

**Parent scaffolding of young children's use of touch screen tablets**

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### **Abstract**

Parents play a key role in supporting young children's interactions with tablets (e.g., iPads). Little is known about the types of scaffolding parents provide during tablet activities and how these relate to child age, SES, and home use. Fifty-five parent-child dyads ( $M$  child age = 3.49 years) were videoed as they played on an iPad. All parent utterances were coded into three types of scaffolding behaviors (cognitive, affective, technical scaffolding; CATs). Home tablet use and family demographics were reported via a parent questionnaire. Parents used CATs strategies to support their children's learning. Parents most frequently used cognitive scaffolding and least frequently technical scaffolding. SES was not related to the number of tablets at home. The negative association found between technical scaffolding and child age suggests that younger children require more scaffolding by parents. Coaching parents in using scaffolding strategies during joint-tablet activities has the potential to support early learning.

*Keywords:* parent scaffolding, touch screen tablets, iPads, apps, young children, literacy

## Introduction

Touch screen tablets are becoming increasingly popular in the homes of young children (Livingstone, Marsh, Plowman, Ottovordemgentschenfelde, & Fletcher-Watson, 2014; Neumann, 2015, 2016; Ofcom, 2014; Rideout, 2013). The touch-based multimodal interface of tablets provides an easy to use platform for young children, particularly when compared to a mouse that requires fine motor and keyboarding skills (Lauricella, Barr, & Calvert, 2014; Siegle, 2013; Wood, Petkovski, De Pasquale, Gottardo, Evans, & Savage, 2016). Tablets allow pre-schoolers to engage in a range of interactive digital experiences such as creating stories, videos, music, and coding (Marsh et al., 2015). The wide range of entertainment and education apps available provides multisensory experiences for young children to learn about their world from an early age. Children can use tablets to learn independently or through socio-cultural interactions with others (Vygotsky, 1978), such as their parents (Neumann & Neumann, 2014, 2016; Wood et al., 2016; Verenikina & Kervin, 2011). Researchers have emphasised the important role that *scaffolding* plays in early learning (Bodrova and Leong, 1998; Wood, Bruner, & Ross, 1976). During scaffolding, a more knowledgeable adult uses specific behaviours to guide a child through a challenging task so that they can eventually master the task and complete it independently.

Parent scaffolding of non-digital activities (e.g., writing with paper/pencil; reading paper-printed books) has been shown to be critical in supporting early learning (e.g., Aram, 2008; Clarke-Stewart & Beck, 1999; Vandermaas-Peeler, Nelson, Bumpass, & Sassine, 2009). However, little is known about how parents scaffold young children's learning with touch screen tablets (Danby et al. 2013; Kucirkova, Sheehy, & Messer, 2014; Kucirkova, Messer, Sheehy, & Flewitt, 2013; Neumann & Neumann, 2015). Research has begun to examine how parent-child interactions with tablets can provide positive learning experiences for pre-schoolers. Wood et al. (2016) video-recorded parent-child dyads ( $N = 104$ ; child age 2

to 6 years old), from a Canadian city, using a touch screen tablet in an observation room set up to reflect a home setting. Parents were provided with an iPad and 12 apps to select from. The names of the specific apps were not reported. During the 10 minute session parents were observed to provide a range of positive supports during joint-iPad play. These supports were classified as physical (e.g., holding the iPad), verbal (e.g., “can you tell me where the triangle is?”), emotional-verbal (e.g., “you can do it”) and emotional-physical (e.g., hugging the child). However, little detail was provided about the types of technical support provided by parents.

