number and calibration record relating to each child was noted with their results.

f9hs004 Hearing tester: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	176	2.3	2.4	2.4
	2.00	436	5.6	5.8	8.2
	3.00	782	10.1	10.5	18.6
	4.00	599	7.8	8.0	26.7
	5.00	937	12.1	12.5	39.2
	6.00	847	11.0	11.3	50.5
	7.00	764	9.9	10.2	60.7
	8.00	2754	35.7	36.8	97.6
	9.00	87	1.1	1.2	98.7
	10.00	96	1.2	1.3	100.0
	Total	7478	96.8	100.0	
Missing	-9.00 Did not do hearing	247	3.2		
Total		7725	100.0		

At the start of the session, parents were informed that they would not be told any details of the test results. But they would be informed if their child's hearing was satisfactory or whether a referral was recommended.

3.6.1 Audiometry

Hearing thresholds were determined using air conduction and bone conduction audiometry. A GSI 61 clinical audiometer was used with TDH50P headphones for conventional frequencies, and HAD2000 headphones for 16 kHz thresholds. Audiometry was performed as per BSA (British Society of Audiology) standards with thresholds taken as 2 out of 3 presentations on the ascending scales.

Testing was started with air conduction audiometry. The first ear of testing was randomized across subjects, and hearing thresholds were obtained in the frequency order 1, 2, 4, 8 and 0.5 kHz on the first ear and then in the same order on second ear. 1 kHz was then rechecked on the initial test ear. Bone conduction audiometry was then performed by placing the bone vibrator on the initial test ear, and hearing thresholds were obtained in the order 1, 2 and 0.5 kHz. Finally, air conduction hearing threshold was measured at 16 kHz on both ears.

f9hs009 Audiometry done: Hearing: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	7382	95.6	98.7	98.7
	2 No	96	1.2	1.3	100.0
	Total	7478	96.8	100.0	
Missing	-9 Did not do hearing	247	3.2		
Total		7725	100.0		

3.6.1.1 Air conduction

The data (not shown) on the release files are as follows

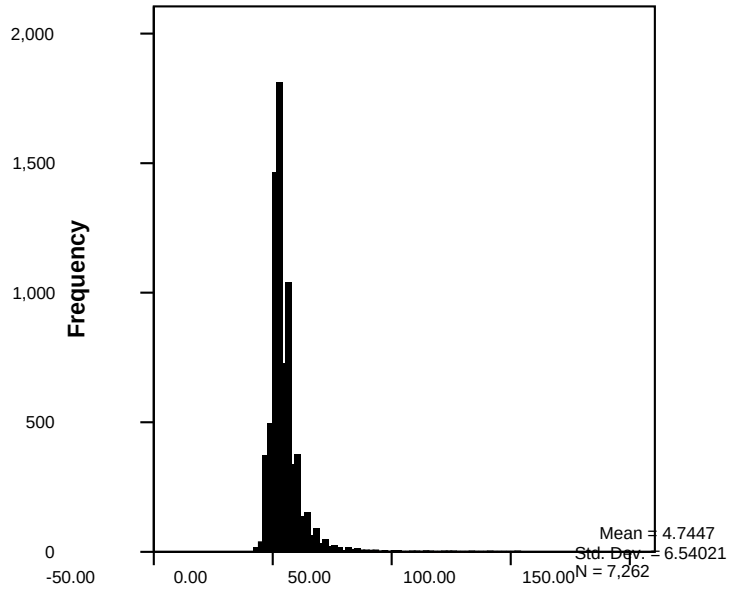
F9HS010: Air cond hearing threshold level (dBHL) R ear 500 Hz: Hearing: F9
F9HS011: Air cond hearing threshold level (dBHL) R ear 1 kHz: Hearing: F9
F9HS012: Air cond hearing threshold level (dBHL) R ear 2 kHz: Hearing: F9
F9HS013: Air cond hearing threshold level (dBHL) R ear 4 kHz: Hearing: F9
F9HS014: Air cond hearing threshold level (dBHL) R ear 8 kHz: Hearing: F9
F9HS015: Air cond hearing threshold level (dBHL) R ear 16 kHz: Hearing: F9
F9HS016: Air cond hearing threshold level (dBHL) R ear repeat 1 kHz: Hearing: F9
F9HS020: Air cond hearing threshold level (dBHL) L ear 500 Hz: Hearing: F9
F9HS021: Air cond hearing threshold level (dBHL) L ear 1 kHz: Hearing: F9
F9HS022: Air cond hearing threshold level (dBHL) L ear 2 kHz: Hearing: F9
F9HS023: Air cond hearing threshold level (dBHL) L ear 4 kHz: Hearing: F9
F9HS024: Air cond hearing threshold level (dBHL) L ear 8 kHz: Hearing: F9
F9HS025: Air cond hearing threshold level (dBHL) L ear 16 kHz: Hearing: F9

From the above data, variables were derived to indicate the average threshold across different frequencies in each ear.

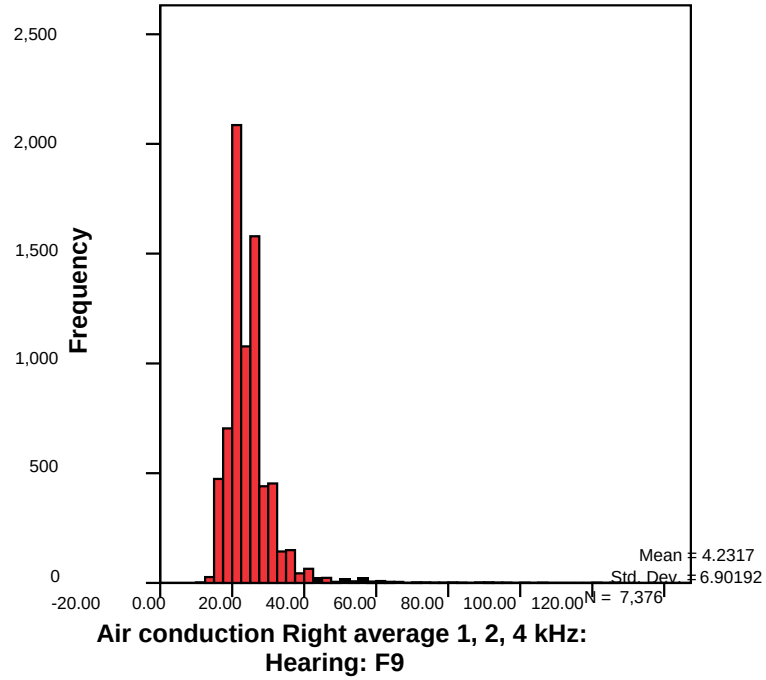
R ear: F9HS017=(F9HS010 +: F9HS011 +: F9HS012 +: F9HS013) / 4:
F9HS018=(F9HS011 +: F9HS012 +: F9HS013) / 3

L ear: F9HS027=(F9HS020 +: F9HS021 +: F9HS022 +: F9HS023) / 4:
F9HS028=(F9HS021 +: F9HS022 +: F9HS023) / 4

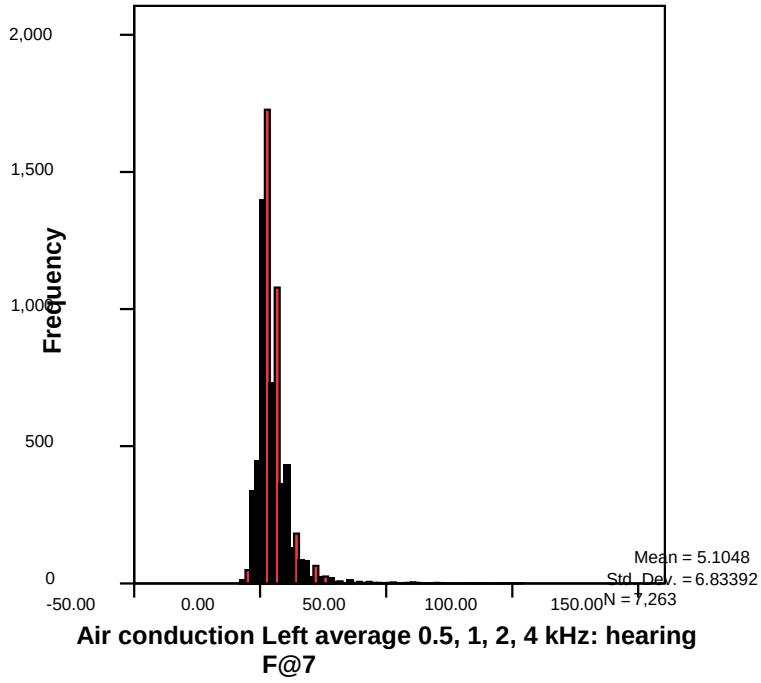
F9HS017: Air conduction Right average 0.5, 1, 2, 4 kHz: Hearing: F9



