

Look at that: Spatial deixis reveals experience-related changes in prediction

Supplementary Material

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Abstract

Prediction-based theories posit that interlocutors use prediction to process language efficiently and to coordinate dialogue. The present study evaluated whether listeners can use spatial deixis (i.e., *this*, *that*, *these*, and *those*) to predict the plurality and proximity of a speaker's upcoming referent. In two eye-tracking experiments with varying referential complexity ($N = 168$), native English-speaking adults, native English-learning 5-year-olds, and non-native English-learning adults viewed images while listening to sentences with or without informative deictic determiners, e.g., *Look at the/this/that/these/those wonderful cookie(s)*. Results showed that all groups successfully exploited plurality information. However, they varied in using deixis to anticipate the proximity of the referent; specifically, L1 adults showed more robust prediction than L2 adults, and L1 children did not show evidence of prediction. By evaluating listeners with varied language experiences, this investigation helps refine proposed mechanisms of prediction, and suggests that linguistic experience is key to the development of such mechanisms.

Experiment 1

Descriptive Statistics

Table 1: Language Groups

Language Group	Number of Subjects
L1 Adults	28
L1 Children	28
L2 Adults	28

Table 2: Age Descriptives

Children Age in Years	Min Age	Max Age	Mean Age	SD Age
L1 Children	60	71	65.07	3.84

Table 3: Age Descriptives

Adult Age in Years	Min Age	Max Age	Mean Age	SD Age
L1 Adults	18	34	20.54	4.23
L2 Adults	18	34	23.14	4.97

Table 4: Sex

Language Group	Sex	Number of Subjects
L1 Adults	Female	17
L1 Adults	Male	11
L1 Children	Female	19
L1 Children	Male	9
L2 Adults	Female	15
L2 Adults	Male	13

Practice Trials

We first confirmed that participants understood the spatial context of the eye-tracking task by analyzing their looking behavior during practice trials. Practice trials used deixis contrastively and emphasized the proximity information encoded in deictic terms by pairing the proximal and distal deictic terms with “over here” and “over there” respectively. We analyzed participants’ proportion of target looks during a time window from 200 ms after the exact onset of the deictic determiner to 2000 ms after the exact onset of the target noun using one-tailed one-sample t-tests to compare target looks to chance performance (50%). We found that all groups reliably looked to the target referent during practice trials:

Table 5: One-Sample T-test Summary

One-Sample T-tests	df	t	p	Cohen’s d
L1 Adults vs. Chance	27	11.35	< .001	2.14
L1 Children vs. Chance	27	3.75	< .001	0.71
L2 Adults vs. Chance	27	9.27	< .001	1.75

Plurality Mixed-Effects Model

We analyzed listeners' proportion of looks to plural referents for singular deictic sentences (e.g., *this/that cookie*) and plural deictic sentences (e.g., *these/those cookies*) with a mixed-effects logistic regression model, including fixed effects for language group (contrasts: L1 adults, L1 children, L2 adults), condition (contrasts: singular, plural) and time (100-ms bins, -1000 to 500 ms from noun onset) and their interactions. The model also included random intercepts for subjects and items. The below table summarizes results.

term	estimate	statistic	p.value	sig
Intercept	0.005	0.04	0.97	
L1 Children	0.524	3.90	< 0.001	*
L2 Adults	0.541	4.01	< 0.001	*
Condition	-1.591	-14.10	< 0.001	*
Time	0.048	1.04	0.3	
L1 Children x Condition	0.885	13.78	< 0.001	*
L2 Adults x Condition	0.334	5.19	< 0.001	*
L1 Children x Time	-0.140	-2.18	0.029	*
L2 Adults x Time	-0.173	-2.68	0.007	*
Condition x Time	-0.964	-21.04	< 0.001	*
L1 Children x Condition x Time	0.477	7.46	< 0.001	*
L2 Adults x Condition x Time	0.291	4.54	< 0.001	*

Cluster-Based Permutation Analyses

We first evaluated whether participants used deixis to predict the *plurality* of the referent. We compared looks to plural referents for singular deictic sentences (e.g., *this/that cookie*) and plural deictic sentences (e.g., *these/those cookies*) with a cluster-based permutation analysis (Maris & Oostenveld, 2007). The below tables summarize results for L1 adults, L1 children, and L2 adults, respectively.

start	end	cluster.stat	pval
-500	500	91.8227	< 0.001

start	end	cluster.stat	pval
-400	500	46.36682	< 0.001

start	end	cluster.stat	pval
-800	500	77.20261	< 0.001

We also used cluster-based permutation analysis to compare looks to plural referents for singular and plural neutral sentences (e.g., *the cookie* vs. *the cookies*). In this case, because the neutral determiner “the” does not provide information about the plurality of the subsequent noun, we expect to observe significant effects *after* the onset of the noun, indicating that participants oriented to the appropriate plural and singular referents once they had access to the noun’s number marking. The below tables summarize results for L1 adults, L1 children, and L2 adults, respectively.