One approach to examine how children’s use of technology is scaffolded by adults, is to adopt the classification scheme described by Yelland and Masters (2007). The authors outlined three types of scaffolding that teachers provided during student learning using computers in a primary school classroom (child age: 7 to 8 years old). *Cognitive scaffolding* involved asking questions and giving directions to assist in conceptual and procedural understandings; *Affective scaffolding* involved positive encouragement to encourage higher level thinking; and *Technical scaffolding* was the in-built features of the computer software that facilitated learning that teachers can highlight to support learning outcomes (Yelland & Masters, 2007). Neumann and Neumann (2016) extended this classification scheme to situations when parents guide pre-schooler’s interactions with touch screen tablets. The definition of technical scaffolding was extended to include adult supports needed to help young children successfully operate and navigate through an app (e.g., “Tap that icon with your finger, now swipe the screen, then push the arrow”).

Neumann and Neumann (2016) examined how one mother scaffolded her two children’s (aged 2 and 3 years old) tablet interactions. From these interactions, a coding system was developed to measure cognitive, affective, and technical scaffolding (CATs) behaviours provided by a parent. The study showed that the mother provided mostly

cognitive scaffolding followed by affective scaffolding and technical scaffolding. As the generalisability of this single case study is limited, it is necessary to examine parent scaffolding using the CATs coding system in a larger sample of parent-child dyads.

Furthermore, little is known about parent scaffolding during child tablet use and potential associations with home (SES; number of tablets at home) and child factors (age, frequency of home use). Parent scaffolding during joint use of computers plays a key role in supporting young children's early learning (Aram & Bar-Am in press; Krcmar & Cingel, 2014; Lauricella, Barr, & Calvert, 2009; Lauricella et al., 2014). Family SES (Farver et al. 2006; Kluczniok et al. 2013; Korat 2009; Leseman and DeJong 1998; McLoyd, 1998; Purcell-Gates, 1996; Umek, Podlesek, & Fekonja, 2005) also shapes the home environment (e.g., types of educational activities and resources in the home). Lower SES families are reported to have fewer educational resources and engage in fewer parent-child educational activities at home when compared to higher SES families (Aram, Korat, Hassunah-Arafat, 2013; Aram & Levin, 2001; Kluczniok et al., 2013; Neumann, 2016). An examination of the relationship between SES and tablet use in the home will provide insight into these home factors and will extend Wood et al.'s (2016) parent-child tablet observational study where SES of participants was not examined.

Child age is also an important factor that has the potential to influence parent-child use of tablets (Connell, Lauricella, & Wartella, 2015; Wood et al., 2016). Research on non-digital activities such as shared reading and joint writing show that parents vary the level of verbal language based on children's age (Aram & Levin, 2001; Kermani & Brenner, 2000; Senechal, Cornell, & Broda, 1995). Therefore, the association between child age and parent scaffolding when using tablets needs examination. By documenting the types of parent-child joint tablet experiences and their relationships to key variables, it may be possible to recommend effective scaffolding strategies that parents and teachers can use to support

children's early learning with tablets. Accordingly, the questions addressed in the present study were:

1. To what extent do parents use cognitive, affective and technical scaffolding to support children during a joint-tablet activity?
2. What are the relationships between parent scaffolding during a joint tablet activity and family SES, tablet use at home, and child age?

## Method

### Participants

Fifty-five English speaking parent-child dyads (46 mothers and 9 fathers) from 6 childcare centres in South-East Queensland, Australia participated. The children's (29 girls; 26 boys) mean age was 3.49 years ( $SD = 0.72$ ; range = 1.98 to 4.59 years). Most parents were married (92.8%), 3.6% were never married, and 3.6% were divorced. The majority of parents identified as Australian (mothers, 67.3%; fathers, 80%) and Australian Aboriginal (fathers, 1.8%) or were from a range of cultural backgrounds: New Zealander (mothers, 7.3%; fathers 12.8%), British (mothers, 9.1%; fathers, 3.6%), European (mothers, 5.5%; fathers, 1.8%), Asian (mothers, 3.6%), American (mothers, 1.8%), Pacific Islander (mothers, 1.8%), and South African (mothers, 3.6%).