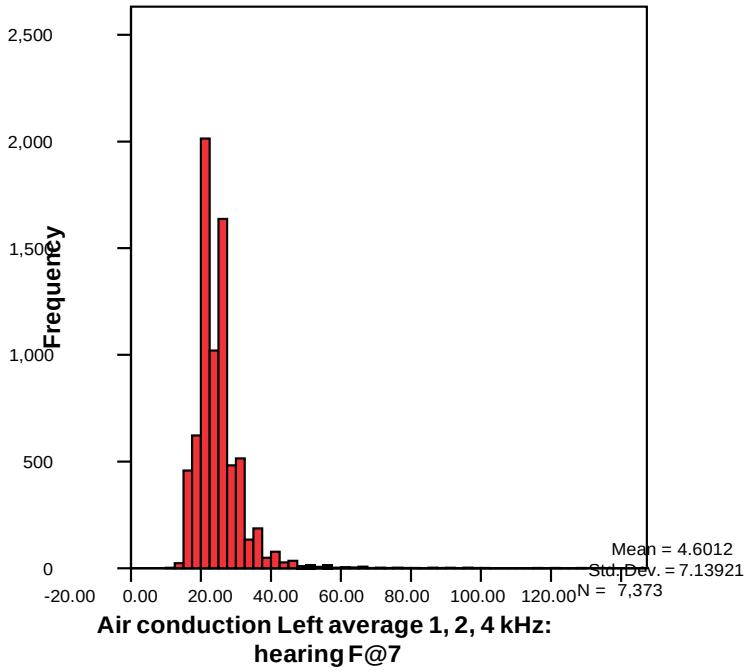
F9HS018: Air conduction Right average 1, 2, 4 kHz: Hearing: F9



F9HS027: Air conduction Left average 0.5, 1, 2, 4 kHz: hearing F@7



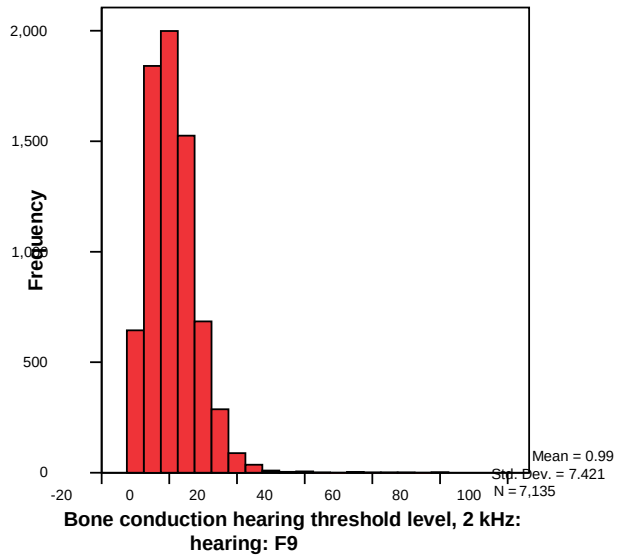
F9HS028: Air conduction Left average 1, 2, 4 kHz: hearing F@7



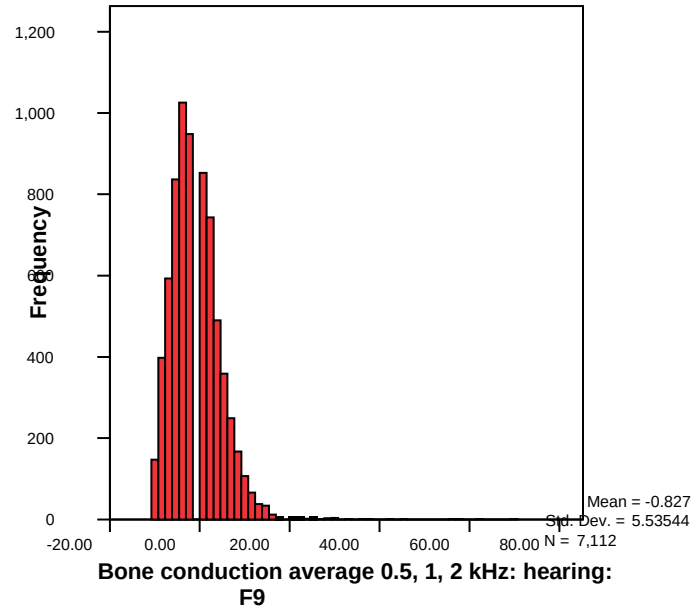
3.6.1.2 Bone conduction

F9HS030: Bone conduction hearing threshold level (dBHL) 0.5 kHz: Hearing: F9:
F9HS031: Bone conduction hearing threshold level (dBHL) 1 kHz: Hearing: F9:
F9HS032: Bone conduction hearing threshold level (dBHL) 4 kHz: Hearing: F9

F9HS032: Bone conduction hearing threshold level, 2 kHz: hearing: F9



F9HS033: Bone conduction average 0.5, 1, 2 kHz: Hearing: F9



A further variable was created denoting bilateral hearing impairment (F9HS036).:

F9HS036 was derived using the following information:

Bilateral normal hearing	Bilateral average AC thresholds 1, 2 and 4 kHz, less than or equal to 20 dB
Right mild unilateral sensorineural hearing impairment	Right ear average AC thresholds 1, 2 and 4 kHz between 21 – 40 dB HL (inclusive); left ear normal Type A tympanogram in the right ear
Left mild unilateral hearing impairment	Left ear average AC thresholds 1, 2 and 4 kHz between 21 – 40 dB HL (inclusive); right ear normal Type A tympanogram in the left ear
Mild bilateral sensorineural hearing loss	Average AC thresholds 1, 2 and 4 kHz between 21 – 40 dB HL (inclusive) in both ears Type A tympanogram in both ears If data available, air bone gap at 1 kHz in the better of the two ears less than or equal to 10 dB
Moderate bilateral sensorineural hearing loss	Average AC thresholds 1, 2 and 4 kHz greater than or equal to 41 dB HL in both ears Type A tympanogram in both ears If data available, air bone gap at 1 kHz in the better of the two ears less than or equal to 10 dB
Right moderate unilateral sensorineural hearing loss	Right ear average AC thresholds 1, 2 and 4 kHz greater than or equal to 41 dB HL; left ear normal Type A tympanogram in the right ear
Left moderate unilateral sensorineural hearing loss	Left ear average AC thresholds 1, 2 and 4 kHz greater than or equal to 41 dB HL; right ear normal Type A tympanogram in the left ear
Left ear mild, right ear moderate sensorineural hearing loss	Left ear average AC thresholds 1, 2 and 4 kHz between 21 – 40 dB HL inclusive; Right ear average AC thresholds greater than or equal to 41 dB HL Type A tympanogram in both ears If data available, air bone gap at 1 kHz in the left ear less than or equal to 10 dB
Right ear mild, left ear moderate sensorineural hearing loss	Right ear average AC thresholds 1, 2 and 4 kHz between 21 – 40 dB HL inclusive; Left ear average AC thresholds greater than or equal to 41 dB HL Type A tympanogram in both ears If data available, air bone gap at 1 kHz in the right ear less than or equal to 10 dB

Equipment and calibration numbers were recorded by the tester .

The testers also made any appropriate comments about the session and the child (coded in variables: F9HS050 and: F9HS051, frequencies not shown). It is recommend that when analysing audiometry data the researcher excludes unreliable codes. They may also want to exclude data which was recorded in noisy conditions.

3.6.2 Video-otoscopy

Pictures were taken of each child's left and right ear drum using a hand-held camera probe. Two pictures were taken of each ear drum: one of the attic region (pars flaccida), and one of the lower section (pars tensa). Each child was given a picture of their ear drum to take home. Pictures were stored electronically, and were analysed after the test visit by Mr Richard Maw, Ear, Nose and Throat Surgeon. The pars flaccida and pars tensa were categorized as either normal or abnormal. Those that were categorized abnormal were then coded as follows:

Pars flaccida	
Attic retraction	None/mild/moderate/severe
Perforation	Yes/No
Cholesteatoma	Yes/No
Crust	Yes/No
Discharge	Yes/No
Other	Yes/No – give details

Pars tensa	
Atelectasis	None/mild/moderate/severe
Retraction pocket	Yes (give quadrant location)/No
Tympanosclerosis	Yes (give quadrant location)/No
Perforation	Yes (give quadrant location)/No
Myringotomy	Yes (give quadrant location)/No
Ventilation tube	In situ/in situ blocked/in meatus/none
Discharge	Yes (give quadrant location)/No
Cholesteatoma	Yes (give quadrant location)/No
Other	Yes/No – give details

Note, this data is not currently available.

f9hs100 Video-otoscopy done: Hearing: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	7264	94.0	97.1	97.1
	2 No	214	2.8	2.9	100.0
	Total	7478	96.8	100.0	
Missing	-9 Did not do hearing	247	3.2		
Total		7725	100.0		

f9hs101 Video-otoscopy L ear successful: Hearing: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	6437	83.3	88.9	88.9
	2 No	806	10.4	11.1	100.0
	Total	7243	93.8	100.0	
Missing	-9 Did not do hearing	247	3.2		
	-2 Video-otoscopy not done	214	2.8		
	-1 Missing	21	.3		
	Total	482	6.2		
Total		7725	100.0		

f9hs102 Video-otoscopy R ear successful: Hearing: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	6508	84.2	89.9	89.9
	2 No	729	9.4	10.1	100.0
	Total	7237	93.7	100.0	
Missing	-9 Did not do hearing	247	3.2		
	-2 Video-otoscopy not done	214	2.8		
	-1 Missing	27	.3		
	Total	488	6.3		
Total		7725	100.0		

3.6.3 Tympanometry

All the children had a measure of their middle ear function using tympanometry to determine whether otitis media with effusion (OME) ('glue ear') was present.

