

Language Learning On Screen: Promoting Bilingual Vocabulary Development in Preschool-Aged Dual Language Learners

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Kevin M. Wong, Ph.D.
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A. Background

Children and Media

- 2+ hours media use among young children
- Opportunity for bilingual input and development

Language of Instruction (L2)

- Immersion in L2
- Allowing strategic L1 supports

Importance of Vocabulary

- Foundation of fluency

B. Conditions

Condition	Language	Age	Duration	Materials	Assessment
Condition 1	English	4-5 years	10 min	Interactive English L2 program	Pre-test, Post-test
Condition 2	English	4-5 years	10 min	Interactive English L2 program	Pre-test, Post-test
Condition 3	English	4-5 years	10 min	Interactive English L2 program	Pre-test, Post-test
Condition 4	English	4-5 years	10 min	Interactive English L2 program	Pre-test, Post-test
Condition 5	English	4-5 years	10 min	Interactive English L2 program	Pre-test, Post-test
Condition 6	English	4-5 years	10 min	Interactive English L2 program	Pre-test, Post-test
Condition 7	English	4-5 years	10 min	Interactive English L2 program	Pre-test, Post-test
Condition 8	English	4-5 years	10 min	Interactive English L2 program	Pre-test, Post-test
Condition 9	English	4-5 years	10 min	Interactive English L2 program	Pre-test, Post-test
Condition 10	English	4-5 years	10 min	Interactive English L2 program	Pre-test, Post-test

I. English Immersion: English L2, English Definitions

II. English with Mandarin Immersion: English L2, Chinese Definitions

C. Methods

Design

- Within subjects design
- Participants exposed to all conditions
- Participants serve as their own control

Sample

- 87 children
- 4-5 years old
- Mandarin heritage speakers
- Affected program for Chinese-American, Immigrant, Low-income communities

D. Findings

RESEARCH QUESTION 1: Language of Instruction

- The language of instruction was facilitative in L1 and L2 vocabulary learning
- word identification, $F(1, 82) = 7.34, p < .001$
- receptive word meaning, $F(1, 82) = 20.81, p < .001$
- expressive word meaning, $F(1, 82) = 22.14, p < .001$
- see highlighted text in Table 4 below

RESEARCH QUESTION 2: Language of Definitions

- The language of definitions was neither facilitative nor a hindrance towards L1 and L2 vocabulary learning

E. Implications

- Ability for preschool bilingual learning through educational media
- Opportunity for new language learning
- Opportunity for heritage language maintenance
- Language of instruction matters
- Language of definitions may play additive role, versus no further investigation

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A. BACKGROUND

Children and Media

- 2+ hours media use among young children
- Opportunity for bilingual input and development

Language of Instruction (LOI)

- Immersion in L2
- Allowing *strategic* L1 supports

Importance of Vocabulary

- Foundation of (bi)literacy
- Explicit definitions to support acquisition

Aim: to examine how the language of instruction and the language of definitions as *strategic scaffolds* to support vocabulary learning on screen.

Research Questions

1. How does the language of instruction affect L1 and L2 vocabulary learning in DLLs?
2. How does the language of definitions affect L1 and L2 vocabulary learning in DLLs?

B. CONDITIONS

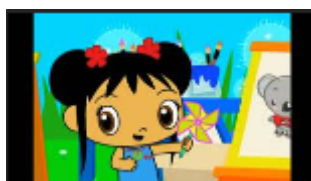
Table 1

Conditions for Home Language Supports

	Language of instruction	Language of definitions	Example
Condition 1: English Immersion	English	English	Monkey: Blow out the candles, Rintoo. Kai-Lan: What does blow mean? Monkey: Blow is when you make air come out of your mouth.
Condition 2: English with Mandarin Supports	English	Mandarin	Monkey: Blow out the candles, Rintoo. Kai-Lan: Blow 的意思是什麼呢? Monkey: Blow 就是從你的嘴巴把空氣推出來的動作。
Condition 3: Mandarin Immersion	Mandarin	Mandarin	Monkey: Rintoo要 吹 蠟燭。 Kai-Lan: 吹 的意思是什麼呢? Monkey: 吹 就是從你的嘴巴把空氣推出來的動作。
Condition 4: Mandarin with English Supports	Mandarin	English	Monkey: Rintoo要 吹 蠟燭。 Kai-Lan: What does 吹 mean? Monkey: 吹 is when you make air come out of your mouth.

