

# Supplementary Materials

## DVAR and DAB Scores

### Changes over time

#### DVAR Composite

Formula: Composite ~ TimePoint \* Grade + (1 | ChildID) + (TimePoint | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	82.38	2.02	0.26	39.88	40.88	<0.001	***
Time Point	-4.15	1.38	-0.18	42.06	-3.01	0.004	**
Grade	-6.59	2.88	-0.28	39.65	-2.29	0.027	*
Time Point x Grade	-4.05	1.96	-0.17	41.80	-2.06	0.045	*

#### DVAR Phonology

Formula: Phon ~ TimePoint \* Grade + (1 | ChildID) + (TimePoint | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	85.13	1.83	0.21	43.83	46.43	<0.001	***
Time Point	-1.86	2.12	-0.07	40.07	-0.88	0.384	
Grade	-5.94	2.61	-0.22	43.49	-2.27	0.028	*
Time Point x Grade	-6.69	3.02	-0.25	39.78	-2.22	0.032	*

#### DVAR 3sg

Formula: 3SG ~ TimePoint \* Grade + (1 | ChildID) + (TimePoint | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	87.07	2.40	0.11	36.33	36.27	<0.001	***
Time Point	-1.42	1.80	-0.05	33.01	-0.79	0.433	
Grade	-4.63	3.42	-0.16	36.12	-1.35	0.185	
Time Point x Grade	-2.45	2.56	-0.09	32.77	-0.96	0.346	

#### DVAR Irregular

Formula: Irreg ~ TimePoint \* Grade + (1 | ChildID) + (TimePoint | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	76.06	3.13	0.25	37.73	24.29	<0.001	***
Time Point	-7.26	1.89	-0.21	41.04	-3.83	<0.001	***
Grade	-8.63	4.47	-0.25	37.52	-1.93	0.061	.
Time Point x Grade	-4.33	2.70	-0.13	40.72	-1.60	0.117	

### DAB Elicited Imitation

Formula: DAB\_EI ~ TimePoint \* Grade + (1 | ChildID) + (TimePoint | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	16.93	0.34	-0.37	43.11	49.30	<0.001	***
Time Point	1.40	0.25	0.33	44.55	5.54	<0.001	***
Grade	1.93	0.49	0.46	42.86	3.94	<0.001	***
Time Point x Grade	-0.27	0.36	-0.06	44.20	-0.75	0.46	

### DAB Translation

Formula: DAB\_TR ~ TimePoint \* Grade + (1 | ChildID) + (TimePoint | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	6.45	0.34	-0.45	65.22	18.91	<0.001	***
Time Point	1.47	0.35	0.29	125.54	4.20	<0.001	***
Grade	2.30	0.49	0.45	64.74	4.72	<0.001	***
Time Point x Grade	1.65	0.50	0.32	124.68	3.31	0.001	**

### Dialect change predicting reading

#### DVAR Composite only

Formula: ReadingW-ScorePost ~ ReadingW-ScoreBaseline + CompositeChange + (1 | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	96.04	9.27	0.00	366.56	10.36	<0.001	***
Reading W-Score Baseline	0.82	0.02	0.85	376.32	36.27	<0.001	***
Composite Change	-0.15	0.04	-0.08	466.96	-3.97	<0.001	***

#### DVAR Composite with DAB

Formula: ReadingW-ScorePost ~ ReadingW-ScoreBaseline + CompositeChange + (1 | ClassroomID) + DAB\_EIChange + DAB\_TRChange

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	98.02	9.34	0.00	367.83	10.50	<0.001	***
Reading W-Score Baseline	0.81	0.02	0.84	378.42	35.58	<0.001	***
Composite Change	-0.14	0.04	-0.08	464.84	-3.81	<0.001	***
DAB_EI Change	-0.25	0.17	-0.03	456.90	-1.50	0.133	
DAB_TR Change	0.22	0.12	0.04	445.55	1.86	0.064	.