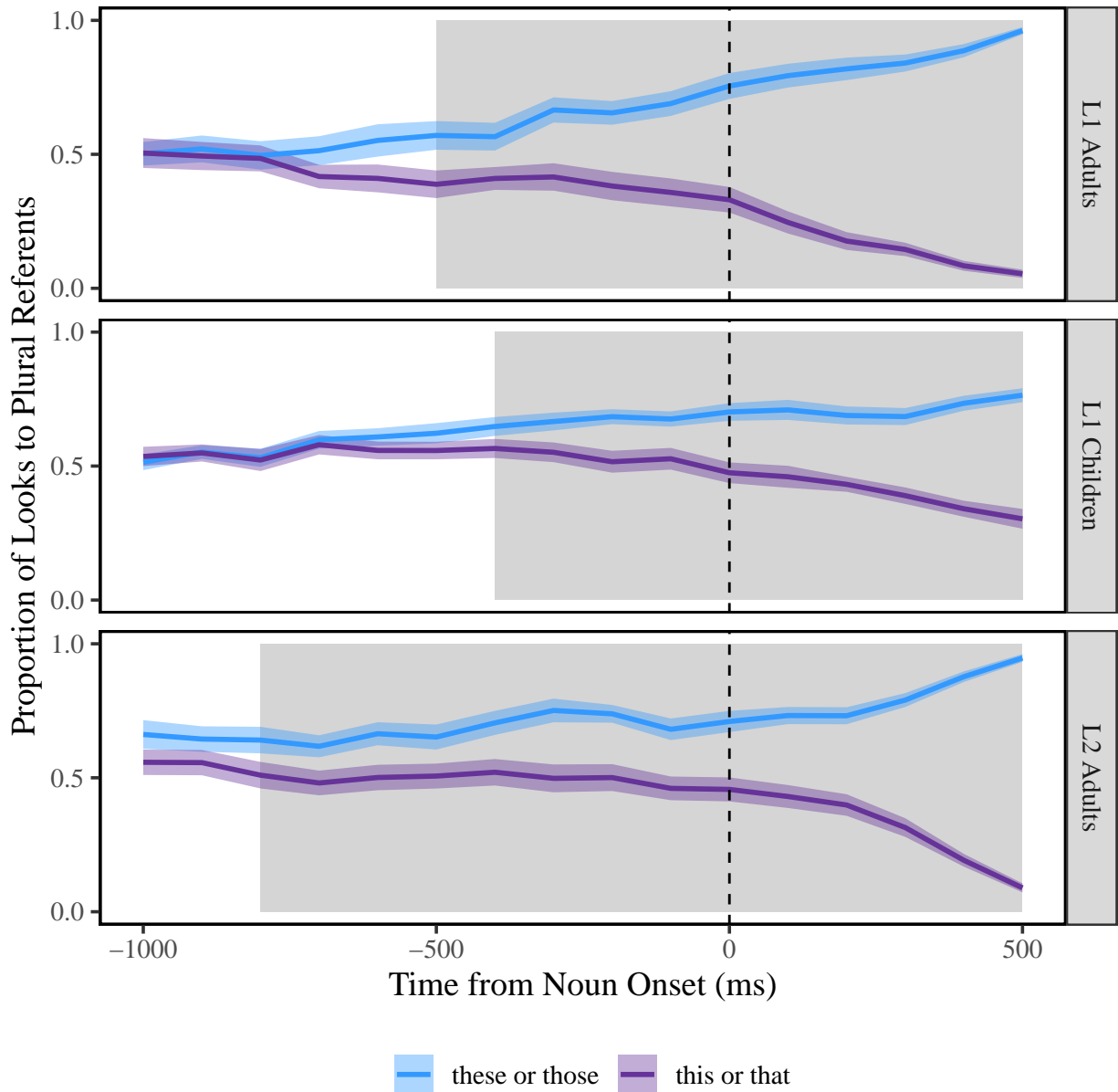
start	end	cluster.stat	pval
200	1000	200.2182	< 0.001

start	end	cluster.stat	pval
400	1000	64.50257	< 0.001

start	end	cluster.stat	pval
200	1000	136.3902	< 0.001

Plurality Figure

Experiment 1 results. Proportion of looks to plural referents for L1 adults ($n = 28$), L1 children ($n = 28$), and L2 adults ($n = 28$) during plural deictic sentences (blue) and singular deictic sentences (purple). Line shading represents one standard error from the mean, averaged by subjects. Vertical dashed lines indicate noun onset (e.g., cookie/cookies). Area shading indicates significant effects from cluster-based permutation analyses ($ps < 0.05$). In sum, results indicate that L1 adults, L1 children, and L2 adults used the plurality of deictic determiners to predict the plurality of the upcoming referent, as evident from anticipatory eye movements generated before the onset of the number-marked noun.



Proximity Mixed-Effects Model

We next evaluated whether participants used deixis to predict the proximity of the referent, using a mixed-effects logistic regression model and cluster-based permutation analyses, repeating the above plurality analyses. We compared looks to proximal referents for proximal deictic sentences (e.g., *this/these cookie/cookies*) and distal deictic sentences (e.g., *that/those cookie/cookies*). The below table summarizes results.

term	estimate	statistic	p.value	sig
Intercept	0.724	3.60	0.001	*
L1 Children	0.312	1.18	0.242	
L2 Adults	0.322	1.21	0.229	
Condition	-0.957	-21.08	< 0.001	*
Time	-0.353	-7.73	< 0.001	*
L1 Children x Condition	0.770	12.22	< 0.001	*
L2 Adults x Condition	0.401	6.35	< 0.001	*
L1 Children x Time	0.297	4.69	< 0.001	*
L2 Adults x Time	-0.105	-1.65	0.1	
Condition x Time	-0.822	-18.27	< 0.001	*
L1 Children x Condition x Time	0.529	8.42	< 0.001	*
L2 Adults x Condition x Time	0.138	2.19	0.029	*

Cluster-Based Permutation Analyses

The below tables summarize results for L1 adults, L1 children, and L2 adults, respectively.

start	end	cluster.stat	pval
-100	500	50.67892	< 0.001

start	end	cluster.stat	pval
300	500	14.44599	< 0.001

start	end	cluster.stat	pval
200	500	32.09432	< 0.001

We also used cluster-based permutation analysis to compare looks to proximal referents for proximal and distal neutral sentences (e.g., *the cookie/cookies* with a proximal referent vs. *the cookie/cookies* with a distal referent). As with the previous analysis of neutral sentences, we expect to observe significant effects *after* the onset of the noun, indicating that participants oriented to the appropriate proximal and distal referents once they had access to the noun. The below tables summarize results for L1 adults, L1 children, and L2 adults, respectively.

