



Ministry of Housing,
Communities &
Local Government

Annex E

Statistical Modelling Output

Contents

Contents	2
Introduction	3
1 Intention to treat (ITT) Models	4
1.1 Model 1 Change in speaking & listening score	4
1.2 Model 2 Change in reading score	5
1.3 Model 3 Change in writing score	6
1.4 Model 4 Follow-up measure speaking & listening score	7
1.5 Model 5 Follow-up measure reading score	8
1.6 Model 6 Follow-up measure writing score	9
2 Standard (non-ITT) models	10
2.1 Model 7 Change in speaking & listening score	10
2.2 Model 8 Change in reading score	11
2.3 Model 9 Change in writing score	12
2.4 Model 10 Follow-up measure speaking and listening score	13
2.5 Model 11 Follow-up measure reading score	14
2.6 Model 12 Follow up measure writing score	15

Introduction

This annex presents statistical models fitted to data. For each model, an estimates table is provided. These tables present estimates and standard errors from each of the models. They can be interpreted in much the same way as for standard single-level regression with each explanatory variable in the model having a reference category on which to compare.

Reference categories in the tables can be identified by having an estimate of zero, and no standard error. Positive estimates indicate an increase in score compared to the reference category, while negative estimates indicate a decrease.

Models were run under an intention to treat (ITT) and standard approach. The ITT models were used within the presentation of findings within the main report, while the standard models used as an alternative approach and sensitivity check.

In all models tables, statistically significant findings (e.g. with a p-value .05 or less) are indicated in bold with the corresponding significance indicated within charts by the presence of an. The levels of significance are indicated in the following way: * = significant at the 5% level; ** = significant at the 1% level; and *** = significant at the 0.1% level.

1. Intention to treat (ITT) Models

1.1 Model 1 Change in speaking & listening score

Models presented under this section are conducted using an ITT approach (with outcome data at the follow-up point computed based on a last observation carried forward basis adjusted to mirror the change observed in the control group). The first three model outputs in this section set the outcome variable as the change in score for **baseline and follow-up assessments** and the following three look at the follow-up score only. Models are presented in the following sequence: speaking and listening, reading and writing.

Multilevel model of change in English speaking score between baseline and follow-up assessments

Predictor	Group	Estimate	Std. Err	t-value
(Intercept)		1.41	0.56	2.53
Condition	Control	0.00	-	-
	Treatment***	0.92	0.25	3.70
Baseline test score	English speaking***	-0.30	0.05	-6.68
Language	Arabic	0.00	-	-
	Bengali	-0.31	0.43	-0.73
	Other	-0.37	0.40	-0.94
	Punjabi	-0.10	0.46	-0.21
	Somali	-1.64	1.38	-1.83
	Urdu	-0.07	0.40	-0.17
Gender	Female	0.00	-	-
	Male	-0.49	0.26	-1.85
Age group	18-24	0.00	-	-
	25-34	0.35	0.36	0.98
	35-44	0.22	0.38	0.57
	45-55	-0.11	0.43	0.26
	55+	-0.09	0.48	-0.18
Education	No formal education	0.00	-	-
	Primary	0.20	0.22	0.92
	Secondary	0.12	0.23	0.55
	College	0.05	0.29	0.19
	University**	1.68	0.64	2.62
Time in UK	Years	0.04	0.06	0.60
Child under 5	No child u5	0.00	-	-
	Child u5	0.18	0.19	0.96
Child 5 or over	No child 5/+	0.00	-	-
	Child 5/+*	0.45	0.18	2.49
Baseline after course start	No	0.00	-	-
	Yes	-0.25	0.27	-0.96

1.2 Model 2 Change in reading score

Multilevel model of change in English reading score between baseline and follow-up assessments

