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Can Interactive Media Replace the Parent as the 'More Knowledgeable Other' in Early Language Development?

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Abstract

Society is currently living in a screen age. Interactive media devices are increasingly being used by young children, often independently, without the presence of a parent. Parental reasons for this focus on educational, entertainment and babysitting purposes. Building on behaviourist and socio-constructivist understandings of young children's language development, this is problematic for two important reasons. Firstly, it reduces the amount of parental linguistic input that a child receives in their early years, that is essential for language development. Secondly, features of parent-child interactions that drive language development cannot be replicated by interactive media use when children are alone (including scaffolding techniques, promoting joint attention, providing gestural clues and providing a familiar voice). Ultimately, interactive media cannot replace the parent as the More Knowledgeable Other in young children's language development. Parents need to apply what is known about language development and be aware of their important role as the More Knowledgeable Other in interactive learning experiences before it is too late. Parents should engage in learning activities that revolve around parent-child interactions, before passing the responsibility of children's language learning to interactive media becomes normalised. Implications for Educational Psychology practice and potential areas for further research are also discussed.

Introduction

Language development is foundational to children's school readiness and achievement, and further enables children to share meanings and participate in cultural learning (Tamis-LeMonda & Rodriguez, 2009). Language acquisition is seen to occur within a critical period extending from infancy to puberty (Lenneberg, 1967), with the amount of linguistic input a child receives before the age of three having utmost significance (Huttenlocher, Haight, Bryk,

Seltzer, & Lyons, 1991).

Despite the importance of early years in language development, society appears to be living in a screen age. Interactive media devices (e.g., screened tablets, iPads, smartphones, e-books and computers) are increasingly being used by young children (Holloway, Green, & Livingstone, 2013) with 73% of children under five using tablets and computers (Billington, 2016), 72% of educational applications targeting pre-schoolers (Shuler, Levine, & Ree, 2012) and 53% of three and four year olds going online for eight hours a week (Ofcom, 2017). Children under two are using screen media for an average of 42 minutes a day, compared to just 21 minutes reading, with less than half of children under two reading or being read to daily (Common Sense Media, 2017). Education, entertainment and babysitting are the main stated reasons that parents expose their children under two to interactive media (Zimmerman, Christakis, & Meltzoff, 2007), with parents seeing the benefits of the internet to outweigh the risks (Ofcom, 2017). Moreover, computers are increasingly being used to promote language development in children (McCarrick & Xiaoming, 2007), with 66% of parents viewing media as assisting with children's learning (Common Sense Media, 2017).

Young children often use interactive media alone. 32% of parents report watching television or videos alongside their child (Zimmerman et al., 2007). Additionally, 35% of children use interactive media without parents, particularly at the beginning and end of the day (Marsh et al., 2015). This potentially encourages social isolation, resulting in less face to face interaction with family (McCarrick & Xioming, 2007).

Whilst it is likely that various factors (biological, cultural, and experiential) influence language development (Woolfolk, 2013), the adult as a mediator of learning in the early years of life is fundamental. In line with Operant Conditioning (Skinner, 1957) and Social Learning Theory (Bandura, 1977), the adult's role in language development is to model and reinforce correct language. Furthermore, Vygotsky's socio-constructivist theory (Vygotsky, 1978) emphasises how children develop language from communicating with a More Knowledgeable Other (MKO), who uses scaffolding techniques to drive development within the child's Zone of Proximal Development (ZPD). Vygotsky defined the ZPD as "the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance" (1978, p. 86). Here, the MKO, as somebody with enhanced understanding and a higher ability than the child (McLeod, 2018), uses scaffolded interaction as a communicative frame "that enables a child or novice to solve a task or achieve a goal that would be beyond his unassisted efforts" (Wood, Bruner, & Ross, 1976, p. 90). Similarly, Feuerstein emphasised the importance of the Mediated Learning Experience (MLE) considered as "human interactions that generate the capacity of individuals to change, to modify themselves in the direction of greater adaptability and toward the use of higher mental processes" (Feuerstein, 1979, p.110). Jensen and Feuerstein (1987) propose that reciprocity, intentionality, meaningfulness and transcendence are necessary components of the MLE at preschool level. Intentionality is a purposeful component of the MLE where the mediator "deliberately guides the interaction in a chosen direction by selecting, framing and interpreting specific stimuli" (Seng, 1997, p. 7). Reciprocity occurs when