Tympanometry was always preceded by video otoscopy. The probe of a GSI 38 tympanometer, placed at the entrance to the ear canal, measured the middle ear compliance, middle-ear pressure and ear canal volume. Staff graded the resultant tympanogram according to whether it had a normal peak, a flat shape, an abnormal shape, or whether there was a grommet or perforation present.

f9hs200 Tympanometry done: Hearing: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	7423	96.1	99.3	99.3
	2 No	55	.7	.7	100.0
	Total	7478	96.8	100.0	
Missing	-9 Did not do hearing	247	3.2		
Total		7725	100.0		

The tympanogram was categorised after the test visit into the following groups:

Type	**Classification**	**Interpretation**
Type A	Normal peak Middle ear pressure of +100 to –100 daPa. Middle ear compliance >0.00 ml	Normal middle ear function
Type C1	Middle ear pressure of –101 to –200 daPa Normal peak Middle ear compliance >0.00 ml	Indicates slight eustachian tube dysfunction
Type C2	Middle ear pressure <200 daPa Normal peak Middle ear compliance >0.00	Indicates eustachian tube dysfunction. Impossible to tell from tympanometry alone whether ear is recovering from OME or fluid is starting to build up.
Type B	Flat trace	Eardrum immobile. Indicates the presence of OME.
Grommet	Grommet observed on otoscopy Flat trace	Grommet in-situ. Large ear canal volume indicates the grommet is

Type	Classification	Interpretation
		patent.
Perforation	Perforation observed on otoscopy or reported by parents Flat trace	Perforation of ear drum.

f9hs203 Tympanometry L ear Grading: Hearing: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Normal	7085	91.7	96.2	96.2
	2 Flat shape	224	2.9	3.0	99.3
	3 Abnormal shape	26	.3	.4	99.6
	4 Perforation	10	.1	.1	99.7
	5 Grommett	19	.2	.3	100.0
	Total	7364	95.3	100.0	
Missing	-9 Did not do hearing	247	3.2		
	-2 Tymp not done	55	.7		
	-1 Missing	59	.8		
	Total	361	4.7		
Total		7725	100.0		

f9hs205 Tympanometry result L ear: Hearing: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 A	6194	80.2	83.4	83.4
	2.00 C1	527	6.8	7.1	90.5
	3.00 C2	244	3.2	3.3	93.8
	4.00 B	224	2.9	3.0	96.8
	5.00 Grommet	19	.2	.3	97.1
	6.00 Perforation	10	.1	.1	97.2
	9.00 Not known	205	2.7	2.8	100.0
	Total	7423	96.1	100.0	
Missing	-9.00 Did not do hearing	247	3.2		
	-2.00 Tymp not done	55	.7		
	Total	302	3.9		
Total		7725	100.0		

Equipment and calibration numbers were recorded by the tester.

F9HS216 combines the results of: F9HS203 and: F9HS205 to produce a bilateral tympanometry variable.

f9hs216 Bilateral OME: Hearing: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 Bilateral A	5700	73.8	76.8	76.8
	2.00 Bilateral B	90	1.2	1.2	78.0
	3.00 Bilateral C1	176	2.3	2.4	80.4
	4.00 Bilateral C2	82	1.1	1.1	81.5
	5.00 Unilateral B	243	3.1	3.3	84.8
	9.00 Other	1132	14.7	15.2	100.0
	Total	7423	96.1	100.0	
Missing	-9.00 Did not do hearing	247	3.2		
	-2.00 Tymp not done	55	.7		
	Total	302	3.9		
Total		7725	100.0		

The tester recorded appropriate comments about the tympanometry testing (variable: F9HS225, frequencies not shown).

3.6.4 Previous referrals

A history was obtained about previous visits to an audiologist or ENT service, asking whether the child had ever been referred, if so, at what age (F9HS300/1) and their current status (were seen once only and discharged, kept under review and later discharged or still under review-F9HS303). It was also recorded whether the child had any ENT surgery (grommets, tonsils, adenoids, other) and the age this had occurred – see Table 3.6.4 overleaf.

f9hs300 Previously referred for hearing assessment/ENT: hearing: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Yes	1872	24.2	25.1	25.1
	2 No	5595	72.4	74.9	100.0
	Total	7467	96.7	100.0	
Missing	-9 Did not do hearing	247	3.2		
	-1 Missing	11	.1		
	Total	258	3.3		
Total		7725	100.0		

f9hs303 Referral status: hearing: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 Seen once, discharged	649	8.4	35.8	35.8
	2 Was under review, discharged	989	12.8	54.5	90.3
	3 Still under review	176	2.3	9.7	100.0
	Total	1814	23.5	100.0	
Missing	-9 Did not do hearing	247	3.2		
	-2 Never referred	5595	72.4		
	-1 Missing	69	.9		
	Total	5911	76.5		
Total		7725	100.0		

Table 3.6.4: Child had any ENT surgery

Type of surgery	Variable label: Y/N	Freq Y	Variable label: Age of most recent
Any	F9HS304	498	-
Grommets	F9HS305	418	F9HS306/7
Tonsils out	F9HS308	130	F9HS309
Adenoids out	F9HS310	238	F9HS311
Other	F9HS312	28	F9HS313

Finally, the tester recorded any other information relevant to the hearing session (variables: F9HS350)

f9hs350 Comment: Genenal hearing info: hearing: F9

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 Not commented	7217	93.4	96.5	96.5
	1 Glue ear info	22	.3	.3	96.8
	2 Adenoids info	6	.1	.1	96.9
	4 Grommets info	44	.6	.6	97.5
	5 Ear infection/pref etc info	43	.6	.6	98.0
	6 Colds/URTI info	8	.1	.1	98.2
	7 Concern/under review hearing	34	.4	.5	98.6
	8 Previously wore hearing aids	7	.1	.1	98.7
	9 Currently wears hear aids	11	.1	.1	98.8
	10 Prev hearing assessment info	31	.4	.4	99.3
	11 Previous concern hearing	4	.1	.1	99.3
	13 Had meningitis	4	.1	.1	99.4
	16 Speech/lang/dyslexia info	22	.3	.3	99.7
	17 Child deaf	1	.0	.0	99.7
	18 Refused referral/wants referral but outside criteria	20	.3	.3	99.9
	19 Sensitive loud noise/tinnitus	4	.1	.1	100.0
	Total	7478	96.8	100.0	
Missing	-9 Did not do hearing	247	3.2		
Total		7725	100.0		

3.6.5. Otoacoustic emissions

At age 9 and 11 years, transient evoked otoacoustic emissions were recorded using the Otodynamics ILO92 system. Click stimuli were presented at a gain of −10.5 dB and −19.5 dB (re: reference click at ~80 dB sound pressure level (SPL)) and recordings made in the linear mode. These settings were used as lower-level stimuli may be more sensitive to changes and differences in cochlear function. Please refer to the protocol below for more detailed information.

FOCUS @ 9

Otoacoustic Emissions Test Protocol

1 OBJECTIVES

Obtain transient evoked (TE) otoacoustic emissions (OAE) from both ears in the linear mode, at levels of 60 and 70 dBpeSPL

2 EQUIPMENT REQUIRED

Sound-attenuating booth

Echoport and PC

ILO288 Software

Standard ILO B-type adult probe (8 pin)

Disposable probe tips (EAR plugs)