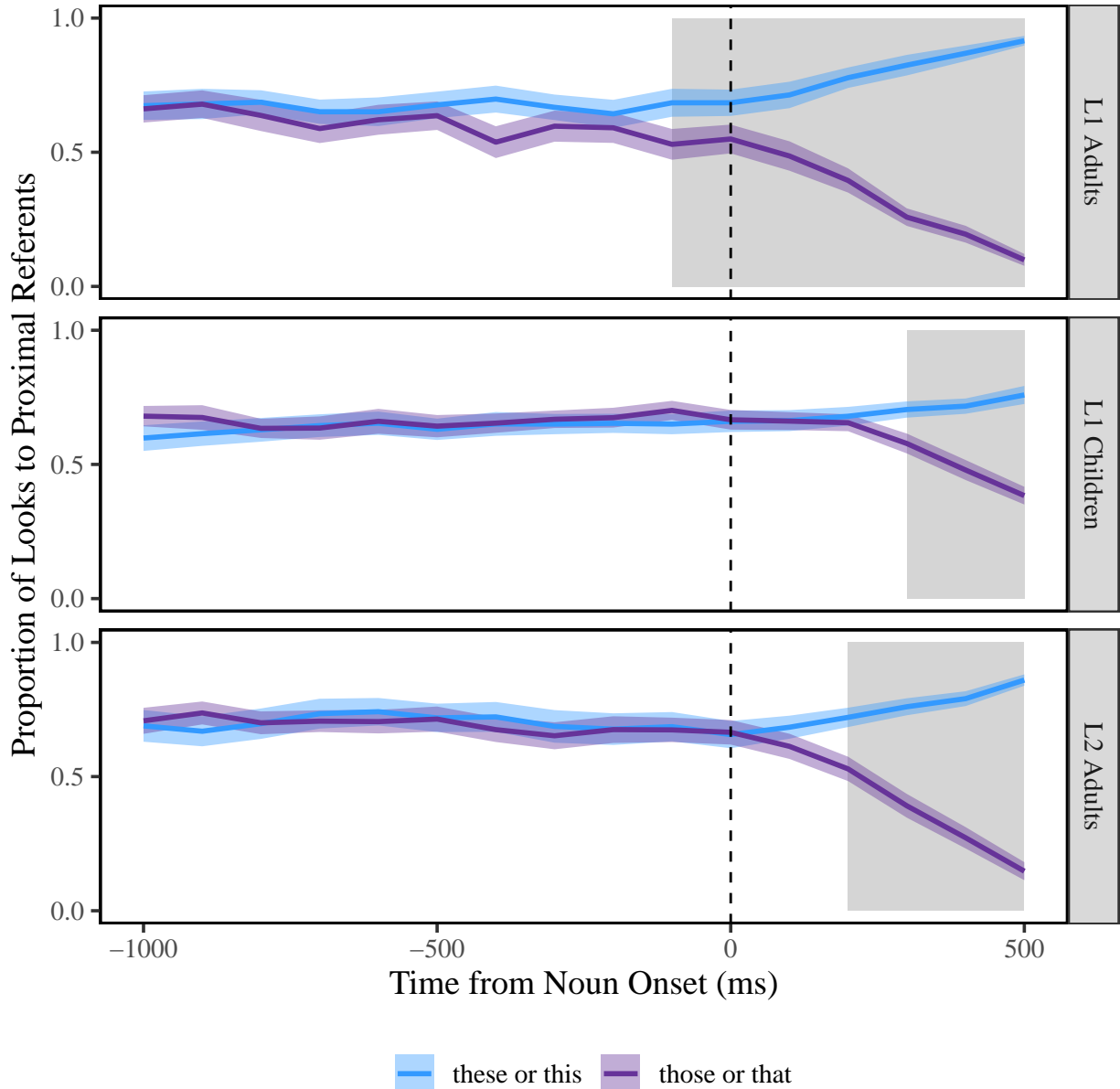
start	end	cluster.stat	pval
300	1000	159.8579	< 0.001

start	end	cluster.stat	pval
200	1000	58.26556	< 0.001

start	end	cluster.stat	pval
200	1000	138.4025	< 0.001

Proximity Figure

Experiment 1 results. Proportion of looks to proximal referents for L1 adults ($n = 28$), L1 children ($n = 28$), and L2 adults ($n = 28$) during proximal deictic sentences (blue) and distal deictic sentences (purple). Line shading represents one standard error from the mean, averaged by subjects. Vertical dashed lines indicate noun onset (e.g., cookie/cookies). Area shading indicates significant effects from cluster-based permutation analyses ($ps < 0.05$). In sum, results indicate that only L1 adults used the proximity information encoded in deictic determiners to predict the proximity of the upcoming referent.



