Critical Review:
Does screen time exposure during infancy have a negative impact on language development?

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This critical review examines the evidence regarding screen time exposure during infancy and its effect on language development. Study designs include survey research, a longitudinal study, a case-control study, and informational articles. Overall, findings are highly suggestive that regularly viewing television and/or DVDs/videos during the first two years of life is associated with slower vocabulary development and language delays. One study found that content and program type need to be taken into consideration when describing media effects. Recommendations for future research and clinical practice are provided.

Introduction

In 1999, the American Academy of Pediatrics (AAP) recommended that children under the age of 2 years should not be exposed to television (Strasburger, 2007), as increased screen time results in less parent-child interactions, impacting brain growth and the development of language and social skills.

Nevertheless, the research indicates that very young children are much more likely to watch television than they did in the past. Certain and Khan (2002) conducted a survey and found that only 32% of parents with children younger than 2 years of age complied with the AAP recommendations. Other parent reports suggest even lower compliance with infants first viewing videos at approximately 3 months of age and becoming regular viewers of infant-directed programming over the first year of life (Courage & Howe, 2010). In 2004, a survey of 100 parents found that infants were watching an average of two hours of television per day (Strasburger, 2007), and the production of new television programs and DVDs/videos that target very young children is on the rise (Anderson & Pempek, 2005).

The media industry contends that infant-directed video material may provide an opportunity to enhance early learning and language development (Courage & Howe, 2010). Research by Courage and Howe (2010) shows both short and long-term positive effects of educational television on literacy, math, science, problem-solving, and prosocial behaviour for children and adolescents. Given the strength of this evidence, parents may assume that infants and toddlers might also benefit from screen media.

Overall, studies have found both positive and negative impacts of screen time exposure on language development, and these conflicting findings make it difficult for parents to evaluate the issue (Courage & Howe, 2010).

Critical evaluation of the literature will allow speech-language pathologists to properly educate caregivers on the risks and/or benefits associated with screen time exposure during the first two years of life.

Objectives

The primary objective of this paper was to critically evaluate existing literature regarding the impact of screen time exposure during infancy on language development.

Methods

Search Strategy

Online databases such as Scopus, PubMed and PsycInfo were searched using the following keywords: (“screen time”) OR (television*) or (media) AND (language) OR (vocabulary) AND (infant*) OR (toddler*).

The search was limited to peer-reviewed articles and/or reviews written in English between 2005 and 2015.

Reference lists of previously searched articles were also used to obtain other relevant studies.

Selection Criteria

Studies and reviews selected for inclusion in this critical review were required to investigate the relationship, if any, between screen time exposure during infancy (i.e., the first two years of life) and language development.

Data Collection

The results of the literature search yielded the following types of articles that met the aforementioned selection criteria: survey design (1), longitudinal design (1), case-control design (1), and informational articles (2).

Results

Zimmerman, Christakas, and Meltzoff (2007) conducted a survey study in order to examine the association between the amount of time children spent viewing television and vocabulary development. A total of 1008 parents of children age 2 to 24 months were surveyed by telephone. Parents were asked questions regarding the amount of time their child spent interacting with adults in several capacities (e.g., being read to, listening to stories, listening to music), and whether their child ever watched television or DVDs/videos. Parents were then asked to report the typical amount of viewing time in each of 6 content types, which were reduced to 4 categories for reasons not specified. Parents were provided with example television shows and/or DVDs/videos for each content type. Parents also completed a well-accepted inventory of communication development for infants although details regarding administration were not provided.

Strengths of this study included a large sample size, appropriate statistical analyses, and the control of extraneous variables. The recruitment criteria used had a number of limitations. Recruitment was limited to those in two states and with available home phone numbers on record. Although variables such as income and education were controlled for in the analyses, the sample had higher incomes and education in comparison to the population from which it was recruited. The associations between normed communication inventory scores and media exposure were evaluated using appropriate multivariate regression. Separate appropriate regressions were performed for those who completed the standardized inventory for infants (8 to 16 months) and toddlers (17 to 24 months). Overall, results revealed that each hour per day of viewing infant DVDs/videos was significantly associated with lower communication inventory scores in infants only, corresponding to a 6 to 8 word difference in comparison to a child with typical language development.

Although survey research has a number of limitations, such as participant biases, the clinical importance of the findings cannot be underestimated. As such, these results are highly suggestive of a relationship between exposure to screen media during infancy and slower vocabulary development.

Linebarger and Walker (2005) conducted a longitudinal study in order to examine the associations among television viewing time, content type, and expressive language development. A total of 51 parents reported the number of hours of television their child watched per week every 3 months, beginning at 6 months of age. Outcome measures were administered every 6 months and included direct observations of caregiver-child interactions using well-accepted home environment observation checklists, parent report measures of vocabulary development, and a less common assessment of expressive language skills.

