

Changing How Literacy is Taught: Evidence on Synthetic Phonics

By STEPHEN MACHIN, SANDRA MCNALLY AND MARTINA VIARENGO

Online Appendix

A. Phonics Description

Box A1: How to Teach Reading Post Rose Review.

‘Letters and Sounds: principles and practice of high quality phonics’ (Primary National Strategy, 2007)

As summarised by Wyse and Gosmani (2008):

- Following the teaching of general orientation to sound discrimination in nursery years, daily lessons for a six week period to feature ‘discrete phonics teaching’.
- Teachers must ‘teach at least 19 letters, and move children on from oral blending and segmentation to blending and segmenting with letters (p.48).
- Application of this knowledge during the Letters and Sounds lessons is limited to ‘read or write a caption (with the teacher) using one or more high-frequency words and words containing the new letter (week 3 onwards)’ (p.49).
- This is followed by further discrete teaching, lasting up to 12 weeks. The purpose of this phase is to ‘teaching another 25 graphemes, most of them comprising two letters (e.g. oa) so the children can represent each of about 42 phonemes by a grapheme’ (p.74).
- Application at this stage is to ‘read or write a caption or sentence using one or more tricky words and words containing the graphemes’ (p.75).
- This pattern of a limited context for application of grapheme-phoneme correspondences continues through year one (age 5 to 6) until year two (age 6 to 7) at which point phonics instruction moves to an emphasis on spelling.

B. Additional Tables

TABLE A1—LOCAL AUTHORITIES IN TREATMENT AND CONTROL GROUPS

Groups	Phonics Programme	LA	Entry	LA names
Treatment Group 1	Pilot, EDRp	Schools in 18 LAs	2005/06	Barnsley, Cheshire, Coventry, Hertfordshire, Islington, Leeds, Liverpool, Luton, Manchester, Medway, Nottingham, Peterborough, Redcar and Cleveland, Stoke-on-Trent, Tameside, Tower Hamlets, Waltham Forest, Wiltshire
Treatment Group 2	First Phase, CLLD	Schools in same 18 LAs + 32 new LAs	2006/07	18 LAs above AND Bath and North East Somerset, Birmingham, Blackburn with Darwen, Bury, Dorset, Ealing, East Sussex, Essex, Gloucestershire, Greenwich, Hackney, Hammersmith and Fulham, Haringey, Hartlepool, Kent, Knowsley, Lambeth, Lewisham, Middlesbrough, North Tyneside, Oldham, Sandwell, Sefton, Sheffield, Shropshire, Southampton, Southwark, Surrey, Swindon, Thurrock, Torbay. Kingston-upon-Hull*
Control group		Schools in next 50 LAs	2008/09 and 2009/10	All remaining Local Authorities represented in control group (for schools that came into the treatment in 2008/09 and 2009/10)
		Schools in next 50 LAs	2009/10	

Notes: *Kingston-upon-Hull withdrew due to floods (and no data available).

TABLE A2—COMMUNICATION, LANGUAGE AND LITERACY AT AGE 5

	Pilot v Control		First Phase v Control	
	(1)	(2)	(3)	(4)
Treatment*2004	0.021	0.009	0.022	0.010
[Birth Cohort: 1999]	(0.076)	(0.075)	(0.051)	(0.050)
Treatment*2005	0.027	0.019	0.041	0.025
[Birth Cohort: 2000]	(0.080)	(0.079)	(0.053)	(0.052)
Treatment*2006	0.246***	0.258***	0.053	0.040
[Birth Cohort: 2001]	(0.086)	(0.089)	(0.053)	(0.053)
Treatment*2007	0.191***	0.183***	0.242***	0.229***
[Birth Cohort: 2002]	(0.068)	(0.068)	(0.047)	(0.046)
Treatment*2008	0.197***	0.182**	0.299***	0.281***
[Birth Cohort: 2003]	(0.072)	(0.073)	(0.048)	(0.048)
Treatment*2009	0.100	0.091	0.253***	0.23***
[Birth Cohort: 2004]	(0.067)	(0.069)	(0.047)	(0.047)
Treatment*2010	-0.007	-0.014	0.139***	0.120***
[Birth Cohort: 2005]	(0.068)	(0.069)	(0.047)	(0.047)
Treatment*2011	0.026	0.015	0.163***	0.142***
[Birth Cohort: 2006]	(0.068)	(0.070)	(0.047)	(0.047)
Additional Controls	No	Yes	No	Yes
R ²	0.107	0.182	0.102	0.174
Sample Size	267094	267093	346410	346409
Number of Schools	1234	1234	1603	1603