"there is responsivity from the mediatee… and an indication of being receptive to and involved in the learning" (Seng, 1997, p. 7). Furthermore, meaningfulness arises when "the mediator shows interest and emotional involvement, discusses the importance of the activity with the child and elicits an understanding of why the activity should be done" (Seng, 1997, p. 8). Lastly, transcendence is evident when "the mediator links a specific issue or activity with others" (Seng, 1997, p. 9). Despite this theoretical understanding, technologies are increasingly being embedded within our culture, society and norms, and as a result, families may have disregarded arguments relating to the negative impact of digital technologies on development (Edwards, 2013).

Building on the ideas of Vygotsky (1978) and Feuerstein (1979), in this essay I will argue that interactive media cannot replace the parent as the MKO in young children's language development (specifically zero to five years old), drawing upon two central theses. Firstly, children's interactive media use isolates them from essential social interactions which reduces the amount of linguistic input they receive. Secondly, it is the features of parent-child interaction that optimise the MLE, which cannot be effectively replicated by using interactive medias alone. Reverting back to basics and using learning activities that promote parent-child interactions, (such as shared book reading, storytelling, pretend play, educational games and using narratives around events), may be best before it becomes normalised for society to pass the responsibility of children's language learning to interactive media. Implications for early intervention and areas for further research will also be discussed.

Interactive media use and decreased linguistic input

Exposure to language plays a crucial role in children's development, helping to interpret the meaning of words (Dickinson, Griffith, Michnick Golinkoff, & Hirsh-Pasek, 2012). Specifically, the quantity of linguistic input that a child receives before age three is strongly related to subsequent language and cognitive development (Huttenlocher et al., 1991). Plowman, McPake, and Stephen (2010, p. 72) refer to the "technologisation of childhood" where the child is socially isolated through using interactive media which puts their linguistic, intellectual and imagination development at risk. It also seems that young children are emerged in bedroom cultures, where using interactive media is isolating them from family interactions (Bovill & Livingstone, 2001). Reduced linguistic input, as a result of social isolation, reduces opportunities for language to be correctly modelled by and adult in order for imitation and reinforcement to occur, in line with operant conditioning (Skinner, 1957) and Social Learning Theory (Bandura, 1977).

Research has explored how the amount and type of linguistic input provided by parents affects young children's language development. Hart and Risley's (1995) longitudinal study found that parents from low SES families exposed children to less language which was less varied (from seven months to age three), resulting in children's reduced vocabulary size at age three, compared to high SES families. They proposed a 30-million-word age gap between these groups of children. Moreover, Ota, Davies-Jenkins, and Skarabela (2018) demonstrated that mothers' use of diminutives and reduplications in their speech towards children at nine months old was associated with subsequent vocabulary growth at 21 months.

Although research in this area has been influential, reflected in paediatric practice where parents are advised to provide an abundance of linguistic input to their child in early years (Zimmerman et al., 2009), it is important to interpret this research with some caution. Often, research relating linguistic input to language development is correlational and does not always control for extraneous variables that threaten the study's internal validity. For example, Hart & Risley (1995) cannot firmly establish cause and effect as other extraneous variables could partly explain their findings. Although the study used naturalistic observations, parents' behaviour from high SES families may have been altered through the Hawthorne Effect, or parents from low SES families may have had more children, thus having less time to speak individually with one child. Additionally, when comparing the type of language used in low and high SES groups, researchers did not control for differences in frequency of speech between groups. High SES parents were found to exhibit more varied vocabulary because these parents spoke more in the first place. Nevertheless, Ota et al. (2018) went on to control for lexical diversity (amount of parental talk) before associating the type of parental talk with vocabulary growth, establishing this relationship further whilst maintaining internal validity.

To argue that the amount of linguistic input that a child receives in early years completely explains language development alone would be reductionist. Therefore, in addition to this thesis, the features of parent-child interactions are also essential, and are not as evident in children's communication with interactive media.

