



Morphosyntactic abilities of early L2 learners in adolescence and young adulthood: Convergence with monolinguals and role of vocabulary size

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Background:

For children whose home language is different from the majority community language and of schooling, developing skills in the new language is important for integrating within society and for academic success (Cummins *et al.*, 2012; OECD, 2006; Saunders & O'Brien, 2006).

Capturing timelines of when L2 learners have developed equivalent proficiency to their monolingual peers is of interest to educators, parents, and practitioners.

Academic Performance

L2ers tend to underperform academically (Demie & Strand, 2006; Kohler & Lazarin, 2007; OECD, 2010), though this is not true for all L2ers in all early L2 contexts (Garnett, 2010).

It is important to understand when these children have developed sufficient L2 skills. 'Sufficient' L2 skills may not necessarily mean having identical proficiency to monolinguals.

Timeline of L2 Convergence:

L2ers conversational fluency precedes more complex academic language skills, which take much longer to develop (Cummins *et al.*, 2012).

Previous research assumes a 7-year-timeline for L2ers' academic language skills to converge with monolinguals (Cummins, 1981, 2000; Hakuta *et al.*, 2000; Saunders & O'Brien, 2006).

L2 Oral Language: 7 Years and Beyond

More research is required to understand how closely the 7-year timeline describes early L2ers' attainment of L2 proficiency, particularly for morphosyntax.

In addition, little is known about what attainment looks like at or after 7 years as compared to what it looks like in adulthood.

Appropriate L2 Targets:

Other L2 literature indicates that it will likely always be possible to find monolingual-bilingual differences, when scrutinized closely enough (Abrahamsson & Hyltenstam, 2009).

A language threshold that allows for academic success (Cummins et al, 2012) may be a more appropriate L2 target for bilinguals than comparison with monolinguals.

Potentially this threshold can be better understood by looking at academically successful bilinguals at (or near) ultimate attainment.

Individual Differences in L2 Attainment

Paradis et al. (2016), Paradis & Jia (2017) – external and internal factors predict variance in outcomes up to 6.5 years of L2 exposure

- Internal – vocabulary size & morphosyntax strong connection

Other studies with early bilingual development show connection between vocabulary development and grammar (Marchman et al., 2004; Conboy & Thal, 2006; Parra et al., 2011)

Research Questions:

1. After a minimum of 7 years of exposure, how do English L2s compare at two stages of long-term attainment?
2. How does vocabulary knowledge impact each study group's language proficiency as reflected on a sentence repetition task?

Participants:

Study included 4 participant groups:

1. Adult monolinguals attending university
2. Adult early L2 speakers attending university
3. Adolescent (henceforth 'teen') monolinguals attending middle school
4. Adolescent early L2 speakers attending middle school

Both L2 groups:

- began as early L2ers
- received their education in Canada.
- have diverse L1s

Sentence Repetition:

- Widely used clinically, increasingly popular experimentally
- Measure of broad language ability
 - ◆ Especially syntactic (Chiat et al., 2013; Klem et al., 2015; Poliřenská et al., 2015)

“a complex linguistic task that reflects the integrity of language processing systems at many different levels” (Klem et al., 2015)

Method:

Procedures:

Participants completed:

- Peabody Picture Vocabulary Test (PPVT; Dunn & Dunn, 2007)
 - Measure of receptive vocabulary
- Language Background Questionnaire
 - Probed language use factors, as well as timing of English exposure
- Sentence Repetition (SR) Task

Sentence Repetition Task:

Participants completed the SR task by listening to the stimulus sentences through headphones, and then repeating them into a microphone for recording.

Sentence repetitions were transcribed and errors such as omissions, additions, and replacements of words or morphemes were counted for each stimulus.