Notes: The outcome is the (teacher assessed) standardised score in Communication, Language and Literacy. Baseline is the treatment year 2003 (or 1998 birth cohort). Controls are: year dummies; school fixed effects. Standard errors clustered by school. Additional controls: student gender, ethnicity; whether speaks English as an additional language; whether eligible to receive free school meals, whether receives a statement of Special Educational Needs percent of students in the year group by: gender, ethnicity, whether speaks English as an additional language, whether eligible to receive free school meals, whether receives a statement of Special Educational Needs. Control schools come into the programme in either 2009 or 2010. Highlighted cells show when the programme was operational in treated schools, but not in *any* of the control schools.

*** Significant at the 1 percent level; ** Significant at the 5 percent level; * Significant at the 10 percent level.

TABLE A3—AGE 5 TEST SCORE GAPS, MILLENNIUM COHORT STUDY CHILDREN IN ENGLAND

	Naming Vocabulary			Pattern Construction			Pattern Similarity		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
English Not First Language At Home	-0.978*** (0.031)		-0.931*** (0.030)	-0.283*** (0.034)		-0.249*** (0.034)	-0.117*** (0.034)		-0.091*** (0.034)
Free School Meals		-0.596*** (0.028)	-0.529*** (0.027)		-0.398*** (0.030)	-0.380*** (0.030)		-0.301*** (0.030)	-0.294*** (0.030)
Age and Gender Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample Size	9706	9706	9706	9674	9674	9674	9718	9718	9718

Notes: The dependent variable is the relevant test score standardised to have mean zero and a unit standard deviation. Standard errors in parentheses. Weighted using MCS country-specific weights. *** Significant at the 1 percent level; ** Significant at the 5 percent level; * Significant at the 10 percent level.

TABLE A4—HETEROGENEITY IN ESTIMATED TREATMENT EFFECTS BY LANGUAGE TYPE (I.E., LATIN SCRIPT v NON-LATIN SCRIPT) AND FREE SCHOOL MEALS ELIGIBILITY

	Pilot v Control (Cohorts 1998 and 2001)	First Phase v Control (Cohorts 1998 and 2002)
	Age 11	Age 11
	(1)	(2)
Latin Script and Free School Meals	0.011 (0.053)	0.031 (0.027)
Latin Script and Non-Free School Meals	-0.064** (0.033)	-0.016 (0.021)
Non-Latin Script and Free School Meals	0.210** (0.093)	0.130** (0.048)
Non-Latin Script and Non-Free School Meals	0.006 (0.072)	0.089** (0.040)
P-value : Native, FSM=Native, Non-FSM	0.150	0.068
P-value: Non-Native FSM=Non-Native, Non-FSM	0.017	0.385

Notes: As for Panel C of Table 4.