Predictor	Group	Estimate	Std. Err	t-value
(Intercept)		1.39	0.85	1.63
Condition	Control	0.00	-	-
	Treatment***	1.29	0.37	3.43
Baseline test score	English reading***	-0.45	0.06	-7.82
Language	Arabic	0.00	-	-
	Bengali*	1.36	0.63	2.17
	Other	1.10	0.59	1.88
	Punjabi	0.87	0.69	1.26
	Somali	-0.71	2.01	-0.35
	Urdu	1.05	0.58	1.80
Gender	Female	0.00	-	-
	Male	0.10	0.40	0.24
Age group	18-24	0.00	-	-
	25-34*	-0.95	0.55	-1.73
	35-44***	-1.17	0.58	-2.02
	45-55*	-2.38	0.65	-3.65
	55+	-0.56	0.76	-2.02
Education	No formal education	0.00	-	-
	Primary*	0.69	0.33	2.08
	Secondary	0.66	0.35	1.89
	College*	1.14	0.45	2.51
	University	1.92	0.99	1.94
Time in UK	Years	0.13	0.08	1.57
Child under 5	No child u5	0.00	-	-
	Child u5	-0.02	0.29	-0.05
Child 5 or over	No child 5+	0.00	-	-
	Child 5+*	0.65	0.28	2.38
Baseline after course start	No	0.00	-	-
	Yes	-0.26	0.40	-0.62

1.3 Model 3 Change in writing score

Multilevel model of change in English writing score between baseline and follow-up assessments

Predictor	Group	Estimate	Std. Err	t-value
(Intercept)		1.80	0.72	2.51
Condition	Control	0.00	-	-
	Treatment**	0.90	0.32	2.86
Baseline test score	English writing***	-0.43	0.06	-7.68
Language	Arabic	0.00	-	-
	Bengali	0.47	0.55	0.88
	Other	0.51	0.51	0.99
	Punjabi	-0.03	0.60	-0.05
	Somali*	-3.48	1.70	-2.04
	Urdu	0.18	0.51	0.34
Gender	Female	0.00	-	-
	Male	0.17	0.34	0.51
Age group	18-24	0.00	-	-
	25-34**	-0.81	0.47	-1.72
	35-44***	-1.07	0.49	-2.15
	45-55*	-2.21	0.55	-4.04
	55+	-2.01	0.62	3.15
Education	No formal education	0.00	-	-
	Primary**	0.81	0.29	2.82
	Secondary	0.40	0.27	1.35
	College***	1.31	0.39	3.35
	University***	1.31	0.39	3.35
Time in UK	Years	0.14	0.07	-1.92
Child under 5	No child u5	0.00	-	-
	Child u5	0.14	0.07	1.92
Child 5 or over	No child 5+	0.00	-	-
	Child 5+	0.02	0.25	0.09
Baseline after course start	No	0.00	-	-
	Yes	-0.04	0.35	-0.11

1.4 Model 4 Follow-up measure speaking & listening score

Multilevel model of speaking and listening follow-up score				
Predictor	Group	Estimate	Std. Err	t-value
(Intercept)		1.97	0.55	3.59
Condition	Control	0.00	-	-
	Treatment***	0.95	0.24	3.93
Baseline test score	English speaking***	0.56	0.04	12.91
Language	Arabic	0.00	-	-
	Bengali	-0.19	0.41	-0.51
	Other	-0.30	0.38	-0.76
	Punjabi	-0.02	0.45	-0.05
	Somali	-2.03	1.33	-1.53
	Urdu	0.02	0.38	0.07
Gender	Female	0.00	-	-
	Male	-0.45	0.25	-1.79
Age group	18-24	0.00	-	-
	25-34	0.25	0.35	0.72
	35-44	0.11	0.38	0.30
	45-55	-0.06	0.42	-0.14
	55+	-0.20	0.48	-0.41
Education	No formal education	0.00	-	-
	Primary	0.22	0.21	1.05
	Secondary	0.05	0.21	0.24
	College	0.17	0.28	0.62
	University*	1.38	0.61	2.26
Time in UK	Years	0.03	0.06	0.48
Child under 5	No child u5	0.00	-	-
	Child u5	0.13	0.18	0.68
Child 5 or over	No child 5+	0.00	-	-
	Child 5+**	0.51	0.18	2.88
Baseline after course start	No	0.00	-	-
	Yes	-0.15	0.26	-0.57

