

**Supplemental Material S1.** Tables including fixed effects of generalized linear mixed-effects regression (GLMER) analyses.

**Fixed Effects**

GLMER = generalized linear mixed-effects regression; Est = estimated coefficients; SE = standard errors; CD = control deaf individuals without CIs and nonnative users of sign language; CI group = users of unilateral cochlear implants; LSE group = native users of Spanish Sign Language; RT = reaction time.

**EXPERIMENT 1**

**Magnified Condition:**

*Eye Movements*

**Table 1s.** Magnified condition as reference level.

*Fixed effects of GLMER model with all participants, magnified and baseline conditions and lipreading, working memory and nonverbal IQ as predictors of fixations.*

Parameter	Est.	SE	z-value	p-value
Intercept	1.69	.23	7.18	< .001
Baseline condition	0.46	.10	4.72	< .001
Lipreading	0.45	.24	1.88	.06
Nonverbal IQ	0.19	.23	0.85	.39
Working memory	-0.05	.24	-0.22	.83
Baseline condition × Lipreading	-0.28	.11	-2.53	< .05
Baseline condition × Working memory	-0.36	.10	-3.60	< .001

All participants = 36.

*Note.* Formula: fixation ~ conditions × lipreading + condition × working memory + nonverbal IQ + (1 | subjects) + (1 | items).

**Table 2s.** Magnified condition and CD group as reference levels.

*Fixed effects of GLMER model with all groups, magnified and baseline conditions and lipreading as predictors of fixations.*

Parameter	Est.	SE	z-value	p-value
Intercept	2.22	.39	5.59	< .001
CI group	-0.95	.54	-1.77	.08
LSE group	-0.59	.56	-1.06	.29
Baseline condition	-0.16	.17	-.97	.34
Lipreading	0.48	.22	2.16	< .05
Baseline condition × CI group	0.52	.23	2.29	< .05
Baseline condition × LSE group	1.56	.27	5.81	< .001
Baseline condition × Lipreading	-0.48	.11	-4.54	< .001

CI group = 13. CD group = 12. LSE group = 11.

*Note.* Formula: fixation ~ groups × conditions + conditions × lipreading + (1 | subjects) + (1 | items).

**Table 3s.** Magnified condition and CD group as reference levels.

*Fixed effects of GLMER model with all groups, magnified and baseline conditions and lipreading, working memory and nonverbal IQ as predictors of fixations.*

Parameter	Est.	SE	z-value	p-value
Intercept	2.29	.40	5.77	< .001
CI group	-1.07	.54	-1.96	.05
LSE group	-0.62	.56	-1.11	.27
Baseline condition	-0.21	.17	-1.25	.21
Lipreading	0.48	.23	2.07	< .05
Nonverbal IQ	0.26	.22	1.15	.25
Working memory	0.03	.23	0.14	.89
Baseline condition × CI group	0.64	.23	2.74	< .01
Baseline condition × LSE group	1.52	.27	5.69	< .001
Baseline condition × Lipreading	-0.33	.11	-2.94	< .01
Baseline condition × Working memory	-0.35	.10	-3.34	< .001

CI group = 13. CD group = 12. LSE group = 11.

*Note.* Formula: fixation ~ groups × conditions + conditions × lipreading + nonverbal IQ + conditions × working memory + (1 | subjects) + (1 | items).

## Accuracy

**Table 4s.** Magnified condition as reference level.

*Fixed effects of GLMER model with all participants, magnified and baseline conditions and lipreading, working memory and nonverbal IQ as predictors of accuracy.*

Parameter	Est.	SE	z-value	p-value
Intercept	1.55	.22	7.14	< .001
Baseline condition	0.17	.18	0.95	.34
Lipreading	0.28	.14	2.00	< .05
Nonverbal IQ	0.02	.16	0.15	.88
Working memory	0.01	.16	0.08	.93
Baseline condition × nonverbal IQ	0.33	.19	1.74	.08
Baseline condition × working memory	0.36	.19	1.87	.06

All participants = 36.

*Note.* Formula: accuracy ~ conditions + lipreading + condition × nonverbal IQ + condition × working memory + (1 | subjects) + (1 | items).

**Table 5s.** Magnified condition and CD group as reference levels.

*Fixed effects of GLMER model with all groups, magnified and baseline conditions and lipreading as predictors of accuracy.*

Parameter	Est.	SE	z-value	p-value
Intercept	1.72	.29	5.86	< .001
CI group	-0.18	.33	-0.54	.59
LSE group	-0.28	.34	-0.84	.40
Baseline condition	0.11	.18	0.62	.54
Lipreading	0.31	.14	2.20	< .05

CI group = 13. CD group = 12. LSE group = 11.