Parent education ranged from completing 9th grade to post-graduate training at university with 11.2% of mothers and 9.6% fathers not completing high school; 18.4% of mothers and 26.9% fathers being high school graduates; 31.5% mothers and 36.5% fathers completing partial college or specialized training. A similar proportion of mothers (20.4%) and fathers (19.3%) held a university degree with more mothers (18.5%) completing a post-graduate qualification than fathers (7.7%). The modal occupation for mothers was professionals (39.6%) and for fathers was trades persons (35.2%). Family socio-economic status (SES) based on parent education and occupation was calculated using the Hollingshead

(1975) index. The mean SES of this participant sample ( $M = 45.74$ ;  $SD = 10.80$ ; range = 14 – 63.50) fell in Hollingshead's (1975) middle SES range (40 - 54).

### **Procedure**

Following university ethics and childcare centre approval, parents who wished to participate gave informed consent and completed a questionnaire. The video observation of each parent-child dyad was conducted in a quiet room at each child's centre. Each parent and child sat side by side on a low chair at a table and the iPad was placed in front of the child. The researcher remained in the room for the iPad activity and sat one meter in front of the table behind the video camera. The researcher asked each parent-child dyad "*please play with the Endless reader app with your child*". The initial minute of video recorded session allowed time for the app to load up and the app's introductory song to be played. The following 5 minutes of iPad play was coded for analysis.

The Endless Reader app (Originator Inc., 2013) is an interactive early literacy-based app available to download from the app store. The app consists of matching tasks that involves dragging letters to its correct place in a word and matching jumbled words by dragging the words into a sentence (for a full description of the app please see Neumann & Neumann, 2016). This app was selected as suitable app for parents and young children to use because it contained key criteria described by Hillman and Marshall's (2009) app selection criteria (i.e., interactivity, digital literacy, age appropriateness, open ended activity, and participation).

### **Measures**

#### **Cognitive, affective, and technical scaffolding**

Each parent-child video was fully transcribed. Maternal utterances were coded as cognitive, affective, and technical scaffolding based on Yelland and Masters (2007) general descriptions of teacher scaffolding during student computer use in the classroom. These

descriptions of scaffolding behaviour were further refined by Neumann and Neumann (2016) to code parent scaffolding (CATs) during parent-child iPad activities. Each type of verbal scaffolding provided by the parent was scored 1 point for that type of scaffolding. *Cognitive scaffolding* (e.g., “What does that start with?”) helps children solve problems, gain content knowledge and understandings about their world, and involves asking questions, providing directions, expansions on vocabulary and word meanings, repeating and emphasising words. *Affective scaffolding* (e.g., “Very good”) provides children with positive encouragement and feedback to complete the task. *Technical scaffolding* (e.g., “drag it”) supports children in their operation of the iPad and helps them navigate successfully through the app task (e.g., slide, tap, drag it over, click up here, push the arrow).

### **Inter-rater reliability**

The author initially coded and scored each of the 55 parent-child video sessions. Next, a trained research assistant coded a random selection of 25% ( $N = 14$ ) of the sample. Inter-rater reliability was as follows: cognitive scaffolding ( $r = .95$ ); affective scaffolding ( $r = .80$ ); technical scaffolding ( $r = .79$ ) which was acceptable. As the scores were similar, the author's scores were used for analysis.

### **Frequency of home tablet use**

In the home questionnaire parents reported the number of touch screen tablets they have at home. The frequency of child home use of a touch screen tablet was measured using a 6-point rating scale where parents responded 1 = *never* to 6 = *several times daily*. There were 7 items examining frequency of tablet use and parents were asked how frequently their child will: read an e-book on an iPad or tablet by themselves; play app games on an iPad or tablet; have a family member read them an E-book on an iPad or tablet; type letters and words on a iPad or tablet by themselves; write letters and words on an iPad or tablet by themselves; play

with literacy apps on an iPad or a tablet; have a family member help them write on an iPad or tablet. Cronbach's  $\alpha = .77$  indicating acceptable internal consistency for this measure.