TABLE A5—HETEROGENEOUS EFFECTS FOR BOYS AND GIRLS

	Pilot v Control (Cohorts 1998 and 2001)			First Phase v Control (Cohorts 1998 and 2001)		
	Age 5 (1)	Age 7 (2)	Age 11 (3)	Age 5 (4)	Age 7 (5)	Age 11 (6)
A. Boys						
Native Speaker and Free School Meals	0.294 (0.293)	0.120* (0.064)	0.061 (0.065)	0.196* (0.108)	0.144*** (0.037)	0.106*** (0.039)
Native Speaker and Non-Free School Meals	0.271** (0.133)	0.034 (0.035)	-0.075* (0.043)	0.217*** (0.070)	0.066** (0.026)	-0.023 (0.028)
Non-Native Speaker and Free School Meals	0.731 (0.481)	0.250*** (0.090)	0.262*** (0.087)	0.190 (0.145)	0.167*** (0.052)	0.086 (0.054)
Non-Native Speaker and Non-Free School Meals	0.748** (0.334)	0.153** (0.071)	-0.042 (0.105)	0.204 (0.138)	0.111*** (0.039)	0.073 (0.046)
P-value : Native, FSM=Native, Non-FSM	0.941	0.204	0.056	0.852	0.039	0.002
P-value: Non-Native, FSM=Non-Native, Non-FSM	0.978	0.367	0.004	0.938	0.335	0.828
B. Girls						
Native Speaker and Free School Meals	0.087 (0.292)	0.071 (0.060)	-0.045 (0.073)	0.122 (0.099)	0.060* (0.033)	-0.020 (0.037)
Native Speaker and Non-Free School Meals	0.203 (0.138)	0.045 (0.029)	-0.049 (0.037)	0.254*** (0.068)	0.009 (0.024)	-0.014 (0.027)
Non-Native Speaker and Free School Meals	-0.135 (0.583)	0.177* (0.109)	0.099 (0.120)	0.199 (0.144)	0.232*** (0.049)	0.121** (0.052)
Non-Native Speaker and Non-Free School Meals	0.710* (0.402)	0.028 (0.073)	-0.019 (0.075)	0.191 (0.128)	0.073* (0.037)	0.066 (0.043)
P-value : Native, FSM=Native, Non-FSM	0.716	0.662	0.963	0.216	0.143	0.867
P-value: Non-Native, FSM=Non-Native, Non-FSM	0.148	0.180	0.366	0.961	0.003	0.343

Notes: As for Panel C of Table 4.

TABLE A6—AGE 11 RESULTS WITH AND WITHOUT IMPUTATION

A. Baseline Results (Table 3)	Pilot v Control			First Phase v Control		
	(1)	(2)	(3)	(4)	(5)	(6)
	Age 11 (Table 3)	Age 11 (With Imputation A)	Age 11 (With Imputation B)	Age 11 (Table 3)	Age 11 (With Imputation A)	Age 11 (With Imputation B)
Treatment*1999 Birth Cohort	0.003 (0.028)	-0.002 (0.026)	0.004 (0.028)	-0.024 (0.019)	-0.031 (0.018)	-0.022 (0.019)
Treatment*2000 Birth Cohort	-0.001 (0.027)	-0.010 (0.026)	0.002 (0.027)	-0.016 (0.018)	-0.019 (0.017)	-0.015 (0.018)
Treatment*2001 Birth Cohort	-0.018 (0.031)	-0.028 (0.029)	-0.017 (0.031)	0.021 (0.019)	0.013 (0.018)	0.023 (0.019)
Treatment*2002 Birth Cohort				0.019 (0.019)	0.013 (0.018)	0.019 (0.019)
Additional Controls	Yes	Yes	Yes	Yes	Yes	Yes
Sample Size	163272	168689	168689	268565	277474	277474
Number of Schools	1217	1217	1217	1598	1598	1598
B. Heterogeneity Results (Table 4)	Pilot v Control (Cohorts 1998 and 2001)			CLLD v Control (Cohorts 1998 and 2002)		
	(7)	(8)	(9)	(10)	(11)	(12)
	Age 11 (Table 4)	Age 11 (With Imputation A)	Age 11 (With Imputation B)	Age 11 (Table 4)	Age 11 (With Imputation A)	Age 11 (With Imputation B)
Native and Free School Meals	0.011 (0.052)	0.013 (0.054)	0.011 (0.051)	0.042 (0.028)	0.045* (0.027)	0.039 (0.027)
Native and Non-Free School Meals	-0.061* (0.032)	-0.066** (0.031)	-0.060* (0.033)	-0.017 (0.021)	-0.022 (0.021)	-0.016 (0.022)
Non-Native and Free School Meals	0.181** (0.087)	0.132* (0.080)	0.182** (0.087)	0.099** (0.041)	0.097** (0.039)	0.096** (0.041)
Non-Native and Non-Free School Meals	-0.031 (0.066)	-0.045 (0.064)	-0.031 (0.066)	0.070** (0.035)	0.058* (0.034)	0.068** (0.035)
P-value : Native, FSM=Native, Non-FSM	0.167	0.142	0.163	0.032	0.011	0.039
P-value: Non-Native FSM=Non-Native, Non-FSM	0.014	0.032	0.014	0.464	0.300	0.461
Sample Size	87985	90885	90885	114592	118207	118207
Number of Schools	1217	1217	1217	1598	1598	1598

