Implicit Encoding with 3 Speeded Naming Tasks

Jessica Nicosia

Updated 3/5/18

Contents

Implicit Encoding

```
## Joining, by = c("Subject", "nameItem", "freq", "studied", "Target.RT", "rt.trim", "enterResponse.RES
## Joining, by = c("Subject", "nameItem", "freq", "studied", "Target.RT", "rt.trim", "enterResponse.RES

## Joining, by = c("Subject", "recog", "type", "RT", "freq", "studied")
## Joining, by = c("Subject", "recog", "type", "RT", "freq", "studied")
```

Z-Scored Response Times

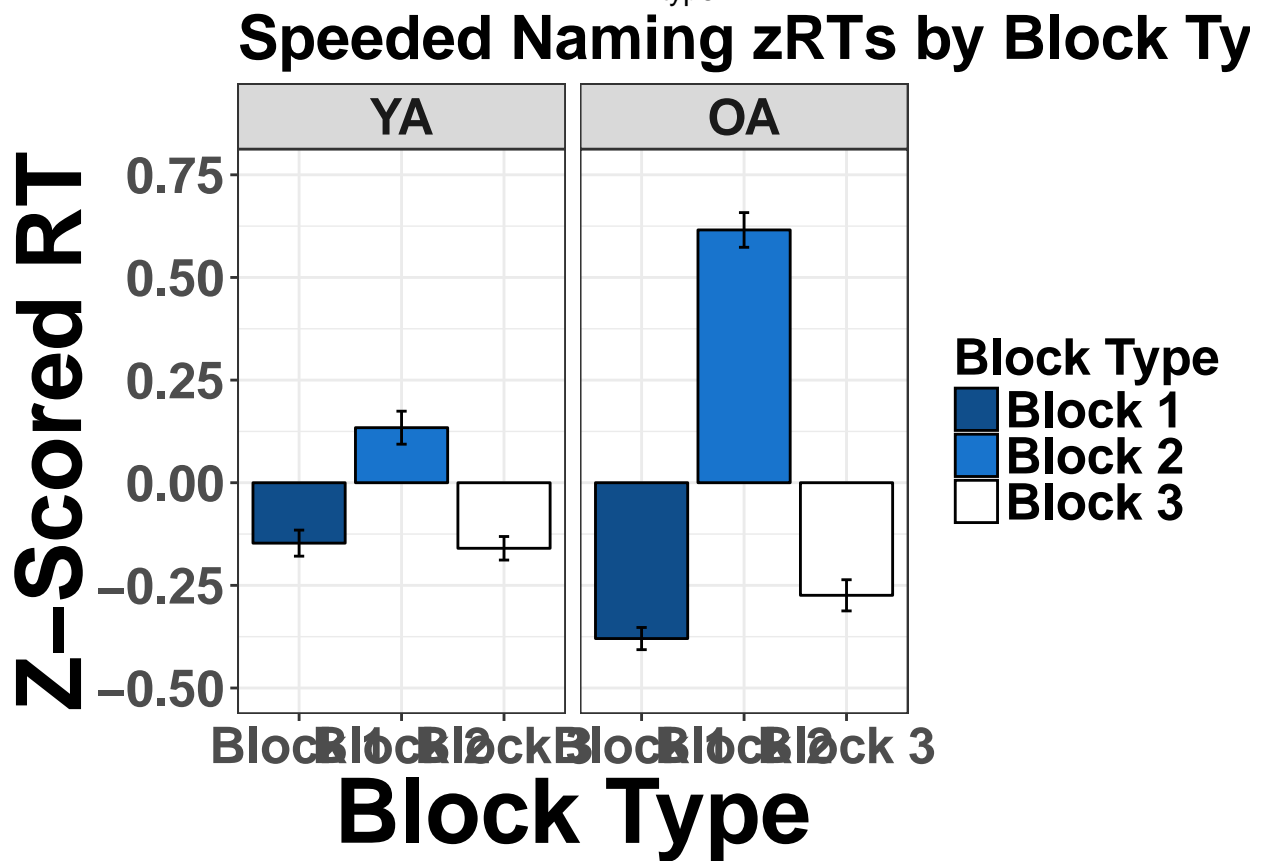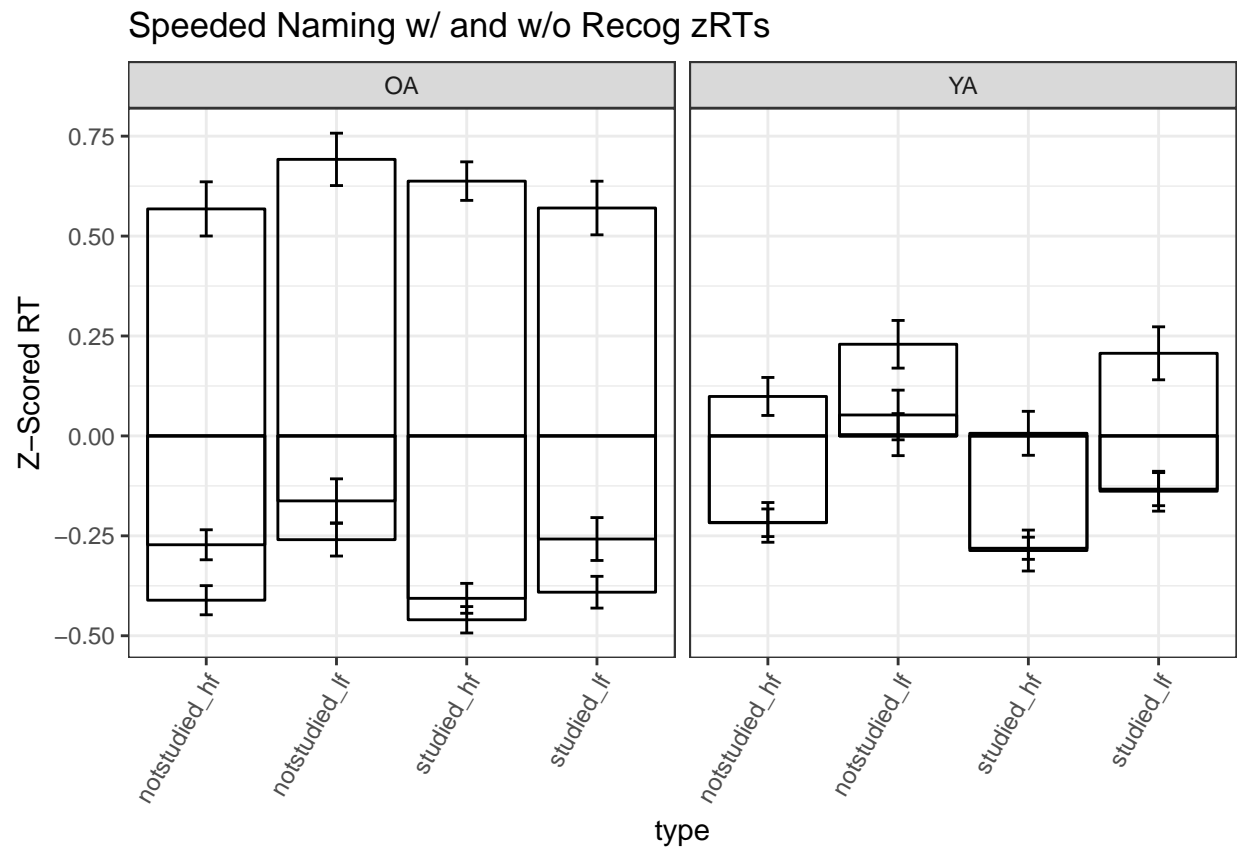### Speeded Naming

Study X Frequency

Table 1: Speeded Naming Mean zRTs

recog	type	age	N	RT	sd	se	ci
Block 1	notstudied_hf	OA	30	-0.41	0.20	0.04	0.07
Block 1	notstudied_hf	YA	36	-0.22	0.30	0.05	0.10
Block 1	notstudied_lf	OA	30	-0.26	0.22	0.04	0.08
Block 1	notstudied_lf	YA	36	0.05	0.37	0.06	0.13
Block 1	studied_hf	OA	30	-0.46	0.18	0.03	0.07
Block 1	studied_hf	YA	36	-0.28	0.17	0.03	0.06
Block 1	studied_lf	OA	30	-0.39	0.22	0.04	0.08
Block 1	studied_lf	YA	36	-0.14	0.30	0.05	0.10
Block 2	notstudied_hf	OA	30	0.57	0.37	0.07	0.14
Block 2	notstudied_hf	YA	36	0.10	0.29	0.05	0.10
Block 2	notstudied_lf	OA	30	0.69	0.36	0.07	0.13
Block 2	notstudied_lf	YA	36	0.23	0.36	0.06	0.12
Block 2	studied_hf	OA	30	0.64	0.26	0.05	0.10
Block 2	studied_hf	YA	36	0.01	0.33	0.06	0.11
Block 2	studied_lf	OA	30	0.57	0.37	0.07	0.14
Block 2	studied_lf	YA	36	0.21	0.40	0.07	0.13
Block 3	notstudied_hf	OA	30	-0.27	0.21	0.04	0.08
Block 3	notstudied_hf	YA	36	-0.22	0.21	0.03	0.07
Block 3	notstudied_lf	OA	30	-0.16	0.30	0.06	0.11
Block 3	notstudied_lf	YA	36	0.00	0.32	0.05	0.11
Block 3	studied_hf	OA	30	-0.41	0.20	0.04	0.08
Block 3	studied_hf	YA	36	-0.29	0.31	0.05	0.10
Block 3	studied_lf	OA	30	-0.26	0.29	0.05	0.11
Block 3	studied_lf	YA	36	-0.13	0.25	0.04	0.08

Table 2: Analysis of Variance Table

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	0.3726	0.3726	4.374	0.03682
studied	1	1.512	1.512	17.75	2.819e-05
freq	1	3.995	3.995	46.89	1.535e-11
recog	2	60.69	30.34	356.2	3.572e-110
age:studied	1	0.01778	0.01778	0.2088	0.6479
age:freq	1	0.4604	0.4604	5.404	0.02034

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
studied:freq	1	0.1669	0.1669	1.959	0.162
age:recog	2	19.29	9.647	113.2	7.925e-44
studied:recog	2	0.1937	0.09687	1.137	0.3213
freq:recog	2	0.1503	0.07514	0.882	0.4144
age:studied:freq	1	0.0171	0.0171	0.2007	0.6543
age:studied:recog	2	0.02353	0.01176	0.1381	0.871
age:freq:recog	2	0.05118	0.02559	0.3004	0.7406
studied:freq:recog	2	0.0648	0.0324	0.3803	0.6838
age:studied:freq:recog	2	0.3147	0.1573	1.847	0.1584
Residuals	768	65.42	0.08519	NA	NA

Speeded Naming w/ and w/o Recog zRTs

Speeded Naming zRTs by Block Ty

Age X Recog (only SN1 & SN3)

Table 3: Speeded Naming Mean zRTs

recog	type	age	N	RT	sd	se	ci
Block 1	notstudied_hf	OA	30	-0.41	0.20	0.04	0.07
Block 1	notstudied_hf	YA	36	-0.22	0.30	0.05	0.10
Block 1	notstudied_lf	OA	30	-0.26	0.22	0.04	0.08
Block 1	notstudied_lf	YA	36	0.05	0.37	0.06	0.13
Block 1	studied_hf	OA	30	-0.46	0.18	0.03	0.07
Block 1	studied_hf	YA	36	-0.28	0.17	0.03	0.06
Block 1	studied_lf	OA	30	-0.39	0.22	0.04	0.08
Block 1	studied_lf	YA	36	-0.14	0.30	0.05	0.10
Block 3	notstudied_hf	OA	30	-0.27	0.21	0.04	0.08
Block 3	notstudied_hf	YA	36	-0.22	0.21	0.03	0.07
Block 3	notstudied_lf	OA	30	-0.16	0.30	0.06	0.11
Block 3	notstudied_lf	YA	36	0.00	0.32	0.05	0.11
Block 3	studied_hf	OA	30	-0.41	0.20	0.04	0.08
Block 3	studied_hf	YA	36	-0.29	0.31	0.05	0.10
Block 3	studied_lf	OA	30	-0.26	0.29	0.05	0.11
Block 3	studied_lf	YA	36	-0.13	0.25	0.04	0.08

Table 4: Analysis of Variance Table

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	4.03	4.03	58.82	8.768e-14
studied	1	1.583	1.583	23.1	2.024e-06
freq	1	3.444	3.444	50.26	4.482e-12
recog	1	0.2232	0.2232	3.258	0.07165
age:studied	1	0.00545	0.00545	0.07955	0.778
age:freq	1	0.1927	0.1927	2.813	0.09409
studied:freq	1	0.1293	0.1293	1.888	0.1701
age:recog	1	0.4577	0.4577	6.681	0.01002
studied:recog	1	0.0001844	0.0001844	0.002692	0.9586
freq:recog	1	8.426e-05	8.426e-05	0.00123	0.972
age:studied:freq	1	0.04538	0.04538	0.6624	0.4161
age:studied:recog	1	0.01984	0.01984	0.2896	0.5907
age:freq:recog	1	0.01152	0.01152	0.1681	0.682
studied:freq:recog	1	0.06276	0.06276	0.9162	0.3389
age:studied:freq:recog	1	0.007882	0.007882	0.1151	0.7346
Residuals	512	35.08	0.06851	NA	NA

Speeded Naming w/ and w/o Recog zRTs
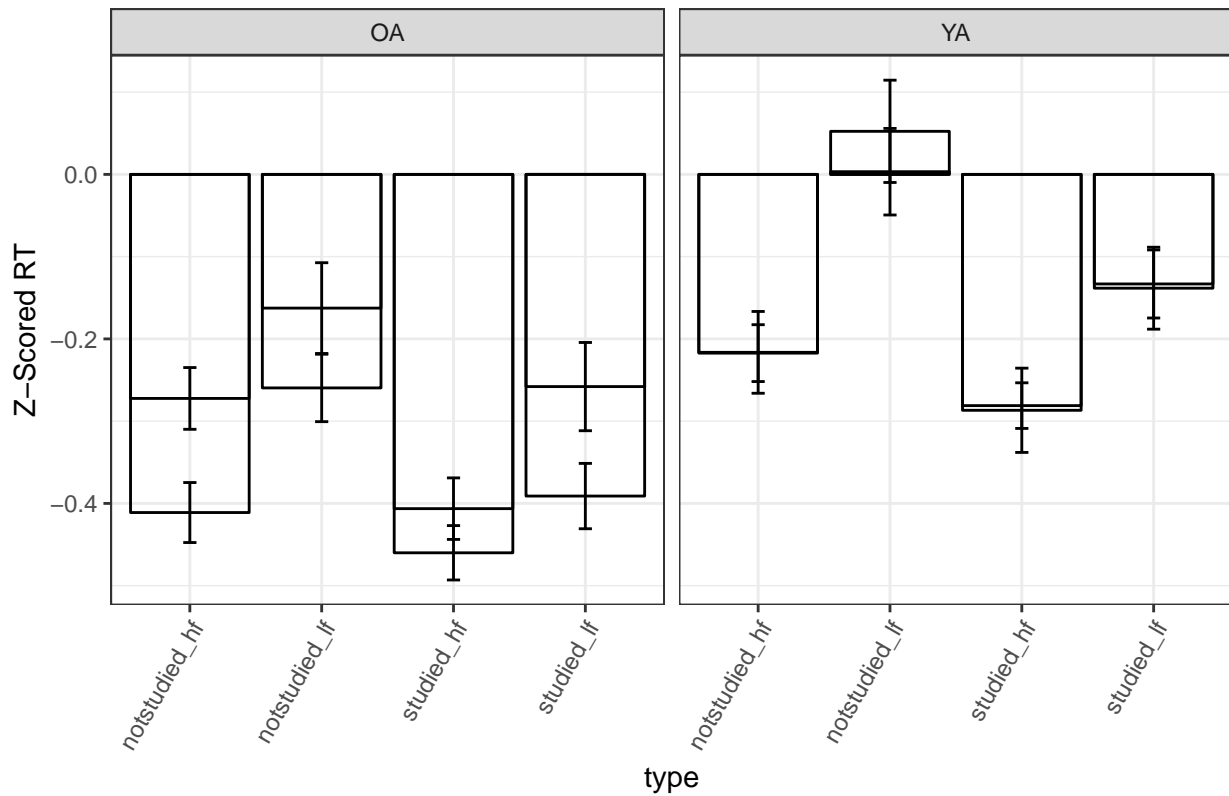
Speeded Naming zRTs by Block Ty
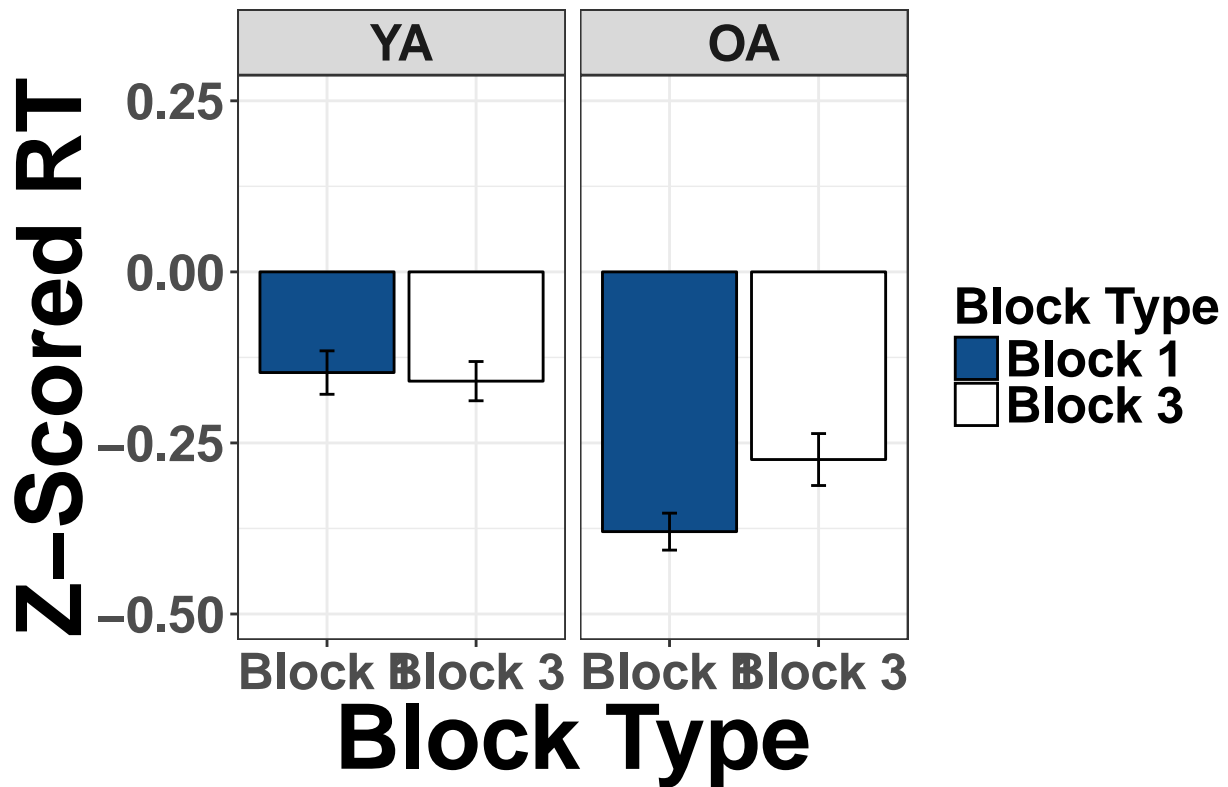
Block 2 Halves