### Results

Most families (89%) had at least one touch screen tablet at home. The majority of children used a tablet at home to play entertainment app games (84%) and literacy apps (82%). Forty percent of children played entertainment app games on a daily basis and 24% of children played literacy games daily. Reading E-books on tablets occurred less commonly with two-thirds of children never reading an E-book by themselves (67%) or with a parent (64%). A third of children typed or wrote on tablets by themselves (36%) with about half (56%) of parents reporting that they help their child write on a tablet.

Table 1 shows the descriptive statistics for parent scaffolding, home tablet use, age and SES. Over the 5 minute video session parents provided children with all three types of scaffolding. The mostly frequently observed was cognitive scaffolding ( $M = 49$  instances) followed by affective scaffolding ( $M = 10$  instances). Technical scaffolding was the least frequently observed during the joint-tablet activity ( $M = 5$  instances). All parents provided cognitive and affective scaffolding, and 5% of parents did not provide their child with any technical scaffolding.

Table 1

*Descriptive Statistics for Parent scaffolding, Child Home Use of Tablets, Number of Tablets at Home, Child Age, and SES*

Measure	Mean	SD	Range
Cognitive scaffolding	49.07	21.35	13-105
Affective scaffolding	9.92	5.94	1-28
Technical scaffolding	4.87	3.82	0-18
Child home use of tablets	15.85	6.10	7-30
Number of tablets at home	1.67	1.12	0-5
Child age	3.49	0.72	1.98-4.59
SES	45.75	10.80	14-63.50

Representative extracts from three transcripts of parent scaffolding of a 2 (transcript A), 3 (transcript B), and 4 (transcript C) year old child are shown below. These examples illustrate the important role parents play in guiding children through a tablet task. Cognitive, affective, and technical scaffolding are clearly observed across the children regardless of their age. The mother of the 2 year old child (transcript A) repeated technical directions (e.g., “Tap it, Tap it”) to assist her child in interacting with the screen. The mother of the three year old child (transcript B) provided technical scaffolding (e.g., “Drag the word”) with several instances of cognitive scaffolding such as direction-giving, use of metalinguistic language (e.g., word, sentence) and asking questions to help the child complete the literacy tasks (e.g., Can you find the word funny? Can you see it down here in the sentence?). Similarly the mother of the 4 year old child (transcript C) focussed on saying the letter sounds (e.g., “Buh, buh, buh”; cognitive scaffolding) and provided affective feedback to encourage the child to complete the task himself (e.g., “Good job”). (The type of scaffolding for each parent utterance is shown in square brackets e.g., [cognitive]).

*Transcript A: A parent scaffolding her two year old son*

Mother: “E, a, t [cognitive]. Do you want to read? [cognitive] What does this say? [cognitive]. Grumpkin likes to eat three sardines on his spaghetti [cognitive]. Tap it [technical]. Tap it [technical]. Not slide tap [technical]”.

Mother: “Funny [cognitive]. Oh ok let’s see if you can put it together [cognitive]. Look at its eyes [cognitive]. Where does that go? [cognitive]. Y. [cognitive]. It doesn’t go there that’s an f [cognitive]. Try this one [cognitive]. Good work [affective]. That’s a y [cognitive]. What about this one? [cognitive]. F [cognitive]. Where’s the f? [cognitive]”.

*Transcript B: A parent scaffolding her three year old daughter*

Mother: “Good job [affective]. Can you put the word *funny* where it goes? [cognitive]. Can you drag it [technical]. Can you see where the word says *funny* in the sentence? [cognitive]. Look on here can you find the word funny? [cognitive]. Can you see it down here in the sentence [cognitive]. Can you see where it says *funny*? [cognitive]. Drag it [technical]. Can you put it in the sentence [cognitive]. Is that one the same? [cognitive]. Drag it up [technical]. There you go [affective]”.

Child: “Those funny sounds are like an animal”.

Mother: “Yes [cognitive]. Press the button [technical]. *Eat* [cognitive].”