1cc calibration syringe

3. TEST PROTOCOL

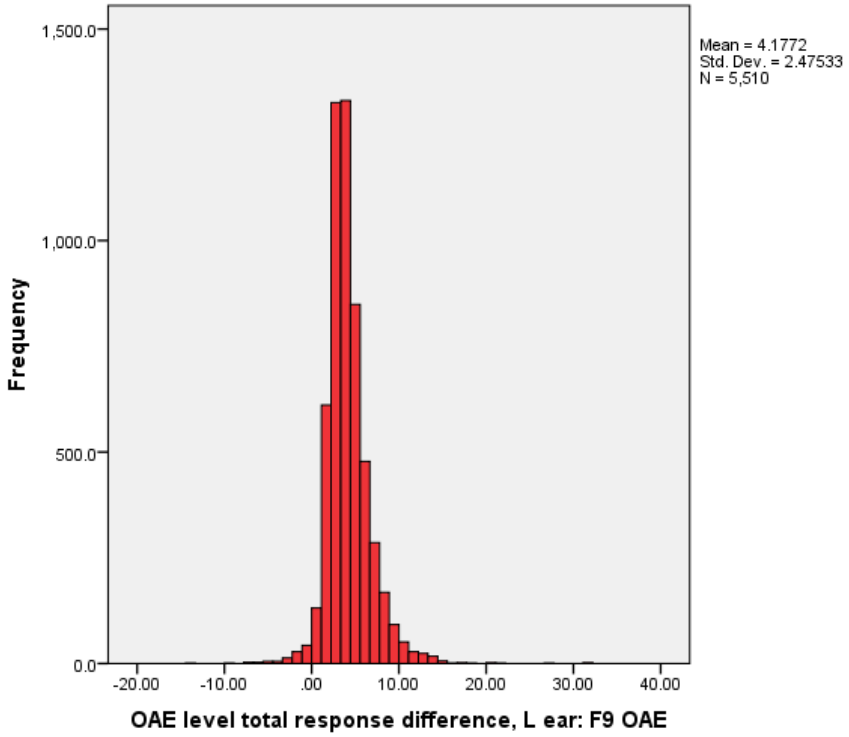
1. TEOAE should be preceded by video-otoscopy. Contraindications for TEOAE are the presence of wax (in a position to block the TEOAE probe), small ear canals (with a diameter smaller than the diameter of the probe) or ear infection.
2. Sit the child in the sound-attenuating booth. Give them instructions, which should be words to the effect of:

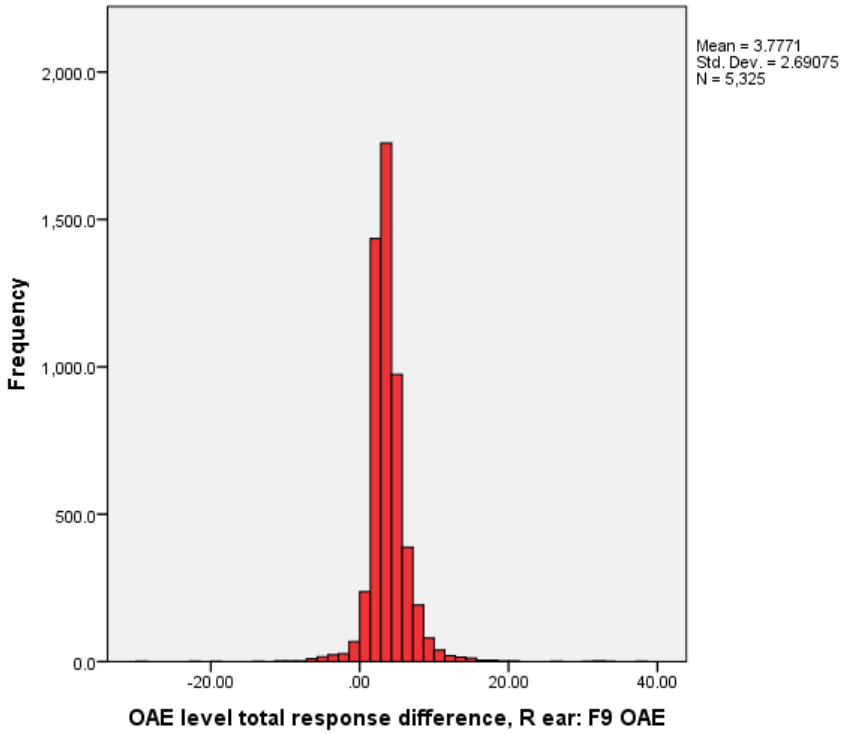
   "I'm going to measure sounds from your ear using this little probe. I'm going to put the probe in the entrance to your ear and you may hear some noises. I want you to keep very quiet and still the whole time."

   Record any non-standard testing conditions that could affect the quality of the TEOAE on the data collection sheet.
3. Always test the left ear first, then the right ear. Cover the probe with the yellow foam tip, using a new tip for each child. Ensure the end of the foam tip is flush with the end of the probe and then insert in the child's ear. Trim the foam tip if necessary, to fit in the child's ear. Foam tips should be thrown in the bin after testing.
4. Enter the clinic ID number under the Name field of the software.
5. Set the click intensity level to 70 dB.
6. At the checkfit mode, ensure there are no more than 50 % rejections. If too many are being rejected (>50 %) use the arrow keys to change the artefact rejection to increase the level of artefact rejection from the default level (Noise 4.6 mPa, Limit 47.3 dB).
7. Record a TEOAE in the linear mode and save the data.
8. Set the click intensity level to 60 dB. Follow steps 6 and 7.
9. Insert probe in the right ear and repeat steps 5 to 8.
10. Record the ILO filenames (date format) for the left and right ears on the OAE data sheet, see Appendix VI.

11. On the data sheet, record whether OAE was attempted on the left and right ears ("attempted" is defined as Yes, if the child came into the room with the intention of having OAE performed).
12. If OAE was not attempted, on the data sheet, record whether this was due to the presence of wax on the left or right ears (only tick yes if there was sufficient wax to prevent OAE being attempted).
13. If OAE was not attempted for some other reason, record this in the comments section of the data sheet (e.g. equipment problems, staffing etc).
14. Record whether OAE was successful on the left and right ears. Tick Yes if a minimum of 1 level was recorded on a particular ear and the data was saved. This should not be an interpretation of whether an OAE was present, but whether the child was able sit still with the probe in their ear for long enough to complete a run. This may be No if the child was fidgety for example.
15. Record the equipment number and calibration number of the OAE machine.

F9OA260: OAE level total response difference, L ear: F9 OAE





3.6.5.1 Response

Funding for analysis of the OAE waveforms was obtained from Deafness Research UK (B754). See Hall et al (2012) for further information on the original project.

Analysis was performed by Professor Mark Lutman, Institute of Sound & Vibration Research, University of Southampton:

Analysis of the OAE waveforms concentrated on the measure that is conventionally named as response, which is the SPL of the recorded components that are common to the two interleaved averages obtained during recording, conventionally denoted by A and B. Analogous to the way that the power of a signal is obtained mathematically by summating across frequency the product of the Fourier transform of the signal and its complex conjugate, the response measure is derived by summating across frequency the real part of the cross-product of the Fourier transform of A and the complex conjugate of the Fourier transform of B. The real part contains only those components that are in phase in A and B. This measure can simply be considered as an estimate of the OAE signal after removal of the noise. The response measure was obtained from the raw (unfiltered) recordings and also after filtering into frequency bands centred on 1, 2, 3 and 4 kHz. Each filter had a bandwidth of 1 kHz.

Hall A, Pembrey M, Lutman M, Steer C, Bitner-Glindzicz M. (2012) ‘Prevalence and audiological features in carriers of GJB2 mutations, c.35delG and c.101T>C (p.M34T), in a UK population study’. *BMJ Open*: 2:e001238 [doi:10.1136/bmjopen-2012-001238]

Descriptive Statistics n=5688

	Min	Max	M	SD
f9oa300 DV: Broadband, AB average: F9	-15.06	30.68	13.8908	5.38447
f9oa301 DV: Broadband, noise: F9	-5.63	30.15	2.3253	2.36954
f9oa302 DV: Broadband, correlation: F9	-.72	1.00	.9225	.13819
f9oa303 DV: Broadband, response level: F9	-12.04	30.67	13.8007	5.46272