1.5 Model 5 Follow-up measure reading score

Multilevel model of reading follow-up score				
Predictor	Group	Estimate	Std. Err	t-value
(Intercept)		1.39	0.85	1.63
Condition	Control	0.00	-	-
	Treatment***	1.26	0.37	3.43
Baseline test score	English reading***	0.55	0.06	9.63
Language	Arabic	0.00	-	-
	Bengali*	1.36	0.63	2.17
	Other	1.10	0.59	1.88
	Punjabi	0.87	0.68	1.27
	Somali	-0.71	2.01	-0.35
	Urdu	1.05	0.59	1.80
Gender	Female	0.00	-	-
	Male	-0.09	0.40	0.24
Age group	18-24	0.00	-	-
	25-34*	-0.95	0.55	-1.73
	35-44***	-1.17	0.58	-2.02
	45-55*	-2.38	0.65	-3.67
	55+	-1.56	0.75	-2.10
Education	No formal education	0.00	-	-
	Primary*	0.69	0.33	2.08
	Secondary	0.66	0.35	1.89
	College*	1.14	0.45	2.51
	University	1.92	0.99	1.93
Time in UK	Years	0.13	0.08	1.56
Child under 5	No child u5	0.00	-	-
	Child u5	-0.02	0.29	-0.06
Child 5 or over	No child 5+	0.00	-	-
	Child 5+*	0.66	0.28	2.24
Baseline after course start	No	0.00	-	-
	Yes	-0.26	0.41	-0.62

1.6 Model 6 Follow-up measure writing score

Multilevel model of writing follow-up score				
Predictor	Group	Estimate	Std. Err	t-value
(Intercept)		1.80	0.72	2.51
Condition	Control	0.00	-	-
	Treatment**	0.90	0.32	2.83
Baseline test score	English writing***	0.56	0.06	9.80
Language	Arabic	0.00	-	-
	Bengali	0.48	0.55	0.88
	Other	0.51	0.51	0.99
	Punjabi	-0.03	0.60	0.05
	Somali*	-3.48	1.70	-2.04
	Urdu	0.18	0.51	0.35
Gender	Female	0.00	-	-
	Male	0.17	0.34	0.51
Age group	18-24	0.00	-	-
	25-34**	-0.81	0.47	-1.72
	35-44***	-1.06	0.49	-2.15
	45-55*	-2.21	0.55	-4.04
	55+	-2.01	0.55	-4.04
Education	No formal education	0.00	-	-
	Primary**	0.81	0.29	2.82
	Secondary	0.40	0.30	1.36
	College***	1.31	0.39	3.35
	University***	2.96	0.84	3.51
Time in UK	Years	0.14	0.07	1.92
Child under 5	No child u5	0.00	-	-
	Child u5	0.02	0.25	0.09
Child 5 or over	No child 5+	0.00	-	-
	Child 5+	0.16	0.24	0.70
Baseline after course start	No	0.00	-	-
	Yes	-0.04	0.35	-0.11

2. Standard (Non-ITT) models

Models presented under this section were not conducted using an ITT approach (there is no imputation for missing follow-up measures). As per the previous chapter the first three model outputs set the outcome variable as the change in score measure, and the following three the follow-up score. Models are presented in the following sequence: speaking and listening, reading and writing.

2.1 Model 7 Change in speaking & listening score

Multilevel model of change in English speaking score between baseline and follow-up assessments

Predictor	Group	Estimate	Std. Err	t-value
(Intercept)		2.33	0.80	2.93
Condition	Control	0.00	-	-
	Treatment***	1.19	0.33	3.65
Baseline test score	English speaking***	-0.51	0.06	-8.46
Language	Arabic	0.00	-	-
	Bengali	-0.49	0.64	-0.77
	Other	-0.60	0.61	-0.99
	Punjabi	-0.14	0.69	-0.21
	Somali*	-3.12	1.56	-1.9
	Urdu	-0.42	0.59	-0.70
Gender	Female	0.00	-	-
	Male	-0.37	0.34	-1.15
Age group	18-24	0.00	-	-
	25-34	0.40	0.42	0.96
	35-44	0.26	0.45	0.57
	45-55	-0.22	0.50	0.45
	55+	-0.45	0.58	-0.78
Education	No formal education	0.00	-	-
	Primary	0.43	0.27	1.59
	Secondary	0.28	0.28	1.02
	College	0.63	0.37	1.70
	University**	2.38	0.84	2.82
Time in UK	Years	0.05	0.07	0.73
Child under 5	No child u5	0.00	-	-
	Child u5	0.01	0.24	0.04
Child 5 or over	No child 5/+	0.00	-	-
	Child 5/+**	0.64	0.23	2.80
Baseline after course start	No	0.00	-	-
	Yes	-0.20	0.36	-0.58