### DVAR subscores only

Formula: ReadingW-ScorePost ~ ReadingW-ScoreBaseline + PhonChange + 3SGChange + IrregChange + (1 | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	96.05	9.29	0.00	363.54	10.34	<0.001	***
Reading W-Score Baseline	0.82	0.02	0.85	373.40	36.19	<0.001	***
Phon Change	-0.07	0.02	-0.06	461.58	-2.93	0.004	**
3SG Change	-0.02	0.03	-0.02	460.98	-0.85	0.394	
Irreg Change	-0.06	0.02	-0.05	456.40	-2.54	0.011	*

### DVAR subscores with DAB

Formula: ReadingW-ScorePost ~ ReadingW-ScoreBaseline + PhonChange + 3SGChange + IrregChange + (1 | ClassroomID) + DAB\_EIChange + DAB\_TRChange

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	97.93	9.36	0.00	364.12	10.46	<0.001	***
Reading W-Score Baseline	0.81	0.02	0.84	374.68	35.50	<0.001	***
Phon Change	-0.06	0.02	-0.06	460.00	-2.84	0.005	**
3SG Change	-0.02	0.03	-0.02	459.52	-0.86	0.388	
Irreg Change	-0.06	0.02	-0.05	454.84	-2.37	0.018	*
DAB_EI Change	-0.25	0.17	-0.03	455.01	-1.49	0.137	
DAB_TR Change	0.21	0.12	0.04	444.32	1.77	0.078	.

### Baseline dialect predicting reading

#### DVAR Composite only

Formula: ReadingW-ScorePost ~ ReadingW-ScoreBaseline + CompositeBaseline

+ (1 | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	105.93	11.03	0.00	434.75	9.60	<0.001	***
Reading W-Score Baseline	0.81	0.02	0.84	406.47	33.48	<0.001	***
Composite Baseline	-0.07	0.03	-0.05	466.25	-2.11	0.036	*

### DVAR Composite with DAB

Formula: ReadingW-ScorePost ~ ReadingW-ScoreBaseline + CompositeBaseline  
+ (1 | ClassroomID) + DAB\_EIBaseline + DAB\_TRBaseline

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	97.63	10.91	0.00	426.53	8.95	<0.001	***
Reading W-Score Baseline	0.79	0.02	0.81	416.19	32.62	<0.001	***
Composite Baseline	-0.02	0.03	-0.01	464.17	-0.52	0.601	
DAB_EI Baseline	0.66	0.16	0.10	460.16	4.23	<0.001	***
DAB_TR Baseline	0.23	0.15	0.03	453.63	1.52	0.13	

### DVAR subscores only

Formula: ReadingW-ScorePost ~ ReadingW-ScoreBaseline + (DELV\_Prop\_PhonBaseline  
+ 3SGBaseline + DELV\_Prop\_Aux)Baseline + (1 | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	104.01	11.20	0.00	436.93	9.29	<0.001	***
Reading W-Score Baseline	0.81	0.02	0.84	408.22	33.39	<0.001	***
Phon Baseline	0.00	0.03	0.00	453.62	0.14	0.888	
3SG Baseline	-0.03	0.03	-0.03	462.25	-0.97	0.334	
Irreg Baseline	-0.03	0.03	-0.03	463.39	-1.21	0.226	

### DVAR subscores with DAB

Formula: ReadingW-ScorePost ~ ReadingW-ScoreBaseline + PhonBaseline  
+ 3SGBaseline + IrregBaseline + (1 | ClassroomID) + DAB\_EIBaseline  
+ DAB\_TRBaseline

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	96.38	11.05	0.00	428.92	8.72	<0.001	***
Reading W-Score Baseline	0.79	0.02	0.82	417.87	32.47	<0.001	***
Phon Baseline	0.01	0.03	0.01	452.41	0.43	0.667	
3SG Baseline	-0.01	0.03	-0.01	461.85	-0.45	0.653	

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Irreg Baseline	-0.01	0.03	-0.01	462.58	-0.35	0.73	
DAB_EI Baseline	0.65	0.16	0.10	457.96	4.17	<0.001	***
DAB_TR Baseline	0.23	0.15	0.03	451.75	1.52	0.13	