*Transcript C: An example of a mother scaffolding her four year old son*

Mother: “Right, are you going to do the next one? [cognitive]. No that goes back to the start [technical]”.

Child: “Oh”.

Mother: “You just have to push that arrow [technical]. That’s right [affective]. So look that’s the same letters as *all* but there’s a b in the front [cognitive] That’s a funny letter isn’t it? [cognitive]. So what sound does b make? [cognitive]. Buh Buh Buh Buh [cognitive]”.

Child: “I don’t know”.

Mother: “Remember it’s in the shape of a ball [cognitive]. Where’s the word *ball*? [cognitive]. There you go [affective]. Good job [affective]”.

Child: “Red, Red, Red”.

Mother: “Do you know where the word *ball* is? [cognitive]”

Table 2 shows associations between parent scaffolding, use of and number of tablets at home, child age and SES. Cognitive and affective scaffolding correlated with each other but not with technical scaffolding. Total number of tablets at home and frequency of child use of tablets were moderately correlated. A negative association was found between child age and technical scaffolding provided by parents. No relationships were found between the frequency of tablet use at home by children and any type of parent scaffolding. There was a negative relationship between SES and frequency of tablet use at home by children. Family SES was unrelated to the number of tablets at home.

Table 2

*Correlations between Parent scaffolding, Child Home Use of Tablets, Number of Tablets at Home, Child Age, and SES*

	1	2	3	4	5	6
1. Cognitive scaffolding	-					
2. Affective scaffolding	.308*	-				
3. Technical scaffolding	.103	-.022	-			
4. Child home use of tablets	-.019	-.094	-.149	-		
5. Number of tablets at home	.197	-.092	-.044	.484**	-	
6. Child age	-.149	-.166	-.278*	.166	-.030	-
7. SES	.249	-.146	.144	-.412**	-.257	-.204

\* $p < .05$ , \*\* $p < .01$

## Discussion

The present study examined parent scaffolding of children’s interactions with a touch screen tablet using the CATs coding criteria (Neumann & Neumann, 2016). The joint-tablet activity was an enjoyable experience for both parents and children with parents providing

rich language feedback that supported children's learning and interactions with a tablet. Although there was variation among parents on the relative frequency of each form of scaffolding, on average cognitive scaffolding was the most commonly observed type of scaffolding followed by affective, then technical. Parents' technical scaffolding was negatively associated with child age and use of tablets at home was unrelated to parent scaffolding. Coaching parents in using a wider range of cognitive, affective and technical strategies during tablet activities could further assist in supporting children's learning with these mobile devices.

### **Cognitive, affective and technical scaffolding**

The findings of this study is consistent with previous work showing the critical role parents play in supporting children's interactions with tablets (Danby et al., 2013; Kucirkova et al., 2014; Wood et al., 2016). The present study highlights three types of scaffolding parents used to guide children through a touch screen tablet task. Similar to the findings of a case study of one mother and her two children (Neumann & Neumann, 2016), parent's in the present study provided mostly cognitive scaffolding (on average 49 instances over 5 minutes) by giving confirmations, expansions, directions, asking questions specific to the task's content and to solve problems. For example: *"What does dog start with? Do you want to read what it says? I wonder if you can open the presents; Yes scarfs are for snow; Look for the words that match the words; Have a look at the letters and see if there's one over there that looks the same; Which one is the only one left now? Which one is missing?"* Parents were clearly capable and confident in guiding and providing children with cognitive-based strategies during the word-sentence and matching activities. It is possible that the particular design of the app used and its literacy based content helped facilitate parent cognitive scaffolding. It would be important to examine if the frequency of parent cognitive scaffolding

differs with parent-child use of other types of apps such as creating, drawing, writing, E-book, and math apps.