Table 5: Analysis of Variance Table

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	7.761	7.761	71.21	5.891e-14
half	1	1.895	1.895	17.38	5.587e-05
age:half	1	0.2638	0.2638	2.421	0.1222
Residuals	128	13.95	0.109	NA	NA

Block 2 First and Second Halves
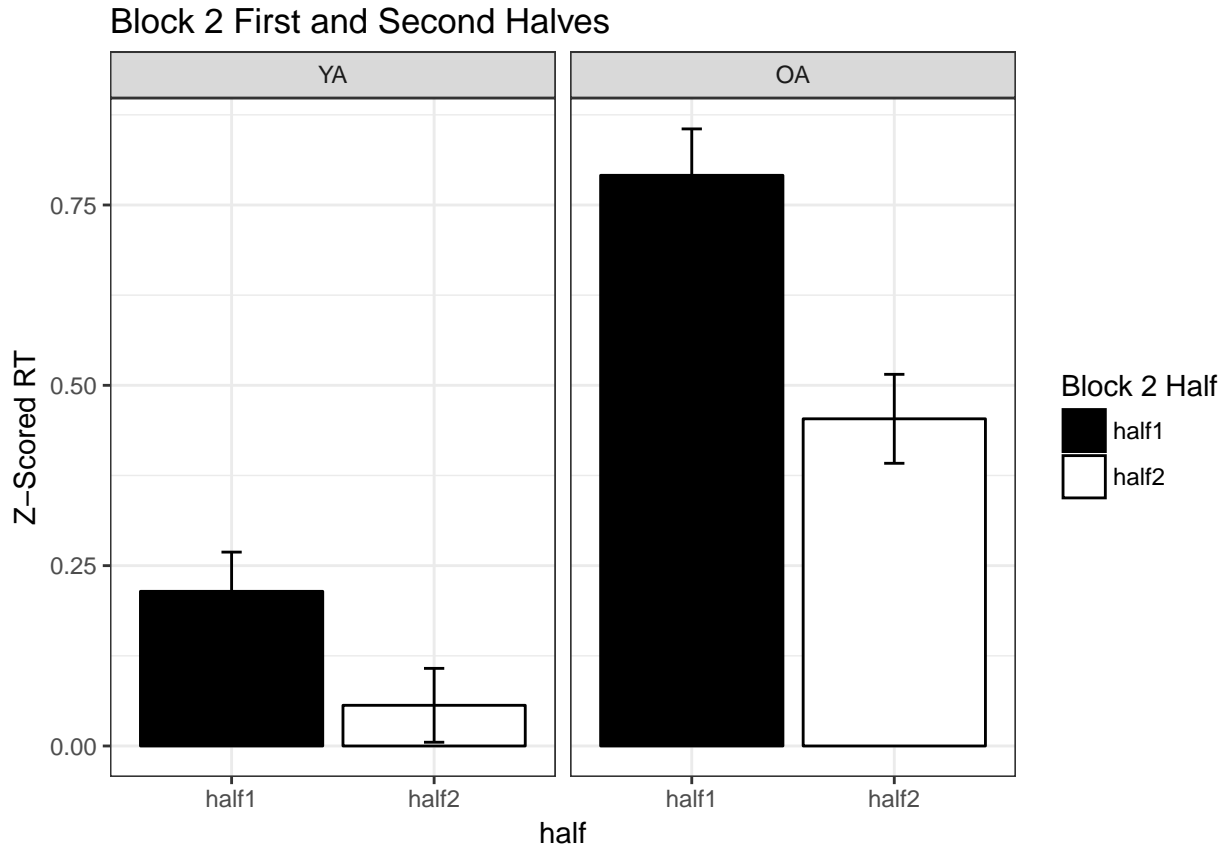
Block 3 Halves

Table 6: Analysis of Variance Table

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	0.4279	0.4279	8.004	0.00542
half	1	0.146	0.146	2.73	0.1009
age:half	1	0.04912	0.04912	0.9187	0.3396
Residuals	128	6.843	0.05346	NA	NA

Block 3 First and Second Halves
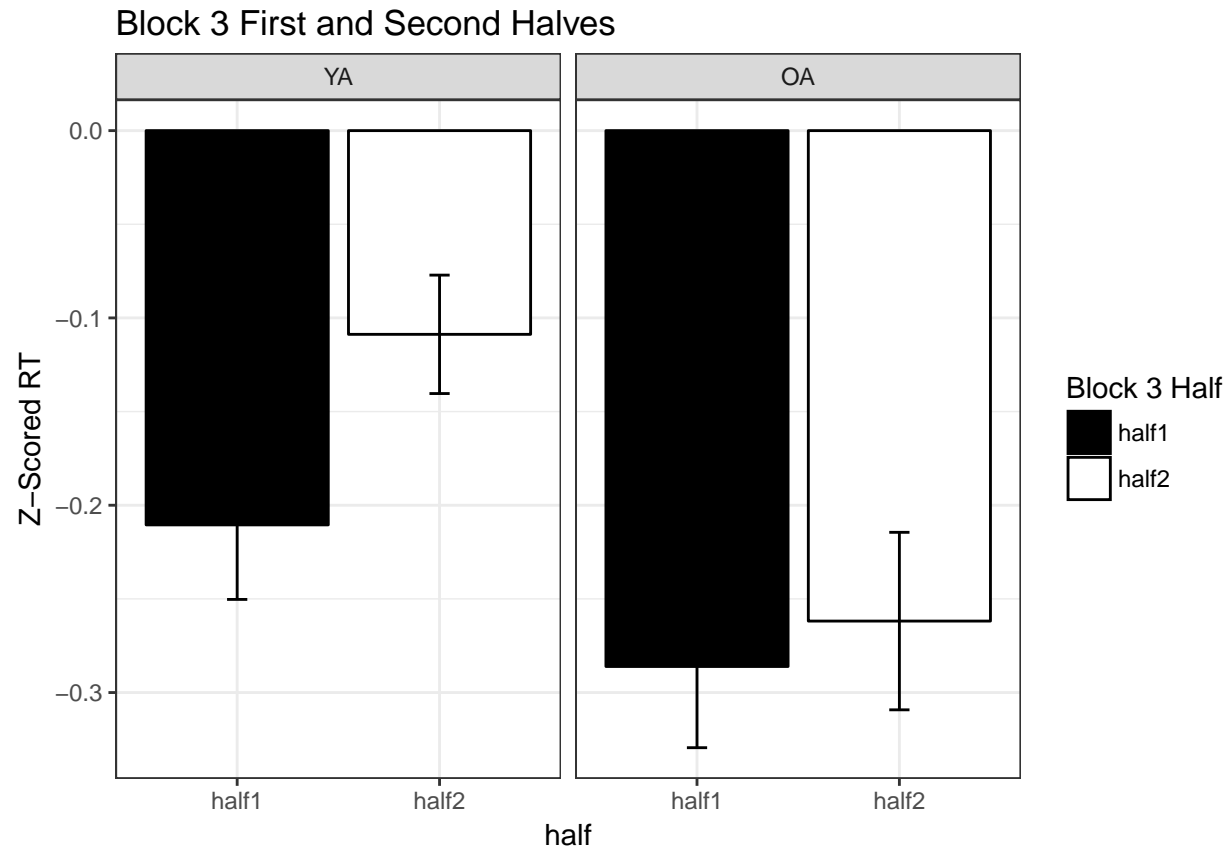
WFE by Block

Block 1

Table 7: Speeded Naming Mean zRTs - Block 1 Only

type	studied	freq	age	N	RT	sd	se	ci
notstudied_hf	notstudied	HF	OA	30	-0.41	0.20	0.04	0.07
notstudied_hf	notstudied	HF	YA	36	-0.22	0.30	0.05	0.10
notstudied_lf	notstudied	LF	OA	30	-0.26	0.22	0.04	0.08
notstudied_lf	notstudied	LF	YA	36	0.05	0.37	0.06	0.13
studied_hf	studied	HF	OA	30	-0.46	0.18	0.03	0.07
studied_hf	studied	HF	YA	36	-0.28	0.17	0.03	0.06
studied_lf	studied	LF	OA	30	-0.39	0.22	0.04	0.08
studied_lf	studied	LF	YA	36	-0.14	0.30	0.05	0.10
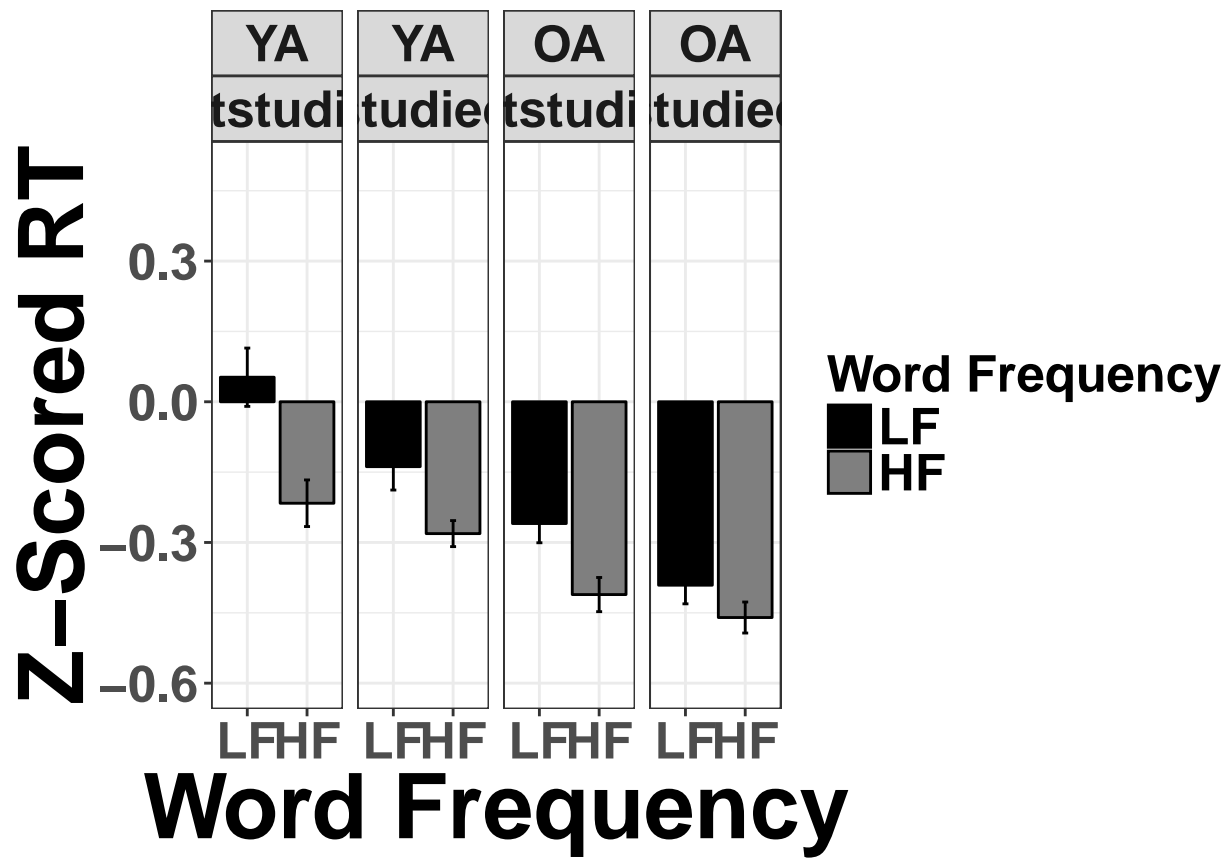
Block 2

Table 8: Speeded Naming Mean zRTs - Block 2 Only

type	studied	freq	age	N	RT	sd	se	ci
notstudied_hf	notstudied	HF	OA	30	0.57	0.37	0.07	0.14
notstudied_hf	notstudied	HF	YA	36	0.10	0.29	0.05	0.10
notstudied_lf	notstudied	LF	OA	30	0.69	0.36	0.07	0.13
notstudied_lf	notstudied	LF	YA	36	0.23	0.36	0.06	0.12
studied_hf	studied	HF	OA	30	0.64	0.26	0.05	0.10
studied_hf	studied	HF	YA	36	0.01	0.33	0.06	0.11
studied_lf	studied	LF	OA	30	0.57	0.37	0.07	0.14
studied_lf	studied	LF	YA	36	0.21	0.40	0.07	0.13