Notes: As for Table 3 for (1)-(6). As for Table 4 for (7)-(12). Columns (1) and (4) are reproduced from Table 3; columns (2) and (4) are the same for the extended sample with imputation which assigns missing values to the lowest score given at the school that the student attended at this age; columns (3) and (6) assign missing values to the average score given at the school attended by the student at this age. Columns (7) and (10) are reproduced from Table 4; columns (8) and (11) are the same for the extended sample with imputation which assigns missing values to the lowest score given at the school that the student attended at this age; columns (9) and (12) assign missing values to the average score given at the school attended by the student at this age. The test score is imputed for students who were not entered into the test because they were working below the level of the English test. *** Significant at the 1 percent level; ** Significant at the 5 percent level; * Significant at the 10 percent level.

C. Selection Criteria for Schools and Local Authorities: Information from the Department for Education

In relation to the 18 LAs selected for the *The Early Reading Development Pilot* pilot in 2005/06, communication with officials in the Department of Education reveals the following: selection of Local Authorities was based on current involvement with the 'Intensifying Support Programme'¹; capacity to deliver at short notice; existing expertise around early years learning, reading and phonics teaching; effective working relationships across Early Years and Literacy/School Improvement teams; mix of LA type and representation across regions; commitment to advocacy for early reading pilot approach; willingness to support dissemination. The decision regarding the selection of schools into the pilot was made by the Local Authority. As described by officials in the Department of Education, the criteria were as follows: willingness and capacity to engage with the pilot at all levels (i.e. headteacher, early years coordinator, relevant teachers...); commitment by the school/setting to improve the quality of teaching of early reading; need to improve children's outcomes in communication, language and literacy; quality of teaching in early years must be at least satisfactory; at least two of the ten schools/settings identified in a single authority would have the potential to become leading practice schools in terms of early reading – building long-term capacity in the authority area.

In September 2006, the Communication, Language and Literacy Development Programme (CLLD) was launched to implement the recommendations of the Rose Review, replacing the EDRp. A further 32 LAs were invited to join the original 18 LAs, each receiving funding for a dedicated learning consultant. Details are similarly vague on how the additional 32 LAs were selected. We are told that they were selected after consultation with the National Strategy regional teams on the basis of several factors including data, LA capacity and the need to encompass a range of different sorts of LAs.

A second group of 50 LAs were invited to join the CLLD programme from April 2008, making 100 LAs in total. The selection was based on the number of young children in the LA who were in the 30 percent most deprived 'super output areas' so that the programme could support work in 'closing the gap' in attainment at age 5. LAs were advised to select their target schools on the basis of their data for attainment at ages 5 and 7, taking into account local knowledge about capacity.

¹ This was introduced in 2002. 13 Local Authorities with a number of local attaining schools were invited to join this two-year pilot to work with their schools in challenging circumstances. The programme was further extended to 76 LAs in 2004-05. Note that treatment and control groups of schools used in this analysis do not coincide with participation in this earlier programme.

However, the consultant's remit was to work beyond the targeted schools to disseminate effective practice as widely as possible in the LA. The CLLD programme was extended to all authorities from April 2009 with the same guidance offered on the selection of targeted schools.