Participant Statistics:

L2 participants all had an age of arrival of less than 10 years of age and more than 7 years of subsequent English exposure. L1 groups are age matched to the L2s.

	number	mean age	mean age of arrival	mean age of English education	mean English exposure
Adult L1	36	20;8 (2;5)	birth	4.11 (0.78)	-
Adult L2	35	20;1 (1;8)	3.66 (3.66)	5.69 (1.91)	16.39 (3.23)
Teen L1	26	13;10 (0;10)	birth	3.87 (0.88)	-
Teen L2	40	13;5 (0;12)	2.48 (2.48)	4.33 (1.67)	10.94 (1.93)

Participant PPVT Score:

Mean Receptive Vocabulary Scores for Each Participant Group

	mean PPVT score	std. dev.
Adult L1	113.22	11.27
Adult L2	104.83	9.12
Teen L1	110.35	15.38
Teen L2	110.79	14.02

Note. Mean age standardized PPVT scores. Standard score is 100 with an SD range of 15 above and below the standard score.

Stimulus Condition:

Stimuli were constructed to fit three different sentence patterns; adjacent; non-adjacent; and short.

adjacent: **On the arm of the sofa, the cat is** sitting quietly.

non-adjacent: **The cat on the arm of the sofa is** sitting quietly.

short: The cat is sitting quietly.

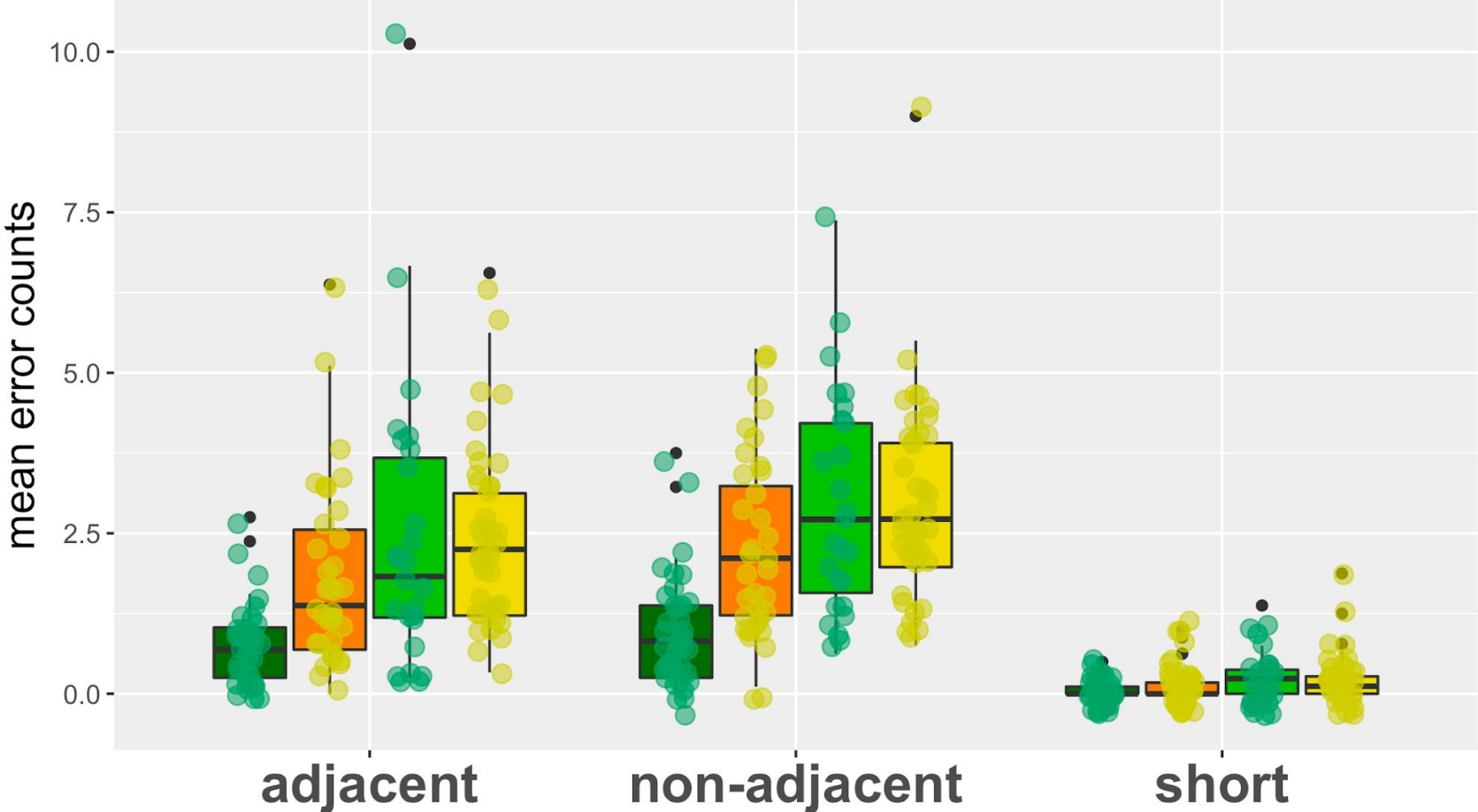
Results:

Results: Mean Error Counts

Group	adjacent	non-adjacent	short
Adult L1	0.75 (1.42)	0.98 (1.66)	0.06 (0.34)
Adult L2	1.74 (2.38)	2.28 (2.49)	0.16 (0.52)
Teen L1	2.48 (3.15)	2.93 (2.99)	0.28 (0.88)
Teen L2	2.41 (2.7)	2.98 (2.65)	0.23 (0.79)

Mean Error Counts per Condition

- Group**
- Adult L1
 - Adult L2
 - Teen L1
 - Teen L2



Analysis:

Negative binomial mixed-effects regression for a count dependent variable

Dependent variable: Number of errors per sentence

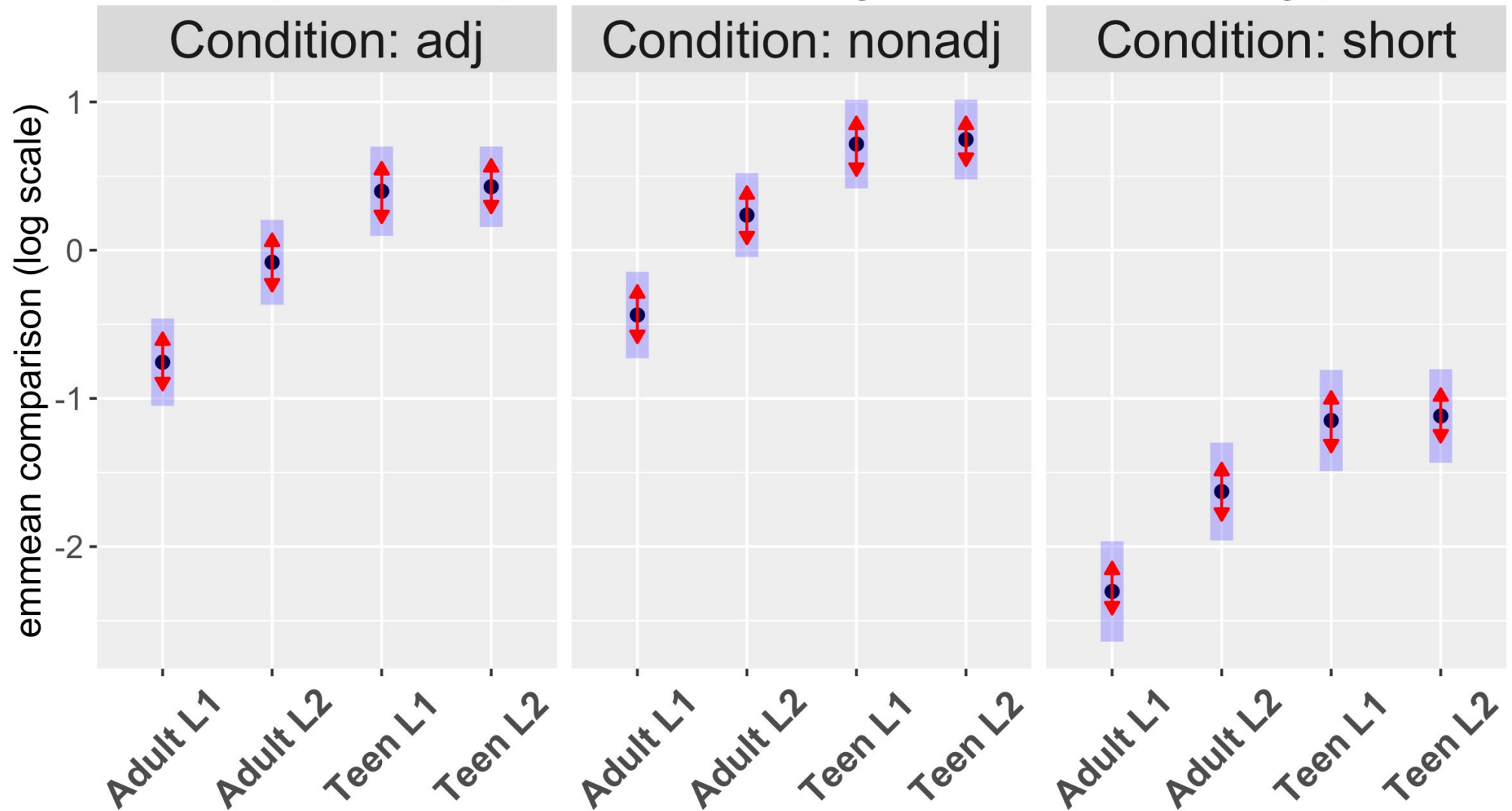
Fixed Effects:

- Condition (adjacent; non-adjacent; short)
- Group (Adult L1; Adult L2; Teen L1; Teen L2)
- Receptive Vocabulary (standardized PPVT score)
- an offset for stimulus length

Random Effects:

- Random intercepts for Subject and Item

Group Comparisons by Stimulus Type

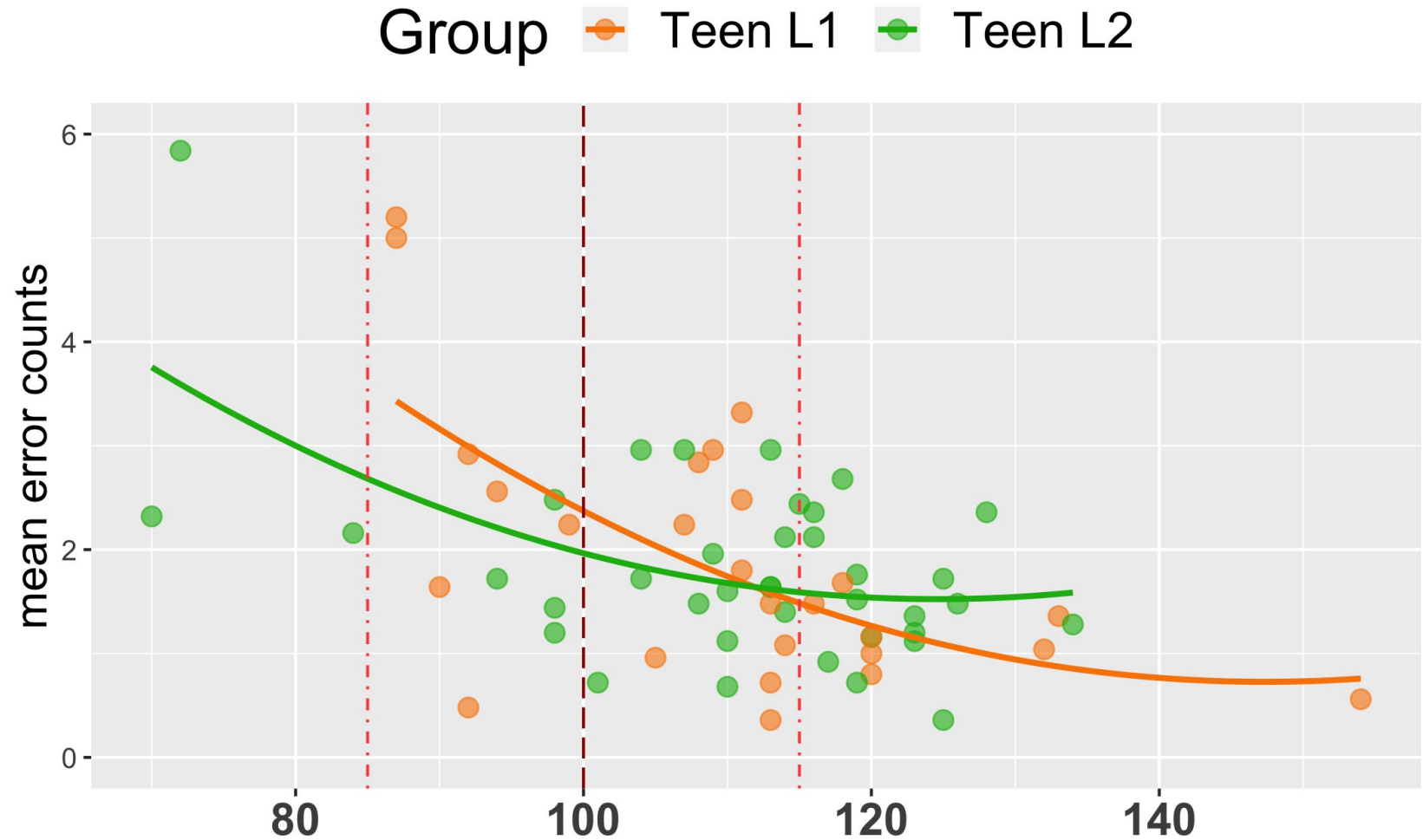


Impact of Receptive Vocabulary: Teens

Inclusion of PPVT score:

PPVT (scaled)
estimate: -0.365
 $p < .001^{***}$

Receptive Vocabulary vs. Mean Errors



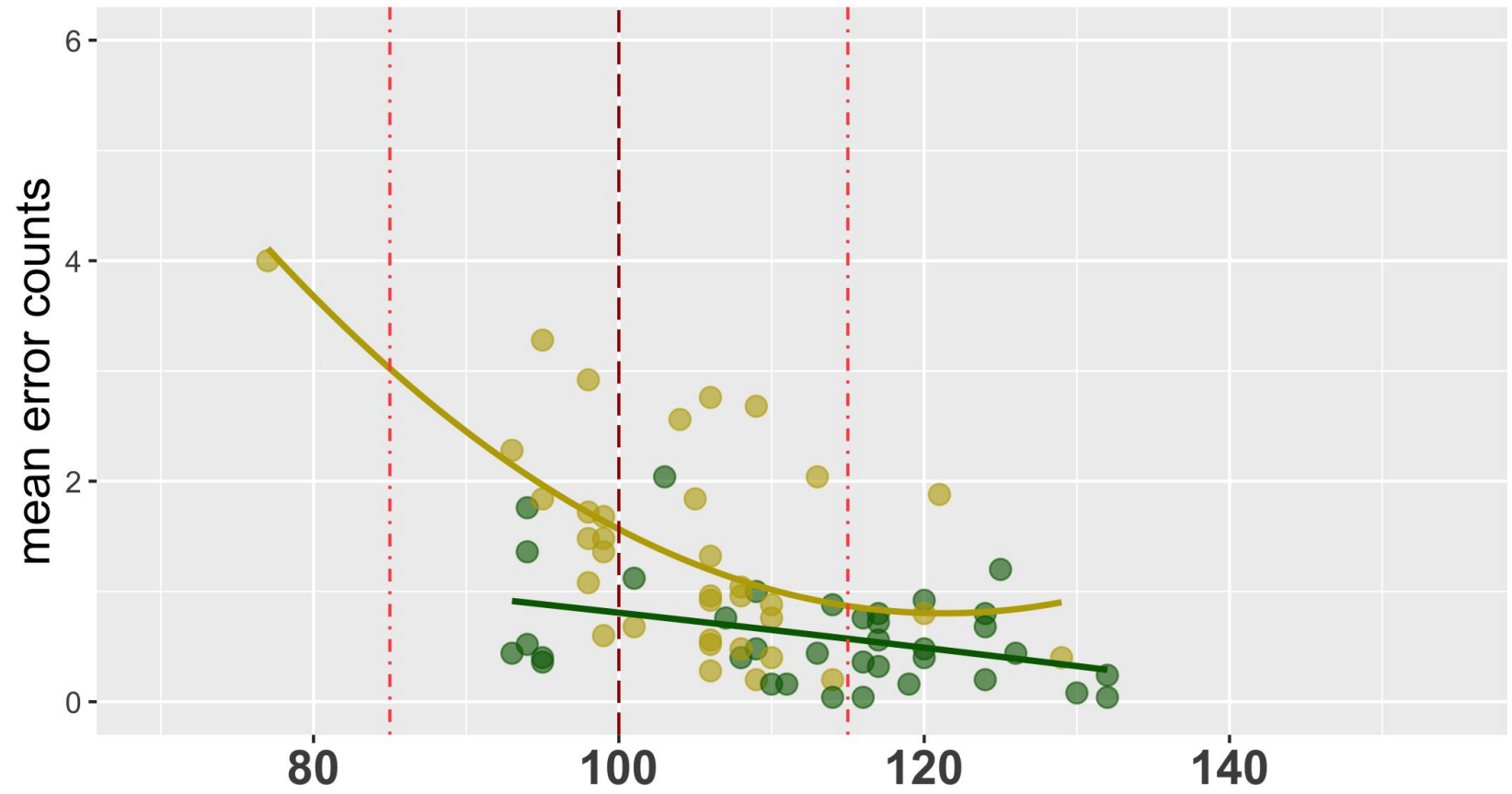
Impact of Receptive Vocabulary: Adults

Inclusion of PPVT score:

PPVT (scaled)
estimate: -0.365
 $p < .001^{***}$

Receptive Vocabulary vs. Mean Errors

Group ● Adult L1 ● Adult L2



Discussion:

Group Differences

Of the 4 study groups, the 2 teen groups are very similar, both in mean PPVT scores (L1s - 110.35, & L2s - 110.79), and in their performance on the SR task (estimated difference in accuracy 0.03; $p = .997$).

The near-identical teen groups were significantly less accurate than either of the 2 adult groups. However, the adult L1s were significantly more accurate than the adult L2s.

Monolingual vs. Bilingual Convergence

Our cross-sectional evidence suggests that development may not plateau after 7 years of English exposure for either L1s or L2s.

Though the adult L1s and L2s are significantly different for accuracy, it is unlikely that this difference reflects a practical limitation on the academic success of the adult L2s.

Receptive Vocabulary

Receptive vocabulary as reflected by PPVT score, predicted more accurate performance for all participant groups.

Thus, receptive vocabulary improves SR accuracy without regard to whether the language is a participant's L1 or L2.

The relationship between vocabulary and morphosyntax endures from early bilingual development into adulthood.

Thanks for Listening.

Questions?