I. English Immersion:

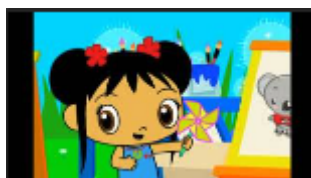
English LOI, English Definitions



(click here for video) (<https://drive.google.com/file/d/1E1cM2VwLXNJCTY2-iwv0NTEqOi790FDI/view?usp=sharing>)

II. English with Mandarin Supports:

English LOI, Chinese Definitions (https://drive.google.com/file/d/1m6j04kfVXKLL7W4WSIHeAD_yBQf-mMRt/view?usp=sharing)



(click here for video) (https://drive.google.com/file/d/1m6j04kfVXKLL7W4WSIHeAD_yBQf-mMRt/view?usp=sharing)

III. Chinese Immersion:

Chinese LOI, Chinese Definitions (<https://drive.google.com/file/d/1op6wEmFGPSKxkmlqPcv52tem64YJyh8f/view?usp=sharing>)



([click here for video](#)) (<https://drive.google.com/file/d/1op6wEmFGPSKxkmlqPcv52tem64YJyh8f/view?usp=sharing>)

IV. Chinese with English Supports

Chinese LOI, English Definitions



([click here for video](#)) (<https://drive.google.com/file/d/1nNIGSaCR7ATeGmMdvh7YCjS9lI3hvc9U/view?usp=sharing>)

C. METHODS

Design

- Within-subjects design
- Participants exposed to all conditions
- Participants serve as own control

Sample

- 87 children
- 4-5 years old
- Mandarin heritage speakers
- Afterschool program for Chinese-American, Immigrant, Low-income communities

Table 2

Descriptive Statistics and Demographics of Full Sample (N = 87)

Variable	Characteristic
Female	51%
Age (months)	59.42 (7.97)
Age Span	48-72
Ethnically Chinese	91%
PPVT	
English PPVT Standard Score	88.78 (13.21)
Chinese PPVT Standard Score	80.15 (19.93)
Language Environment Questionnaire (max. = 14)	
English Composite Score	7.07 (2.70)
Chinese Composite Score	8.21 (3.28)

Measures

Pre-Assessments

- English PPVT (vocabulary; Dunn & Dunn, 2007)
- Chinese PPVT (vocabulary; Lu & Liu, 1998)
- Word Identification
 - Receptive & Expressive
 - English & Chinese

Post-Assessments

- Word Identification (same as pretest)
- Word Meaning
 - Receptive & Expressive
 - English & Chinese

Video Stimuli

- Ni-hao Kai-lan
- Four episode clips
- Three novel words per clip (n/adj/v)
- See video samples in conditions column

Table 3

Details of Video Clips Selected

Episode	Duration	Synopsis	English Vocabulary	Chinese Vocabulary	CHILDES
<i>Roller Rintoo</i>	2:08	Kai-lan and friends go roller skating. Rintoo doesn't know how to roller skate but learns to skate with the help of his friends.	rink (n.) wobbly (adj.) glide (v.)	旱冰場 (量) 搖搖晃晃 (形) 滑行 (動)	0 3 0
<i>The Snowiest Ride</i>	2:14	Kai-lan and friends go on a sledding adventure down a mountain and discover beautiful ice sculptures.	ice sculpture (n.) transparent (adj.) carve (v.)	冰雕 (量) 透明 (形) 雕刻 (動)	0 0 2
<i>Lulu Day</i>	2:15	Kai-lan gets ready to play with her friend, Lulu. Together, they play with a new toy, the pinwheel.	pinwheel (n.) thrilled (adj.) twirl (v.)	紙風車 (量) 興奮 (形) 旋轉 (動)	1 0 0
<i>Tolee's Rhyme Time</i>	2:13	Kai-lan's friend, Tolee, is feeling frustrated. After grandpa teaches them how to do Tai Chi, they feel better.	Tai Chi (n.) frustrated (adj.) meditate (v.)	太極 (量) 挫敗 (形) 冥想 (動)	0 0 0

Procedure

- pretest
- video + posttest
- counterbalanced by Latin square design
- 30-35 minutes completion

Data Analysis

- 2 x 2 repeated measures ANCOVA
- language of instruction (2: English, Chinese) as the first between-subjects factor
- language of definitions (2: English, Chinese) as the second between-subjects factor
- Covariates included age in months, standardized English and Chinese PPVT scores, word identification pretest scores

E. IMPLICATIONS

- Ability for preschool bilingual learning through educational media
- Opportunity for new language learning
- Opportunity for heritage language maintenance
- Language of instruction matters
- Language of definitions may play additive role; warrants further investigation



D. FINDINGS

RESEARCH QUESTION 1: Language of Instruction

- The language of instruction was facilitative in L1 and L2 vocabulary learning
- word identification, $F(1, 82) = 7.84, p=.006$;
- receptive word meaning, $F(1, 82) = 20.83, p=.000$;
- expressive word meaning, $F(1, 82) = 22.14, p=.000$
- see highlighted text in Table 4 below

RESEARCH QUESTION 2: Language of Definitions

- The language of definitions was neither facilitative nor a hindrance towards L1 and L2 vocabulary learning
- word identification, $F(1, 82) = 1.64, p=.203$;
- receptive word meaning, $F(1, 82) = .201, p=.655$;
- expressive word meaning, $F(1, 82) = 1.31, p=.257$
- [see blue text in Table 4 below](#)