2.2 Model 8 Change in reading score

Multilevel model of change in English reading score between baseline and follow-up assessments

Predictor	Group	Estimate	Std. Err	t-value
(Intercept)		0.85	1.21	0.71
Condition	Control	0.00	-	-
	Treatment**	1.34	0.50	2.67
Baseline test score	English reading***	-0.51	0.08	-6.54
Language	Arabic	0.00	-	-
	Bengali*	1.98	0.98	2.02
	Other*	1.81	0.92	1.97
	Punjabi	1.16	1.04	1.05
	Somali	-0.76	2.38	-0.32
Gender	Urdu	1.45	0.90	1.62
	Female	0.00	-	-
	Male	0.49	0.51	0.97
Age group	18-24	0.00	-	-
	25-34***	-0.87	0.64	-1.36
	35-44	-1.17	0.69	-1.70
	45-55	-2.95	0.75	-3.90
	55+	-1.43	0.88	-1.62
Education	No formal education	0.00	-	-
	Primary	1.21	0.41	2.97
	Secondary	1.33	0.43	3.05
	College*	1.98	0.57	3.51
	University	3.53	1.26	2.80
Time in UK	Years	0.15	0.10	1.50
Child under 5	No child u5	0.00	-	-
	Child u5	-0.37	0.36	-1.02
Child 5 or over	No child 5+	0.00	-	-
	Child 5+	0.83	0.35	2.37
Baseline after course start	No	0.00	-	-
	Yes	0.01	0.54	-0.02

2.3 Model 9 Change in writing score

Multilevel model of change in English writing score between baseline and follow-up assessments

Predictor	Group	Estimate	Std. Err	t-value
(Intercept)		0.94	0.95	0.98
Condition	Control	0.00	-	-
	Treatment**	1.26	0.39	3.23
Baseline test score	English writing***	-0.48	0.07	-6.83
Language	Arabic	0.00	-	-
	Bengali	1.01	0.77	1.29
	Other	1.26	0.73	1.72
	Punjabi	0.49	0.84	0.58
	Somali	-2.83	1.90	-1.49
	Urdu	-0.61	0.74	-0.82
Gender	Female	0.00	-	-
	Male	-0.43	0.42	1.04
Age group	18-24	0.00	-	-
	25-34	0.60	0.53	-1.13
	35-44	-0.96	0.57	-1.68
	45-55***	2.56	0.62	-4.12
	55+**	-2.29	0.73	-3.15
Education	No formal education	0.00	-	-
	Primary***	-1.20	0.39	3.56
	Secondary	0.68	0.35	1.92
	College***	2.02	0.47	4.31
	University***	4.48	1.06	4.24
Time in UK	Years	0.17	0.09	1.96
Child under 5	No child u5	0.00	-	-
	Child u5	0.13	0.29	-0.43
Child 5 or over	No child 5+	0.00	-	-
	Child 5+	0.15	0.28	0.57
Baseline after course start	No	0.00	-	-
	Yes	-0.16	0.41	-0.40