Z–Scored RT

YA	YA	OA	OA
notstudied	studied	notstudied	studied

0.8

0.4

0.0

−0.4

LF HF LF HF LF HF LF HF

Word Frequency

Word Frequency
- LF
- HF
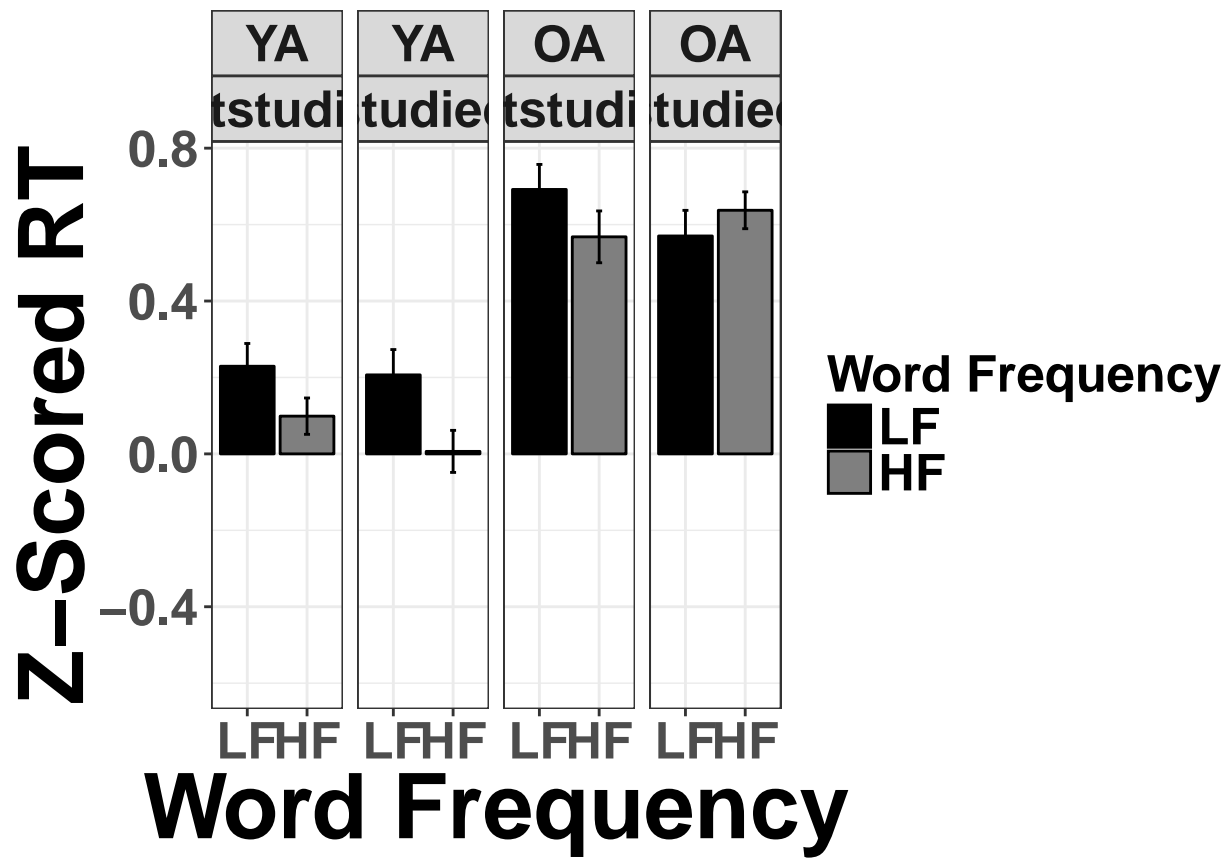
Block 3

Table 9: Speeded Naming Mean zRTs - Block 3 Only

type	studied	freq	age	N	RT	sd	se	ci
notstudied_hf	notstudied	HF	OA	30	-0.27	0.21	0.04	0.08
notstudied_hf	notstudied	HF	YA	36	-0.22	0.21	0.03	0.07
notstudied_lf	notstudied	LF	OA	30	-0.16	0.30	0.06	0.11
notstudied_lf	notstudied	LF	YA	36	0.00	0.32	0.05	0.11
studied_hf	studied	HF	OA	30	-0.41	0.20	0.04	0.08
studied_hf	studied	HF	YA	36	-0.29	0.31	0.05	0.10
studied_lf	studied	LF	OA	30	-0.26	0.29	0.05	0.11
studied_lf	studied	LF	YA	36	-0.13	0.25	0.04	0.08
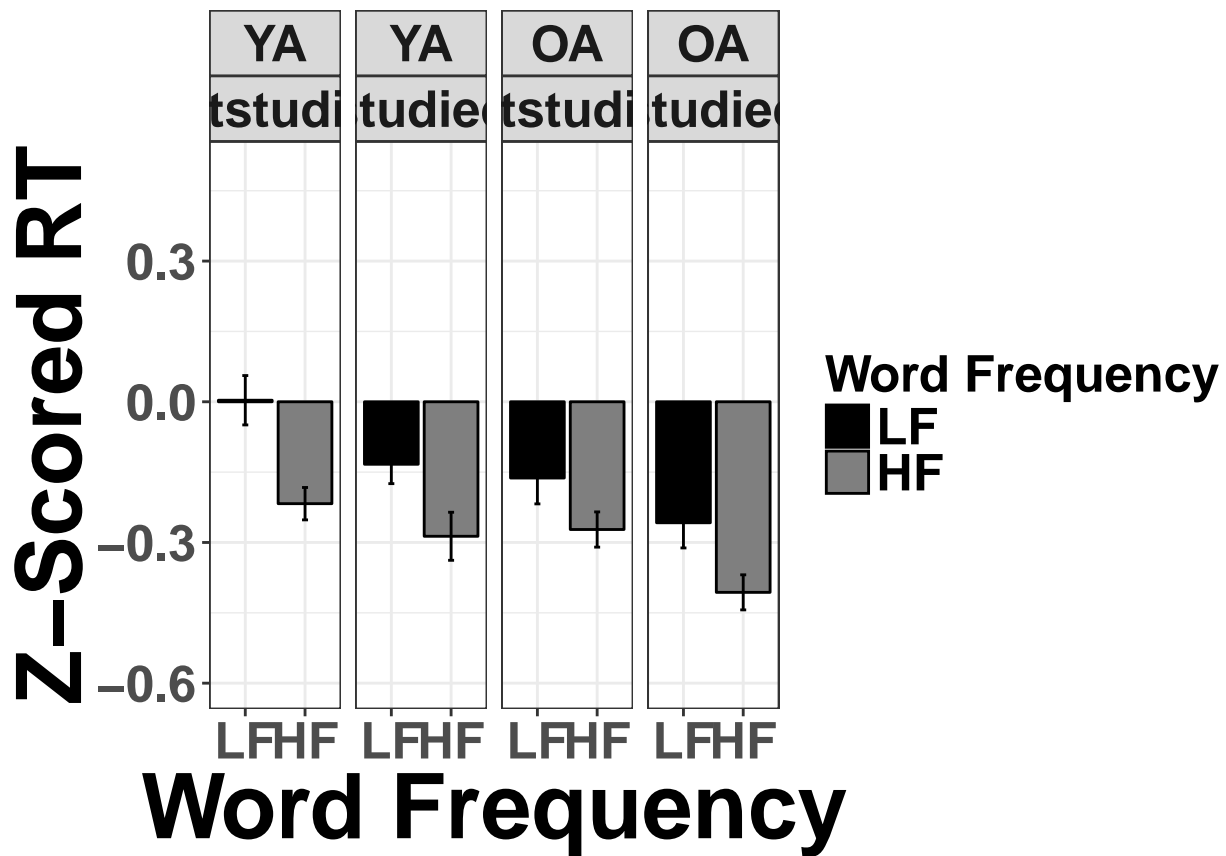
Priming Scores

```
## Joining, by = c("Subject", "age")
## Joining, by = c("Subject", "age")
```

Table 10: Speeded Naming Mean Priming zRTs

age	recog	N	primingScore	sd	se	ci
OA	priming_norecog	30	0.09	0.17	0.03	0.06
OA	priming_norecog2	30	0.11	0.16	0.03	0.06
OA	priming_recog	30	0.03	0.28	0.05	0.11
YA	priming_norecog	36	0.13	0.27	0.05	0.09
YA	priming_norecog2	36	0.10	0.29	0.05	0.10
YA	priming_recog	36	0.06	0.30	0.05	0.10

Table 11: Analysis of Variance Table

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	0.01639	0.01639	0.2497	0.6179
recog	2	0.1874	0.09368	1.427	0.2426
age:recog	2	0.02425	0.01212	0.1847	0.8315
Residuals	192	12.61	0.06566	NA	NA

Speeded Naming Priming Score (based on zRTs)
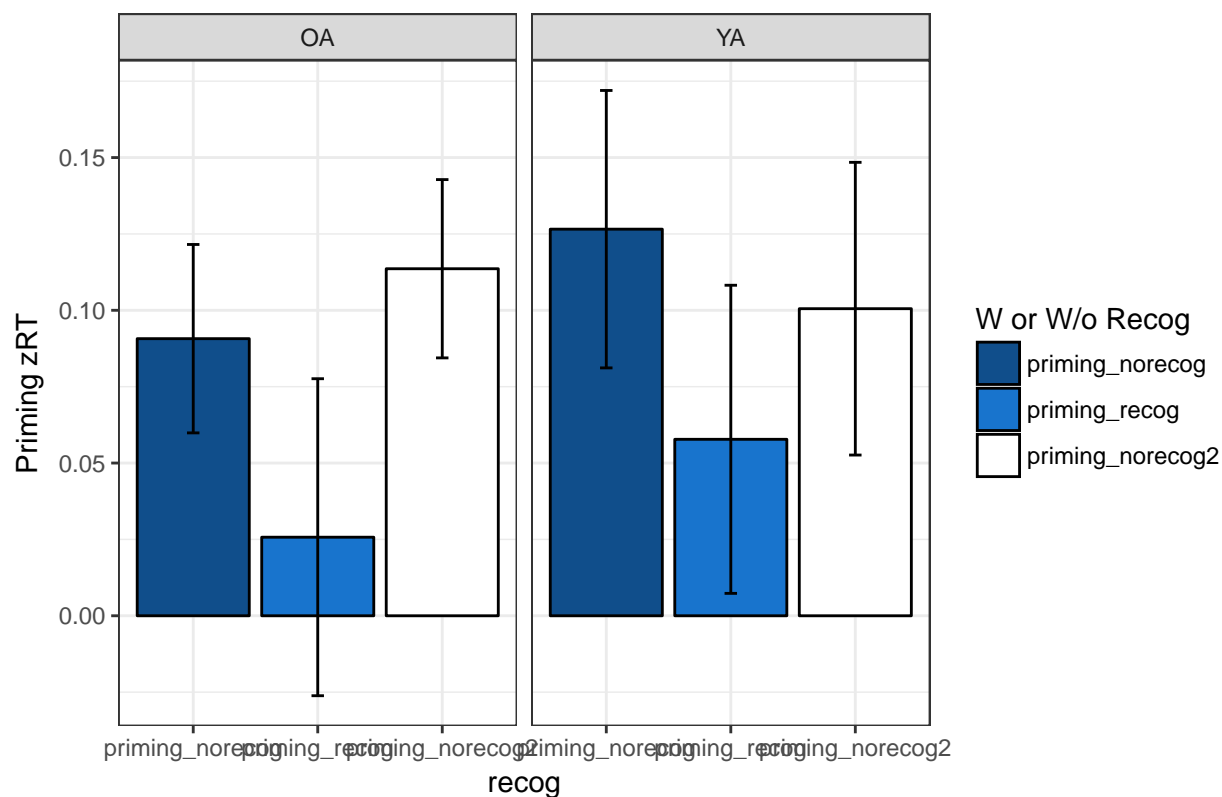
Word Frequency Effects

```
## Joining, by = c("Subject", "age")
## Joining, by = c("Subject", "age")
```

Table 12: Speeded Naming Mean WFE zRTs

age	recog	N	wfe	sd	se	ci
OA	Block1	30	0.11	0.16	0.03	0.06
OA	Block2	30	0.03	0.25	0.04	0.09
OA	Block3	30	0.13	0.16	0.03	0.06
YA	Block1	36	0.21	0.19	0.03	0.07
YA	Block2	36	0.17	0.30	0.05	0.10
YA	Block3	36	0.19	0.25	0.04	0.08

Table 13: Analysis of Variance Table

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	0.458	0.458	9.003	0.003053
recog	2	0.1469	0.07343	1.444	0.2386
age:recog	2	0.05442	0.02721	0.5349	0.5866
Residuals	192	9.767	0.05087	NA	NA

Word Frequency Effect from zRTs b
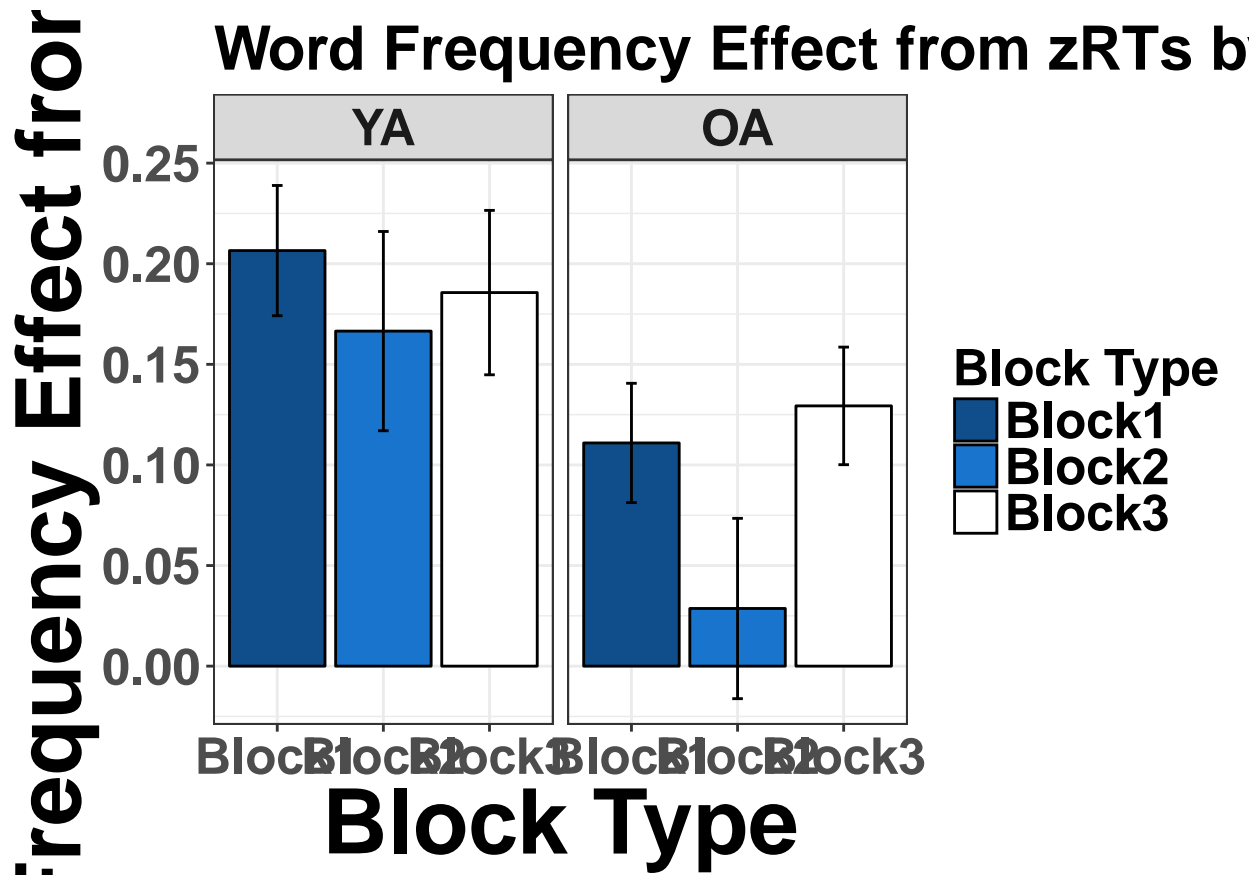
No Block 3

```
## Joining, by = c("Subject", "age")
```

Table 14: Speeded Naming Mean WFE zRTs

age	recog	N	wfe	sd	se	ci
OA	Block1	30	0.11	0.16	0.03	0.06
OA	Block2	30	0.03	0.25	0.04	0.09
YA	Block1	36	0.21	0.19	0.03	0.07
YA	Block2	36	0.17	0.30	0.05	0.10

Table 15: Analysis of Variance Table

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	0.4459	0.4459	8.246	0.004782
recog	1	0.1157	0.1157	2.14	0.1459
age:recog	1	0.01462	0.01462	0.2703	0.604
Residuals	128	6.921	0.05407	NA	NA

Table 16: Welch Two Sample t-test: `freq.wide.ya$Block1` and `freq.wide.ya$Block2`

Test statistic	df	P value	Alternative hypothesis	mean of x	mean of y
0.6763	60.3	0.5015	two.sided	0.2065	0.1665

Table 17: Welch Two Sample t-test: `freq.wide.oa$Block1` and `freq.wide.oa$Block2`

Test statistic	df	P value	Alternative hypothesis	mean of x	mean of y
1.531	50.3	0.132	two.sided	0.1109	0.02865
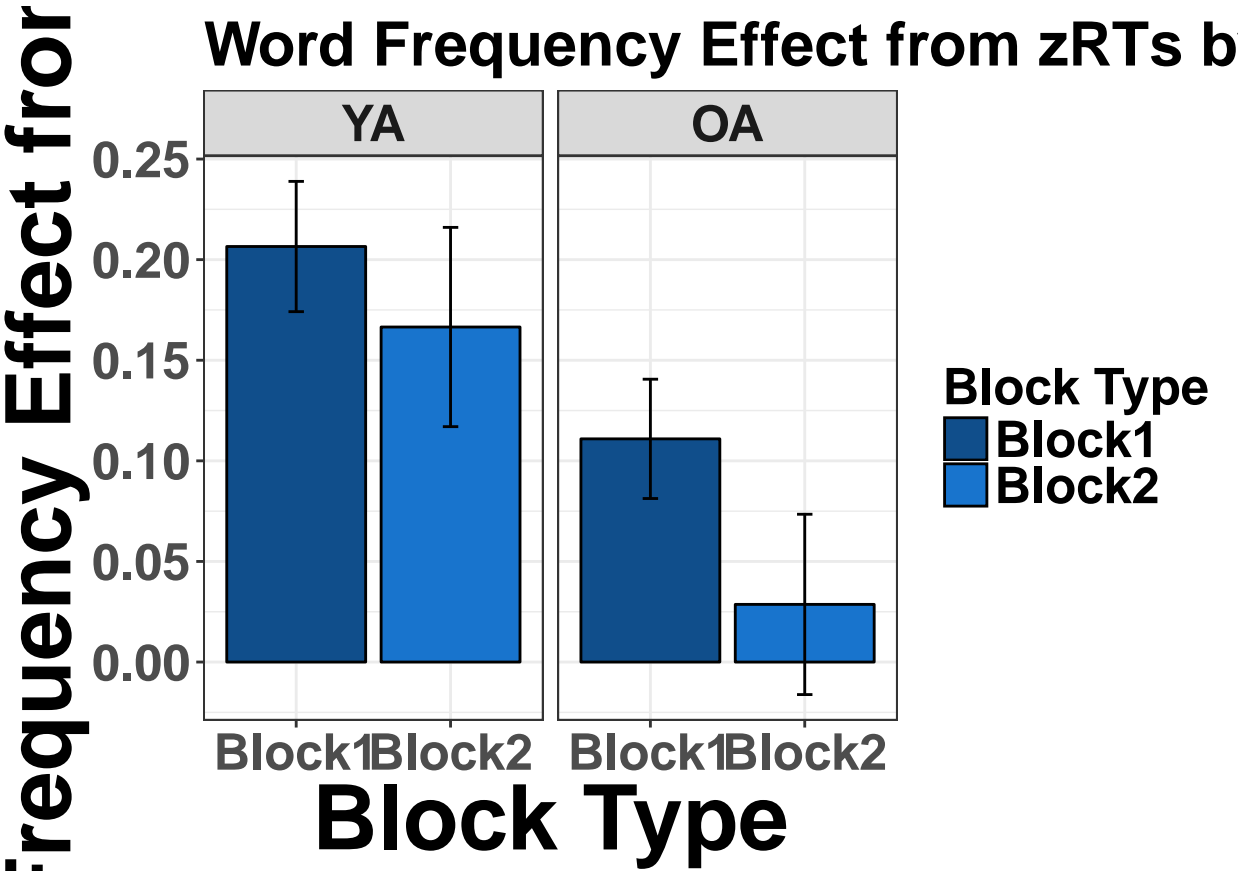
Recognition

Study X Frequency

Table 18: Recognition Mean zRTs

type	age	N	RT	sd	se	ci
notstudied_hf	OA	30	-0.07	0.27	0.05	0.10
notstudied_hf	YA	36	-0.05	0.24	0.04	0.08
notstudied_lf	OA	30	-0.07	0.37	0.07	0.14

type	age	N	RT	sd	se	ci
notstudied_lf	YA	36	-0.09	0.33	0.06	0.11
studied_hf	OA	30	-0.05	0.31	0.06	0.12
studied_hf	YA	36	-0.05	0.29	0.05	0.10
studied_lf	OA	30	0.02	0.45	0.08	0.17
studied_lf	YA	36	-0.09	0.34	0.06	0.12

```
## Warning: Converting "Subject" to factor for ANOVA.
## Warning: Converting "study" to factor for ANOVA.
## Warning: Converting "freq" to factor for ANOVA.
## Warning: Converting "age" to factor for ANOVA.
## Warning: Data is unbalanced (unequal N per group). Make sure you specified
## a well-considered value for the type argument to ezANOVA().
```