Descriptive Statistics

	N	Min	Max	M	SD
f9oa304 DV: 1 kHz, AB average: F9	5688	-22.61	25.58	9.0623	6.60912
f9oa305 DV: 1 kHz, noise: F9	5688	-9.81	27.63	-.9449	3.10551
f9oa306 DV: 1 kHz, correlation: F9	5688	-.93	1.00	.8604	.23921
f9oa307 DV: 1 kHz, response level: F9	5688	-16.43	25.58	8.9267	6.71454
f9oa308 DV: 2 kHz, AB average: F9	5688	-23.67	26.63	6.8257	6.44960
f9oa309 DV: 2 kHz, noise: F9	5688	-16.37	22.11	-6.8343	2.61869
f9oa310 DV: 2 kHz, correlation: F9	5688	-.57	1.00	.9333	.15498
f9oa311 DV: 2 kHz, response level: F9	5688	-23.30	26.63	6.7263	6.55892
f9oa312 DV: 3 kHz, AB average: F9	5688	-24.42	30.43	5.3153	7.01244
f9oa313 DV: 3 kHz, noise: F9	5688	-19.11	13.89	-8.1901	2.08314
f9oa314 DV: 3 kHz, correlation: F9	5688	-.38	1.00	.9306	.15246
f9oa315 DV: 3 kHz, response level: F9	5688	-25.14	30.43	5.2049	7.13955
f9oa316 DV: 4 kHz, AB average: F9	5688	-25.09	25.08	2.7017	7.28612
f9oa317 DV: 4 kHz, noise: F9	5688	-18.99	9.62	-9.9642	2.27237
f9oa318 DV: 4 kHz, correlation: F9	5688	-.45	1.00	.9179	.16232
f9oa319 DV: 4 kHz, response level: F9	5688	-25.53	25.08	2.5654	7.43967
f9oa320 DV: Broadband, AB average: F9	5469	-5.11	30.40	14.7820	5.36434
f9oa321 DV: Broadband, noise: F9	5469	-3.65	23.04	2.6548	2.42824
f9oa322 DV: Broadband, correlation: F9	5469	-.24	1.00	.9307	.12675
f9oa323 DV: Broadband, response level: F9	5469	-6.08	30.39	14.6993	5.44571
f9oa324 DV: 1 kHz, AB average: F9	5469	-15.34	27.21	10.1511	6.58007
f9oa325 DV: 1 kHz, noise: F9	5469	-10.98	22.33	-.5696	3.15683
f9oa326 DV: 1 kHz, correlation: F9	5469	-.48	1.00	.8753	.22921
f9oa327 DV: 1 kHz, response level: F9	5469	-15.23	27.21	10.0290	6.68547
f9oa328 DV: 2 kHz, AB average: F9	5469	-17.22	27.08	7.9907	6.33598
f9oa329 DV: 2 kHz, noise: F9	5469	-12.84	11.53	-6.5293	2.59016
f9oa330 DV: 2 kHz, correlation: F9	5469	-.27	1.00	.9458	.13101
f9oa331 DV: 2 kHz, response level: F9	5469	-17.85	27.07	7.9013	6.44757
f9oa332 DV: 3 kHz, AB average: F9	5469	-17.26	28.24	5.9901	7.09112
f9oa333 DV: 3 kHz, noise: F9	5469	-16.03	9.46	-7.9445	2.07863
f9oa334 DV: 3 kHz, correlation: F9	5469	-.51	1.00	.9358	.14497
f9oa335 DV: 3 kHz, response level: F9	5469	-17.58	28.24	5.8895	7.20232
f9oa336 DV: 4 kHz, AB average: F9	5469	-20.58	26.67	2.9006	7.29710
f9oa337 DV: 4 kHz, noise: F9	5469	-16.33	8.18	-9.6954	2.31587
f9oa338 DV: 4 kHz, correlation: F9	5469	-.43	1.00	.9181	.15891
f9oa339 DV: 4 kHz, response level: F9	5469	-21.17	26.67	2.7625	7.44746

3.7 Fitness

At the: F9 clinic, fitness was measured using an electronically braked cycle ergometer (Lode Rechor P). The ergometer saddle and handle bar height was adjusted for each child, and after a 1 min warm up period children pedalled at a rate of 55–65 revolutions per minute (rpm) for 3 min at each workload (20, 40 and 60 W), followed by a 2 min cool down. Heart rate was recorded every 5 seconds during the test using a heart rate monitor with a chest strap (Polar S180).

Whilst this data is not currently included in the released files, the raw data from this session is available.

Please see the datasheets overleaf for details of the measures.

Those interested in accessing the raw data from this session are invited contact ALSPAC.

3.7.2 Predicted work capacity

Physical work capacity (measured in watts) at a heart rate of 170 beats per minute has been used as an assessment of cardiorespiratory fitness.

Hunt et. al. (2011) have provided two continuous derived variables to capture predicted work capacity, which are published in the following paper:

Hunt, L.P., Shield, J.P., Cooper, A.R., Ness, A.R., Lawlor, D.A. (2011). 'Blood pressure in children in relation to relative body fat composition and cardio-respiratory fitness.' *International Journal of Pediatric Obesity.* 3(4): 275-284. DOI: 10.3109/17477166.2011.583655

Descriptive Statistics

	N	Min	Max	Mean	Std. Deviation
f9ft500 DV: Predicted work capacity at a heart rate of 170 bpm: F9	3853	35.83	91.72	64.0646	9.11498
f9ft501 DV: Predicted work capacity at 170bpm per kg weight: F9	3846	.61	3.21	1.9186	.39008
Valid N (listwise)	3846				

3.7.1 Fitness datasheets

Version 1:

Focus at 9 Fitness Session – v1 F1 Session start time (24 hrs) [ ][ ] : [ ][ ] Form 9F 18.01.01

Visit No. [ ] F2 Visit Date [ ] HH F3 Staff Initials [ ][ ][ ] F4 Rm Temp [ ][ ] °C

Safety Check

F5 Asthma No [2] Yes [1] If F5=yes, acute attack in last 3 wk req. oral steroids F6 No [2] Yes [1] If F5 = yes, PEF >70% F7 No [2] Yes [1]

	No	Yes	
F8 Heart Condition/ BP problem	[2]	[1]	F9 Details _____
F10 Dizziness/Lose Consciousness	[2]	[1]	F11 Details _____
F12 Chest pain during Ex	[2]	[1]	F13 Details _____
F14 Bone/Joint problems	[2]	[1]	F15 Details _____
F16 Serious restriction of movement	[2]	[1]	F17 Details _____
F18 Any Other Reason eg Severe Viral Infection in last 3wk	[2]	[1]	F19 Details _____

F20 Parent's consent Yes [1] No [2] Ch R [3] NA [4]

F21 Ex test started Yes [1] No [2] If F21 = yes, **File No.** F22 [ ][ ] If F21= no Basketball instead F23 Yes [1] No [2]

F24 Ex test completed Yes [1] No [2] F25 Approx Ex Duration Min [ ] : Sec [ ][ ] F26 Target HR Reached Yes [1] No [2]

F27 Salbutamol given No [2] Yes [1] If F27 = yes, Child's own or F@9's F28 Child's [1] F@9 [2]

If F21 = yes, final downloaded polar file no. F29 [ ][ ][ ][ ][ ][ ][ ][ ] hrm

F30 Session Comments _____

Staff ratings - please complete this section for every child

COOP	SHY	FIDG	ACTIV	ATTN	RAPP	ANX
FCR1 ☐	FCR2 ☐	FCR3 ☐	FCR4 ☐	FCR5 ☐	FCR6 ☐	FCR7 ☐

FCR8 (comments)……………………………………………………………………………………………..

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Unusual behaviour/reactions FCR9 ☐

FCR10 ☐ FCR11 ☐ FCR12 ☐ FCR13 ☐ FCR14 ☐ FCR15 ☐

FCR16 ☐ FCR17 ☐ FCR18 ☐ FCR19 ☐ FCR20 ☐

FCR21 (comments) ………………………………...

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Focus at 9 Fitness Session – v2 F1 Session start time (24 hrs) [ ][ ] : [ ][ ] Form 9F 10.01.02

Visit No. [ ] F2 Visit Date [ ] FC F3 Staff Initials [ ][ ][ ]

F4 Rm Temp [ ][ ] °C

ROOM [ ] G/Y

Safety Check

F5 Asthma No [2] Yes [1] If F5=yes, acute attack in last 3 wk req. oral steroids F6 No [2] Yes [1] If F5 = yes, PEF >70% F7 No [2] Yes [1]

	No	Yes		
F8 Heart Condition/ BP problem	[2]	[1]	F9 Details	_____
F10 Dizziness/Lose Consciousness	[2]	[1]	F11 Details	_____
F12 Chest pain during Ex	[2]	[1]	F13 Details	_____
F14 Bone/Joint problems	[2]	[1]	F15 Details	_____
F16 Serious restriction of movement	[2]	[1]	F17 Details	_____
F18 Any Other Reason eg Severe Viral Infection in last 3wk	[2]	[1]	F19 Details	_____

F20 Parent's consent Yes [1] No [2] Ch R [3] NA [4]

F21 Ex test started Yes [1] No [2] If F21 = yes, **File No.** F22 [ ][ ] If F21= no Basketball instead F23 Yes [1] No [2]

F24 Ex test completed Yes [1] No [2] F25 Approx Ex Duration Min [ ] : Sec [ ][ ] F26 Target HR Reached Yes [1] No [2]

F27 Salbutamol given No [2] Yes [1] If F27 = yes, Child's own or F@9's F28 Child's [1] F@9 [2]

If F21 = yes, final downloaded polar file no. F29 [ ][ ][ ][ ][ ][ ][ ][ ] hrm

F30 Session Comments _____

Staff ratings - please complete this section for every child

	COOP		SHY		FIDG		ACTIV		ATTN		RAPP		ANX
FCR1	☐	FCR2	☐	FCR3	☐	FCR4	☐	FCR5	☐	FCR6	☐	FCR7	☐

FCR8 (comments)……………………………………………………………………………………………

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Unusual behaviour/reactions FCR9 ☐

FCR10 ☐ FCR11 ☐ FCR12 ☐ FCR13 ☐ FCR14 ☐ FCR15 ☐

FCR16 ☐ FCR17 ☐ FCR18 ☐ FCR19 ☐ FCR20 ☐

FCR21 (comments) ……………………………………………………………………………………………

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3.8 Spirometry

The Vitalograph 2120 spirometers were calibrated at the beginning of each half-day session according to the manufacturer's instructions using a 1L calibration syringe. Pneumotachograph screens were dried with warm air between subjects and cleaned at the end of each day's testing, being allowed to dry overnight. Measurements were made in the sitting position. Children were given a demonstration by the clinician on how to perform the FEV1, FVC manoeuvre and were checked for correct positioning before starting. 'Start of test' criteria were automated within the Spirotrac programme and manoeuvres failing to meet these were rejected. Each subject was instructed to blow at least three times to produce a maximal expiratory manoeuvre. Repeatability criteria were set to three manoeuvres within 200ml FVC.