L2 Adults Language Survey

Age Started Learning English	Number of Subjects
1	1
2	1
3	4
4	4
5	2
6	2
7	5
8	2
9	1
10	2
11	1
12	3

Measure	Min	Max	Mean	SD
Proficiency in Speaking English	4	9	7.57	1.50
Proficiency in Understanding English	5	9	7.96	1.20
Proficiency in Reading English	6	9	8.21	0.96
Proficiency in Writing English	4	9	7.71	1.46
Accent when Speaking English	1	9	6.39	2.38
Comfort when Speaking English	3	9	7.25	1.80

Measure	Min	Max	Mean	SD
Years of ESL Classes during Elementary School	0	5	2.32	2.04
... during Middle School	0	5	1.82	1.56
... during High School	0	5	1.75	1.76
... during College / after High School	0	5	0.61	1.26

Do you watch television/movies and/or listen to music in English?	Number of Subjects
Often	17
Sometimes	11

Native Language(s)	Number of Subjects
Bulgarian	2
Cantonese	6
German	1
Hebrew	1
Indonesian	1
Italian	1
Japanese	1
Kinyarwanda	1
Korean	4
Mandarin	1
Modern Greek	1
Nepalese	1
Portuguese	1
Russian	2
Spanish	2
Telugu	1
Vietnamese	1

Language(s) Spoken at Home before College	Number of Subjects
Bulgarian	2
Cantonese	6
German	1
Hebrew	1
Indonesian and English	1
Italian	1
Japanese	1
Kinyarwanda and French and Swahili	1
Korean	3
Korean and English	1
Mandarin	1
Modern Greek	1
Nepalese	1
Portuguese	1
Russian	2
Spanish	1
Spanish and Italian	1
Telugu and Hindi	1
Vietnamese	1

Exploratory Analyses

We conducted exploratory analyses to correlate L2 adults' looking behaviors during eye tracking with the questionnaire measures. The below table summarizes results.

Table 26: Correlation Summary

Prediction Correlated with...	R	df	p-value
Age Began Learning English	0.234	26	0.231
Total Years of English Exposure	-0.223	26	0.255
Total Years of ESL Classes	0.143	26	0.469
Self-Reported Proficiency in Understanding English	0.003	26	0.989
Self-Reported English Proficiency Composite Score	0.056	26	0.778

Are any groups suspiciously “accidentally correct” - already looking to the target above chance at determiner onset?

```
##
## One Sample t-test
##
## data: L1s$targetlook.mean
## t = 0.19382, df = 295, p-value = 0.8465
## alternative hypothesis: true mean is not equal to 0.25
## 95 percent confidence interval:
## 0.2066534 0.3028171
## sample estimates:
## mean of x
## 0.2547352

##
## One Sample t-test
##
## data: L1kids$targetlook.mean
## t = 0.11159, df = 342, p-value = 0.9112
## alternative hypothesis: true mean is not equal to 0.25
## 95 percent confidence interval:
## 0.2080149 0.2970354
## sample estimates:
## mean of x
## 0.2525251

##
## One Sample t-test
##
## data: L2s$targetlook.mean
## t = 1.191, df = 296, p-value = 0.2346
## alternative hypothesis: true mean is not equal to 0.25
## 95 percent confidence interval:
## 0.2305893 0.3289125
## sample estimates:
## mean of x
## 0.2797509
```

Experiment 2

Descriptive Statistics

Table 27: Language Groups

Language Group	Number of Subjects
L1 Adults	28
L1 Children	28
L2 Adults	28

Table 28: Age Descriptives

Children Age in Years	Min Age	Max Age	Mean Age	SD Age
L1 Children	60	69	63.21	2.57

Table 29: Age Descriptives

Adult Age in Years	Min Age	Max Age	Mean Age	SD Age
L1 Adults	18	21	19.32	1.22
L2 Adults	18	35	22.07	4.22

Table 30: Sex

Language Group	Sex	Number of Subjects
L1 Adults	Female	19
L1 Adults	Male	9
L1 Children	Female	16
L1 Children	Male	12
L2 Adults	Female	15
L2 Adults	Male	13

Practice Trials

As in Experiment 1, we first analyzed participants' looking behavior during practice trials to confirm they understood the spatial context of the task. As in Experiment 1, and again found that all groups reliably looked to the target referent during practice trials.

Table 31: One-Sample T-test Summary

One-Sample T-tests	df	t	p	Cohen's d
L1 Adults vs. Chance	27	12.25	< .001	2.32
L1 Children vs. Chance	27	2.65	0.007	0.50
L2 Adults vs. Chance	27	5.21	< .001	0.98

Proximity Mixed-Effects Model

As in Experiment 1, we analyzed listeners' proportion of looks to proximal referents with a mixed-effects model, using the same specifications as the previous models. The below table summarizes results.

term	estimate	statistic	p.value	sig
Intercept	1.136	7.29	< 0.001	*
L1 Children	-0.243	-1.16	0.251	
L2 Adults	0.202	0.96	0.341	
Condition	-1.452	-33.44	< 0.001	*
Time	-0.616	-13.94	< 0.001	*
L1 Children x Condition	1.087	17.92	< 0.001	*
L2 Adults x Condition	0.507	8.42	< 0.001	*
L1 Children x Time	0.457	7.48	< 0.001	*
L2 Adults x Time	-0.004	-0.06	0.949	
Condition x Time	-1.098	-25.41	< 0.001	*
L1 Children x Condition x Time	0.642	10.62	< 0.001	*
L2 Adults x Condition x Time	0.163	2.71	0.007	*

Cluster-Based Permutation Analyses

As in Experiment 1, we used cluster-based permutation analyses to evaluate whether participants used deixis to predict the *proximity* of the referent. The below tables summarize results for L1 adults, L1 children, and L2 adults, respectively.

start	end	cluster.stat	pval
-600	500	125.7087	< 0.001

start	end	cluster.stat	pval
300	500	19.97367	< 0.001

start	end	cluster.stat	pval
-400	-100	7.128247	0.002
0	500	54.967551	< 0.001

We also used cluster-based permutation analysis to compare looks to proximal referents for proximal and distal neutral sentences (e.g., *the cookie/cookies* with a proximal referent vs. *the cookie/cookies* with a distal referent). As with the previous analysis of neutral sentences, we expect to observe significant effects *after* the onset of the noun, indicating that participants oriented to the appropriate proximal and distal referents once they had access to the noun. The below tables summarize results for L1 adults, L1 children, and L2 adults, respectively.