Table 19: Implict Encoding zRTs

	Effect	DFn	DFd	F	p	p<.05	ges
2	age	1	64	1.4	0.25		0.0015
3	study	1	64	0.22	0.64		0.0014
5	freq	1	64	0.024	0.88		9.2e-05
4	age:study	1	64	0.24	0.63		0.0015
6	age:freq	1	64	0.93	0.34		0.0036
7	study:freq	1	64	0.16	0.69		7e-04
8	age:study:freq	1	64	0.2	0.66		0.00084

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Recognition RT
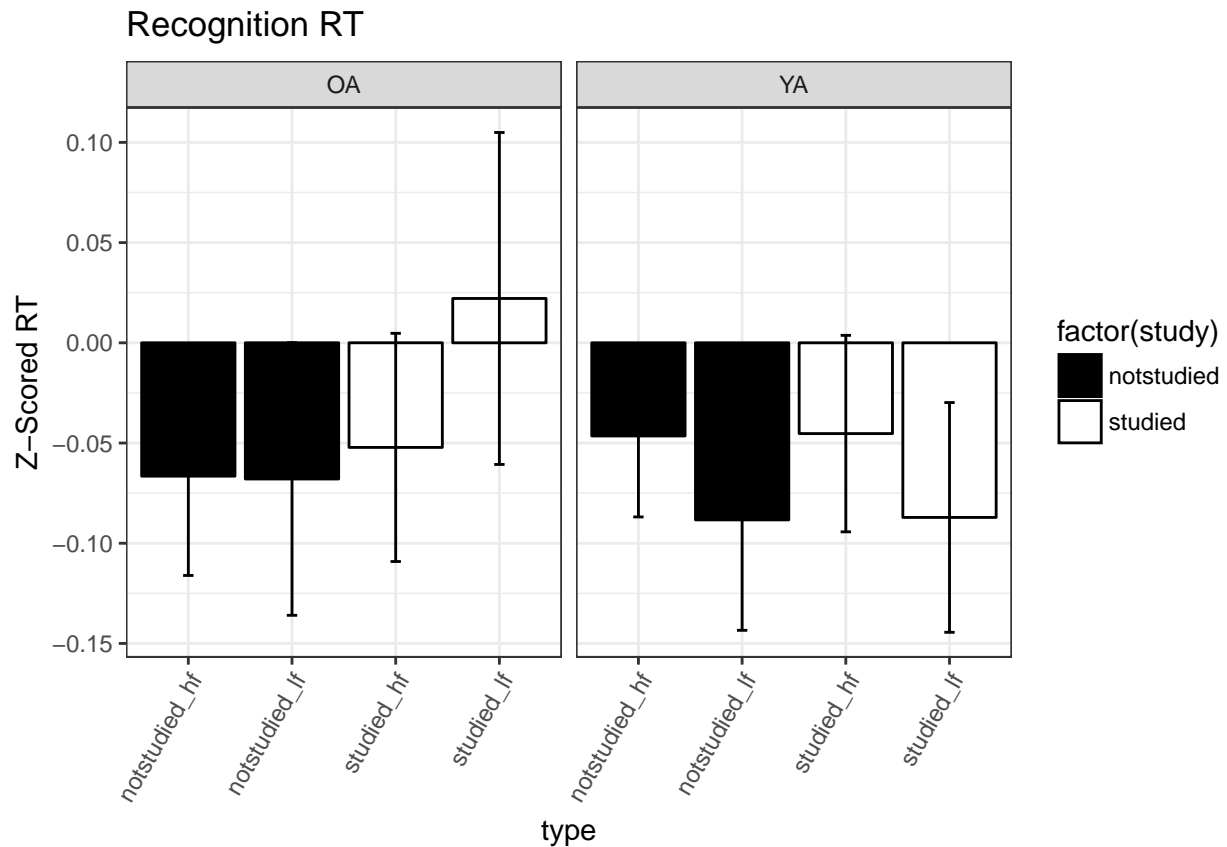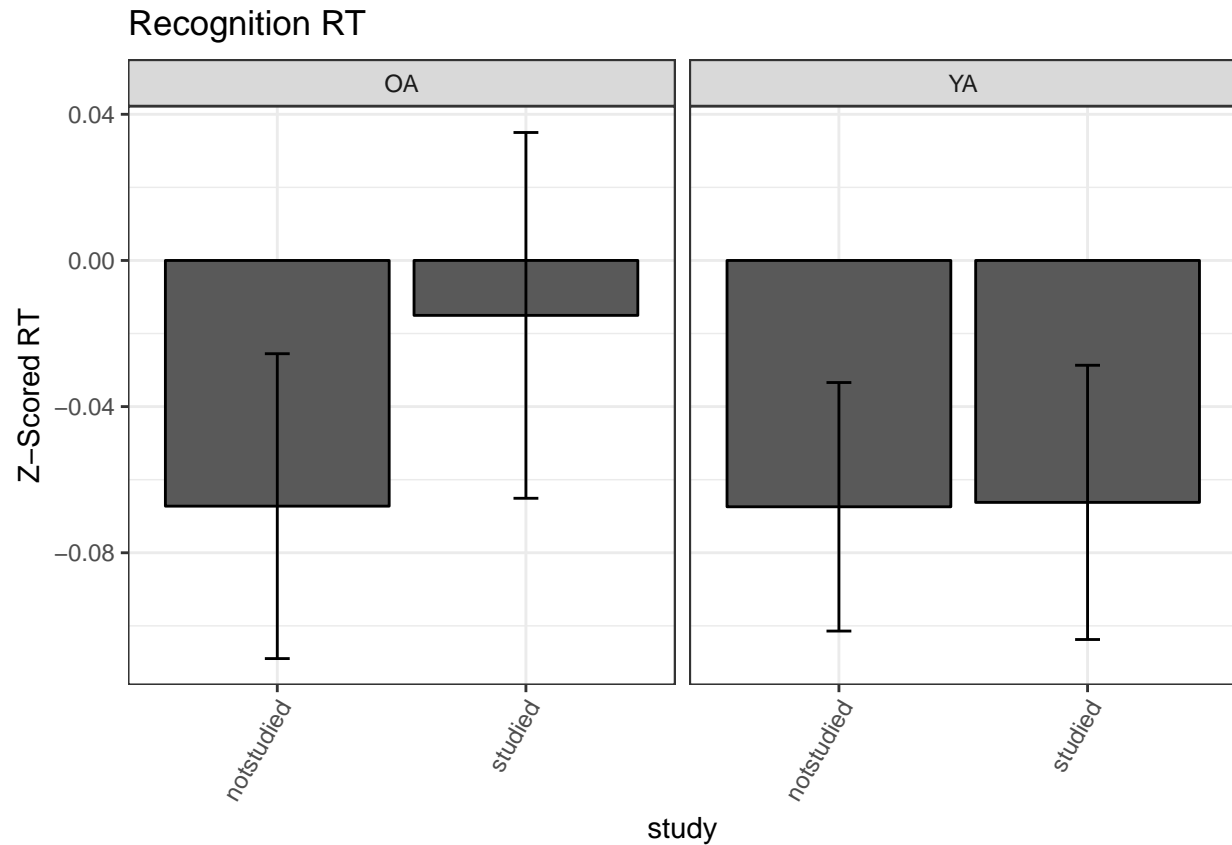
Recog Cost and Recog Acc

```
## Joining, by = c("Subject", "age")
```

Table 20: Analysis of Variance Model

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	8.393	8.393	64.2	3.766e-11
recogAcc	1	0.007246	0.007246	0.05542	0.8147
age:recogAcc	1	0.1577	0.1577	1.206	0.2763
Residuals	62	8.105	0.1307	NA	NA

Table 21: Pearson's product-moment correlation: `switchCostwRecogAcc$recogCost` and `switchCostwRecogAcc$recogAcc`

Test statistic	df	P value	Alternative hypothesis	cor
-2.974	64	0.004146 * *	two.sided	-0.3484

Recognition Accuracy by Block Cos...

Block 2 zRT – Block 1

= −0.39, p < 0.001

on of Correctly Recognized
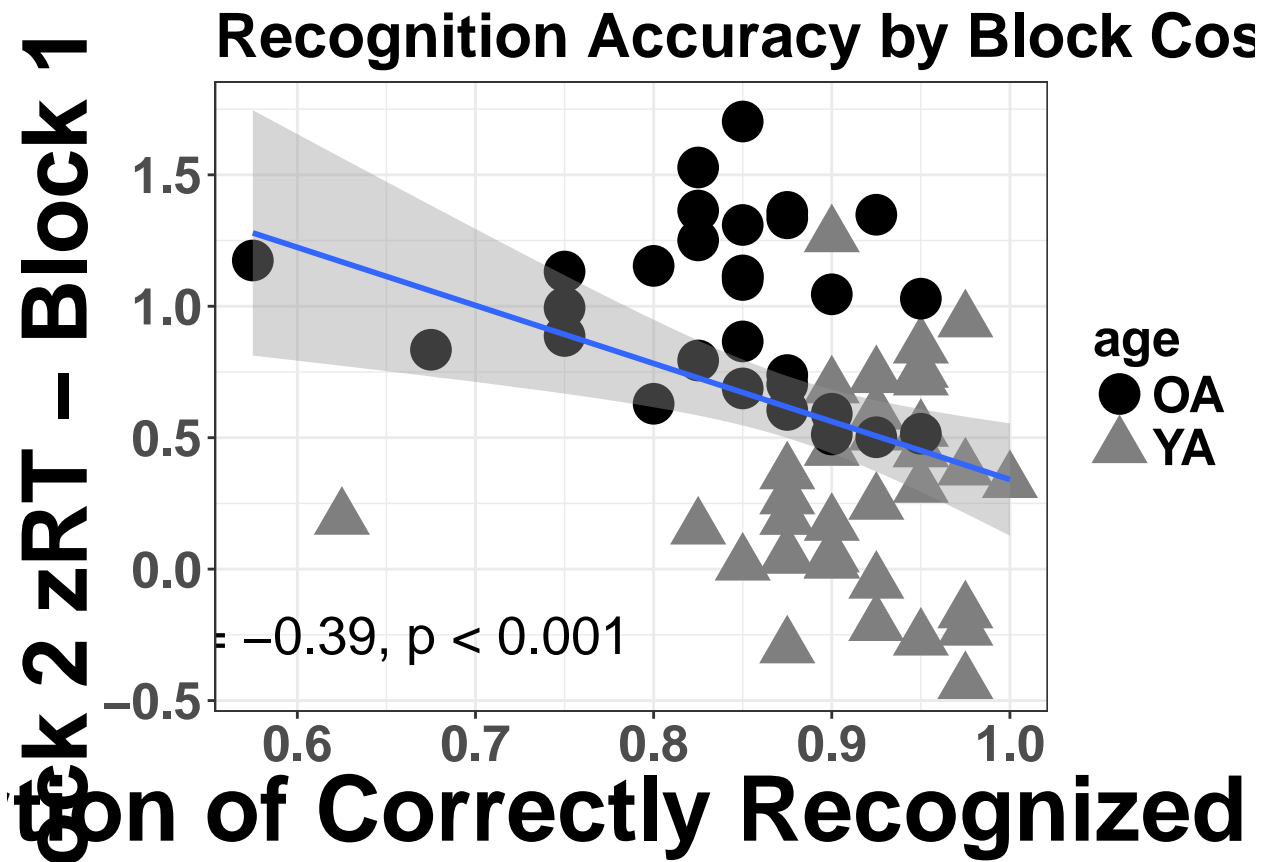
Raw, Trimmed Response Times

Speeded Naming

```
## Joining, by = c("Subject", "block", "type", "RT", "freq", "studied")
## Joining, by = c("Subject", "block", "type", "RT", "freq", "studied")
```

Study X Frequency

Table 22: Speeded Naming Mean Raw, Trimmed RTs

block	type	age	N	RT	sd	se	ci
Block1	notstudied_hf	OA	30	590.99	89.78	16.39	33.52
Block1	notstudied_hf	YA	36	482.13	63.16	10.53	21.37
Block1	notstudied_lf	OA	30	620.96	105.55	19.27	39.41
Block1	notstudied_lf	YA	36	507.99	66.52	11.09	22.51
Block1	studied_hf	OA	30	577.31	91.08	16.63	34.01
Block1	studied_hf	YA	36	476.26	52.21	8.70	17.67
Block1	studied_lf	OA	30	592.85	101.26	18.49	37.81
Block1	studied_lf	YA	36	488.30	48.05	8.01	16.26
Block2	notstudied_hf	OA	30	829.40	181.89	33.21	67.92
Block2	notstudied_hf	YA	36	518.00	65.12	10.85	22.03
Block2	notstudied_lf	OA	30	847.71	148.56	27.12	55.47
Block2	notstudied_lf	YA	36	530.35	68.36	11.39	23.13

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block	type	age	N	RT	sd	se	ci
Block2	studied_hf	OA	30	851.22	172.13	31.43	64.27
Block2	studied_hf	YA	36	505.53	64.05	10.67	21.67
Block2	studied_lf	OA	30	826.60	169.46	30.94	63.28
Block2	studied_lf	YA	36	527.20	76.30	12.72	25.82
Block3	notstudied_hf	OA	30	617.42	110.88	20.24	41.40
Block3	notstudied_hf	YA	36	481.64	57.24	9.54	19.37
Block3	notstudied_lf	OA	30	641.99	124.32	22.70	46.42
Block3	notstudied_lf	YA	36	504.45	70.41	11.74	23.82
Block3	studied_hf	OA	30	590.69	112.01	20.45	41.82
Block3	studied_hf	YA	36	473.14	62.00	10.33	20.98
Block3	studied_lf	OA	30	621.42	135.44	24.73	50.57
Block3	studied_lf	YA	36	489.02	54.92	9.15	18.58

Table 23: Analysis of Variance Table

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	6748039	6748039	669.1	1.328e-106
studied	1	31507	31507	3.124	0.07753
freq	1	58674	58674	5.818	0.01609
block	2	2680295	1340147	132.9	2.742e-50
age:studied	1	738.1	738.1	0.07319	0.7868
age:freq	1	354.1	354.1	0.03512	0.8514
studied:freq	1	4793	4793	0.4753	0.4908
age:block	2	1757724	878862	87.15	7.77e-35
studied:block	2	7205	3602	0.3572	0.6997
freq:block	2	8889	4444	0.4407	0.6437
age:studied:freq	1	2156	2156	0.2138	0.6439
age:studied:block	2	3668	1834	0.1819	0.8337
age:freq:block	2	7664	3832	0.38	0.684
studied:freq:block	2	1942	970.9	0.09628	0.9082
age:studied:freq:block	2	9714	4857	0.4816	0.618
Residuals	768	7744965	10085	NA	NA