2.4 Model 10 Follow-up measure speaking and listening score

Multilevel model of English speaking follow-up score

Predictor	Group	Estimate	Std. Err	t-value
(Intercept)		2.34	0.80	2.93
Condition	Control	0.00	-	-
	Treatment***	1.20	0.33	3.65
Baseline test score	English speaking***	0.49	0.06	8.04
Language	Arabic	0.00	-	-
	Bengali	-0.50	0.64	-0.77
	Other	-0.60	0.61	-0.99
	Punjabi	-0.14	0.69	-0.21
	Somali*	-3.13	1.56	-2.00
	Urdu	-0.42	0.59	-0.70
Gender	Female	0.00	-	-
	Male	-0.37	0.34	-1.12
Age group	18-24	0.00	-	-
	25-34	0.40	0.42	0.96
	35-44	0.26	0.45	0.57
	45-55	-0.22	0.50	-0.45
	55+	-0.45	0.58	-0.78
Education	No formal education	0.00	-	-
	Primary	0.43	0.27	1.59
	Secondary	0.28	0.28	1.02
	College	0.63	0.37	1.70
	University**	2.38	0.85	2.82
Time in UK	Years	0.05	0.07	0.73
Child under 5	No child u5	0.00	-	-
	Child u5	0.01	0.24	0.04
Child 5 or over	No child 5+	0.00	-	-
	Child 5+**	0.64	0.23	2.81
Baseline after course start	No	0.00	-	-
	Yes	-0.21	0.36	-0.58

2.5 Model 11 Follow-up measure reading score

Multilevel model of English Reading follow-up score

Predictor	Group	Estimate	Std. Err	t-value
(Intercept)		0.85	1.23	0.70
Condition	Control	0.00	-	-
	Treatment**	1.33	0.50	2.68
Baseline test score	English reading***	4.86	0.08	6.20
Language	Arabic	0.00	-	-
	Bengali*	1.98	0.98	2.02
	Other	1.82	0.92	1.97
	Punjabi	1.16	1.05	1.11
	Somali	-0.75	2.38	-0.31
Gender	Urdu	1.45	0.90	1.62
	Female	0.00	-	-
Age group	Male	0.49	0.51	0.97
	18-24	0.00	-	-
	25-34	-0.87	0.64	-1.35
	35-44	-1.17	0.69	-1.70
	45-55***	-2.95	0.75	-3.90
	55+	-1.42	0.88	-1.62
Education	No formal education	0.00	-	-
	Primary**	1.21	0.41	2.97
	Secondary**	1.32	0.43	3.54
	College***	1.98	0.57	3.51
	University**	3.54	1.26	2.80
Time in UK	Years	0.16	0.11	1.50
Child under 5	No child u5	0.00	-	-
	Child u5	-0.37	0.36	-1.01
Child 5 or over	No child 5+	0.00	-	-
	Child 5+*	0.83	0.35	2.37
Baseline after course start	No	0.00	-	-
	Yes	0.01	0.55	0.02

2.6 Model 12 Follow up measure writing score

Multilevel model of English writing follow-up score

Predictor	Group	Estimate	Std. Err	t-value
(Intercept)		0.94	0.95	0.98
Condition	Control	0.00	-	-
	Treatment**	1.26	0.39	3.23
Baseline test score	English writing***	0.51	0.07	7.14
Language	Arabic	0.00	-	-
	Bengali	1.01	0.78	1.30
	Other	1.27	0.74	1.72
	Punjabi	0.04	0.84	0.58
	Somali	-2.83	1.91	-1.49
	Urdu	0.61	0.74	0.82
Gender	Female	0.00	-	-
	Male	0.43	0.42	1.04
Age group	18-24	0.00	-	-
	25-34	-0.60	0.53	-1.13
	35-44	-0.96	0.57	-1.68
	45-55**	-2.56	0.62	-1.12
	55+***	-2.29	0.73	-3.15
Education	No formal education	0.00	-	-
	Primary***	1.21	0.34	3.56
	Secondary	0.68	0.35	1.93
	College**	2.02	0.47	4.31
	University***	4.48	1.06	4.24
Time in UK	Years	0.17	0.09	1.96
Child under 5	No child u5	0.00	-	-
	Child u5	-0.13	0.30	-0.43
Child 5 or over	No child 5+	0.00	-	-
	Child 5+	0.16	0.28	0.57
Baseline after course start	No	0.00	-	-
	Yes	-0.16	0.41	-0.40