*Note.* Formula: accuracy ~ groups + conditions + lipreading + (1 | subjects) + (1 | items).

**Table 6s.** Magnified condition and CD group as reference levels.

*Fixed effects of GLMER model with all groups, magnified and baseline conditions and lipreading, nonverbal IQ and working memory as predictors of accuracy.*

Parameter	Est.	SE	z-value	p-value
Intercept	1.78	.28	6.30	< .001
CI group	-0.32	.31	-1.02	.31
LSE group	-0.33	.32	-1.04	.30
Baseline condition	0.11	.18	0.60	.55
Lipreading	0.26	.14	1.93	.05
Nonverbal IQ	0.20	.13	1.51	.13
Working memory	0.21	.13	1.56	.12

CI group = 13. CD group = 12. LSE group = 11.

*Note.* Formula: accuracy ~ groups + conditions + lipreading + nonverbal IQ + working memory + (1 | subjects) + (1 | items).

### Reaction Times

**Table 7s.** Magnified condition as reference level.

*Fixed effects of GLMER model with all participants, magnified and baseline conditions and lipreading, working memory and nonverbal IQ as predictors of reaction times (RTs).*

Parameter	Est.	SE	t-value
Intercept	2,493.78	207.27	12.03
Baseline condition	105.95	158.20	0.67
Lipreading	-171.94	193.82	-0.89
Nonverbal IQ	76.34	183.12	0.42
Working memory	58.89	191.85	0.31

All participants = 36.

*Note.* Formula: RTs ~ conditions + lipreading + nonverbal IQ + working memory + (1 | subjects) + (1 | items).

**Table 8s.** Magnified condition and CD group as reference levels.

*Fixed effects of GLMER model with all groups, magnified and baseline conditions and lipreading, as predictors of reaction times (RTs).*

Parameter	Est.	SE	t-value
Intercept	2,376.3	337.0	7.05
CI group	171.1	470.8	0.36
LSE group	199.4	485.3	0.41
Baseline condition	304.5	267.9	1.14
Lipreading	-190.2	183.5	-1.04
Baseline condition × CI group	136.9	382.4	0.36
Baseline condition × LSE group	-803.4	392.1	-2.05

CI group = 13. CD group = 12. LSE group = 11.

*Note.* Formula: RTs ~ groups × conditions + lipreading + (1 | subjects) + (1 | items).

**Table 9s.** Magnified condition and CD group as reference levels.

*Fixed effects of GLMER model with all groups, magnified and baseline conditions and lipreading, nonverbal IQ and working memory as predictors of reaction times (RTs).*

Parameter	Est.	SE	t-value
Intercept	2398.05	351.43	6.82
CI group	128.16	500.77	0.26
LSE group	183.72	500.14	0.37
Baseline condition	302.76	267.99	1.13
Lipreading	-201.33	199.82	-1.01
Nonverbal IQ	43.91	192.40	0.23
Working memory	54.45	197.63	0.28
Baseline condition × CI group	138.87	382.48	0.36
Baseline condition × LSE group	-802.56	392.18	-2.05

CI group = 13. CD group = 12. LSE group = 11.

*Note.* Formula: RTs ~ groups × conditions + lipreading + nonverbal IQ + working memory + (1 | subjects) + (1 | items).

## Gaze Contingent Condition:

### Eye Movements

**Table 10s.** Gaze contingent condition as reference level.

*Fixed effects of GLMER model with all participants, gaze contingent and baseline conditions and lipreading, working memory and nonverbal IQ as predictors of fixations.*

Parameter	Est.	SE	z-value	p-value
Intercept	0.74	.27	2.78	< .01
Baseline condition	1.34	.09	13.99	< .001
Lipreading	0.26	.26	0.99	.32
Nonverbal IQ	0.01	.26	0.01	1.00
Working memory	0.06	.27	0.22	.83
Baseline condition × Nonverbal IQ	0.45	.10	4.43	< .001
Baseline condition × Working memory	-0.42	.09	-4.70	< .001

All participants = 36.

*Note.* Formula: fixation ~ conditions + lipreading + condition × nonverbal IQ + condition × working memory + (1 | subjects) + (1 | items).