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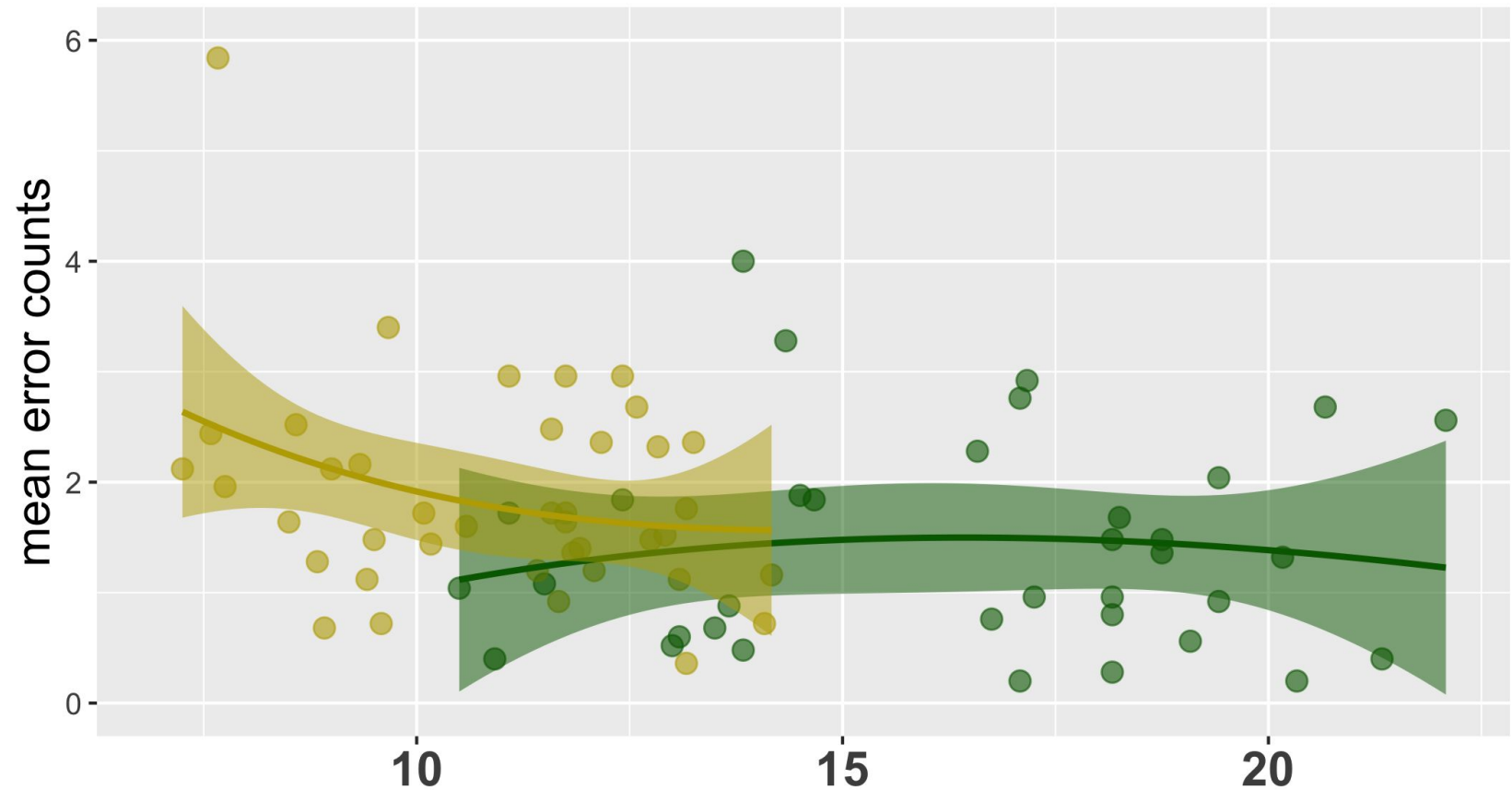
Additional Slides

Accuracy by Length of English Exposure:

Length of English Exposure
Calculated by difference in age
at test and age of beginning
English education.

