

# Investigating the Association Between E-book Interactive Features and Learning Outcomes During Bilingual Shared Reading



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# Introduction

## The impacts of E-book features on children's learning

- E-book usage and screen-mediated reading significantly increased in children's home literacy practices (Kodama et al., 2021; Rideout, 2020; Strouse & Ganea, 2017; Wang et al., 2019).
- Reading experiences and digital learning vary significantly due to the e-book design features (Doty, 2015; Tackas et al., 2015).
- Gold standard: a features that are congruent to the narration could enhance children's learning, while incongruent features can impede children's learning (Furenes et al., 2021; Kucirkova, 2019; Richter & Courage, 2017; Sung, 2017)..
- Congruence between e-book features and the storyline has been widely accepted as an e-book design principle for researchers and designers.

## Lack of research in bilingual shared reading setting

- Little attention has been drawn to reading e-book in bilingual settings, though millions of EFL students and parents consider English e-books a rich and authentic language learning resource (Al-Ali & Ahmed, 2015; Gohar, 2017).
- Most researchers focus on children's independent use of e-book and ignore the common home literacy practices in bilingual setting, parent-child shared reading.
- The study aims to fill these gaps in the literature by investigating how children and parents in an EFL setting interact with the e-book interactive hotspot features during shared-reading and how these interactions contribute to children's learning and reading motivation.



## Research Questions

- How do parents and children in the EFL setting interact with two types of e-book hotspots (multimedia dictionary hotspot and story character statement hotspot) during shared reading?
- How does hotspot activation associate with children's learning outcomes and learning motivation?





# Methodology

## Participants:

Descriptive Statistics			
Variable	Obs	Female	Male
Child Gender	132	59	73
Parent Gender	132	123	9

## The Interactive E-book and User Log Variables:

- (1) Multimedia Dictionary (**relevant to the vocabulary but not necessarily related to the main storyline**): A dictionary window pops up if users touch words/phrases with hyperlinks in the text or story-relevant items in the illustration (e.g., gift, fence). The multimedia dictionary window contains four elements: a child-friendly definition in English, a child-friendly example sentence of the target word in English, Chinese translation, and a visual representation of that word as either an animated or static picture.
- (2) Story Character Statement (**congruent to the storyline**): Story character statement hotspots allow users to click on an item or character and listen to some story-related statements by the characters.

## Measures of Learning and Motivational Outcomes:

- **Story Comprehension**: children receive a comprehension test in order to evaluate how well they understand the story after their reading sessions. Each child is asked seven questions including close-ended questions and open-ended questions, e.g. How many guards does Little Oak have to pass on the way to save his friends and who are they?
- **Story Retelling**: children were also administered a Story Retelling Test after the shared reading sessions where they were asked to retell the story with some key illustrations displayed on the screen.
- **Reading Motivation**: we scored children's reading motivation based on five survey questions, e.g. my child is more motivated to read this e-book compared to other reading materials.