**Table 11s.** Gaze contingent condition and CD group as reference levels.

*Fixed effects of GLMER model with all groups, gaze contingent and baseline conditions and lipreading as predictors of fixations.*

Parameter	Est.	SE	z-value	p-value
Intercept	0.96	.44	2.20	< .05
CI group	-0.48	.60	-0.80	.42
LSE group	-0.16	.62	-0.26	.79
Baseline condition	1.02	.16	6.45	< .001
Lipreading	0.31	.24	1.27	.20
Baseline condition × CI group	0.03	.22	0.14	.89
Baseline condition × LSE group	0.85	.24	3.53	< .001
Baseline condition × Lipreading	-0.25	.09	-2.63	< .01

CI group = 13. CD group = 12. LSE group = 11.

*Note.* Formula: fixation ~ groups × conditions + conditions × lipreading + (1 | subjects) + (1 | items).

**Table 12s.** Gaze contingent condition and CD group as reference levels.

*Fixed effects of GLMER model with all groups, gaze contingent and baseline conditions and lipreading, nonverbal IQ and working memory as predictors of fixations.*

Parameter	Est.	SE	z-value	p-value
Intercept	1.02	.45	2.26	< .05
CI group	-0.56	.62	-0.90	.37
LSE group	-0.20	.64	-0.32	.75
Baseline condition	1.07	.16	6.53	< .001
Lipreading	0.27	.26	1.03	.30
Nonverbal IQ	0.04	.26	0.15	.88
Working memory	0.10	.27	0.37	.71
Baseline condition × CI group	-0.01	.22	-0.01	1.00
Baseline condition × LSE group	0.87	.24	3.58	< .001
Baseline condition × Nonverbal IQ	0.50	.10	4.83	< .001
Baseline condition × Working memory	-0.36	.09	-3.92	< .001

CI group = 13. CD group = 12. LSE group = 11.

*Note.* Formula: fixation ~ groups × conditions + lipreading + conditions × nonverbal IQ + conditions × working memory + (1 | subjects) + (1 | items).

## Accuracy

**Table 13s.** Gaze contingent condition as reference level.

*Fixed effects of GLMER model with all participants, gaze contingent and baseline conditions and lipreading, nonverbal IQ and working memory as predictors of accuracy.*

Parameter	Est.	SE	z-value	p-value
Intercept	1.06	.17	6.10	< .001
Baseline condition	0.56	.17	3.25	< .01
Lipreading	0.22	.13	1.65	.09
Nonverbal IQ	0.19	.12	1.52	.13
Working memory	-0.04	.15	-0.26	.79
Baseline condition × Working memory	0.40	.18	2.25	< .05

All participants = 36.

*Note.* Formula: accuracy ~ conditions + lipreading + nonverbal IQ + condition × working memory + (1 | subjects) + (1 | items).

**Table 14s.** Gaze contingent condition and CD group as reference levels.  
Fixed effects of GLMER model with all groups, gaze contingent and baseline conditions and lipreading as predictors of accuracy.

Parameter	Est.	SE	z-value	p-value
Intercept	0.98	.25	3.92	< .001
CI group	0.23	.31	0.74	.46
LSE group	0.00	.32	0.01	.99
Baseline condition	0.52	.17	3.07	< .01
Lipreading	0.22	.13	1.68	.09

CI group = 13. CD group = 12. LSE group = 11.

Note. Formula: accuracy ~ groups + conditions + lipreading + (1 | subjects) + (1 | items).

**Table 15s.** Gaze contingent condition and CD group as reference levels.  
Fixed effects of GLMER model with all groups, gaze contingent and baseline conditions and lipreading, nonverbal IQ and working memory as predictors of accuracy.

Parameter	Est.	SE	z-value	p-value
Intercept	1.03	.24	4.24	< .001
CI group	0.11	.30	0.38	.70
LSE group	-0.03	.30	-0.09	.93
Baseline condition	0.51	.17	3.04	< .01
Lipreading	0.20	.13	1.55	.12
Nonverbal IQ	0.18	.12	1.48	.14
Working memory	0.13	.13	1.01	.31

CI group = 13. CD group = 12. LSE group = 11.

Note. Formula: accuracy ~ groups + conditions + lipreading + nonverbal IQ + working memory + (1 | subjects) + (1 | items).

## Reaction Times

**Table 16s.** Gaze contingent condition as reference level.  
Fixed effects of GLMER model with all participants, gaze contingent and baseline conditions and lipreading, working memory and nonverbal IQ as predictors of reaction times (RTs).