Providing positive praise and emotional encouragement (e.g., good job, well done, clever boy, that's right) is critical to encouraging young children to stay on task and keep working to complete a challenging activity (Dodici, Draper, & Peterson, 2003; Otto, 2008; Plowman & Stephen, 2007). The present iPad activity (matching words into sentences) provided opportunities for parents to provide positive feedback and help children extend themselves and successfully complete the task. However, on average, parents provided less affective scaffolding (on average 10 instances over 5 minutes) than cognitive scaffolding (49 instances) during the iPad activity. Encouraging parents to provide more frequent affective feedback during tablet activities has the potential to enhance children's learning. However, it is possible that the inbuilt positive feedback provided by the app itself (e.g., congratulatory music and animated stars that appear following successful matching of letters) reduced parent's need to provide affective feedback and allowed parents to focus more on providing cognitive scaffolding.

In contrast to affective and cognitive scaffolding, technical scaffolding in which parents helped children navigate smoothly through the app (e.g., press the button, push the arrow, take your finger off, click on it, touch it and drag it down) occurred least frequently (on average 5 instances over 5 minutes). Although speculative, this limited amount of technical scaffolding may have occurred because 89% of children had access to tablets in their homes and played with entertainment games and literacy apps on a daily basis. It is possible that the children were already technically competent users of touch screen tablets and had gained the necessary operational and technical skills such as dragging, tapping, and swiping to complete the app tasks. This may also explain the lack of an association between technical scaffolding and tablet use at home.

Another explanation for the low frequency of technical scaffolding could be that the Endless Reader app does not demand advanced technical operation but is intuitive and easy for young children to navigate through independently. Alternatively, parents may be limited in their ability to effectively scaffold technical knowledge and skills and may benefit from additional coaching in utilising more advanced technical support strategies. This would be an important factor to consider especially when helping parents guide their children through more technically complex learning apps (e.g., creative/building/coding apps; Neumann, 2014). Higher levels of technical scaffolding may help young children move beyond the basics of dragging and tapping to more advanced operational skills such as swiping, pinching, scrolling, using a pop-up keyboard and creating and searching for digital information.

### **Parent scaffolding and home factors**

The types of parent-child interactions in the home setting plays a key role in children's early learning (Aram 2008). Due to the relatively recent release of tablets (Orrin & Olcese, 2011) little research has been conducted to examine the associations between parent scaffolding during child tablet use, family SES, and home use of tablets. In the present sample of participants, a positive association was found between the number of tablets at home and child use of tablets. Children used tablets at home mainly for entertainment and educational purposes. This suggests that opportunities were available for children at home to engage in various learning activities such as reading E-books, writing, typing, and learning about their digital world. No relationship was evident between family SES and number of tablets at home suggesting that children had access to tablets regardless of their parent's level of occupation and education. This queries the notion of a digital divide between SES levels and prompts stakeholders (educators, researchers, policy makers) to consider providing all families regardless of SES guidance in supporting young children's learning with tablets at home.

Interestingly, there was a negative relationship between SES and frequency of child home use of tablets suggesting that children of lower SES backgrounds used tablets more frequently at home. This association requires further investigation to determine whether higher frequency of tablet use at home is beneficial to learning or whether the quality of time spent on tablets is more important. It is also important to consider other influencing factors such as the type of app used (e.g., entertainment/gaming apps vs educational and creative/building apps) and the degree to which parent scaffolding and time spent on tablets assists aspects of early learning in each of the cognitive, social-emotional and physical domains.

Surprisingly, no association was found between cognitive, affective, and technical scaffolding and frequency of child use of tablets at home. Although speculative, it could be that in their home environment children mainly play on tablets independently without direct support from their parents. It may also be due to the types of apps used at home and extent of the in-built software features of apps that support children's learning with tablets. It is difficult from the limited scope of the present study to determine the quality of children's home experiences with tablets. For example, the extent of learning that occurs when a child plays a gaming app versus an educational app requires further investigation as some research suggests that computer games may be less conducive to learning than educational software (e.g., Bittman, Rutherford, Brown, & Unsworth, 2011). Therefore, future studies should examine whether types of parent scaffolding and extent of in-built scaffolding provided by the app itself are related to or dependent upon the type and quality of app a child is using.