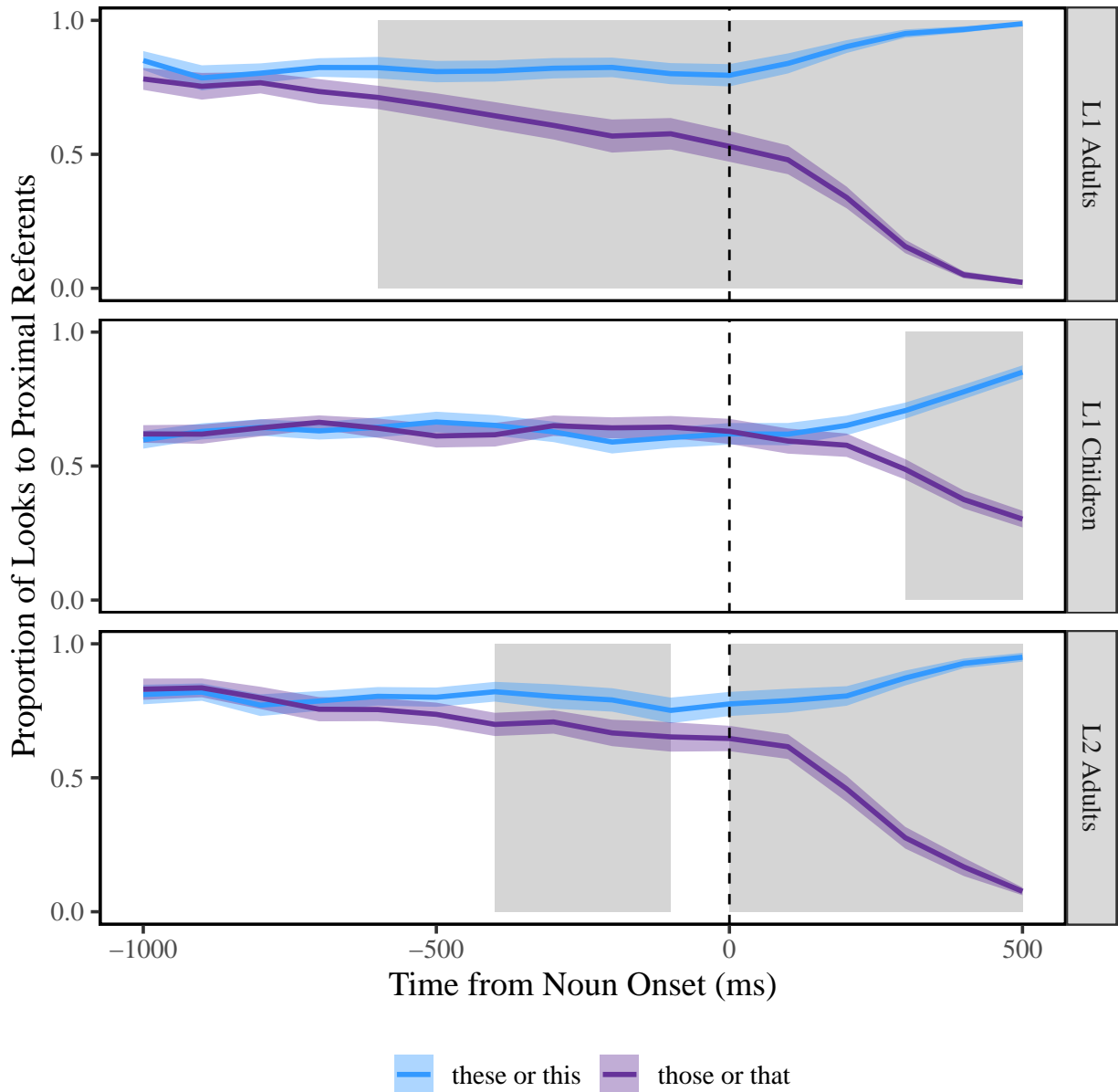
start	end	cluster.stat	pval
200	1000	291.9048	< 0.001

start	end	cluster.stat	pval
400	1000	83.50692	< 0.001

start	end	cluster.stat	pval
200	1000	185.5451	< 0.001

Proximity Figure

Experiment 2 results. Proportion of looks to proximal referents for L1 adults ($n = 28$), L1 children ($n = 28$), and L2 adults ($n = 28$) during proximal deictic sentences (blue) and distal deictic sentences (purple). Line shading represents one standard error from the mean, averaged by subjects. Vertical dashed lines indicate noun onset (e.g., cookie/cookies). Area shading indicates significant effects from cluster-based permutation analyses ($ps < 0.05$). In sum, results indicate that L1 adults and L2 adults, but not L1 children, used deictic determiners to predict the proximity of the upcoming referent, as evident from anticipatory eye movements generated before the onset of the proximal or distal noun.