Table 4

ANCOVA Inferential Statistics for All Vocabulary Assessments

Dependent Variable	Contrast	Main Effects and Interactions					
		F	df	Sig.	MS _{Effect}	SS _{Error}	MS _{Error}
Word Identification Posttest	Language of Instruction*	7.835	1, 82	.006	.201	45.270	.041
	Language of Definitions	1.644	1, 82	.203	.032		
	English PPVT	3.492	1, 82	.065	.143		
	Chinese PPVT*	8.828	1, 82	.004	.361		
	Age*	30.057	1, 82	.000	1.229		
	Pretest*	15.409	1, 82	.000	.630		
Receptive Word Meaning Posttest	Language of Instruction*	20.833	1, 82	.000	.972	185.541	.062
	Language of Definitions	.201	1, 82	.655	.005		
	English PPVT*	6.438	1, 82	.013	.402		
	Chinese PPVT	3.925	1, 82	.051	.245		
	Age*	9.158	1, 82	.003	.572		
	Pretest*	6.426	1, 82	.013	.402		
Expressive Word Meaning Posttest	Language of Instruction*	22.136	1, 82	.000	.528	18.354	.047
	Language of Definitions	1.306	1, 82	.257	.027		
	English PPVT*	6.974	1, 82	.010	.327		
	Chinese PPVT	1.539	1, 82	.218	.072		
	Age	2.084	1, 82	.153	.098		
	Pretest*	13.032	1, 82	.001	.611		

Note. SS = sum of squares; MS = mean square; PPVT = Peabody Picture Vocabulary Test.

* $p < .05$.

AUTHOR INFORMATION

Kevin Wong is an Assistant Professor at Pepperdine University in the Graduate School of Education and Psychology. He received his Ph.D. in Teaching and Learning at New York University, specializing in literacy and multilingual education. His research and teaching examine educational equity for underserved populations, especially as their academic trajectories are negatively affected by language education. Kevin is currently involved in research projects that collectively investigate language learning in the Pre-Kindergarten to Grade 12 context. These include collaborations on Chinese-English dual language bilingual education, L2 writing assessment, language policies for multilingual education, and early word learning through educational media.

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ABSTRACT

To promote second language development in Dual-Language Learners (DLLs), scholars have long contested whether using a child's L1 or home language in the classroom might facilitate the process of learning a second language (Collins, 2010; Cummins, 1979; Goldenberg, 2013). Research suggests that immersing children in a new language without using a child's L1 maximizes children's exposure to the L2 and provides ample opportunities for children to listen to and use the new language (Curtain & Dahlberg, 2004; Genesee, Paradis, & Crago, 2004; Hoff et al., 2012; Lindholm-Leary, 2001). While many classrooms around the globe use immersion to promote second language development in young learners, not all students are able to navigate the demands of this sink-or-swim model (Cohen & Swain, 1976). Alternatively, scholars note that strategically using a child's L1 to support second language vocabulary development in DLLs (Gersten & Baker, 2000; Goldenberg, 2013), such as using rich definitions of words in a child's L1 to scaffold L2 vocabulary learning (Collins, 2010). While technology-based environments have the ability to facilitate L2 development in DLLs, they simultaneously have the potential to help children learn and maintain their L1. Thus, the current study aims to examine how the language of instruction in educational media might promote bilingual vocabulary development. Research questions guiding this study are: (1) How does the language of instruction in educational media affect L1 and L2 vocabulary learning in DLLs? (2) How do definitional supports in a child's L1 or L2 affect L1 and L2 vocabulary learning in DLLs?

Drawing from theories of dual-coding, linguistic interdependence, and dynamic bilingualism, 87 children ($M = 59.42$ months) viewed educational media programs in four different conditions in a within-subjects design: English immersion, English with Mandarin supports, Mandarin immersion, Mandarin with English supports. At the end of each video, assessors followed a script to administer the vocabulary knowledge assessments: vocabulary labeling, receptive word meaning, expressive word meaning. Through a repeated measures ANCOVA, findings indicate that the language of instruction plays a critical role in L1 and L2 vocabulary learning for the language of instruction with the vocabulary labeling measure, $F(1, 82)=7.84$, $p=.006$; receptive word meaning measure, $F(1, 82)=20.83$, $p=.000$; and expressive word meaning measure, $F(1, 82)=22.14$, $p=.000$. Language of definitions, however, did not appear to influence vocabulary learning.

This study investigates the potential of technology-based environments to facilitate L1 and L2 vocabulary development in DLLs. Findings affirm that when the language of media reflects the dominant language of children, they appear to demonstrate higher vocabulary gains in the L2. Results from the current study may provide educators and parents with an understanding of how bilingual media programs can provide children with opportunities to draw from their linguistic repertoires and make sense of new educational content. Considering educational media has the ability to provide children with focused and targeted instruction, the current study may uncover new potential for dual language maintenance at the nexus of educational media and bilingual education

REFERENCES

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