Parameter	Est.	SE	t-value
Intercept	3107.99	268.99	11.55
Baseline condition	-555.44	194.98	-2.85
Lipreading	-106.47	254.70	-0.42
Nonverbal IQ	10.34	237.12	0.04
Working memory	161.52	250.24	0.64

All participants = 36.

Note. Formula: RTs ~ groups + conditions + lipreading + (1 | subjects) + (1 | items).

**Table 17s.** Gaze contingent condition and CD group as reference levels.

*Fixed effects of GLMER model with all groups, gaze contingent and baseline conditions and lipreading as predictors of reaction times (RTs).*

Parameter	Est.	SE	t-value
Intercept	3237.3	414.0	7.82
CI group	174.1	554.6	0.31
LSE group	-625.6	570.5	-1.10
Baseline condition	-551.6	195.0	-2.83
Lipreading	-110.7	237.6	-0.47

CI group = 13. CD group = 12. LSE group = 11.

*Note.* Formula: RTs ~ groups + conditions + lipreading + (1 | subjects) + (1 | items).

**Table 18s.** Gaze contingent condition and CD group as reference levels.

*Fixed effects of GLMER model with all groups, gaze contingent and baseline conditions and lipreading, nonverbal IQ and working memory as predictors of reaction times (RTs).*

Parameter	Est.	SE	t-value
Intercept	3261.24	431.33	7.56
CI group	139.11	591.59	0.23
LSE group	-656.24	588.20	-1.12
Baseline condition	-553.32	194.99	-2.84
Lipreading	-163.96	257.52	-0.64
Nonverbal IQ	-33.34	244.36	-0.14
Working memory	160.55	252.87	0.63

CI group = 13. CD group = 12. LSE group = 11.

*Note.* Formula: RTs ~ groups + conditions + lipreading + (1 | subjects) + (1 | items).

## EXPERIMENT 2

### Fixations

**Table 19s.** Mismatching condition as reference level.

*Fixed effects of GLMER model with all participants, mis/matching condition, lipreading, nonverbal IQ and working memory as predictors of fixations.*

Parameter	Est.	SE	z-value	p-value
Intercept	4.27	.40	10.73	< .001
Matching condition	0.74	.35	2.10	< .05
Lipreading	0.30	.30	1.00	.32
Nonverbal IQ	-0.10	.29	-0.36	.72
Working memory	-0.37	.32	-1.15	.25
Matching condition × Working memory	0.59	.27	2.21	< .05

All participants = 36.

*Note.* Formula: fixation ~ mis/matching conditions + lipreading + nonverbal IQ + mis/matching conditions × working memory + (1 | subjects) + (1 | items).

**Table 20s.** Mismatching condition and CD group as reference levels.

*Fixed effects of GLMER model with CI, CD, and LSE groups, mis/matching condition and lipreading as predictors of fixations.*

Parameter	Est.	SE	z-value	p-value
Intercept	4.08	.48	8.48	< .001
CI group	-0.70	.55	-1.27	.20
LSE group	1.46	.73	2.00	< .05
Matching condition	0.68	.34	1.98	< .05
Lipreading	0.29	.24	1.20	.23

CI group = 13. CD group = 12. LSE group = 11.

*Note.* Formula: fixation ~ groups + mis/matching conditions + lipreading + (1 | subjects) + (1 | items).

**Table 21s.** Mismatching condition and CD group as reference levels.

*Fixed effects of GLMER model with CI, CD, and LSE groups, mis/matching condition, lipreading and nonverbal IQ and working memory as predictors of fixations.*

Parameter	Est.	SE	z-value	p-value
Intercept	4.08	.48	8.46	< .001
CI group	-0.71	.56	-1.25	.21
LSE group	1.48	.73	2.02	< .05
Matching condition	0.68	.34	1.98	< .05
Lipreading	0.31	.25	1.20	.23
Nonverbal IQ	0.07	.26	0.26	.79
Working memory	-0.04	.27	-0.16	.87

CI group = 13. CD group = 12. LSE group = 11.

*Note.* Formula: fixation ~ groups + mis/matching conditions + lipreading + nonverbal IQ + working memory + (1 | subjects) + (1 | items).