Speeded Naming w/ and w/o Recog Raw, Trimmed RTs

Speeded Naming Raw RTs by Block
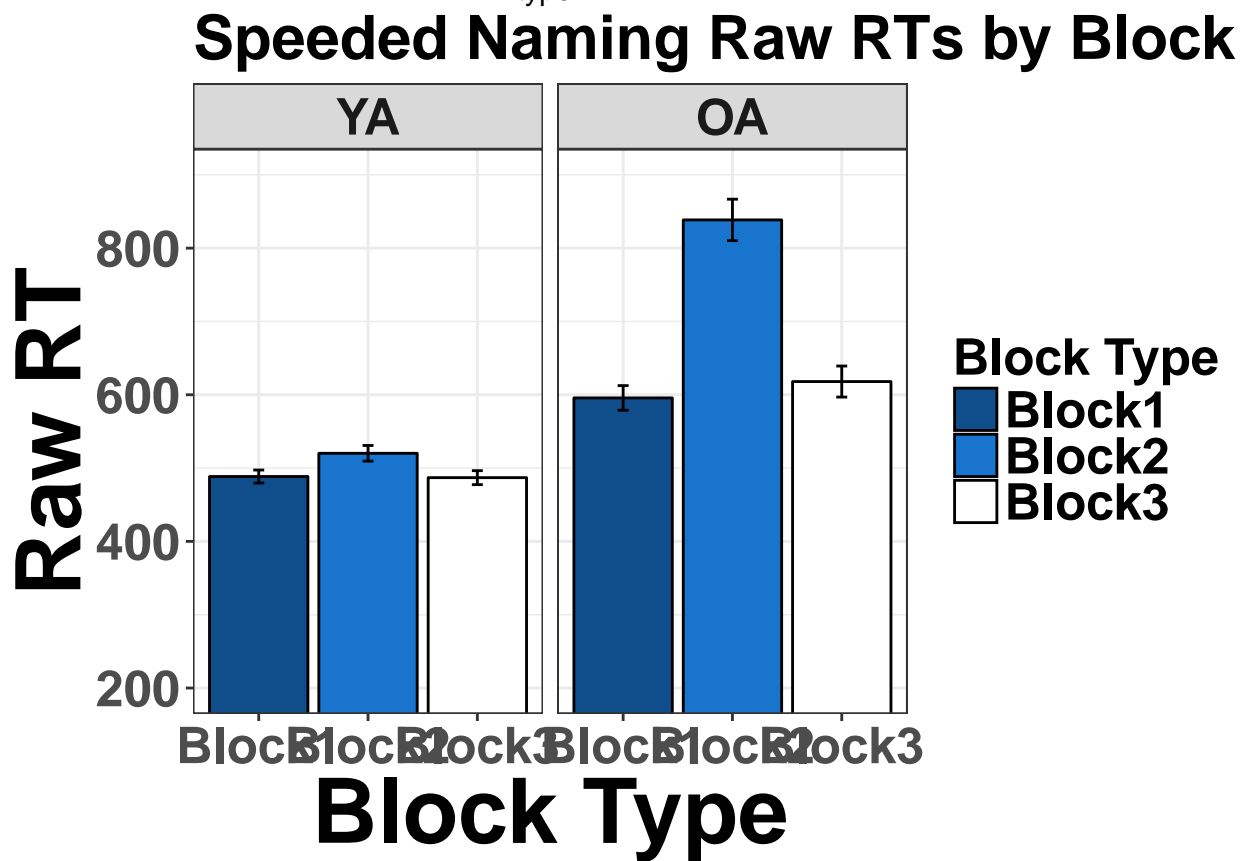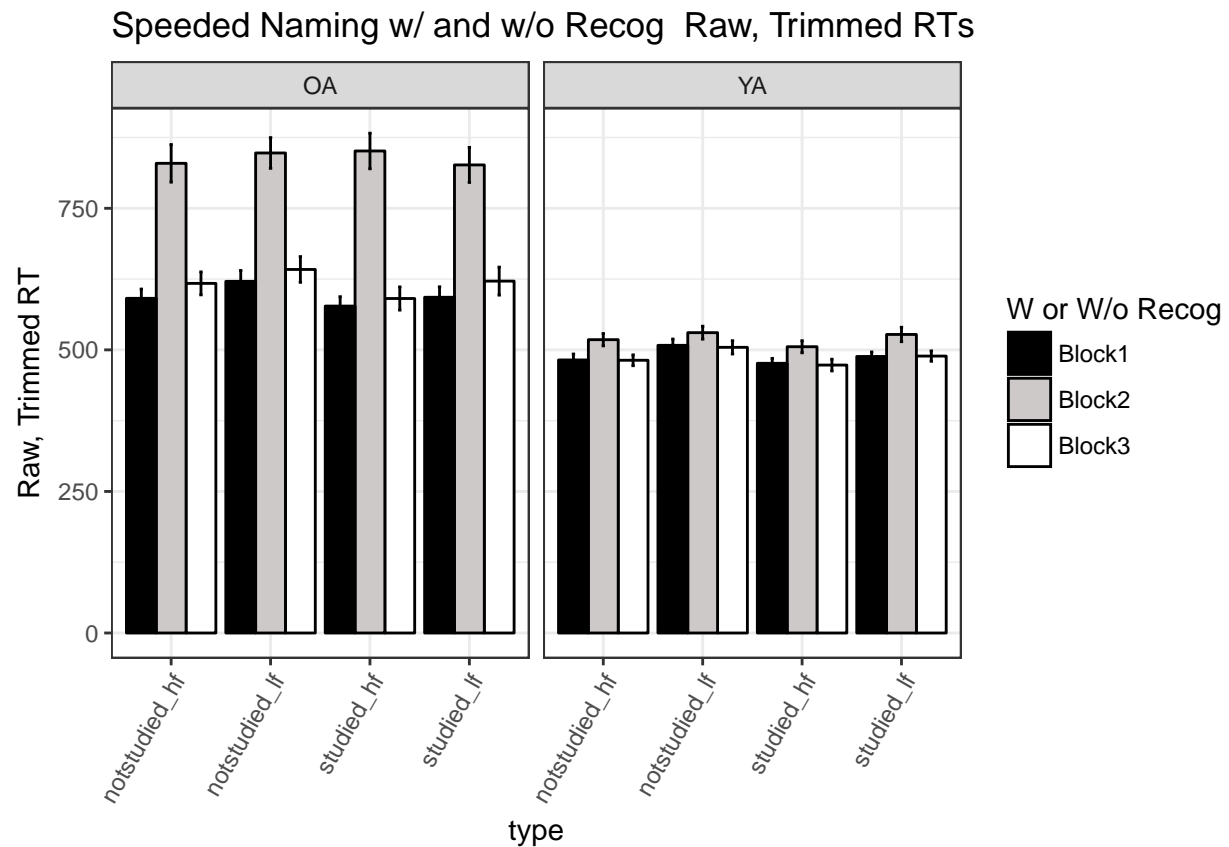
Age X Recog (only SN1 & SN3)

Table 24: Speeded Naming Mean zRTs

block	type	age	N	RT	sd	se	ci
Block1	notstudied_hf	OA	30	590.99	89.78	16.39	33.52
Block1	notstudied_hf	YA	36	482.13	63.16	10.53	21.37
Block1	notstudied_lf	OA	30	620.96	105.55	19.27	39.41
Block1	notstudied_lf	YA	36	507.99	66.52	11.09	22.51
Block1	studied_hf	OA	30	577.31	91.08	16.63	34.01
Block1	studied_hf	YA	36	476.26	52.21	8.70	17.67
Block1	studied_lf	OA	30	592.85	101.26	18.49	37.81
Block1	studied_lf	YA	36	488.30	48.05	8.01	16.26
Block3	notstudied_hf	OA	30	617.42	110.88	20.24	41.40
Block3	notstudied_hf	YA	36	481.64	57.24	9.54	19.37
Block3	notstudied_lf	OA	30	641.99	124.32	22.70	46.42
Block3	notstudied_lf	YA	36	504.45	70.41	11.74	23.82
Block3	studied_hf	OA	30	590.69	112.01	20.45	41.82
Block3	studied_hf	YA	36	473.14	62.00	10.33	20.98
Block3	studied_lf	OA	30	621.42	135.44	24.73	50.57
Block3	studied_lf	YA	36	489.02	54.92	9.15	18.58

Table 25: Analysis of Variance Table

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	1848694	1848694	249.5	4.55e-46
studied	1	37582	37582	5.071	0.02475
freq	1	63307	63307	8.543	0.003622
block	1	11381	11381	1.536	0.2158
age:studied	1	3209	3209	0.4331	0.5108
age:freq	1	1199	1199	0.1618	0.6877
studied:freq	1	1877	1877	0.2533	0.615
age:block	1	18784	18784	2.535	0.112
studied:block	1	21.64	21.64	0.00292	0.9569
freq:block	1	195.7	195.7	0.02641	0.871
age:studied:freq	1	318.5	318.5	0.04298	0.8358
age:studied:block	1	104.1	104.1	0.01404	0.9057
age:freq:block	1	165.7	165.7	0.02236	0.8812
studied:freq:block	1	1419	1419	0.1915	0.6619
age:studied:freq:block	1	385.3	385.3	0.052	0.8197
Residuals	512	3794199	7411	NA	NA

Speeded Naming w/ and w/o Recog zRTs

Speeded Naming Raw RTs by Block
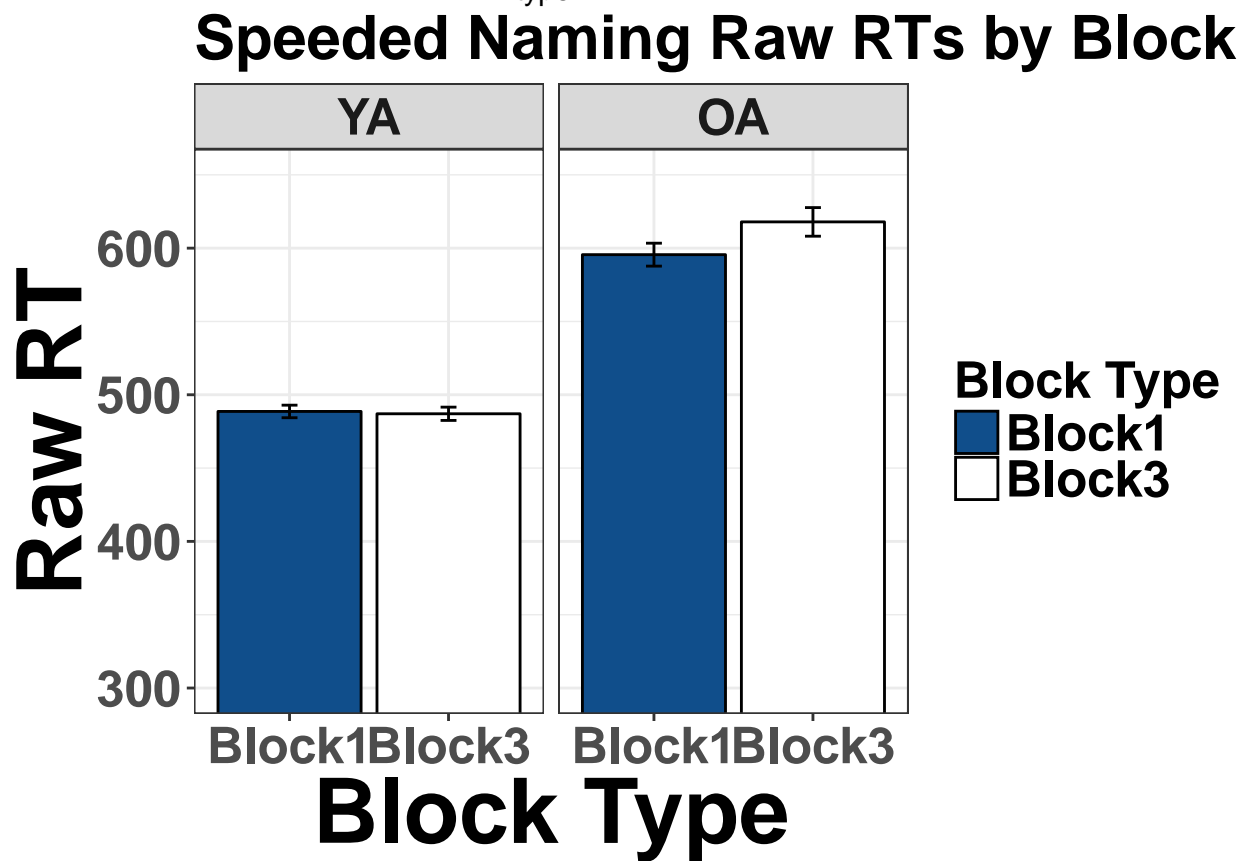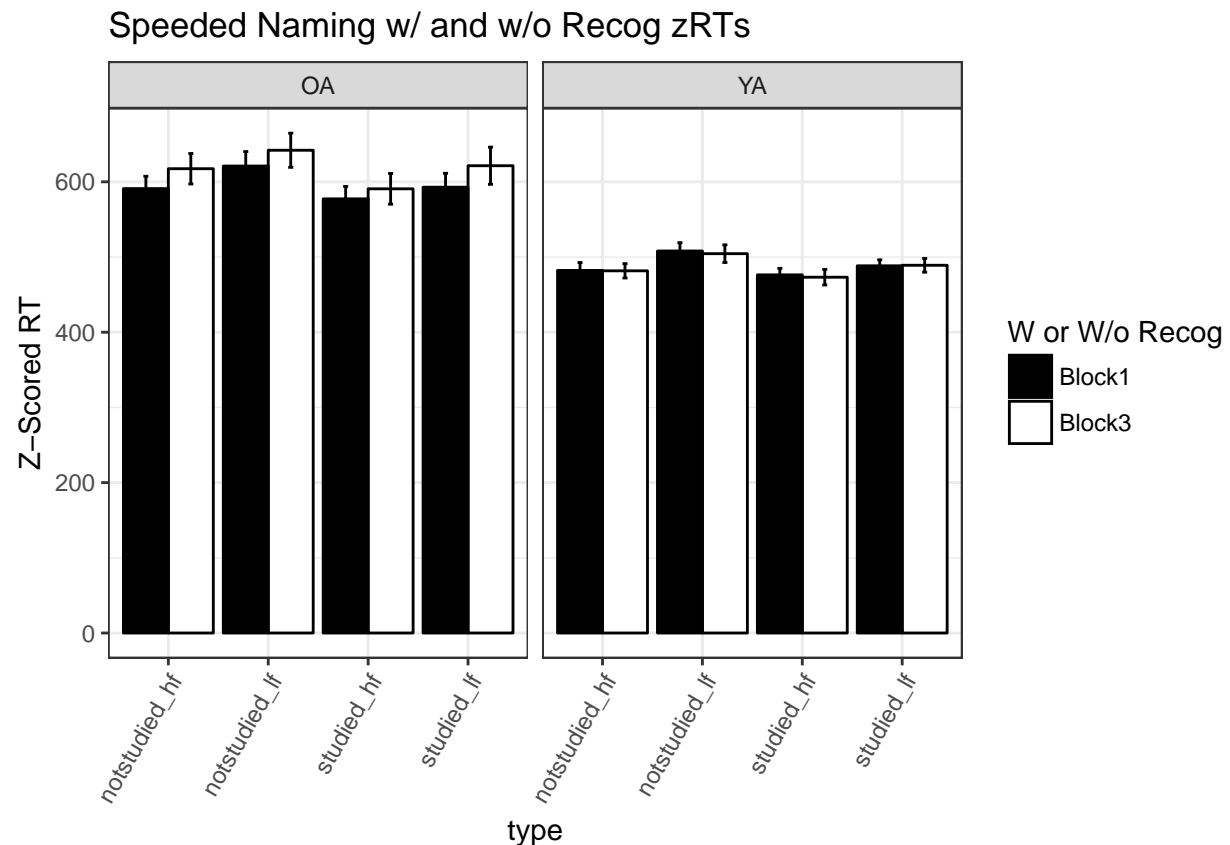
WFE by Block

Block 1

Table 26: Speeded Naming Mean Raw RTs - Block 1 Only

type	studied	freq	age	N	RT	sd	se	ci
notstudied_hf	notstudied	HF	OA	30	590.99	89.78	16.39	33.52
notstudied_hf	notstudied	HF	YA	36	482.13	63.16	10.53	21.37
notstudied_lf	notstudied	LF	OA	30	620.96	105.55	19.27	39.41
notstudied_lf	notstudied	LF	YA	36	507.99	66.52	11.09	22.51
studied_hf	studied	HF	OA	30	577.31	91.08	16.63	34.01
studied_hf	studied	HF	YA	36	476.26	52.21	8.70	17.67
studied_lf	studied	LF	OA	30	592.85	101.26	18.49	37.81
studied_lf	studied	LF	YA	36	488.30	48.05	8.01	16.26

Table 27: Analysis of Variance Table

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	747391	747391	122.2	1.747e-23
studied	1	17900	17900	2.927	0.08831
freq	1	28232	28232	4.617	0.0326
age:studied	1	1079	1079	0.1764	0.6748
age:freq	1	236.7	236.7	0.0387	0.8442
studied:freq	1	3280	3280	0.5365	0.4646
age:studied:freq	1	1.589	1.589	0.0002598	0.9872
Residuals	256	1565442	6115	NA	NA

Speeded Naming Raw RTs by Word I

	YA	YA	OA	OA
	tstudi	tudie	tstudi	tudie

Raw RT

800

600

400

LFHF LFHF LFHF LFHF

Word Frequency

Word Frequency
■ LF
■ HF
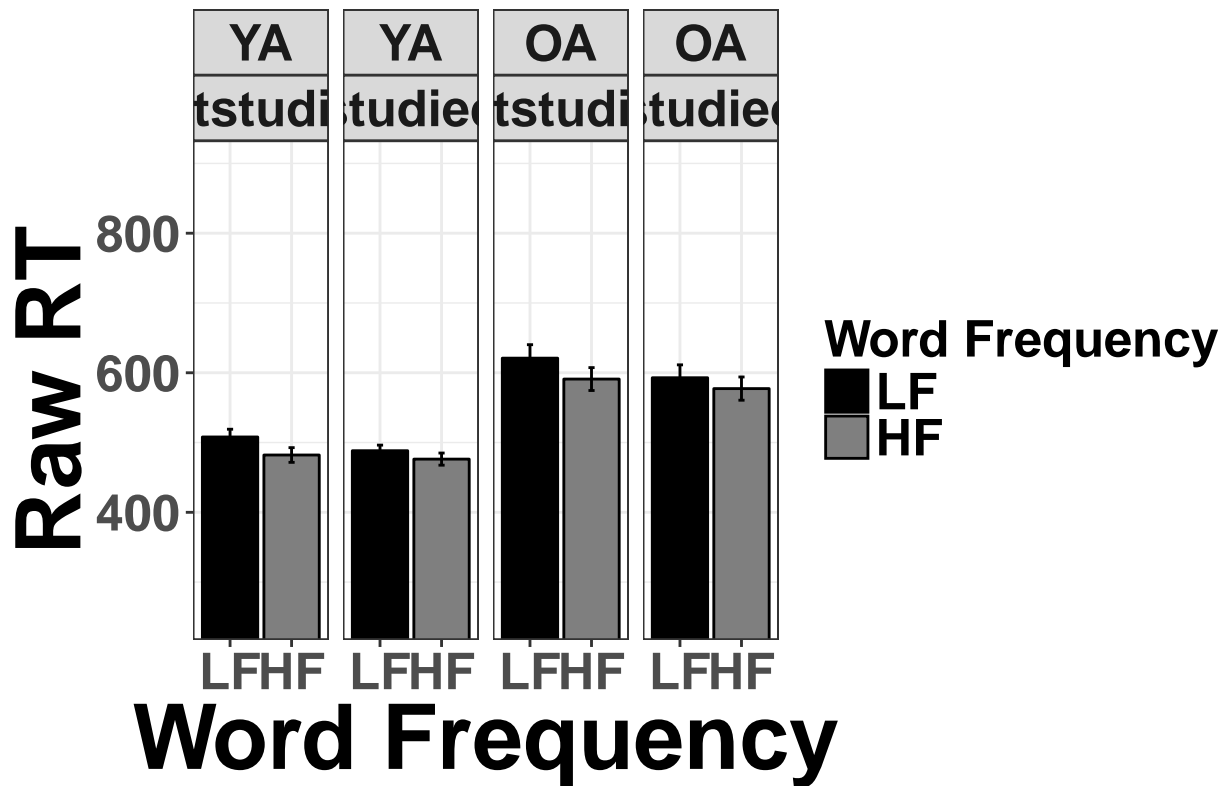
Block 2

Table 28: Speeded Naming Mean Raw RTs - Block 2 Only

type	studied	freq	age	N	RT	sd	se	ci
notstudied_hf	notstudied	HF	OA	30	829.40	181.89	33.21	67.92
notstudied_hf	notstudied	HF	YA	36	518.00	65.12	10.85	22.03
notstudied_lf	notstudied	LF	OA	30	847.71	148.56	27.12	55.47
notstudied_lf	notstudied	LF	YA	36	530.35	68.36	11.39	23.13
studied_hf	studied	HF	OA	30	851.22	172.13	31.43	64.27
studied_hf	studied	HF	YA	36	505.53	64.05	10.67	21.67
studied_lf	studied	LF	OA	30	826.60	169.46	30.94	63.28
studied_lf	studied	LF	YA	36	527.20	76.30	12.72	25.82