## Factor Scores

### Changes over time

#### DELV Phonology

Formula: DELV-Phon ~ TimePoint \* Grade + (1 | ChildID) + (TimePoint | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	0.04	0.05	0.30	43.40	0.73	0.468	
Time Point	-0.09	0.05	-0.15	40.87	-1.88	0.067	.
Grade	-0.21	0.07	-0.33	43.14	-2.86	0.006	**
Time Point x Grade	-0.15	0.07	-0.24	40.62	-2.08	0.044	*

#### DELV 3sg

Formula: DELV-3sg ~ TimePoint \* Grade + (1 | ChildID) + (TimePoint | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	0.03	0.06	0.27	40.97	0.52	0.605	
Time Point	-0.14	0.04	-0.21	42.24	-3.68	<0.001	***
Grade	-0.23	0.09	-0.34	40.75	-2.54	0.015	*
Time Point x Grade	-0.05	0.05	-0.07	41.92	-0.86	0.396	

#### DELV Irregular

Formula: DELV-Irreg ~ TimePoint \* Grade + (1 | ChildID) + (TimePoint | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	0.07	0.06	0.30	40.59	1.22	0.231	
Time Point	-0.17	0.04	-0.26	43.63	-4.52	<0.001	***
Grade	-0.22	0.09	-0.34	40.37	-2.55	0.015	*
Time Point x Grade	-0.05	0.05	-0.07	43.34	-0.92	0.364	

### DAB Elicited Imitation

Formula: DAB-EI ~ TimePoint \* Grade + (1 | ChildID) + (TimePoint | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	0.18	0.04	0.43	44.42	5.03	<0.001	***
Time Point	-0.16	0.02	-0.36	205.65	-7.39	<0.001	***
Grade	-0.22	0.05	-0.49	44.15	-4.38	<0.001	***
Time Point x Grade	-0.01	0.03	-0.02	204.47	-0.32	0.751	

### DAB Translation

Formula: DAB-TR ~ TimePoint \* Grade + (1 | ChildID) + (TimePoint | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	0.14	0.04	0.49	41.12	3.94	<0.001	***
Time Point	-0.17	0.03	-0.36	42.02	-5.54	<0.001	***
Grade	-0.24	0.05	-0.49	40.85	-4.66	<0.001	***
Time Point x Grade	-0.13	0.04	-0.27	41.66	-2.90	0.006	**

### Dialect change predicting reading

#### DELV factor scores only

Formula: ReadingW-ScorePost ~ ReadingW-ScoreBaseline + DELV-PhonChange + DELV-IrregChange + DELV-3sgChange + (1 | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	93.94	9.37	0.00	366.05	10.02	<0.001	***
Reading W-Score Baseline	0.83	0.02	0.85	375.37	36.17	<0.001	***
DELV-Phon Change	-2.68	1.05	-0.06	462.84	-2.54	0.011	*
DELV-Irreg Change	-1.81	2.00	-0.03	459.34	-0.91	0.365	
DELV-3sg Change	1.43	1.79	0.03	455.76	0.80	0.425	

#### DELV and DAB factor scores

Formula: ReadingW-ScorePost ~ ReadingW-ScoreBaseline + DELV-PhonChange + DELV-IrregChange + DELV-3sgChange + DAB-EIChange + DAB-TRChange + (1 | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	94.33	9.46	0.00	364.80	9.97	<0.001	***
Reading W-Score Baseline	0.82	0.02	0.85	374.77	35.64	<0.001	***
DELV-Phon Change	-2.54	1.08	-0.05	458.89	-2.35	0.019	*
DELV-Irreg Change	-1.85	2.05	-0.03	455.45	-0.90	0.367	
DELV-3sg Change	1.49	1.82	0.03	454.23	0.82	0.411	
DAB-EI Change	0.64	2.24	0.01	447.22	0.29	0.775	
DAB-TR Change	-0.94	1.55	-0.01	446.35	-0.61	0.543	

### Baseline dialect predicting reading

#### DELV factor scores

Formula: ReadingW-ScorePost ~ ReadingW-ScoreBaseline + DELV-PhonBaseline + DELV-IrregBaseline + DELV-3sgBaseline + (1 | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	105.34	9.99	0.00	400.32	10.55	<0.001	***
Reading W-Score Baseline	0.80	0.02	0.83	407.05	32.76	<0.001	***
DELV-Phon Baseline	0.19	1.28	0.00	460.11	0.15	0.88	
DELV-Irreg Baseline	-2.70	2.44	-0.06	459.53	-1.11	0.269	
DELV-3sg Baseline	-1.66	2.25	-0.04	456.88	-0.74	0.461	