Length of English Exp. vs. Mean Errors

Group ■ Adult L2 ■ Teen L2



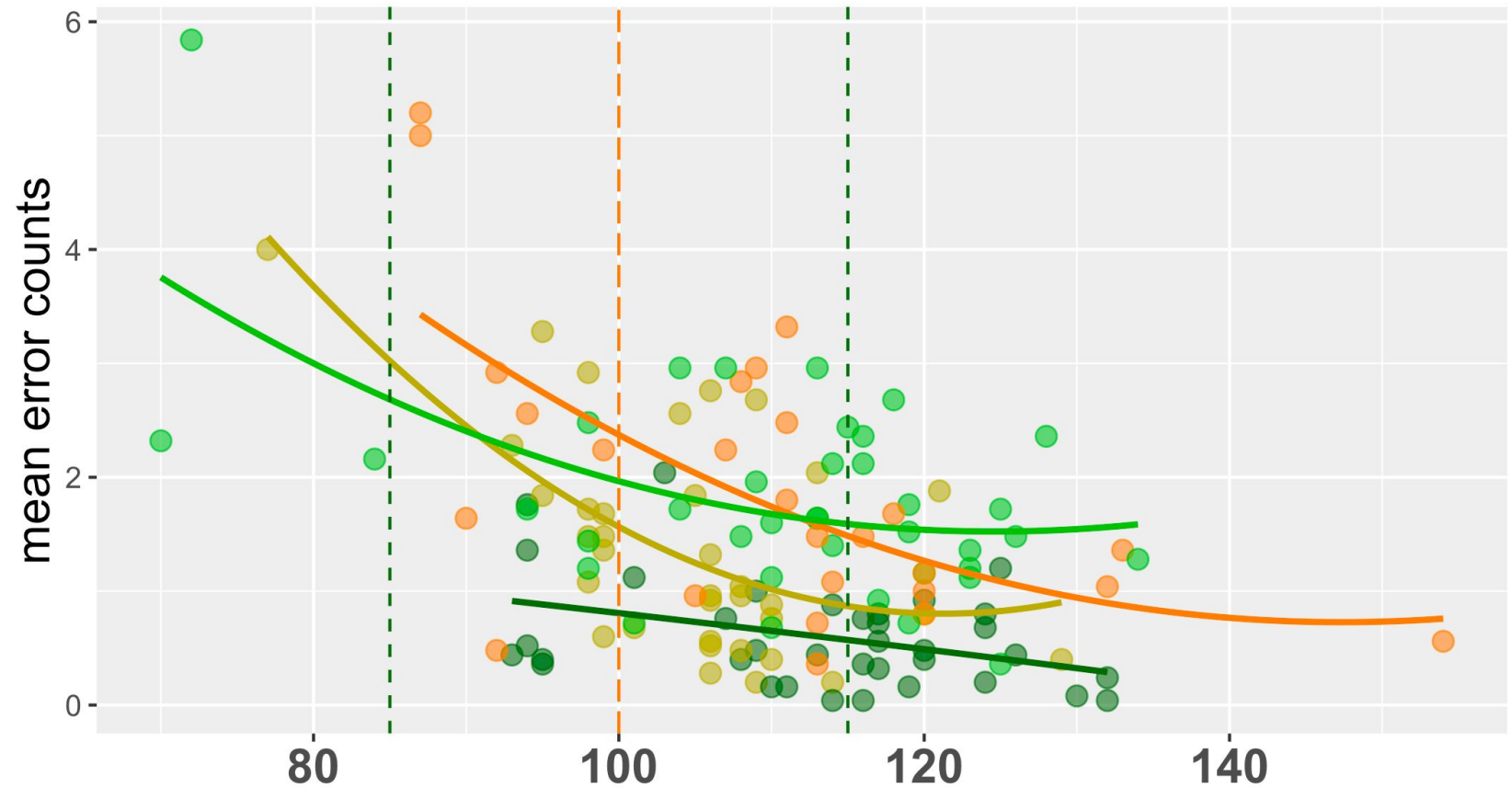
Impact of Receptive Vocabulary

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Receptive Vocabulary vs. Mean Errors

Group ● Adult L1 ● Adult L2 ● Teen L1 ● Teen L2



Pairwise Comparisons: *All Conditions*

	estimate	std. err	df	z-ratio	p-value	
Adult L1 - Adult L2	-0.67	0.15	3,364	-4.40	<.001	***
Adult L1 - Teen L1	-1.15	0.16	3,364	-7.21	<.001	***
Adult L1 - Teen L2	-1.18	0.15	3,364	-8.13	<.001	***
Adult L2 - Teen L1	-0.48	0.16	3,364	-3.05	.012	*
Adult L2 - Teen L2	-0.51	0.14	3,364	-3.56	.002	**
Teen L1 - Teen L2	-0.03	0.15	3,364	-0.20	.997	

Estimated Marginal Means Comparisons for Control and EL2 Groups

Note. This table shows pairwise comparisons between the control and EL2 groups for each stimulus morpheme type. Note that these values will correspond to the 'Group: EL2' comparison from Table 3 when each level for stimulus morpheme type is set to the reference level. $p < .001$ '***', $p < .01$ '**', $p < .05$ '*'.