Table 29: Analysis of Variance Table

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	6638286	6638286	430.1	9.802e-57
studied	1	1107	1107	0.07176	0.789
freq	1	4061	4061	0.2631	0.6084
age:studied	1	1093	1093	0.07082	0.7904
age:freq	1	6653	6653	0.4311	0.512
studied:freq	1	3438	3438	0.2228	0.6373
age:studied:freq	1	11166	11166	0.7235	0.3958

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Residuals	256	3950766	15433	NA	NA

Speeded Naming Raw RTs by Word l
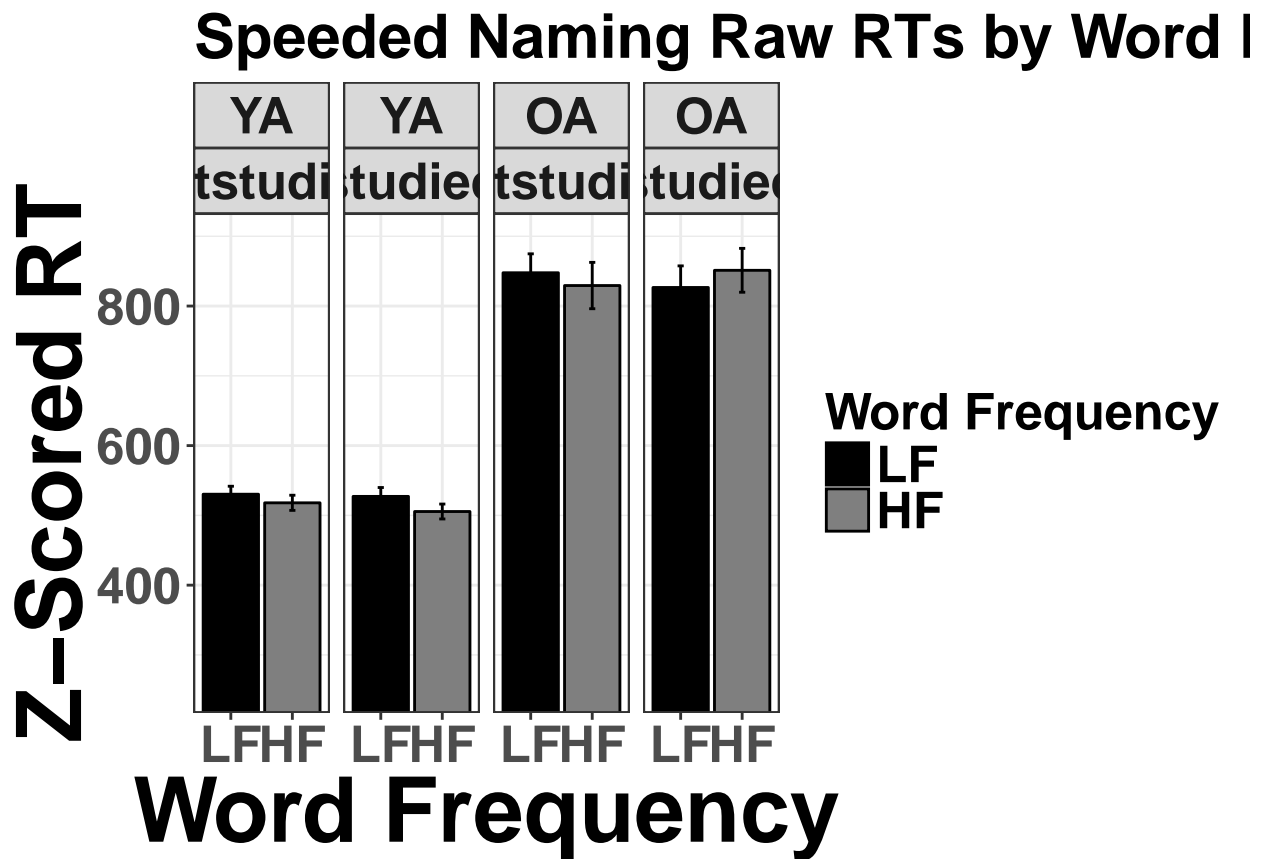
Block 3

Table 30: Speeded Naming Mean Raw RTs - Block 3 Only

type	studied	freq	age	N	RT	sd	se	ci
notstudied_hf	notstudied	HF	OA	30	617.42	110.88	20.24	41.40
notstudied_hf	notstudied	HF	YA	36	481.64	57.24	9.54	19.37
notstudied_lf	notstudied	LF	OA	30	641.99	124.32	22.70	46.42
notstudied_lf	notstudied	LF	YA	36	504.45	70.41	11.74	23.82
studied_hf	studied	HF	OA	30	590.69	112.01	20.45	41.82
studied_hf	studied	HF	YA	36	473.14	62.00	10.33	20.98
studied_lf	studied	LF	OA	30	621.42	135.44	24.73	50.57
studied_lf	studied	LF	YA	36	489.02	54.92	9.15	18.58

Table 31: Analysis of Variance Table

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	1120087	1120087	128.7	1.983e-24
studied	1	19704	19704	2.263	0.1337
freq	1	35271	35271	4.051	0.04518
age:studied	1	2235	2235	0.2567	0.6129

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
age:freq	1	1128	1128	0.1296	0.7192
studied:freq	1	16	16	0.001838	0.9658
age:studied:freq	1	702.3	702.3	0.08066	0.7766
Residuals	256	2228757	8706	NA	NA
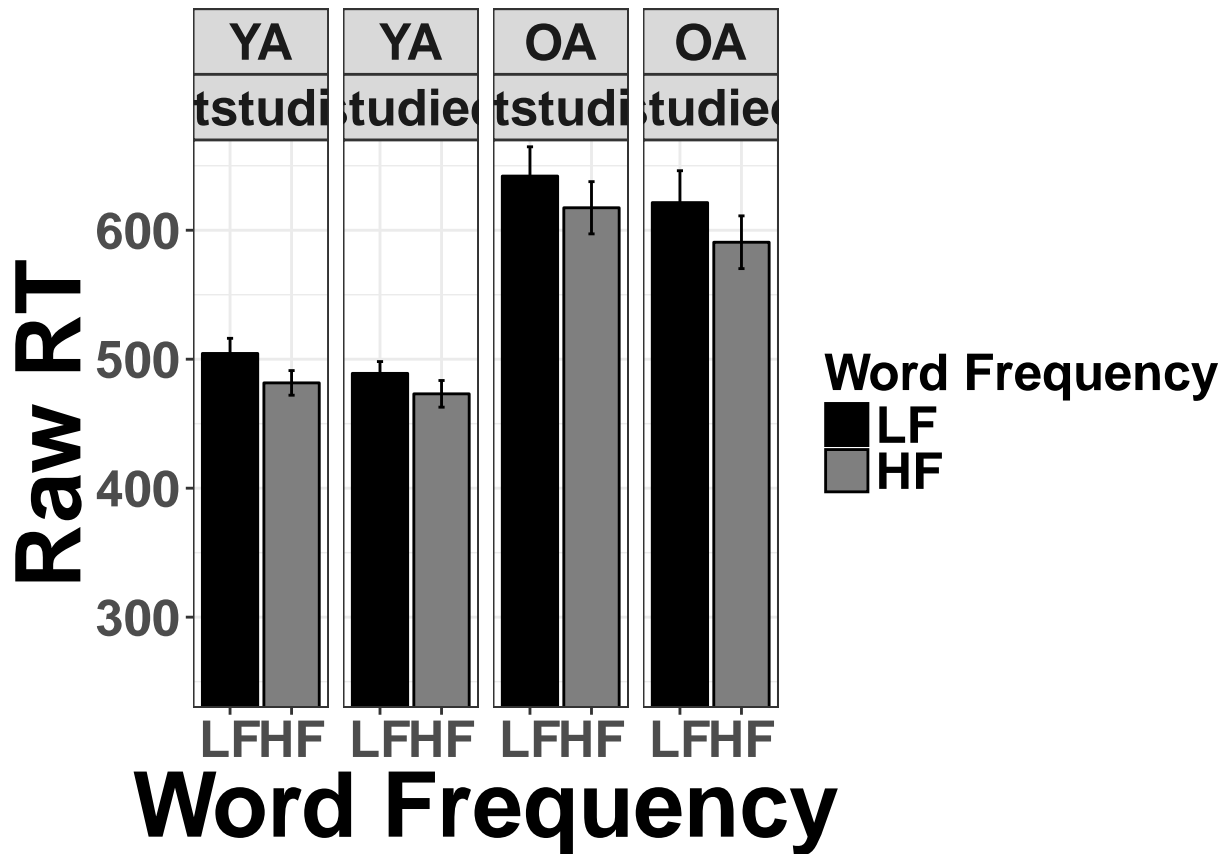
Priming Scores

```
## Joining, by = c("Subject", "age")
## Joining, by = c("Subject", "age")
```
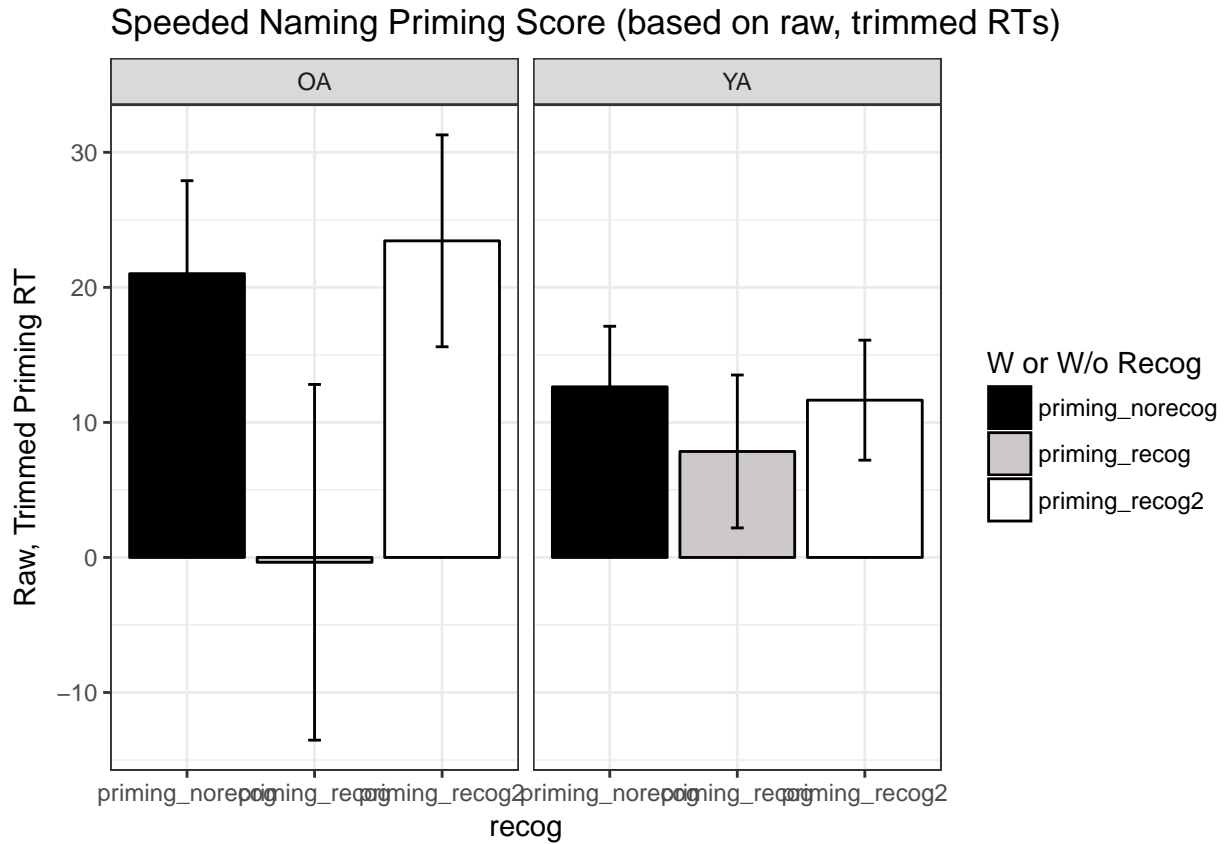
Table 32: Speeded Naming Mean Priming Raw, Trimmed RTs

age	recog	N	primingScore	sd	se	ci
OA	priming_norecog	30	21.01	37.71	6.88	14.08
OA	priming_recog	30	-0.36	72.14	13.17	26.94
OA	priming_recog2	30	23.45	42.97	7.85	16.05
YA	priming_norecog	36	12.63	26.91	4.49	9.11
YA	priming_recog	36	7.85	33.97	5.66	11.49
YA	priming_recog2	36	11.65	26.65	4.44	9.02

```
## Warning: Converting "Subject" to factor for ANOVA.
## Warning: Data is unbalanced (unequal N per group). Make sure you specified
## a well-considered value for the type argument to ezANOVA().
```

Table 33: Priming Scores (based on raw, trimmed RTs)

	Effect	DFn	DFd	F	p	p<.05	ges
2	age	1	64	0.3849	0.5372		0.00232
3	recog	2	128	2.174	0.1179		0.02041
4	age:recog	2	128	1.163	0.3159		0.01102

Speeded Naming Priming Score (based on raw, trimmed RTs)
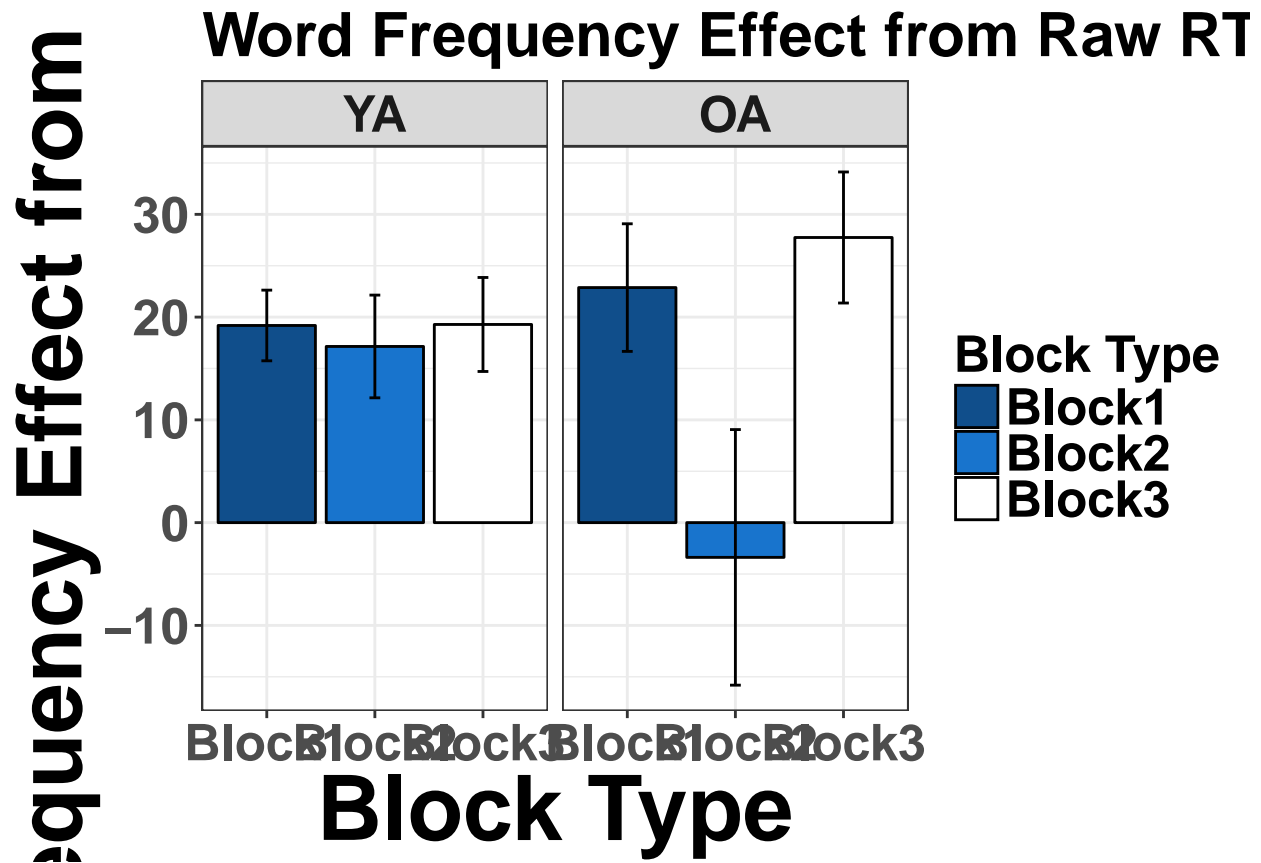
Word Frequency Effects

```
## Joining, by = c("Subject", "age")
## Joining, by = c("Subject", "age")
```

Table 34: Speeded Naming Mean WFE raw, trimmed RTs

age	recog	N	wfe	sd	se	ci
OA	Block1	30	22.87	34.00	6.21	12.70
OA	Block2	30	-3.38	68.10	12.43	25.43
OA	Block3	30	27.75	34.92	6.38	13.04
YA	Block1	36	19.19	20.63	3.44	6.98
YA	Block2	36	17.14	29.98	5.00	10.14
YA	Block3	36	19.28	27.44	4.57	9.29