Features of parent-child interactions that promote language development

Linguistic input alone is not enough. Children need to produce speech and parents need to engage their children in two-sided conversations (Zimmerman et al., 2009). The reciprocal nature of the parent-child interaction process is key and is why learning activities like joint storybook reading provide a context to promote vocabulary development (Hargrave & Senechal, 2000). Research shows that increased exposure to television and video in children under two is linked to delayed expressive language in young children (Zimmerman et al., 2007), potentially resulting from fewer speech production opportunities. The unique role of the parent as the MKO, who optimises the MLE in young children's language learning, will now be discussed in terms of the scaffolding techniques they apply (attuned language and elaboration), how they promote joint attention and gesture, and how the familiarity of their voice promotes children's language development.

Attuned language

The ability of a parent to attune to their child's language levels by calibrating their own speech is essential. Parental speech should not be too simplistic, so the child learns nothing from the adult model, nevertheless speech should not be too sophisticated that the child is left overloaded and unable to model (Zimmerman et al., 2009). The way parents alter their speech through their use of words appears to affect language development. For example, parents' use of diminutives and reduplication in their language towards children at nine months was associated with children's subsequent vocabulary growth at 21 months (Ota et al., 2018). Frequent exposure to parent-child interactions can help parents to become more able to

attune their own language to work within their child's ZPD (Zimmerman., 2009), therefore, increasingly allowing children to use interactive media alone is not providing this opportunity. Additionally, attuned parental language relates to the intentionality principle of the MLE as the parent is purposefully selecting and adjusting their linguistic input to the level of the child.

Ciampa (2015) found that e-books enhanced children's motivation as the self-selected differentiation of reading level component meant participants could work through e-books at their own pace. Whilst this seems to suggest that e-books have some adaptability in their language, this study used opportunity sampling which is prone to bias. Participants that volunteered may have initially been more excited and motivated about the novelty of using an e-book, which ultimately undermines the external validity. Ultimately, interactive media cannot possibly attune as sensitively as an adult to the needs of a child which may result in language that is not tailored enough to the child's specific learning level. This thereby increases the chances of children operating outside of their ZPD.

Elaboration

Parental elaboration on language is also important. Wareham and Salmon (2006) found the amount of maternal talk connected to past and future events that made logical connections between objects, events and concepts was related to children's language development. Furthermore, expanding upon children's language and asking questions, rather than giving directives, has been associated with language growth (Dickinson et al., 2011). Learning activities that rely on parent-child interactions allow for elaboration to occur effectively. For example, shared book reading, including open ended questions and encouragement of children's participation, was found to enhance children's expressive language skills (Huebner & Meltzoff, 2005). Additionally, parental use of metalingual utterances (requests for labels, prompts and recasts of language) has been positively associated with children's language development (Jones & Adamson, 1987).

Elaboration, as a scaffolding technique, enables the child to work with a MKO within their ZPD and particularly relates to the intentionality, transcendence and meaningfulness components of the MLE. The parent, as the mediator, is assisting in creating purposeful links between knowledge within a personally meaningful environment. Learning activities, such as dialogic reading, offers opportunities to tie storybook content to children's own personal experiences, unlike interactive media which would not be personalised enough. Furthermore, activities like dialogic reading allow conversation to diverge from the text, yielding more varied vocabulary and sentence structures (Dickinson et al., 2011). Contrastingly, when using e-books collaboratively, parents spend more time discussing the child's behaviour than relating story features to the child's life (Parish-Morris, Mahajan, Hirsh-Pasek, Michnick Golinkoff, & Fuller Collins, 2013). Therefore, interactive media, like e-books, cannot provide personalised elaboration as effectively as the parent (as the MKO) who is able to elaborate in a personalised way to optimise the MLE.

Joint attention

Joint attention occurs when a parent and child have mutual focus on each other in addition to a third entity, and is essential for early language learning (Akhtar & Gernsbacher, 2007). Joint attention in young children often occurs through contingent talk which is "the extent to which a communication is produced when the intended recipient is fully oriented towards receiving and processing it" (Topping, Dekhinet, & Zeedyk, 2012, p. 391). This is particularly important between the ages of nine and 18 months as during this period children struggle to redirect their attention to understand language (McGillion, Pine, Herbert, & Mathews (2017). Young children whose parents frequently use contingent talk at nine months old go on to develop larger vocabularies as toddlers (McGillion et al., 2013). Additionally, maternal input that follows a child's attentional focus, rather than attempting to re-direct their focus, leads to greater vocabulary development in young children (Tomasello & Farrar, 1986). The concept of contingency is crucial as it relates to the reciprocity principle in MLE as the child needs to be receptive, involved in the learning process and demonstrating cooperation.