# Results



**Table 1.** Descriptive statistics of all variables

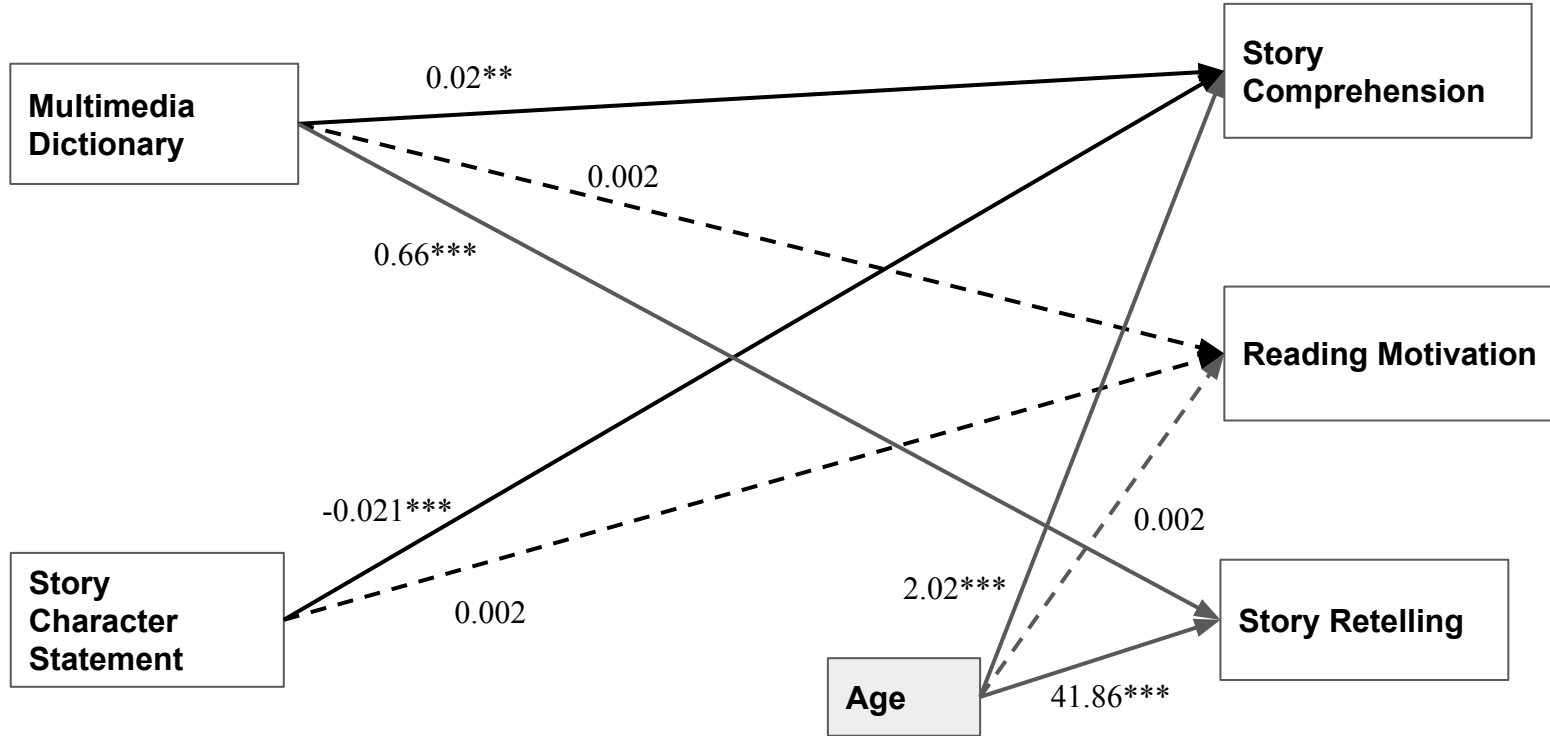
Variable	Obs	Mean	Std. Dev.	Min	Max
Multimedia Dictionary	132	38.21	51.60	0	232
Story Character Statement	132	87.51	77.17	0	533
Reading Motivation	129	3.72	.91	1.25	5
Story Comprehension	130	15.63	7.02	0	24
Story Retelling	131	146.76	135.68	0	636

**Table 2.** Pairwise correlations of the variables in SEM model

Variables	(Dictionary)	(Character statement)	(Children motivation)	(Story comprehension)	(Story recall)
Multimedia Dictionary	1.00				
Story Character Statement	0.29***	1.00			
Reading Motivation	0.14*	0.17*	1.00		
Story comprehension	0.16*	-0.18**	0.08	1.00	
Story Retelling	0.33***	0.13	0.10	0.46***	1.000