Whilst the session data is not currently included in the released files, the raw data is available.

Please see the datasheets overleaf for details of the measures.

Those interested in accessing the raw data from this session are invited to contact ALSPAC.

Focus at 9 Spirometry Session – v1 SP1 Session start time (24 hrs) [ ][ ] : [ ][ ] Form 9SP 18.01.01

Visit No. [ ] SP2 Visit Date [ ] HH SP3 Staff Initials [ ][ ][ ]

SP4 Height. [ ][ ][ ] . [ ] cm SP5 Where Ht measured? S [2] M [1] SP6 Rm temp [ ][ ] ° C

SP7 Dr-diagnosed Asthma? No [2] Yes [1] SP8 Recent Wheeze ≥ 2 episodes in last yr other than with colds No [2] Yes [1] SP9 Currently using medication? Used ≥ once in last yr No [2] Yes [1]

SP10 Other relevant details _____

SP11 SA bronch. used (in past 6hrs) No [2] Yes [1] SP12 Details _____

SP13 LA bronch. used (in past 24 hrs) No [2] Yes [1] SP14 Details _____

SP15 Oral steroids used (in past 3 wks) No [2] Yes [1] SP16 Details _____

SP17 Chest inf /URTI or cold with fever (in past 3 wks) No [2] Yes [1] SP18 Details _____

SP19 Choc/cola tea/coff used (in past 24hrs) No [2] Yes [1] SP20 Details _____

SP21 FVC Reproducible? Yes [1] No [2] SP22 Details _____

SP23 **FVC** [ ] . [ ][ ] L SP24 **FEV_1** [ ] . [ ][ ] L

SP25 **PEF** [ ] . [ ][ ] L/S SP26 **PEF ≥70%** Yes [1] No [2] If SP7,8 or 9 = Yes, AND SP26 = No, Wright's PEF ≥70% SP27 Yes [1] No [2]

SP28 **FEF25-75** [ ] . [ ][ ] L/S SP29 **FEF25** [ ] . [ ][ ] L/S

SP30 **FEF50** [ ] . [ ][ ] L/S SP31 **FEF75** [ ] . [ ][ ] L/S

SP32 Session Comments _____

Staff ratings - please complete this section for every child

COOP	SHY	FIDG	ACTIV	ATTN	RAPP	ANX
SPCR1 ☐	SPFCR2 ☐	SPCR3 ☐	SPCR4 ☐	SPFCR5 ☐	SPCR6 ☐	SPCR7 ☐

SPCR8 (comments) ……………………………………………………………………………………………

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Unusual behaviour/reactions SPCR9 ☐

SPCR10 ☐ SPCR11 ☐ SPCR12 ☐ SPCR13 ☐ SPCR14 ☐ SPCR15 ☐

SPCR16 ☐ SPCR17 ☐ SPCR18 ☐ SPCR19 ☐ SPCR20 ☐

SPCR21 (comments) ……………………………………………………………………………………………

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Focus at 9 Spirometry Session – v2 SP1 Session start time (24 hrs) ☐☐ : ☐☐ Form 9SP 10.01.02

Visit No. ☐☐☐ SP2 Visit Date ☐☐/☐☐/☐☐ FC SP3 Staff Initials ☐☐☐

ROOM ☐ G/Y

SP4 Height. ☐☐☐ . ☐ cm SP5 Where Ht measured? S 2 M 1 SP6 Rm temp ☐☐ ° C

SP7 Dr-diagnosed Asthma? No 2 Yes 1

SP8 Recent Wheeze ≥ 2 episodes in last yr other than with colds No 2 Yes 1

SP9 Currently using medication? Used ≥ once in last yr No 2 Yes 1

SP10 Other relevant details .....

SP11 SA bronch. used (in past 6hrs) No 2 Yes 1 SP12 Details .....

SP13 LA bronch. used (in past 24 hrs) 2 1 SP14 Details .....

SP15 Oral steroids used (in past 3 wks) 2 1 SP16 Details .....

SP17 Chest inf /URTI or cold with fever (in past 3 wks) 2 1 SP18 Details .....

SP19 Choc/cola tea/coff used (in past 24hrs) 2 1 SP20 Details .....

SP21 FVC Reproducible? Yes 1 No 2 SP22 Details .....

SP23 **FVC** ☐ . ☐☐ L SP24 **FEV$_1$** ☐ . ☐☐ L

SP25 **PEF** ☐ . ☐☐ L/S SP26 **PEF ≥70%** Yes 1 No 2 If SP7,8 or 9 = Yes, AND SP26 = No, Wright's PEF ≥70% SP27 Yes 1 No 2

SP28 **FEF25-75** ☐ . ☐☐ L/S SP29 **FEF25** ☐ . ☐☐ L/S

SP30 **FEF50** ☐ . ☐☐ L/S SP31 **FEF75** ☐ . ☐☐ L/S

SP32 Session Comments .....

Staff ratings - please complete this section for every child

COOP	SHY	FIDG	ACTIV	ATTN	RAPP	ANX
SPCR1 ☐	SPFCR2 ☐	SPCR3 ☐	SPCR4 ☐	SPFCR5 ☐	SPCR6 ☐	SPCR7 ☐

SPCR8 (comments) ....

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Unusual behaviour/reactions SPCR9 ☐

SPCR10 ☐ SPCR11 ☐ SPCR12 ☐ SPCR13 ☐ SPCR14 ☐ SPCR15 ☐

SPCR16 ☐ SPCR17 ☐ SPCR18 ☐ SPCR19 ☐ SPCR20 ☐

SPCR21 (comments) ....

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3. References

Bashir SA, Duffy SW. The correction of risk estimates for measurement error. Ann Epidemiol 1997;7:154-64.

Chapman JW, Tunmer WE. A longitudinal study of beginning reading achievement and reading self-concept. British Journal of Educational Psychology 1997; 67: 279-291.

Chapman JW, Tunmer WE. Reading difficulties, reading-related self-perceptions and strategies for overcoming negative self-beliefs. Reading and Writing Quarterly 2003; 19: 5-24.

De Klerk NH, English DR, Armstrong BK. A review of the effects of random measurement error on relative risk estimates in epidemiological studies. Int J Epidemiol 1989;18:705-12.

Hall A, Pembrey M, Lutman M, Steer C, Bitner-Glindzicz M. (2012) 'Prevalence and audiological features in carriers of GJB2 mutations, c.35delG and c.101T>C (p.M34T), in a UK population study'. *BMJ Open*: 2:e001238 [doi:10.1136/bmjopen-2012-001238]

Hunt, L.P., Shield, J.P., Cooper, A.R., Ness, A.R., Lawlor, D.A. (2011). 'Blood pressure in children in relation to relative body fat composition and cardio-respiratory fitness.' *International Journal of Pediatric Obesity.* 3(4): 275-284. DOI: 10.3109/17477166.2011.583655

Marsh H. (1998). The self-description questionnaire I: SDQ manual and research monograph. San Antonio: Psychological Corporation.

Murrell GAC, Coonrad RW, Moorman CT, Finch RD. An assessment of the reliability of the scoliometer. Spine 1993; 18: 709-712.

Neale MD (1997). Neale Analysis of Reading Ability – Revised. Windsor: NFER-Nelson.

Nunes T, Bryant P, Olsson J. Learning morphological and phonological spelling rules: An intervention study. Scientific Studies of Reading 2003; 7: 289-307.

O'Brien SC, Lewis JB, Cunliffe WJ. The Leeds revised acne grading system. J Dermatol Treat 1998; 9: 215-220.

Phillips AN, Davey Smith G. The design of prospective epidemiological studies: when smaller is better. J Clin Epidemiol 1993;46:1203-11.

Schonell F, Goodacre E (1971). The psychology and teaching of reading. London: Oliver and Boyd.

Strachan D, Williams H. The ISAAC Protocol, module 3.1 version. December 1995.

Taylor HJ, Harding I, Hutchinson J, Nelson I, Blom A, Tobias JH, Clark EM (2013) 'Identifying scoliosis in population-based cohort: Development and validation of a novel method based on total body DXA scans'. *Calcified Tissue International.* 92(6):539-547

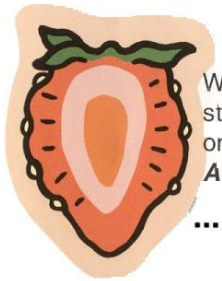
Tunmer WE, Chapman JW. The relation of beginning readers' reported word identification strategies to reading achievement, reading-related skills and academic self-perceptions. Reading and Writing 2002; 15: 341-358.