Learning activities that encompass parent-child interactions promote joint attention. Reading a book with a child promotes attention as books can be visually appealing, the page provides a clear focus and the book can remain stationary (Dickinson et al., 2011). Also, adults can generally tell what the child is attending to through reading a book and can build on words with commentary (Dickinson et al., 2011).

Some may argue that interactive media incorporates many features that attempt to focus children's attention. For example, Flewitt, Messer, and Kucirkova (2015) introduced iPads into three types of settings (nursery, primary and specialist). iPads seemed to have a positive impact on literacy and language development due to children's increased motivation, attention, independent learning and collaboration opportunities. Although this study appears to provide support for iPad use, qualitative data was gained through interviews with practitioners. As Billington (2016) found that six in ten practitioners would like to increase the use of touch screens in their setting, the practitioners in this study may have had a bias and underlying motive to respond positively. Additionally, the study had no control group which weakens the internal validity of its findings. Furthermore, all settings had never used iPads in the classroom previously, thus a novelty factor could explain the increased motivation and attention findings in particular. Whilst Korat and Segal-Drori (2016) propose that multimedia features of e-books help children to understand abstract language and direct attention to details, De Jong and Bus (2003) propose that when children are presented with visual and sound effects, they spend hardly any time listening to the actual narration.

Consequently, interactive media are unlikely to produce contingent communicative responses and cannot follow the child's attentional interest as effectively as the parent. Research has even shown that children under three do not learn words from television that offers little contingent interaction (Roseberry, Hirsh-Pasek, Parish-Morris & Golinkoff, 2009). As young children struggle to direct their attention, they need a parent as the MKO to engage with them in contingent talk in the MLE to develop language.

Gestures

In early language development, children's use of gesture enables them to communicate information they cannot express verbally (Iverson & Goldin-Meadow, 2005). Rowe, Ozcaliskan, and Golin-Meadow (2008) found that although parent gesture use was not related to children's vocabulary development, it did relate to increased child gesture use at 14 months old, which subsequently predicted vocabulary development at 42 months. Iverson and Goldin-Meadow (2005) propose that children's gestures help to develop language through signalling to the parent about readiness for a certain level of linguistic input. Adults have further been shown to alter their input based on children's gestures (Goldin-Meadow & Singer, 2003). Subsequently, children may be shaping their learning environments by providing gestural clues to the parent about the level of linguistic input they need to develop language within their ZPD. This relates to the reciprocity component of the MLE. Furthermore, children's use of gesture may be helping to develop joint attention which could help the parent to follow the child's interest to produce contingent talk. Aziz (2013) suggests that the gestures needed for iPad use (tap, drag, drop, slide, pinch, spread and rotate) cannot all be produced by two and three-year-old children, suggesting that young children cannot effectively communicate with interactive media using gesture. Furthermore, interactive media devices cannot respond to children's gestural clues by altering their language, unlike the responsive parent as the MKO through parent-child learning activities.

Familiarity of voice

The familiarity of the MKO's voice is also important in children's acquisition of language. From birth, new-borns process their mother's voice more actively and differently to a stranger's, activating language relevant cortical areas (Beauchemin et al., 2010). Additionally, three-month-old infants display increased vocalisations (Brown, 1979), motor quieting and mouthing movements (Turnure, 1971) to their mother's voice compared to a stranger's. Furthermore, a familiar talker advantage has been identified where the presence of a familiar voice improves how children store information about how a speaker articulates speech sounds which further advances their own spoken language (Levi, 2015). It is possible that a familiar voice could help direct attention to linguistic input, away from background noise, freeing up cognitive resources and enabling deeper processing. This relates to the reciprocity principle of the MLE, as the child is showing responsiveness and being receptive to the mediator. Interactive media with speech output would typically incorporate many different voices, lessening this potential impact of the familiar talker advantage found in parent-child interactions.