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

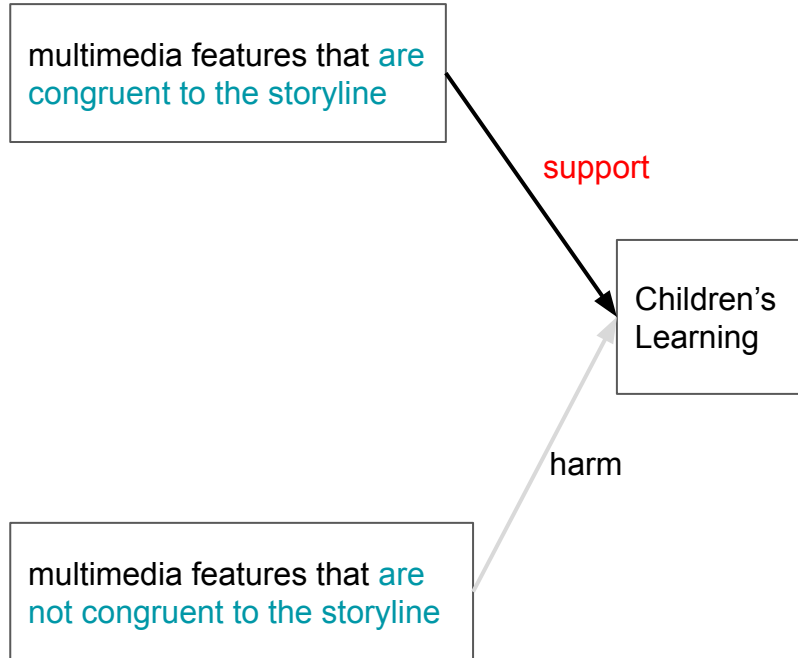
# Result - SEM Model



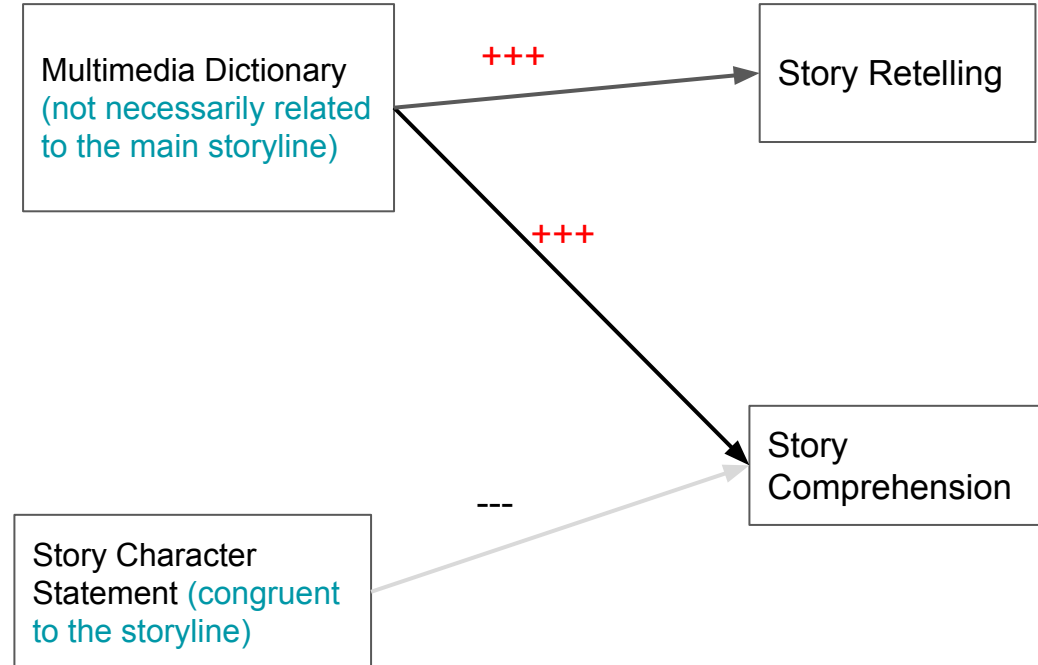


# Discussion

## Gold standard



## Our study





# Conclusion and Future Directions

- Based on these findings, we suspect that using the simple criteria of “whether the e-book feature is congruent or incongruent with the storyline” to judge the educational effectiveness of e-book design features may not be accurate and sufficient.
- This process can become even more complicated when children read bilingual e-books with their parents.
- Considering that our study design and analysis only yield correlational findings, more research is needed to better understand how e-book design features impact children’s learning, particularly for learners from more diverse linguistic backgrounds.
- Our study cannot distinguish whether the hotspot activation is from the parents or children. Future research is warranted to better understand how children and parents’ click impact children’s learning motivation and learning outcomes respectively.



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