Waiter, waiter, this milk is weak.
Well, the cow got caught in the rain !

How can you tell which end of the worm is his head?
Tickle him in the middle and see which end smiles !

Doctor, doctor - I keep thinking I'm a strawberry.
Hm, you're really in a jam, aren't you ?

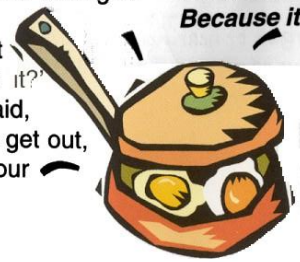
Why did the tomato blush?
Because it saw the salad dressing !



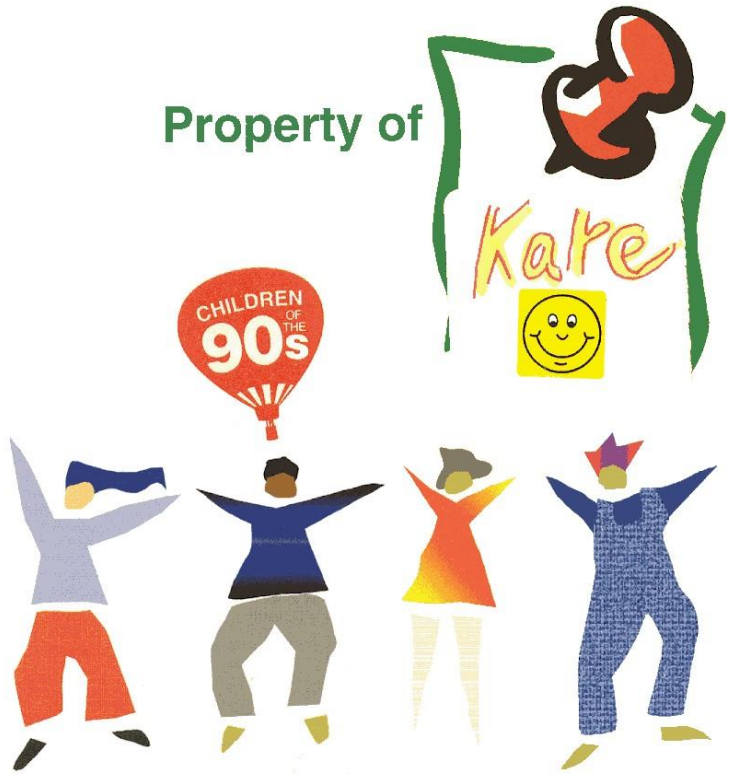
Wnat do you call one hundred strawberries lined up behind one another?
A strawberry jam.

... and to finish off our 'yolky' back page ...

Two eggs were boiling in a pan.One said, 'It's hot in here, isn't it?' The other said, 'Wait till you get out, they bash your head in.'



Why did the egg sail across the world?
Because it was an eggsplorer!



My visit to FOCUS @ 9

Today on 18 / 01 / 02 my exact age is

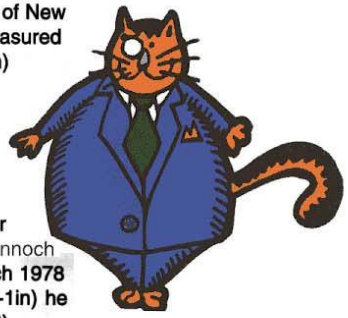
29 years 6 months and 8 days.

My height is .....

My weight is .....

The tallest man in the world ever recorded was Robert Wadlow, he died aged 22 measuring 272cm (8ft-11.1in)

The shortest recorded man was Gul Mohammed of New Delhi, in 1990 he measured only 57cm (1ft-10.5in)



The heaviest man ever recorded was John Minnoch from the USA. In March 1978 measuring 185cm (6ft-1in) he weighed 638kg (100st)

Did you know

- A baby grows most in its first year of life.
- By the age of two, a child is roughly half its adult height.
- Most children grow an average of 5-7.5cm (2-3in) a year.

Word Choice

Just draw a circle round the correct word in brackets.

A (red,read) ***sun was shining on*** *my pet* (hair, hare) ***in the back*** *garden as* (eye,I) *went down* ***the*** (stare, stair) ***to*** (see,sea) (witch,which) (flower,flour) **would need** (to,two,too) **be picked.**

My (read,red)  (shoos,shoes) ***were on over my*** (bear,bare) ***feet, because I couldn't*** (bare, bear) **to** (stair,stare) ***at my toes.***

(Eye,I) ***hoped*** (their,there) ***would soon be a*** (sale,sail) ***and then*** (peat,pete) (would, wood) ***be able to*** (by,buy) **some** (pairs, pears) ***and not*** (waist,waste) ***his money on more*** (flours,flowers) (which,witch) ***had*** (been,bean) ***planted instead of*** (beens,beans).

Now fill in the correct word to complete these sentences !!!!

- A loaf of bread is made out of FLOUR?
- _____ and trees grow in a garden
- It's nice to paddle your _____ feet in the water.
- Paddington _____ loved marmalade.

BONEY TEASERS

Just rearrange these boney letters to find the special name of each bone

LKUSL _____

MEHUSUR _____

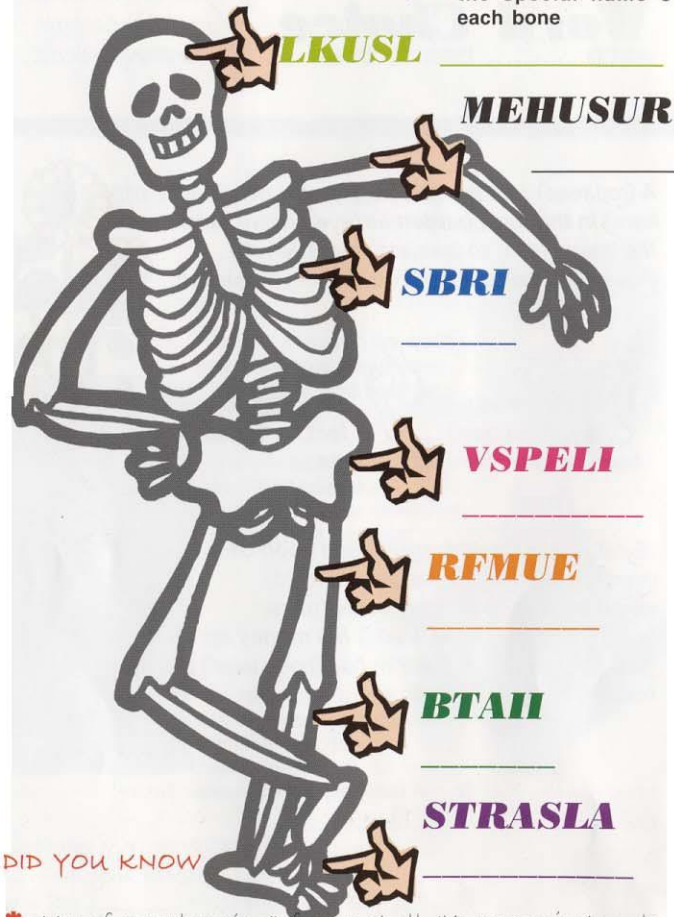
SBRI _____

VSPELI _____

RFMUE _____

BTAII _____

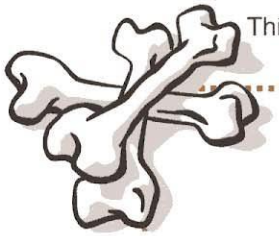
STRASLA _____



DID YOU KNOW

* Your funny bone isn't funny at all. It's a nerve just under the skin in each elbow.

1 Skull 2 Humerus 3 Ribs 4 Pelvis 5 Femur 6 Tibia 7 Tarsals



This is a picture of the bones in my forearm

Put the picture of your bones from Focus@9 here

What happened to the ship that sank in shark infested waters?
It returned with a skeleton crew !

What kind of boats do vampires like?
Blood vessels !

DID YOU KNOW

* When you were born, you had about 350 bones. By the time you have finished growing, there will only be 200 or so bones inside you! Some of the smaller bones in your body join together as you grow to make bigger ones!
* People who spend most of their time riding horses often develop extra bits of bone in their thighs. Some people have an extra pair of ribs and a few people even have extra fingers and toes!

Spot these animals in the grid!

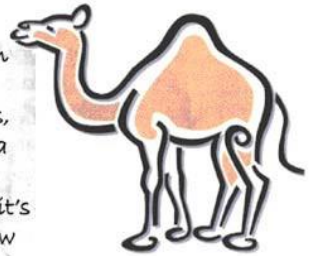
Remember they may be written forwards, backwards or vertically !!