L2 Adults Language Survey

Age Started Learning English	Number of Subjects
3	3
4	3
5	3
6	3
7	4
8	4
9	2
10	1
13	2
14	2
16	1

Measure	Min	Max	Mean	SD
Proficiency in Speaking English	3	9	7.96	1.32
Proficiency in Understanding English	4	9	8.39	1.13
Proficiency in Reading English	5	9	8.46	0.92
Proficiency in Writing English	3	9	7.86	1.46
Accent when Speaking English	3	9	6.93	1.54
Comfort when Speaking English	5	9	7.86	1.15

Measure	Min	Max	Mean	SD
Years of ESL Classes during Elementary School	0	5	2.46	2.10
... during Middle School	0	5	2.00	1.94
... during High School	0	5	1.86	1.88
... during College / after High School	0	5	0.89	1.50

Do you watch television/movies and/or listen to music in English?	Number of Subjects
Often	21
Sometimes	7

Native Language(s)	Number of Subjects
Cantonese	1
Hebrew	1
Japanese	2
Korean	5
Mandarin	3
Norwegian	1
Portuguese	1
Punjabi	1
Russian	4
Spanish	6
Urdu	1
Urdu and Punjabi	1
Vietnamese	1

Language(s) Spoken at Home before College	Number of Subjects
Cantonese	1
French	1
Hebrew and English	1
Japanese	2
Korean	5
Mandarin	3
Norwegian	1
Portuguese	1
Punjabi and English	1
Russian	4
Spanish	5
Urdu and Punjabi	2
Vietnamese	1

Exploratory Analyses

As in Experiment 1, we conducted exploratory analyses to correlate L2 adults' looking behaviors during eye tracking with their questionnaire measures. The below table summarizes results.

Table 45: Correlation Summary

Prediction Correlated with...	R	df	p-value
Age Began Learning English	-0.109	26	0.581
Total Years of English Exposure	-0.016	26	0.935
Total Years of ESL Classes	-0.144	26	0.464
Self-Reported Proficiency in Understanding English	0.165	26	0.401
Self-Reported English Proficiency Composite Score	0.237	26	0.224

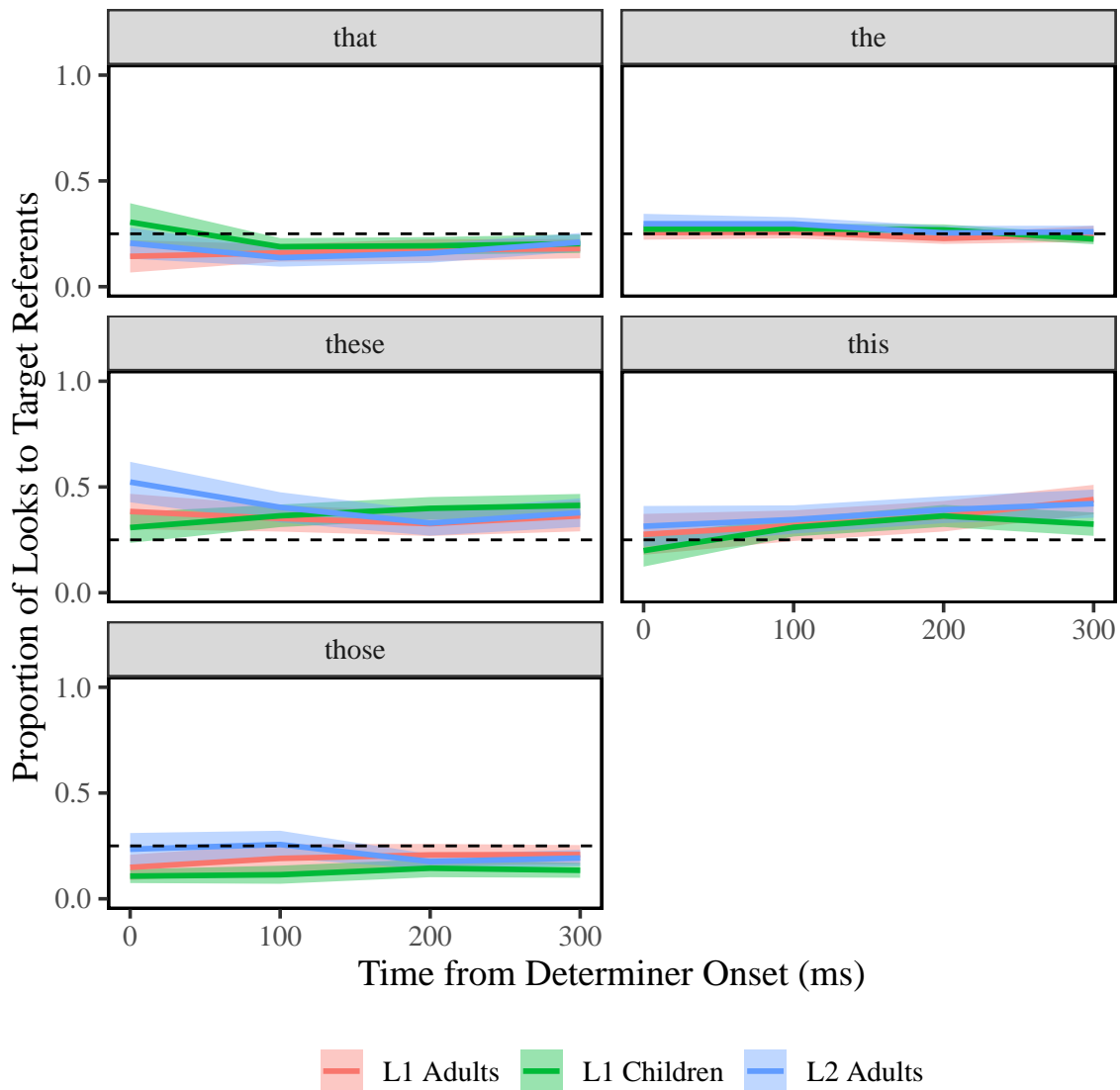
Are any groups suspiciously “accidentally correct” - already looking to the target above chance at determiner onset?

```
##
## One Sample t-test
##
## data: L1s$targetlook.mean
## t = 0.39343, df = 275, p-value = 0.6943
## alternative hypothesis: true mean is not equal to 0.5
## 95 percent confidence interval:
## 0.4534632 0.5697837
## sample estimates:
## mean of x
## 0.5116234

##
## One Sample t-test
##
## data: L1kids$targetlook.mean
## t = -0.36381, df = 347, p-value = 0.7162
## alternative hypothesis: true mean is not equal to 0.5
## 95 percent confidence interval:
## 0.4386732 0.5421809
## sample estimates:
## mean of x
## 0.490427

##
## One Sample t-test
##
## data: L2s$targetlook.mean
## t = -0.98285, df = 301, p-value = 0.3265
## alternative hypothesis: true mean is not equal to 0.5
## 95 percent confidence interval:
## 0.4156235 0.5281671
## sample estimates:
## mean of x
## 0.4718953
```