## Accuracy

**Table 22s.** Mismatching condition as reference level.

*Fixed effects of GLMER model with all participants, mis/matching condition, lipreading, nonverbal IQ and working memory as predictors of accuracy.*

Parameter	Est.	SE	z-value	p-value
Intercept	0.93	.49	1.91	.06
Matching condition	5.99	.77	7.81	< .001
Lipreading	0.77	.44	1.75	.08
Nonverbal IQ	-0.19	.40	-0.46	.64
Working memory	-0.17	.43	-0.39	.69
Matching condition × lipreading	1.95	.62	3.14	< .01
Matching condition × working memory	1.35	.42	3.20	< .01

All participants = 36.

*Note.* Formula: accuracy ~ mis/matching condition × lipreading + nonverbal IQ + mis/matching condition × working memory + (1 | subjects) + (1 | items).



**Table 23s.** Mismatching condition and CD group as reference levels.

*Fixed effects of GLMER model with CI, CD and LSE groups, mis/matching condition and lipreading as predictors of accuracy.*

Parameter	Est.	SE	z-value	p-value
Intercept	1.50	.66	2.27	< .05
CI group	0.31	.83	0.38	.70
LSE group	-2.35	.86	-2.73	< .01
Matching condition	5.71	1.17	4.89	< .001
Lipreading	0.63	.35	1.77	.08
CI group × matching condition	-2.78	1.18	-2.36	< .05
LSE group × matching condition	-0.18	1.21	-0.15	.88

CI group = 13. CD group = 12. LSE group = 11.

*Note.* Formula: accuracy ~ groups × mis/matching condition + lipreading + (1 | subjects) + (1 | items).

**Table 24s.** Mismatching condition and CD group as reference levels.

*Fixed effects of GLMER model with CI, CD and LSE groups, mis/matching condition, lipreading, nonverbal IQ and working memory as predictors of accuracy.*

Parameter	Est.	SE	z-value	p-value
Intercept	1.49	.64	2.32	< .05
CI group	0.16	.82	0.20	.84
LSE group	-2.13	.82	-2.59	< .01
Matching condition	4.56	.55	8.30	< .001
Lipreading	0.62	.36	1.72	.08
Nonverbal IQ	-0.21	.33	-0.64	.52
Working memory	0.01	.35	0.01	1.00

CI group = 13. CD group = 12. LSE group = 11.

*Note.* Formula: accuracy ~ groups + mis/matching condition + lipreading + nonverbal IQ + working memory + (1 | subjects) + (1 | items).

## Reaction Times

**Table 25s.** Mismatching condition as reference level.

*Fixed effects of GLMER model with all participants, mis/matching condition, lipreading, nonverbal IQ and working memory as predictors of reaction times (RTs).*

Parameter	Est.	SE	t-value
Intercept	2400.24	205.74	11.67
Matching condition	494.67	264.56	1.87
Lipreading	75.71	156.47	0.48
Nonverbal IQ	216.56	143.43	1.51
Working memory	267.84	152.89	1.75

All participants = 36.

*Note.* Formula: RTs ~ mis/matching condition + lipreading + nonverbal IQ + working memory + (1 | subjects) + (1 | items).

**Table 26s.** Mismatching condition and CD group as reference levels.

*Fixed effects of GLMER model with CI, CD and LSE groups, mis/matching condition and lipreading as predictors of reaction times (RTs).*

<b>Parameter</b>	<b>Est.</b>	<b>SE</b>	<b>t-value</b>
Intercept	2336.67	299.33	7.81
CI group	210.05	366.38	0.57
LSE group	-6.33	387.67	-0.02
Matching condition	473.92	265.11	1.79
Lipreading	127.95	161.19	0.79

CI group = 13. CD group = 12. LSE group = 11.

*Note.* Formula: RTs ~ groups + mis/matching condition + lipreading + (1 | subjects) + (1 | items).

**Table 27s.** Mismatching condition and CD group as reference levels.

*Fixed effects of GLMER model with CI, CD and LSE groups, mis/matching condition, lipreading, nonverbal IQ and working memory as predictors of reaction times (RTs).*

<b>Parameter</b>	<b>Est.</b>	<b>SE</b>	<b>t-value</b>
Intercept	2432.01	293.81	8.28
CI group	-11.39	367.77	-0.03
LSE group	-89.53	375.08	-0.24
Matching condition	488.98	265.39	1.84
Lipreading	69.18	163.71	0.42
Nonverbal IQ	214.01	153.39	1.39
Working memory	269.13	160.23	1.68

CI group = 13. CD group = 12. LSE group = 11.

*Note.* Formula: RTs ~ groups + mis/matching condition + lipreading + nonverbal IQ + working memory + (1 | subjects) + (1 | items).