No association was found between child age and cognitive and affective scaffolding. This suggests that parents guided children's learning about content knowledge (i.e., literacy concepts) and provided positive feedback regardless of child age. Wood et al. (2016) also found no association between emotional scaffolding and child age. A negative association

was found between children's age and level of technical scaffolding provided by parents in the present study. Parents of younger children provided higher levels of technical scaffolding to suggest that parents were displaying sensitivity to children's technical abilities. This finding is consistent with other research using non-digital activities where parents vary their level of scaffolding based on a child's age (Kermani & Brenner, 2000; Otto, 2008). Wood et al. (2016) also found that parents of younger children provided more scaffolding than those of older children but this was based on observations of verbal and physical scaffolding. Further work in terms of microanalysis of parent-child interactions with tablets is needed to tease out finer aspects of cognitive, affective, and technical factors. Although children may be developing experience and skills in operating tablets at home, age and technical ability are important factors to consider when supporting younger children's interactions with tablets.

### **Future research and limitations**

The results of the present study should be considered in the light of certain limitations. The limited sample size of Australian parents and children prevents generalisation of the findings to other communities. Correlation does not imply causation and thus the relationships discussed should be interpreted with caution. Further empirical work is needed that examines the effect of CATs strategies on early learning in a randomised control group design study with a wider range of families from different backgrounds. Parent report of home use of tablets is subject to social desirability bias with the potential for parents to under- or overestimate child use of tablets. Directly observing parents and children using tablets in their homes would provide a more accurate reflection of types of home tablet activities that occur and the extent that parents scaffold children's interactions with tablets within the home setting. The CATs coding strategy was an effective method to classify parent scaffolding of young children's interactions with touch screen tablets. However, these criteria were used to code parent-child interactions with only one type of app that was literacy-based.

Further work is needed to examine CATs in a range of other types of apps (e.g., science, math, building, coding, creating, and languages other than English).

Despite these limitations the present study showed that parents in this participant sample possessed an ability to positively scaffold young children's interactions with touch screen tablets. However, more research is needed to determine ways to help boost parent's affective and technical guidance during tablet interactions. Such an approach has the potential to provide young children with a deeper use of new mobile technologies and foster learning. Child age is a particularly important factor to consider when scaffolding young children's technical interactions with tablets. For example, parents may benefit from guidance in using types of technical language (tap or touch the button/icon; swipe or slide the screen/interface) when young children begin using tablets. Further research is also needed to examine differences in parent scaffolding using non-digital tools (e.g., paper print books, paper pencil) compared with digital tablet tools and apps (e.g., E-books, math apps, typing, creative apps; Neumann, 2014) and how best to adapt scaffolding strategies based on the type of learning tool used.

As children move from toddlerhood into the pre-school years, coaching parents in how to effectively extend technical support during child use of more complex apps (e.g., building/coding/communication/use of pop-up keyboard) has the potential to foster learning, especially when tablets are becoming ubiquitous socio-cultural tools. Clearly, more empirical research is needed to determine the benefits of scaffolding children's tablet use in addition to developing evidence-based recommendations to parents, educators, and industry partners on how to best use these emerging technologies to support early learning (Aladé, Lauricella, Beaudoin-Ryan, & Wartella, 2016; Troseth, Russo, & Strouse, 2016; Ward, Branson, Cross, & Berson, 2016).

### **Conclusion**

New technologies such as touch screen tablets and apps have the potential to foster early learning especially with the provision of guidance from parents. Such an approach allows children's learning to be extended in their Zone of Proximal Development (Vygotsky, 1978). The three types of scaffolding (Cognitive, Affective, and Technical) identified and the quantity and quality of each may play a critical role in optimizing early learning opportunities. Now is the time for researchers to examine the benefits of tablets and apps for early learning in the home setting and develop ways in which parents from a range of SES backgrounds can effectively support young children's learning through tablets.

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