To evaluate whether there might be early differences in how participants interpret the phonetics of the determiners, we calculated participants' proportion of target looks during an early time window (0-300 ms from determiner onset). We analyzed participants' proportion of target looks for each determiner (*that*, *the*, *these*, *this*, *those*) with logistic mixed-effects models, including interacting fixed effects for language group (contrasts: L1 adults, L1 children, L2 adults) and time (100-ms bins, 0-300 ms from determiner onset), and random intercepts for subjects and items. Experiment 1 model results indicated that there were no significant differences among the three participant groups for any of the determiners. Identical analyses for Experiment 2 indicated that L1 children, as compared to L1 adults, had fewer target looks overall for *this* and had more target looks overall for *those*. This pattern of results is likely due to the fact that L1 adults and L2 adults, as compared to L1 children, had a slight bias to look toward proximal referents. Of course, these exploratory results must be interpreted cautiously. The absence of a significant behavioral effect during this early time window does not definitively determine whether listeners differentially recruited phonetic information of the determiners.

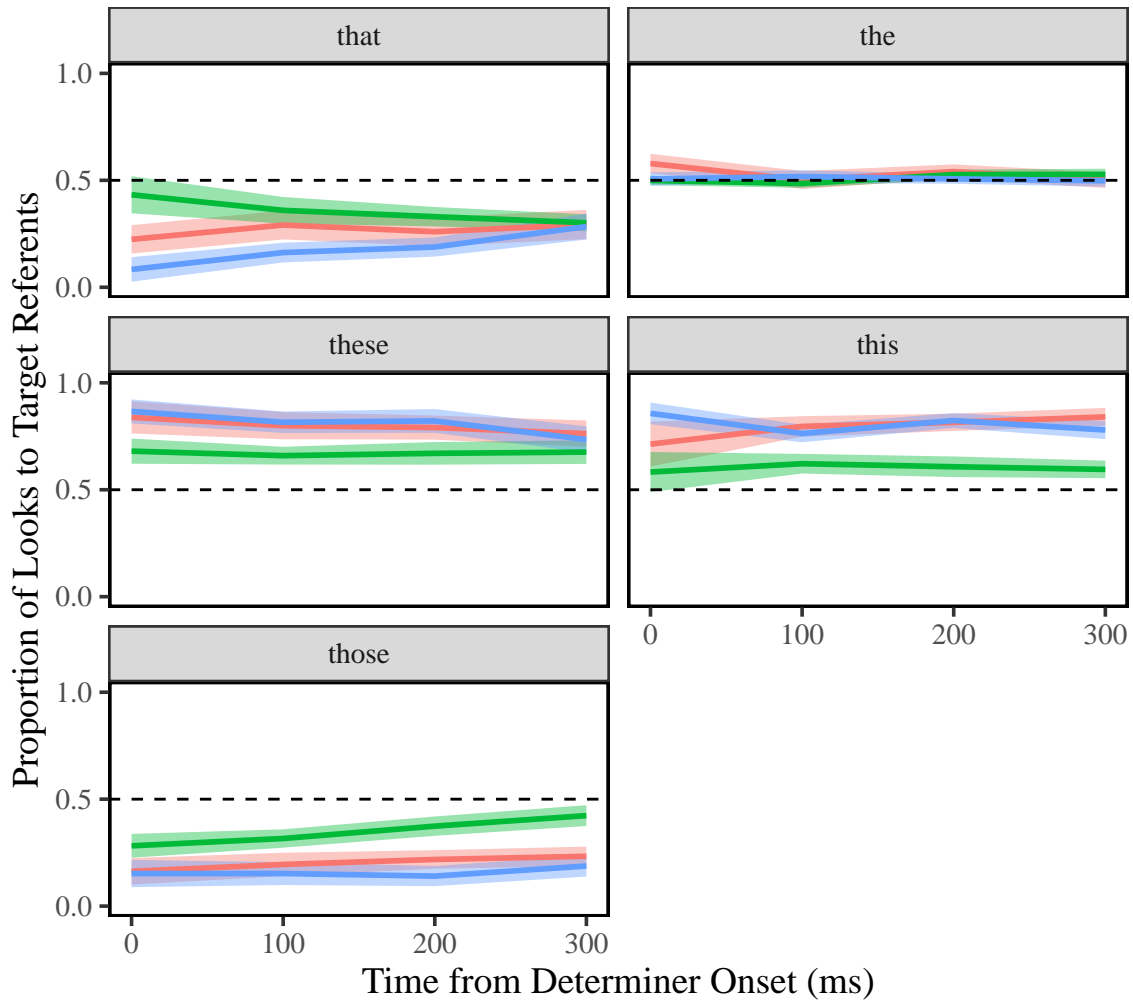



```

##
##
## |term          | estimate| statistic|p.value |sig |
## |:-----|:-----|:-----|:-----|:---|
## |Intercept     |   -2.417|    -7.38|< 0.001 |*   |
## |L1 Children   |    0.191|     0.48|0.63    |    |
## |L2 Adults     |    0.005|     0.01|0.991   |    |
## |Time          |    0.168|     1.10|0.271   |    |
## |L1 Children x Time | -0.256|    -1.24|0.214   |    |
## |L2 Adults x Time  | -0.034|    -0.16|0.873   |    |
##
##
## |term          | estimate| statistic|p.value |sig |
## |:-----|:-----|:-----|:-----|:---|
## |Intercept     |   -1.784|    -8.53|< 0.001 |*   |
## |L1 Children   |    0.026|     0.11|0.909   |    |
## |L2 Adults     |    0.130|     0.56|0.578   |    |
## |Time          |   -0.001|    -0.01|0.992   |    |
## |L1 Children x Time | -0.119|    -0.97|0.33    |    |
## |L2 Adults x Time  |    0.009|     0.07|0.941   |    |
##
##
## |term          | estimate| statistic| p.value|sig |
## |:-----|:-----|:-----|:-----|:---|
## |Intercept     |   -0.860|    -1.71| 0.097|    |
## |L1 Children   |  -0.009|    -0.02| 0.987|    |
## |L2 Adults     |    0.250|     0.44| 0.661|    |
## |Time          |   -0.191|    -1.08| 0.281|    |
## |L1 Children x Time |    0.406|     1.67| 0.095|    |
## |L2 Adults x Time  |  -0.053|    -0.21| 0.834|    |
##
##
## |term          | estimate| statistic| p.value|sig |
## |:-----|:-----|:-----|:-----|:---|
## |Intercept     |   -1.040|    -2.55| 0.013|*   |
## |L1 Children   |  -0.341|    -0.63| 0.530|    |
## |L2 Adults     |    0.016|     0.03| 0.977|    |
## |Time          |    0.267|     1.45| 0.148|    |
## |L1 Children x Time |  -0.136|    -0.55| 0.580|    |
## |L2 Adults x Time  |    0.052|     0.21| 0.836|    |
##
##
## |term          | estimate| statistic|p.value |sig |
## |:-----|:-----|:-----|:-----|:---|
## |Intercept     |   -2.300|    -6.94|< 0.001 |*   |