Table 35: Analysis of Variance Table

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	382.6	382.6	0.266	0.6066
recog	2	9019	4510	3.136	0.0457
age:recog	2	7905	3952	2.748	0.06656
Residuals	192	276117	1438	NA	NA

No Block 3

```
## Joining, by = c("Subject", "age")
```

Table 36: Speeded Naming Mean WFE zRTs

age	recog	N	wfe	sd	se	ci
OA	Block1	30	22.87	34.00	6.21	12.70
OA	Block2	30	-3.38	68.10	12.43	25.43
YA	Block1	36	19.19	20.63	3.44	6.98
YA	Block2	36	17.14	29.98	5.00	10.14

Table 37: Analysis of Variance Table

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	2320	2320	1.385	0.2415
recog	1	5617	5617	3.354	0.06938
age:recog	1	4796	4796	2.863	0.09306
Residuals	128	214397	1675	NA	NA

Table 38: Welch Two Sample t-test: `freq.wide.ya$Block1` and `freq.wide.ya$Block2`

Test statistic	df	P value	Alternative hypothesis	mean of x	mean of y
0.3367	62.07	0.7375	two.sided	19.19	17.14

Table 39: Welch Two Sample t-test: `freq.wide.oa$Block1` and `freq.wide.oa$Block2`

Test statistic	df	P value	Alternative hypothesis	mean of x	mean of y
1.889	42.61	0.06571	two.sided	22.87	-3.381
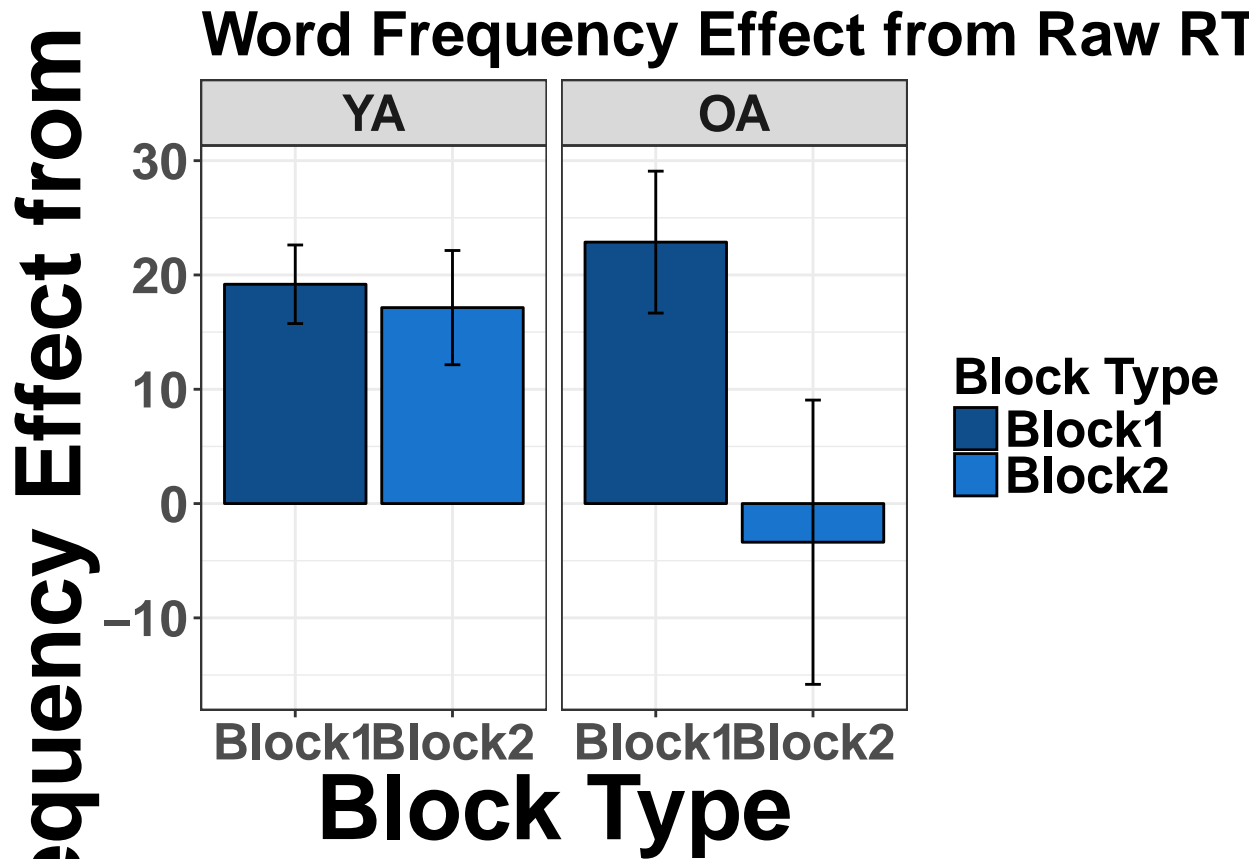
Recognition

Study X Frequency

Table 40: Recognition Mean Raw, Trimmed RTs

type	age	N	RT	sd	se	ci
notstudied_hf	OA	30	732.43	232.88	42.52	86.96
notstudied_hf	YA	36	489.76	153.09	25.51	51.80
notstudied_lf	OA	30	735.88	260.80	47.61	97.38
notstudied_lf	YA	36	482.10	187.08	31.18	63.30
studied_hf	OA	30	749.64	227.32	41.50	84.88
studied_hf	YA	36	474.41	149.37	24.89	50.54
studied_lf	OA	30	773.56	310.42	56.67	115.91
studied_lf	YA	36	477.05	157.68	26.28	53.35

```
## Warning: Converting "Subject" to factor for ANOVA.
## Warning: Converting "study" to factor for ANOVA.
## Warning: Converting "freq" to factor for ANOVA.
## Warning: Converting "age" to factor for ANOVA.
## Warning: Data is unbalanced (unequal N per group). Make sure you specified
## a well-considered value for the type argument to ezANOVA().
```

Table 41: Implict Encoding Raw, Trimmed RTs

	Effect	DFn	DFd	F	p	p<.05	ges
2	age	1	64	38.14	5.062e-08	*	0.2881
3	study	1	64	0.1122	0.7388		0.0002734
5	freq	1	64	0.1028	0.7495		0.0001345
4	age:study	1	64	0.8243	0.3673		0.002006
6	age:freq	1	64	0.2845	0.5956		0.0003721
7	study:freq	1	64	0.2516	0.6176		0.0003188
8	age:study:freq	1	64	0.02895	0.8654		3.668e-05

Recognition Raw, Trimmed RT
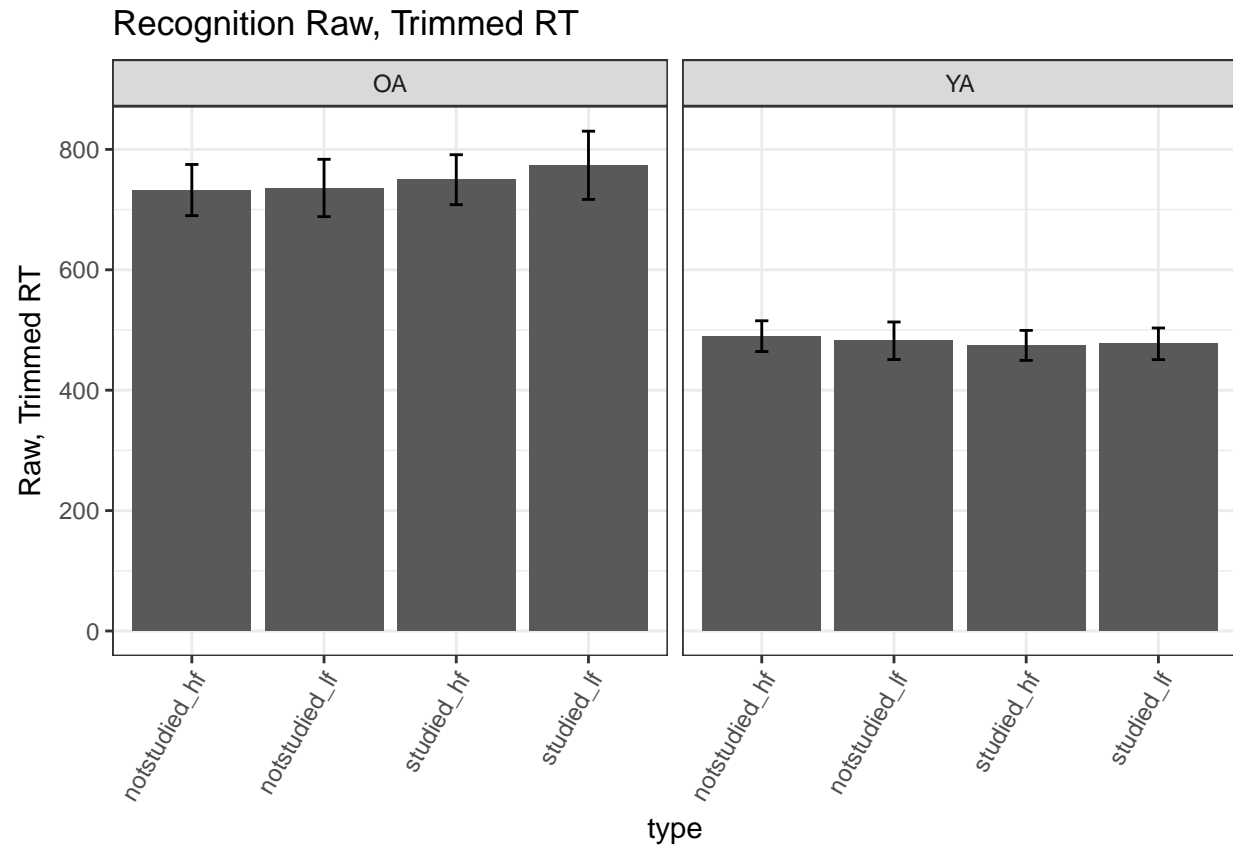
Accuracy

Speeded Naming

Study X Frequency

```
## Joining, by = c("Subject", "age", "recog", "type", "acc")
## Joining, by = c("Subject", "age", "recog", "type", "acc")
```

Table 42: Speeded Naming Mean Accuracy

recog	type	age	N	acc	sd	se	ci
no recog	notstudied_hf	OA	30	1.00	0.00	0.00	0.00
no recog	notstudied_hf	YA	36	1.00	0.02	0.00	0.01
no recog	notstudied_lf	OA	30	0.99	0.03	0.00	0.01
no recog	notstudied_lf	YA	36	0.99	0.02	0.00	0.01
no recog	studied_hf	OA	30	1.00	0.00	0.00	0.00
no recog	studied_hf	YA	36	1.00	0.02	0.00	0.01
no recog	studied_lf	OA	30	1.00	0.02	0.00	0.01
no recog	studied_lf	YA	36	0.99	0.03	0.01	0.01
no recog2	notstudied_hf	OA	30	1.00	0.00	0.00	0.00
no recog2	notstudied_hf	YA	36	0.99	0.02	0.00	0.01
no recog2	notstudied_lf	OA	30	1.00	0.00	0.00	0.00
no recog2	notstudied_lf	YA	36	0.98	0.05	0.01	0.02
no recog2	studied_hf	OA	30	1.00	0.02	0.00	0.01
no recog2	studied_hf	YA	36	0.99	0.04	0.01	0.01

recog	type	age	N	acc	sd	se	ci
no recog2	studied_lf	OA	30	1.00	0.00	0.00	0.00
no recog2	studied_lf	YA	36	0.99	0.05	0.01	0.02
w/ recog	notstudied_hf	OA	30	1.00	0.00	0.00	0.00
w/ recog	notstudied_hf	YA	36	0.99	0.02	0.00	0.01
w/ recog	notstudied_lf	OA	30	1.00	0.02	0.00	0.01
w/ recog	notstudied_lf	YA	36	1.00	0.02	0.00	0.01
w/ recog	studied_hf	OA	30	1.00	0.00	0.00	0.00
w/ recog	studied_hf	YA	36	0.99	0.02	0.00	0.01
w/ recog	studied_lf	OA	30	1.00	0.02	0.00	0.01
w/ recog	studied_lf	YA	36	1.00	0.02	0.00	0.01

Table 43: Analysis of Variance Table

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
age	1	0.007004	0.007004	12.56	0.0004173
studied	1	1.263e-05	1.263e-05	0.02265	0.8804
freq	1	0.001528	0.001528	2.74	0.09825
recog	2	0.002955	0.001477	2.65	0.07131
age:studied	1	1.052e-05	1.052e-05	0.01887	0.8908
age:freq	1	5.093e-05	5.093e-05	0.09135	0.7626
studied:freq	1	0.0006187	0.0006187	1.11	0.2925
age:recog	2	0.004018	0.002009	3.603	0.0277
studied:recog	2	2.525e-05	1.263e-05	0.02265	0.9776
freq:recog	2	0.0009343	0.0004672	0.838	0.433
age:studied:freq	1	7.113e-05	7.113e-05	0.1276	0.7211
age:studied:recog	2	0.0004655	0.0002327	0.4175	0.6589
age:freq:recog	2	0.001779	0.0008893	1.595	0.2035
studied:freq:recog	2	0.001843	0.0009217	1.653	0.1921
age:studied:freq:recog	2	0.001314	0.000657	1.178	0.3083
Residuals	768	0.4282	0.0005575	NA	NA

Speeded Naming w/ and w/o Recog Accuracy
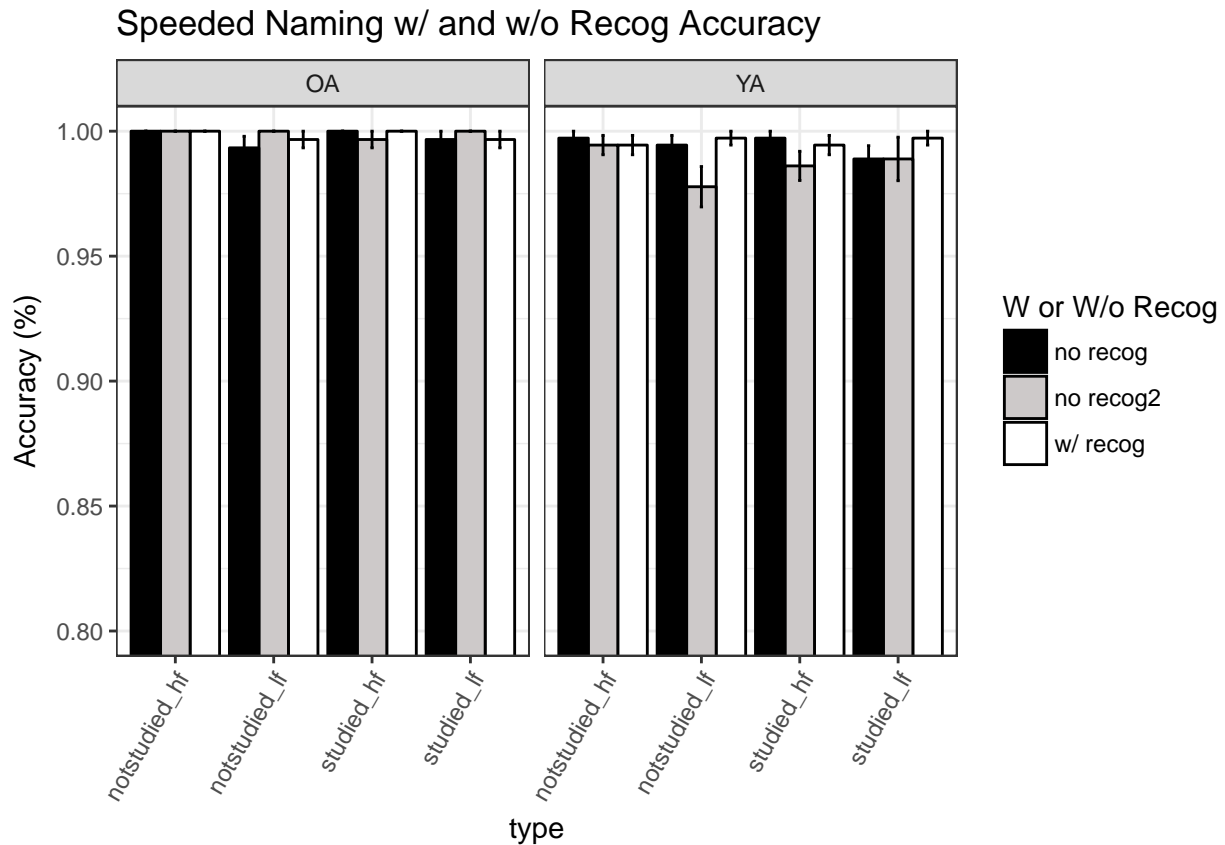
Recognition

Study X Frequency

Table 44: Recognition Accuracy

type	age	N	accuracy	sd	se	ci
notstudied_hf	OA	30	0.88	0.18	0.03	0.07
notstudied_hf	YA	36	0.95	0.09	0.02	0.03
notstudied_lf	OA	30	0.89	0.18	0.03	0.07
notstudied_lf	YA	36	0.96	0.07	0.01	0.02
studied_hf	OA	30	0.81	0.17	0.03	0.06
studied_hf	YA	36	0.86	0.13	0.02	0.05
studied_lf	OA	30	0.78	0.15	0.03	0.06
studied_lf	YA	36	0.89	0.11	0.02	0.04

```
## Warning: Converting "Subject" to factor for ANOVA.
## Warning: Converting "study" to factor for ANOVA.
## Warning: Converting "freq" to factor for ANOVA.
## Warning: Converting "age" to factor for ANOVA.
## Warning: Data is unbalanced (unequal N per group). Make sure you specified
## a well-considered value for the type argument to ezANOVA().
```