Words to Find

Elephant
Tiger
Rabbit
Rhinoceros
Spider
Giraffe
Lion
Zebra
Horse
Dog
Cat
Fox
Guinea pig
Goat
Gorilla
Dolphin

E Z Y D O L P H I N T R
L L G I P A E N I U G A
E J E T B B D K V D I B
B K P P F A L B M R R T
O D H F H R I W Y C A E
Z E O O X A O A X O F A
S W R G R B N T G L F L
P V S B R B X T B L E L
I Q E I O I A I Z U P I
D Z A L H T S G J O T R
E O W R I A N E I X F O
R H I N O C E R O S U G

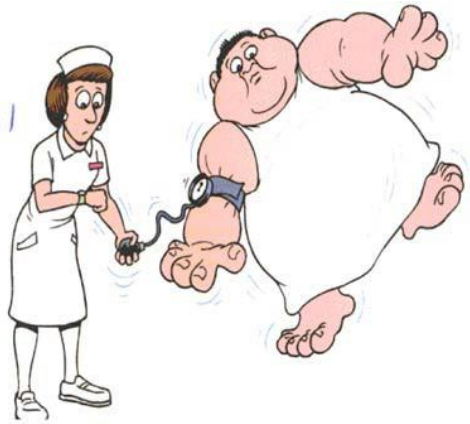
DID YOU KNOW



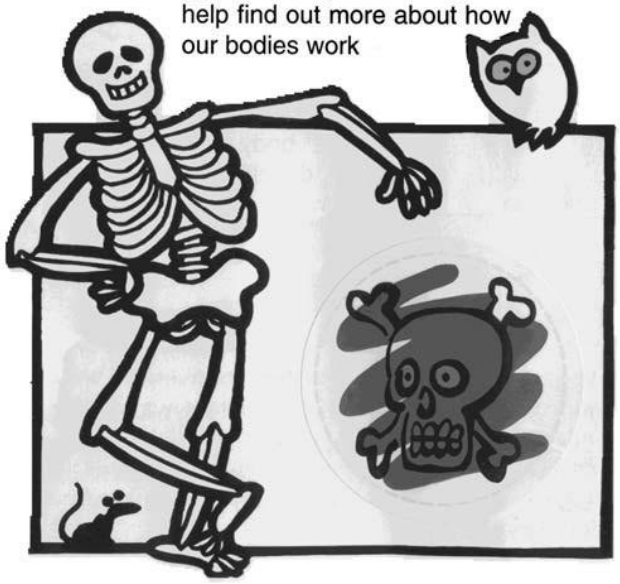
- The Californian leafnosed bat can hear the footsteps of insects.
- Animals can predict earthquakes, dogs howl several minutes before a quake strikes.
- An octopus will eat its own leg if it's very hungry - but it can also grow another in its place !

My blood pressure today was 127/61

My pulse was 64 beats a minute.



I gave a sample of blood to help find out more about how our bodies work



took part in the fitness challenge and cycled for
9 minutes.

Before exercise my heart was beating
65 times per minute.

During exercise my heart was beating
108 times per minute.

Your blood always travels around your body in the same direction. One whole circuit takes about 45 seconds.

DID YOU KNOW

- When we exercise, our hearts beat faster and we breathe more rapidly so that our blood will have more oxygen and go round our body faster.
- Oxygen is needed to help provide fuel for our muscles so that we can keep exercising, rather like a car needs petrol for it to work.

HOW MANY THINGS CAN YOU BLOW ?

candles out

blew for 9 seconds

done !

DID YOU KNOW 3 1/2

- Oxygen is a gas in the air. It has no smell or colour and makes up one fifth of normal air. All animals and plants need oxygen to live.
- It is absorbed into our blood from the air breathed into our lungs.

Loudness is measured in decibels (dB)
The lower the dB the quieter the sound.

The quietest sound could hear was

0dB
Falling
snow

50dB
Quiet
talk

70dB
Television

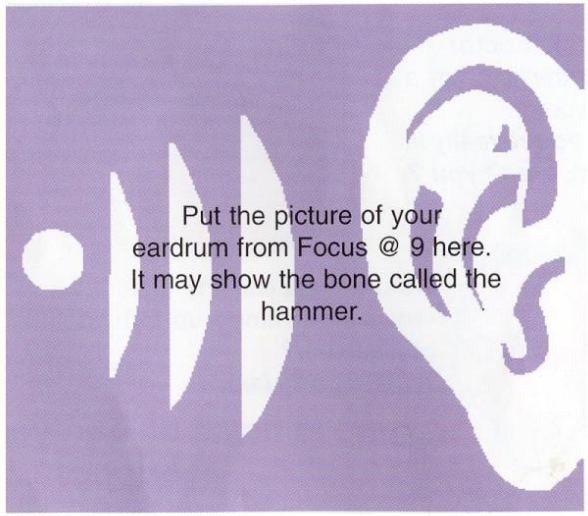
110dB
Chain
saw

140dB
Jet engine at takeoff

What runs about all day and lies about at night with its tongue hanging out?
A pair of trainers !

Why shouldn't you tell secrets in a vegetable garden?
Because potatoes have eyes, corn has ears and beans talk !

Two ears of corn ran up to the top of the hill. What were they when they got there?
Puffed wheat !



DID YOU KNOW

* The ear is the organ of hearing and balance! Hearing with two ears helps people tell what direction a sound is coming from.

* The smallest bone in your body is in your ear - called the stirrup. It is only 3 millimetres long. It carries sound vibrations from the middle ear to the fluid in the inner ear

Appendix 2: Personnel and Funding

Focus visits manager: Sue Sadler
Clinical director: Dr John Henderson
Data Administration: Sue Bonnell, Maureen Brennan, Kate Northstone

Receptionist staff:

Maeve Anglim, Laura Allan, Elaine Basker, Lisa Bassett, Patrick Bell,Claire Bristow, Lauren Carter, Kate Cashmore, Lyn Chapman, Linda Connock, Nicola Craven, Katie Davies-Jenkins, Kate Hambleton, Katie Hamilton, Emma Harrison, Emma Head, Karen Hill, Katie Howe, Tricia Hutchinson, Elaine Jackson, Jan Jenkin, Alison Kinnersley, Jill Klee, Marie Lief, Helen Loveridge, Jessica Mansfield, Natalie Mayer, Elizabeth Miller, Alice Parham, Ailsa Peron, Anna Prescott, Linda Sanders, Glenn Saunders, Claire Sewell, Kate Sherlock, Alison Shinn, Sally Sillence, Lucy Southway, Hannah Steele, Kaija Turvey (TL), Lynda Ware, Charlotte Warman, Nicola Weir, Janet Williams, Judy Willis, Mary Yarwood, Anna Yates.

Trained by Kaija Turvey
Advised by Jennie Cross (for parent interviews)

Measuring team

Anna Yates, Bev Bowden, Charlotte Warman, Elizabeth Miller, Elaine Jackson, Kate Sherlock, Hazel Blake (TL), Judith Grinstead,Nicki Craven, Nicola Lawson, Pat Madely, Rosie Tonkin, Sally Sillence, Sara Cook, Sue Evans.

Trained by - Les Cox trained Hazel Blake initially. In 1998 Lyn Ahmed trained Hazel Blake and Elizabeth Miller, who then trained the team.

Advised and trained by Dr Hywel Williams (flexural dermatitis), Mr Peter Witherow and Dr John Hutchinson (scoliosis), Dr Giles Dunnill (acne), Mr Alan E Timmins (Coton Physics Services Limited) for IRMER and X-Ray densitometry and Dr Jon Tobias in re-analysis of DEXA scans.

Advised by Professor John Reilly for BI, Professor Mike Preece for anthropometry at the initial stage.

Psychology team:

Alison McGrath**,** Amy Roe, Alison McGrath**,** Ben Weaver, Cleo Estrera, Carolyn Small, Claire Cheswick, Clare Robinson, Daniel Hucker, Faye Armstrong, Fiona LeRoy, Giles Greene

Hannah Morris, Helen Gee, Jane Vian, Jayne Chavez, Jaidan D'arcy, James McGurk, Jeremy Horwood, Julia Holder, Kate Hindle, Katie Crews, Larisa Duffy, Lucy Ellis, Lucy Parker, Mary Pears, Nicola Byatt, Paula Morris, Rebecca Moseley, Sarah Farthing, Sue Watkins, Victoria Fletcher-Wood.

Trained by Jeremy Horwood, Clare Bell and Lucy Ellis

Speech & Language team

Helen Gee, Kate Hindle (now Francis), Mary Pears, Claire Robinson, Carolyn Small, Victoria Fletcher-Wood

Hearing team:

Sally Jones, Sylvia Campbell, Salim Suleman, Jenny Harris, Susy Higgins, Amanda Young, Janice Glen, Amanda Hall, Maria Foondun, Clair Underhill

Trained by Amanda Hall/Sally Jones

Samples:

Alex Cross, Barbara Budd, Dorothy Collett, Lyn Booth, Melinda Tovey, Pauline Church, Susan Greer, Terry Portch.

Trained by Pauline Church
Advised by Richard Jones

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