#### DELV factor (drop Irreg)

Formula: ReadingW-ScorePost ~ ReadingW-ScoreBaseline + DELV-PhonBaseline + DELV-3sgBaseline + (1 | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	104.55	9.96	0.00	402.38	10.50	<0.001	***
Reading W-Score Baseline	0.80	0.02	0.83	409.81	32.89	<0.001	***
DELV-Phon Baseline	0.00	1.26	0.00	458.90	0.00	0.999	
DELV-3sg Baseline	-3.79	1.14	-0.08	467.73	-3.32	<0.001	***

#### DELV factor (drop 3sg)

Formula: ReadingW-ScorePost ~ ReadingW-ScoreBaseline + DELV-PhonBaseline + DELV-IrregBaseline + (1 | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	105.17	9.97	0.00	399.47	10.55	<0.001	***
Reading W-Score Baseline	0.80	0.02	0.83	406.24	32.83	<0.001	***

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
DELV-Phon Baseline	0.09	1.27	0.00	462.19	0.07	0.941	
DELV-Irreg Baseline	-4.26	1.24	-0.09	469.57	-3.44	<0.001	***

### DELV and DAB factor scores

Formula: ReadingW-ScorePost ~ ReadingW-ScoreBaseline + DELV-PhonBaseline + DELV-IrregBaseline + DELV-3sgBaseline + DAB-EIBaseline + DAB-TRBaseline + (1 | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	111.71	9.99	0.00	415.31	11.18	<0.001	***
Reading W-Score Baseline	0.78	0.02	0.81	419.88	32.28	<0.001	***
DELV-Phon Baseline	1.16	1.31	0.02	455.57	0.89	0.375	
DELV-Irreg Baseline	-1.35	2.44	-0.03	457.67	-0.55	0.581	
DELV-3sg Baseline	0.79	2.31	0.02	454.87	0.34	0.732	
DAB-EI Baseline	-6.39	2.35	-0.09	454.62	-2.71	0.007	**
DAB-TR Baseline	-3.28	2.00	-0.05	455.44	-1.64	0.102	

## Repertoire

### Changes over time

#### Overt copula

Formula: DAB-Copula ~ TimePoint \* Grade + (1 | ChildID) + (1 | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	z	p	
Intercept	-0.84	0.17	-0.84	-5.02	<0.001	***
Time Point	0.91	0.20	0.91	4.50	<0.001	***
Grade	0.90	0.23	0.90	3.93	<0.001	***
Time Point x Grade	-0.12	0.28	-0.12	-0.44	0.659	

#### Overt past tense

Formula: DAB-Past ~ TimePoint \* Grade + (1 | ChildID) + (1 | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	z	p
Intercept	0.01	0.14	0.01	0.06	0.949
Time Point	0.05	0.19	0.05	0.28	0.776



Fixed Effect	Estimate	SE	Std. Estimate	z	p
Grade	0.18	0.20	0.18	0.89	0.374
Time Point x Grade	-0.09	0.27	-0.09	-0.34	0.736

### Overt possessive

Formula: DAB-Possessive ~ TimePoint \* Grade + (1 | ChildID) + (1 | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	z	p	
Intercept	-1.69	0.23	-1.69	-7.31	<0.001	***
Time Point	-0.16	0.25	-0.16	-0.62	0.533	
Grade	0.02	0.30	0.02	0.05	0.957	
Time Point x Grade	1.02	0.34	1.02	2.97	0.003	**

### DELV Phonology

Formula: DELV-Phon ~ TimePoint \* Grade + (1 | ChildID) + (1 | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	z	p	
Intercept	-0.31	0.15	-0.31	-2.02	0.043	*
Time Point	0.04	0.19	0.04	0.19	0.846	
Grade	0.38	0.22	0.38	1.75	0.081	.
Time Point x Grade	0.47	0.28	0.47	1.70	0.090	.