Conclusion

Young children's increasing use of interactive media has implications for practice. Educational Psychologists (EPs) have opportunities to apply their knowledge of language development through engaging parents in training and intervention. Firstly, training parents on their valuable role as the MKO, who can use scaffolding techniques (e.g., modelling, questioning, using gestures, elaborating, adapting language and linking knowledge), to assist their child to

work within their ZPD would have impact. EPs can then recommend parents to provide increased linguistic input to children in early years through learning activities centred around interaction (e.g., shared book reading and pretend play) and can further explain how parents' own media use may be displacing important interactions. Peterson, Jess, and McCabe (1999) found that a yearlong intervention that encouraged mothers to use more narrative for longer periods and to ask more open ended and context eliciting questions improved children's receptive language. Furthermore, McGillion, et al. (2017) found that even a low intensity 10-minute intervention encouraging parental contingent talk at 11 months old improved vocabulary development at 15 and 18 months.

Rather than using interactive media to replace the MKO, EPs may also consider how they have potential to be an assistive tool to scaffold certain parents to communicate effectively with their child. Interactive media could demonstrate ideas for parent-child activities or could model teaching strategies like dialogic reading or blending (Radesky, Schumacher, & Zuckerman, 2015). Building on Hart and Risley's (1995) findings, this may be of particular importance to low SES families. Furthermore, research has suggested a 'digital generation gap' (Livingstone, 2003) where a child's technological competency may overtake their parent's competency. As technology is inevitably a part of our modern society, EPs could provide training around effective interactive media use for technologically less experienced parents.

Thus far, this essay has discussed language development in relation to typically developing children. Some children with Autism Spectrum Disorders (ASD) may have impairments in joint attention (Jones & Carr, 2004) and often rely on objects in their visual field, rather than human cues, to shift attention (Leekam & Lopez, 2000). Children with ASD are thought to orient less to attentional cues of human actions (Leekam & Lopez, 2000), perhaps resulting from theory of mind difficulties in interpreting the communicator's intentions. Children with ASD may rely on the predictability of links between a cue and a target to understand the meanings of signals (Leekam & Lopez, 2000). Interactive media is free from social demands of parent-child interactions and arguably provides more immediate and predictable responses than an adult. Consequently, further research could explore whether interactive media can be an effective MKO than a parent for children with ASD or whether further social isolation with the use of interactive media would be detrimental.

It is important to note, I am not arguing that young children should be completely free from interactive media use. This is because the positive effects on children's language through frequent learning activities, such as reading, are not affected by further moderate media use (Taylor, Monaghan, & Westermann, 2017). Instead, I have highlighted how interactive media cannot replace the parent as the MKO in optimising the children's MLE. Firstly, as discussed, decreased linguistic input through socially isolated use of interactive media may be detrimental for young children's language development. Secondly, interactive media cannot apply scaffolding techniques (such as attuned language and elaboration) as sophisticatedly as a parent which reduces the chance of the child working within their ZPD. These techniques apply to the intentionality, transcendence and meaningfulness elements of the MLE, which interactive media cannot cater for. Thirdly, interactive media cannot create joint attention,

produce contingent talk or promote the child's use of gestures as effectively as the parent as the MKO, reducing the chance of reciprocity occurring and decreasing the likelihood of optimising the MLE. Lastly, it is unlikely that interactive media can replicate the familiarity of voice effect, thus reducing the chance of reciprocity occurring between the child and device and decreasing the likelihood of optimising the MLE. The unique role of the parent as the MKO in learning activities that promote parent-child interactions can never be replaced by interactive media.

As a society, we are living in a screen age. We may be experiencing a norm whereby the use of interactive media is crowding out opportunities for social interaction. We risk putting the responsibility of children's language learning away from adults as the MKO to interactive media that cannot create the optimal MLE. This is alarming as at a clinical level, research shows that language difficulties in childhood subsequently affect social and emotional development and long-term outcomes (Conti-Ramsden & Botting, 2008). Although interactive media are increasingly used by children, it is important that they assist adults as the MKO, rather than compromise vital social interactions, that are critical in the early years. Humans are essentially social beings; therefore, do we need to assist parents in reverting back to basics before our dependency on interactive media increases further?

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