```

##	L1 Children		-0.359	-0.91 0.368		
##	L2 Adults		0.088	0.22 0.829		
##	Time		0.138	0.94 0.345		
##	L1 Children x Time		-0.105	-0.52 0.604		
##	L2 Adults x Time		-0.195	-0.94 0.346		



— L1 Adults
— L1 Children
— L2 Adults

```
##
##
## |term          | estimate| statistic|p.value |sig |
## |:-----: |-----:|-----:|:-----:|:---|
## |Intercept    | -1.528| -3.79|< 0.001 |*   |
## |L1 Children  |  0.394|  0.80|0.428   |    |
## |L2 Adults    | -0.524| -1.05|0.298   |    |
## |Time         | -0.076| -0.43|0.667   |    |
## |L1 Children x Time | -0.215| -0.90|0.369   |    |
## |L2 Adults x Time  |  0.409|  1.64|0.102   |    |
```

```

##
##
## |term          | estimate| statistic| p.value|sig |
## |:-----|:-----|:-----|:-----|:---|
## |Intercept     |    0.144|     0.78|   0.438|   |
## |L1 Children   |   -0.047|    -0.25|   0.806|   |
## |L2 Adults     |   -0.189|    -0.97|   0.336|   |
## |Time          |   -0.157|    -1.48|   0.139|   |
## |L1 Children x Time |    0.229|     1.59|   0.111|   |
## |L2 Adults x Time  |    0.111|     0.76|   0.449|   |
##
##
## |term          | estimate| statistic|p.value |sig |
## |:-----|:-----|:-----|:-----|:---|
## |Intercept     |    2.166|     5.67|< 0.001 |* |
## |L1 Children   |   -0.948|    -1.95|0.055   |   |
## |L2 Adults     |    0.021|     0.04|0.966   |   |
## |Time          |   -0.196|    -1.15|0.251   |   |
## |L1 Children x Time |    0.192|     0.85|0.395   |   |
## |L2 Adults x Time  |    0.002|     0.01|0.994   |   |
##
##
## |term          | estimate| statistic|p.value |sig |
## |:-----|:-----|:-----|:-----|:---|
## |Intercept     |    2.142|     5.42|< 0.001 |* |
## |L1 Children   |   -1.362|    -3.21|0.002   |* |
## |L2 Adults     |   -0.008|    -0.02|0.985   |   |
## |Time          |    0.279|     1.38|0.167   |   |
## |L1 Children x Time |   -0.208|    -0.79|0.43    |   |
## |L2 Adults x Time  |   -0.325|    -1.20|0.23    |   |
##
##
## |term          | estimate| statistic|p.value |sig |
## |:-----|:-----|:-----|:-----|:---|
## |Intercept     |   -2.158|    -5.82|< 0.001 |* |
## |L1 Children   |    1.158|     2.76|0.007   |* |
## |L2 Adults     |   -0.306|    -0.72|0.476   |   |
## |Time          |    0.240|     1.35|0.178   |   |
## |L1 Children x Time |   -0.043|    -0.18|0.855   |   |
## |L2 Adults x Time  |   -0.206|    -0.86|0.392   |   |

```