### DELV Irregular

Formula: DELV-Irreg ~ TimePoint \* Grade + (1 | ChildID) + (1 | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	z	p	
Intercept	0.09	0.23	0.09	0.40	0.686	
Time Point	0.29	0.21	0.29	1.37	0.170	
Grade	0.56	0.33	0.56	1.73	0.084	.
Time Point x Grade	0.40	0.31	0.40	1.32	0.188	

### DELV 3sg

Formula: DELV-3sg ~ TimePoint \* Grade + (1 | ChildID) + (1 | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	z	p
Intercept	-1.57	0.27	-1.57	-5.86	<0.001 ***
Time Point	0.30	0.25	0.30	1.22	0.221
Grade	0.61	0.34	0.61	1.81	0.071 .
Time Point x Grade	-0.03	0.34	-0.03	-0.07	0.941

### Dialect change predicting reading

#### DELV only

Formula: ReadingW-ScorePost ~ ReadingW-ScoreBaseline + DELV-PhonChange + DELV-3sgChange + DELV-IrregChange + (1 | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p
Intercept	94.62	9.46	0.00	369.82	10.00	<0.001 ***
Reading W-Score Baseline	0.82	0.02	0.85	378.24	35.83	<0.001 ***
DELV-Phon Change	1.02	0.97	0.02	457.29	1.05	0.295
DELV-3sg Change	0.39	1.21	0.01	450.15	0.32	0.746
DELV-Irreg Change	0.81	1.10	0.02	458.79	0.73	0.463

#### DELV and DAB

Formula: ReadingW-ScorePost ~ ReadingW-ScoreBaseline + DAB-CopulaChange + DAB-PossessiveChange + DELV-PhonChange + DELV-3sgChange + DELV-IrregChange + (1 | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p
Intercept	94.60	9.50	0.00	373.82	9.96	<0.001 ***
Reading W-Score Baseline	0.82	0.02	0.85	382.94	35.57	<0.001 ***
DAB-Copula Change	1.08	1.34	0.02	449.82	0.80	0.421
DAB-Possessive Change	0.80	1.64	0.01	455.05	0.48	0.629
DELV-Phon Change	1.00	0.98	0.02	455.14	1.02	0.306
DELV-3sg Change	0.46	1.21	0.01	449.09	0.38	0.702
DELV-Irreg Change	0.74	1.11	0.01	456.95	0.66	0.507

### Baseline dialect predicting reading

#### DELV only

Formula: ReadingW-ScorePost ~ ReadingW-ScoreBaseline + DELV-PhonBaseline + DELV-3sgBaseline + DELV-IrregBaseline + (1 | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	97.48	9.52	0.00	371.77	10.24	<0.001	***
Reading W-Score Baseline	0.81	0.02	0.84	392.63	34.29	<0.001	***
DELV-Phon Baseline	0.52	1.28	0.01	456.00	0.41	0.685	
DELV-3sg Baseline	1.01	1.47	0.02	457.05	0.69	0.492	
DELV-Irreg Baseline	2.87	1.37	0.05	460.02	2.09	0.037	*

### DELV and DAB

Formula: ReadingW-ScorePost ~ ReadingW-ScoreBaseline + DELV-PhonBaseline + DELV-3sgBaseline + DELV-IrregBaseline + DAB-CopulaBaseline + DAB-PossessiveBaseline + (1 | ClassroomID)

Fixed Effect	Estimate	SE	Std. Estimate	df	t	p	
Intercept	100.51	9.42	0.00	368.77	10.67	<0.001	***
Reading W-Score Baseline	0.80	0.02	0.83	392.83	33.97	<0.001	***
DELV-Phon Baseline	0.07	1.27	0.00	455.03	0.05	0.957	
DELV-3sg Baseline	0.80	1.46	0.01	455.28	0.55	0.583	
DELV-Irreg Baseline	2.43	1.36	0.04	458.93	1.78	0.075	.
DAB-Copula Baseline	4.59	1.29	0.08	448.06	3.56	<0.001	***
DAB-Possessive Baseline	1.85	1.63	0.02	464.03	1.14	0.256	