The recruitment criteria used had a number of limitations. Recruitment was limited to two cities within one state and the sample was primarily composed of middle- to upper-middle class families. Variables such as parent's education, child's home environment, and child's cognitive performance were statistically controlled. Appropriate hierarchical linear modeling techniques, and growth curves examining relationships between television exposure and the child's vocabulary knowledge and expressive language skills were used. Overall, results revealed that increased viewing time was related to fewer vocabulary words at 30 months of age, and that viewing certain television programs containing language-promoting strategies was positively related to vocabulary acquisition.

A longitudinal design is useful for establishing causal relationships and for making reliable inferences. Potential biases include control effects—where repeated interviewing of the same sample influences the participant's response. Nevertheless, the clinical importance of the findings cannot be underestimated. As such, these results support the relationship between exposure to screen media during infancy and slower vocabulary development, and support the importance of content and program type when describing media effects.

Chonchaiya and Pruksananonda (2008) conducted a case-control study in order to determine the relationship between television viewing during infancy and delayed language development. A case group of 59 children with delayed language was matched to a control group of 110 children with normal language. Parents were asked questions regarding the parental, family, and home environment, and their child's television viewing habits. The groups were well-matched on

demographic characteristics as shown using appropriate statistical comparisons. Delayed language was diagnosed by a developmental pediatrician using general development criteria rather than specific language tests.

The strengths of this study include well-matched control groups, although one limitation is the retrospective reporting employed. A diagnosis of delayed language development was made in the absence of a formal standardized language assessment. The researchers acknowledged the limitation of the screening measure employed. Appropriate multivariate logistic regression modeling was performed to determine the relationship between all significant risk variables and language development. Additionally, an appropriate one-way ANOVA was used to compare group data. Overall, results revealed that children who began watching television prior to 12 months of age and watched more than 2 hours of television per day were approximately 6 times more likely to have language delays. The results are highly suggestive of a relationship between early onset of television viewing and delayed language development.

Informational Articles

The **American Academy of Pediatrics (2011)** issued a policy statement in order to reaffirm its 1999 statement with respect to media use in children under the age of 2. The article summarized recent research findings addressing this question. In particular, the lack of evidence supporting educational or developmental benefits for media use by children younger than 2 years of age, and its potential adverse health and developmental effects on this population was highlighted. Relevant background literature was reviewed and gaps in current knowledge and research were identified. Although the search strategies and selection criteria for the studies included in the article were not provided, the policy statement presented corroborating evidence that media exposure may have potentially negative effects and no known positive effects for children younger than 2 years.

Cardany (2010) conducted an informational review of the literature on brain development during the first 3 years of life, the educational content of screen media for children younger than 2 years, and whether infants are able to learn from screen media. Relevant background literature was reviewed and gaps in current knowledge and research were identified. The author's conclusion was that the available evidence suggests that very young children learn from concrete, simple repetition, and that the fast-paced scenes of screen media may over-stimulate a developing brain. Although the search strategies and selection criteria for the studies included in the review were not provided, the article presented well-documented literature providing corroborating evidence that direct parent-child interaction without screen media is of most benefit for language development.

Discussion

Overall, the results of the five studies reviewed are suggestive of a relationship between screen media exposure before 2 years of age, slower vocabulary development, and an increased likelihood of being diagnosed with a language delay.

One study found that content and program type need to be considered when describing media effects. Linebarger and Walker (2005) found that at 30 months of age, watching *Dora the Explorer, Blue's Clues, Arthur, Clifford,* or *Dragon Tales* resulted in greater vocabularies and higher expressive language scores in comparison to watching *Teletubbies, Sesame Street,* or *Barney and Friends*. Programs such as *Blue's Clues* and *Dora the Explorer* are speculated to enhance expressive language production and vocabulary development due to the following: onscreen characters label objects, speak directly to the child, actively elicit participation, and provide opportunities to respond (Linebarger & Walker, 2005). The aforementioned language-promoting strategies embedded in specific programs are based on the researchers' informal observations therefore further research is needed to more carefully analyze program content.

Future research considerations:

In order to improve the level of evidence provided by the existing literature, it is recommended that future research take the following into consideration:

a) Future research should employ study designs that offer a stronger level of evidence as well as more representative samples.

b) Language delays should be diagnosed using formal standardized language assessment measures.

c) Future research should be conducted to clarify whether television programs containing language-promoting strategies are in fact able to promote language development in the same manner as face-to-face, direct parent-child interactions

d) Future research should consider the impact of other screen media (e.g., iPads, laptops, smartphones) on language development, as these smaller devices have become more readily accessible and have gained popularity in the last few years.

Clinical Implications

Speech-language pathologists may confidently recommend that children under the age of 2 years should not be exposed to screen media, and educate caregivers on its potentially negative effects on language development.

References

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