Table 45: Implict Encoding Recog Accuracy

|	Effect	DFn	DFd	F	p	p<.05	ges
2	age	1	64	17.65	8.396e-05	*	0.06767
3	study	1	64	11.98	0.0009619	*	0.0793
5	freq	1	64	0.1266	0.7232		0.0002759
4	age:study	1	64	0.03416	0.8539		0.0002455
6	age:freq	1	64	0.8467	0.3609		0.001843
7	study:freq	1	64	0.1287	0.721		0.0002759
8	age:study:freq	1	64	0.9867	0.3243		0.002111

Recognition Accuracy
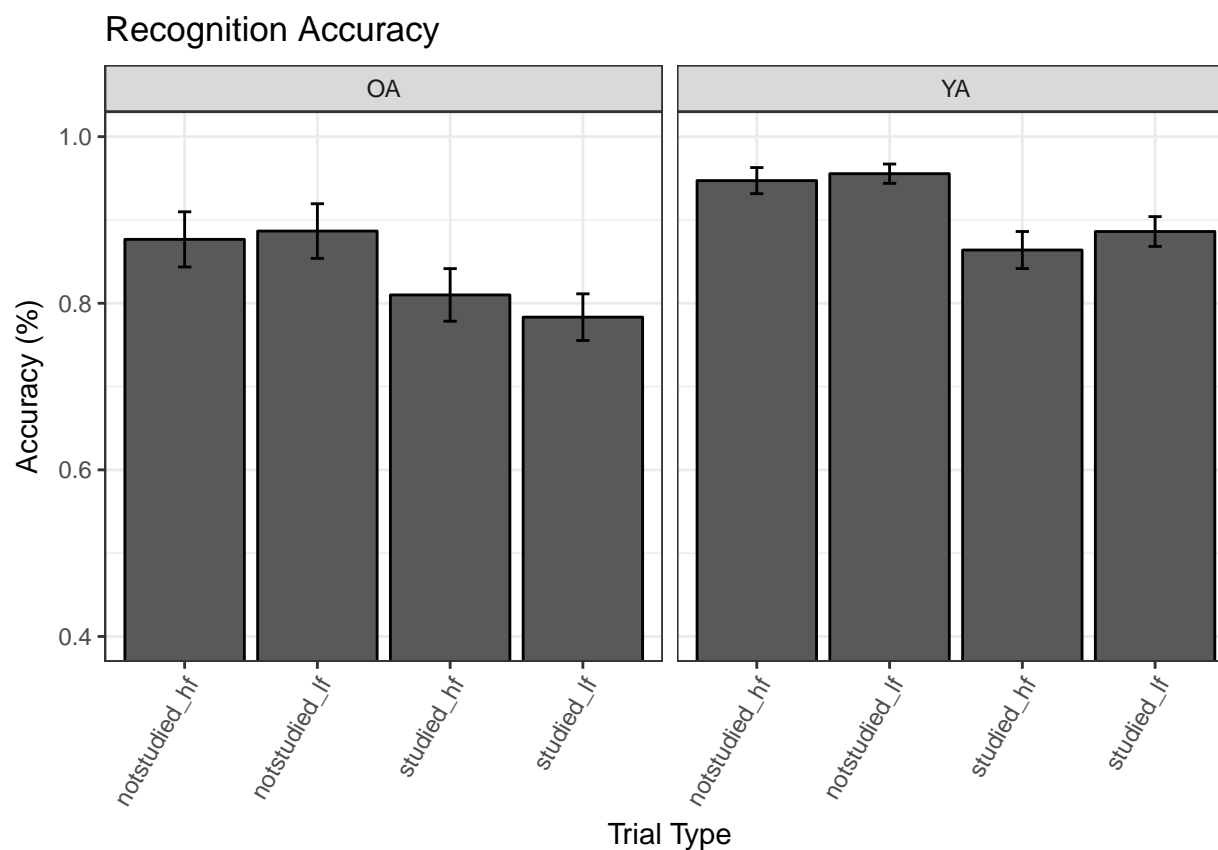
Correlations

Perseverance and MMSE Correlation

```
## Joining, by = c("Subject", "age")
## Joining, by = "Subject"
```

Table 46: Pearson's product-moment correlation: `perseverance$perseverence` and `perseverance$MMSE`

Test statistic	df	P value	Alternative hypothesis	cor
-1.209	27	0.237	two.sided	-0.2267

```
## Warning: Removed 1 rows containing non-finite values (stat_smooth).
## Warning: Removed 1 rows containing missing values (geom_point).
```
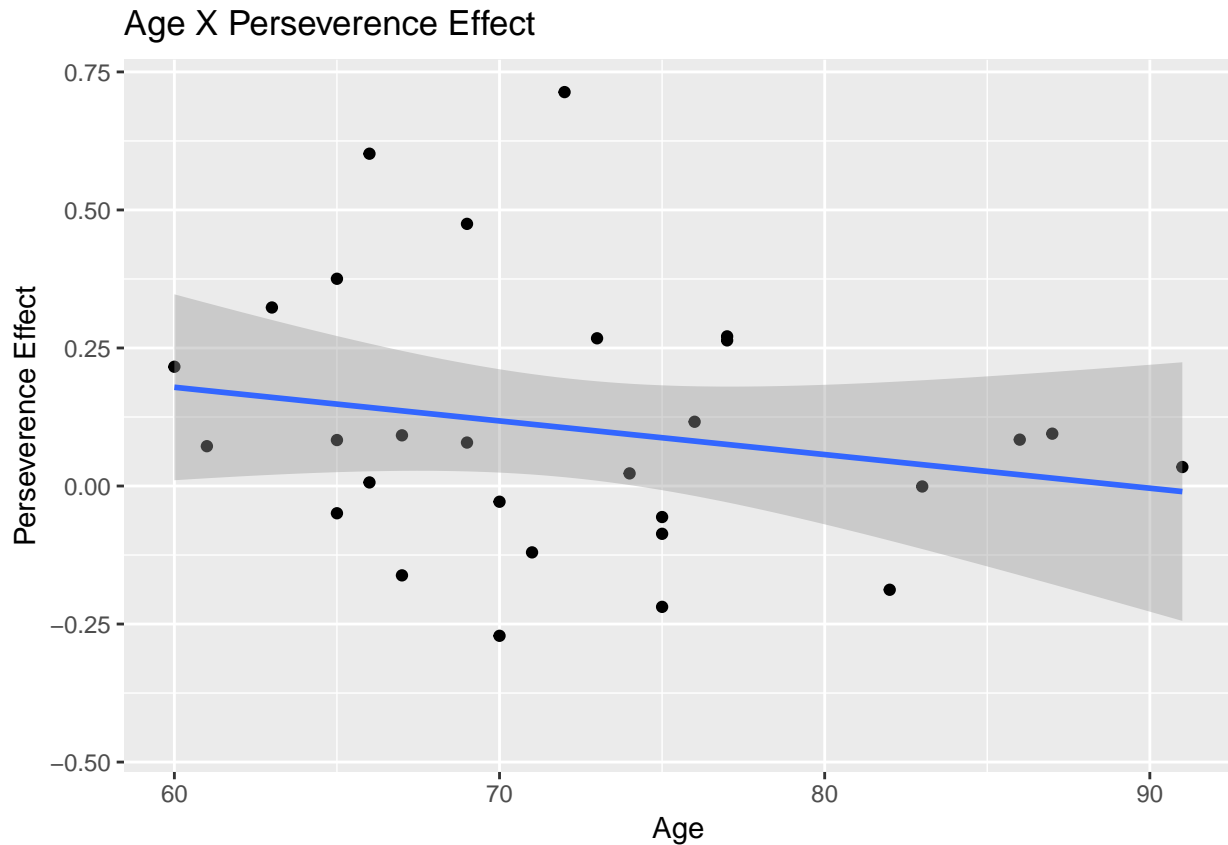

MMSE X Perseverence Effect
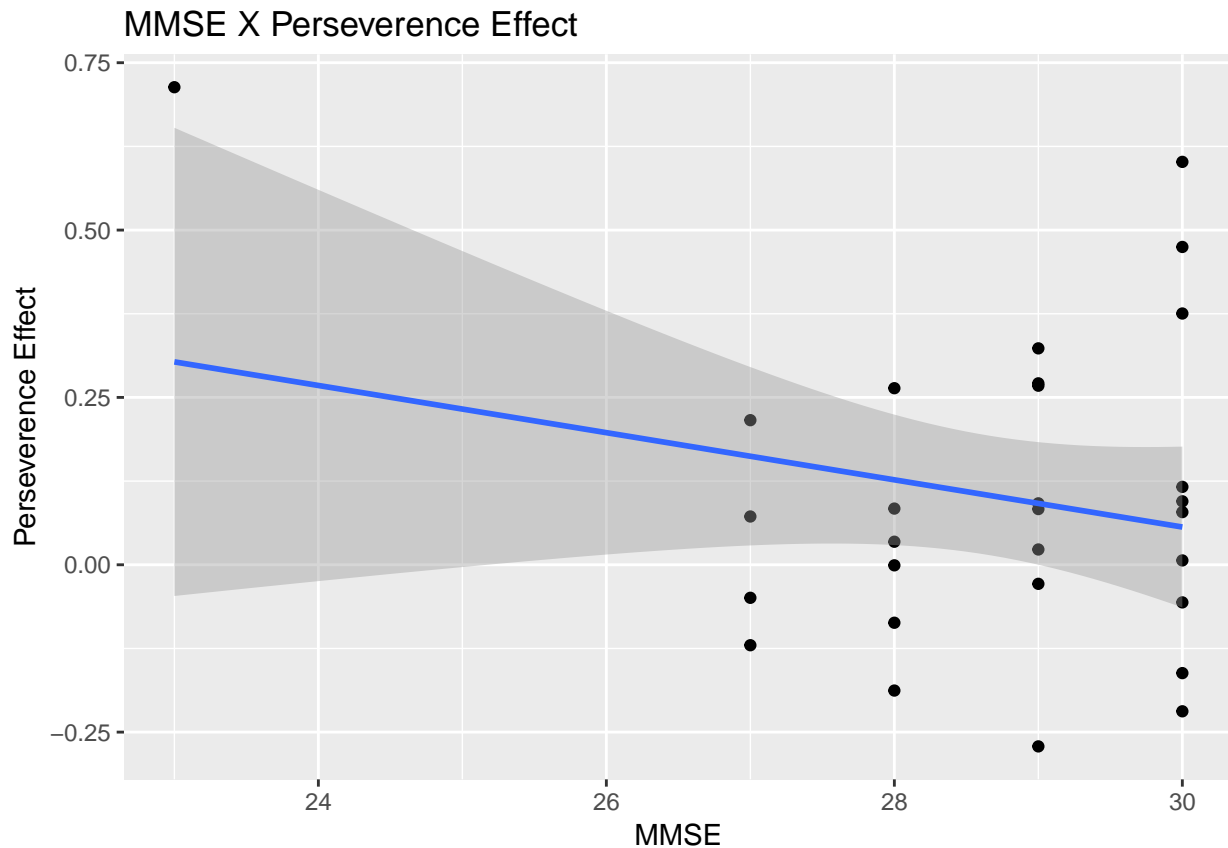
Perseverance and Age Correlation

```
## Joining, by = c("Subject", "age")
## Joining, by = "Subject"
```

Table 47: Pearson's product-moment correlation: perseverance$perseverence and perseverance$Age

Test statistic	df	P value	Alternative hypothesis	cor
-1.08	27	0.2897	two.sided	-0.2035

```
## Warning: Removed 37 rows containing non-finite values (stat_smooth).
## Warning: Removed 37 rows containing missing values (geom_point).
```

Age X Perseverence Effect

Perseverance and Recognition

```
## Joining, by = c("Subject", "age")
## Joining, by = c("Subject", "age")
```

Table 48: Pearson's product-moment correlation: `perseverance$perseverence` and `perseverance$recog`

Test statistic	df	P value	Alternative hypothesis	cor
-1.457	64	0.1501	two.sided	-0.1791

```
## Joining, by = "Subject"
```

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	-0.0999	4.074	-0.02452	0.9806
Age	0.007785	0.05271	0.1477	0.8838
recog	0.8657	4.801	0.1803	0.8584
Age:recog	-0.01794	0.06237	-0.2877	0.776

Table 50: Fitting linear model: perseverence ~ Age * recog

Observations	Residual Std. Error	R^2	Adjusted R^2
29	0.2406	0.07249	-0.03882

Recog Accuracy X Perseverence Effect
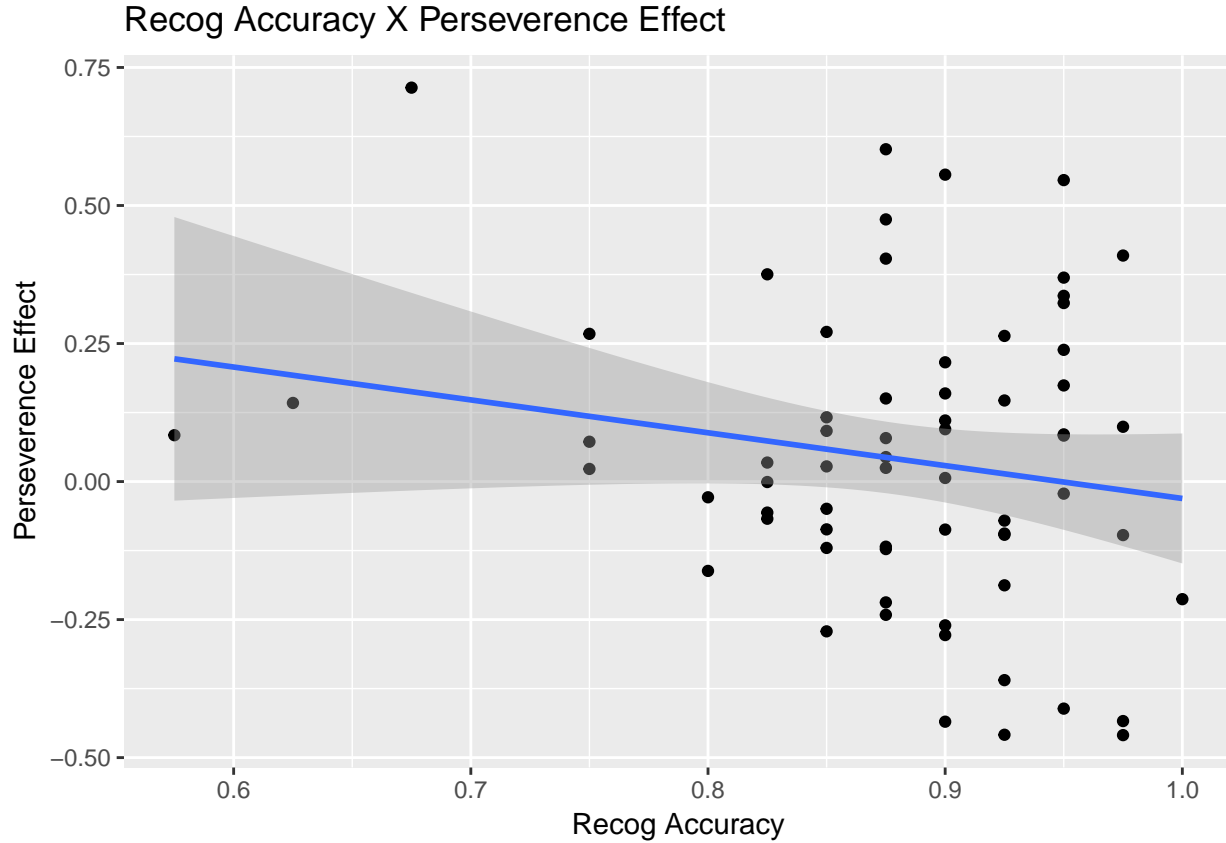
Demographics

```
## Joining, by = c("Subject", "Age", "Gender", "Edu", "Hand", "Alert", "Race", "Hispanic.Latino.", "Firs
## Warning: Column `Gender` joining factors with different levels, coercing to
## character vector
## Warning: Column `Hand` joining factors with different levels, coercing to
## character vector
## Warning: Column `Alert` joining factors with different levels, coercing to
## character vector
## Warning: Column `Race` joining factors with different levels, coercing to
## character vector
## Warning: Column `Hispanic.Latino.` joining factors with different levels,
## coercing to character vector
## Warning: Column `First.Lang.` joining factors with different levels,
## coercing to character vector
## Warning: Column `Eng.before.5.` joining factors with different levels,
## coercing to character vector
## Warning: Column `Etc..` joining factors with different levels, coercing to
## character vector
```

Age

Table 51: Age Group Means

ageGroup	N	Age	sd	se	ci
OA	30	72.33	7.75	1.41	2.89
YA	36	19.33	1.24	0.21	0.42
NA	2	NA	NA	NA	NA

Table 52: Welch Two Sample t-test: `YAs$Age` and `OAs$Age` (continued below)

Test statistic	df	P value	Alternative hypothesis	mean of x
-37.07	30.24	9.006e-27 * * *	two.sided	19.33

mean of y
72.33

Edu

Table 54: Edu Group Means

ageGroup	N	Edu	sd	se	ci
OA	30	16.43	1.89	0.34	0.70
YA	36	13.67	1.70	0.28	0.58
NA	2	NA	NA	NA	NA

Table 55: Welch Two Sample t-test: `YAs$Edu` and `OAs$Edu` (continued below)

Test statistic	df	P value	Alternative hypothesis	mean of x
-6.196	59.13	6.049e-08 * * *	two.sided	13.67

mean of y
16.43

Shipley

Table 57: Shipley Group Means

ageGroup	N	Shipley	sd	se	ci
OA	30	35.10	3.39	0.62	1.26

ageGroup	N	Shipley	sd	se	ci
YA	36	33.42	3.05	0.51	1.03
NA	2	NA	NA	NA	NA

Table 58: Welch Two Sample t-test: `YAs$Shipley` and `OAs$Shipley` (continued below)

Test statistic	df	P value	Alternative hypothesis	mean of x
-2.104	59.04	0.03965 *	two.sided	33.42

mean of y
35.1