

Television and language development in the early years:

[Linguistics](#), [Language Acquisition](#)



Television and language development in the early years: a review of the literature March 2004 Contents Preface Executive Summary 1 Introduction 2 Review findings 2. 1 The relationship between television and language development in the early years 2. 1. 1 Children’s television Attention and comprehension Vocabulary development Expressive language development Grammar development Pre-literacy skills: phonological awareness, narrative and storytelling, knowledge of literacy 2. 1. 2 General audience television 2. 1. 3 Conclusions 2. 2 The characteristics of television programmes that stimulate or hinder language development in their target audience 2. 2. 1 Main factors influencing viewing experience 2. 2. 2 Nature of supervision and interaction by carers during viewing 2. 2. 3 Location of the television in children’s bedrooms where there is likely to be no parental supervision 2. 2. 4 The different benefits/implications between viewing new content on television and the repetition of familiar favourites on a video 2. 2. 5 Conclusions 2. 3 The quantity of television that enhances or detracts from language development 2. 3. 1 Children’s consumption of television 2. 3. 2 Children’s television and quantity of viewing 2. 3. 3 General audience programming and quantity of viewing 2. 3. 4 Conclusions 2. 4 The kinds of activities in the home that maximise benefits and minimise the adverse effects of television 2. 4. 1 Providing an optimal viewing experience 2. 4. 2 Regulating the quantity of television viewing 3 Conclusion 4 References 2 Preface In 2003, the National Literacy Trust commissioned Dr Robin Close to conduct a literature review of published research in order to understand more fully the relationship between television viewing in the early years and language and literacy development. A priority of the National Literacy Trust

is to understand the relationship between language development in children from birth to age three and later literacy development. As television is a central feature of modern western culture, the Trust wished to understand the effects of television viewing on children's language development and wider literacy. The literature review was intended to provide informational support for the Trust's Talk To Your Baby campaign. The review, however, was to be based on an objective assessment of available research evidence and not on any prior agenda of the organisation. The review is written in the format of a report rather than an academic review to provide useful information for professionals concerned with understanding issues surrounding television use by infants, toddlers and pre-schoolers in a critical period of their language development. It is clear from the study that more collaborative research between early language specialists and media specialists is warranted to understand more fully the implications of the television medium and the amount of time young children spend viewing television for language acquisition. It is hoped that the review can serve as a starting point for such work. The review concentrated on international publications over the last 30 years. Most of the material consulted, however, covered the period from the 1980s to February 2004. The review looked mainly at literature focusing on the birth-to-five age range, although priority was given to the birth-to-three age group to correspond with the Trust's focus. While the review investigated research on the relationship between television and language in the international community, priority was given to research in English-speaking countries and first language learners of English. As the Trust is mainly concerned with English literacy among English

speakers, the review concentrated on this target group, although research on second language learners of English was not systematically excluded. Similarly, the absence of these other media does not mean that the researcher perceives them to be unimportant but, rather, it reflects the time constraints of the study. Several people at universities around the world were contacted about their research and consulted on their knowledge of the field. These are mentioned in alphabetic order: Dan Anderson (University of Massachusetts); David Buckingham (University of London); Sandra Calvert (Georgetown University); Tricia David (Canterbury Christchurch University College); Jean Golding (Bristol University); Theresa Grainger (Canterbury Christchurch University College); Barrie Gunter (University of Sheffield); Aletha Huston (University of Texas); Marina Krcmar (University of Connecticut); Deborah Linebarger (University of Pennsylvania); Sonia Livingstone (London School of Economics); Jackie Marsh (University of Sheffield); Ian St James-Roberts (University of London); Patti Valkenburg (Amsterdam University); and Elizabeth Vandewater (University of Texas). I am grateful to Julia Strong, Sam Brookes, Liz Attenborough and Neil McClelland of the National Literacy Trust for their helpful comments. Robin Close 13 March 2004 3 Executive Summary This literature review investigates the relationship between television and language development in children from birth to age five. The aim of the review is to summarise international research pertaining to television and early language and identify the effects of high exposure (quantity of viewing) to television. It also considers caregiver roles in realising potential benefits or mitigating negative effects of television viewing. The research literature was analysed

in the four headings listed below with their main findings. The relationship between television and language development in the early years - - - - A child's age and linguistic maturity, the suitability of the content for his or her age group, the quality of the content viewed, the amount of television viewed, and the involvement of parents during viewing all inform the likelihood of language learning from television. Given the right conditions, children between the ages of two and five may experience benefits from good-quality educational television. For this group of children there is evidence that attention and comprehension, receptive vocabulary, some expressive language, letter-sound knowledge, and knowledge of narrative and storytelling all benefit from high-quality and ageappropriate educational programming. The literature has not, however, established whether children develop grammar, phonological awareness, and knowledge of literacy from viewing such programming. Although there is evidence that children's entertainment television provides opportunities for verbal interaction and talk, there is also evidence that children who are heavy television viewers have lower expressive language scores. Children's programmes can enhance expressive language by encouraging talk, but more evidence is required to demonstrate long-term effects. And, although there is a correlation between low expressive language scores and television viewing, specific cause and effect relationships have not been identified. For children under the age of two, the literature is far less certain about the language benefits of the current crop of children's television. There is some evidence that children at 18 months will be attentive to the visual stimuli of such programmes and respond verbally to them, particularly if the content is of high quality. Other

evidence suggests that children under 22 months acquire information, or learn first words, less effectively from television than from interactions with adults. This research questions the extent that children under two understand television content as opposed to being entertained by it. Evidence is strongest that by 24 months of age, children comprehend content and may extend their language by viewing television. In all cases, the individual characteristics of the child, such as age and linguistic maturity, will determine how a child will respond to television and what he/she will acquire from it. More research is required on this age group. Viewing by children of programming aimed at a general or adult audience is correlated with poor language development in pre-schoolers. Evidence suggests that children who are frequently exposed to such programmes tend to have a lower vocabulary, poorer expressive language and to engage in less TV-talk (i. e. talking about television) with adults. This is attributable to both the quality of the content on offer and the quantity of exposure to television more generally. 4 The characteristics of television programmes that stimulate or hinder language development in their target audience - - - - -

The optimal television viewing experience for language development is one that includes exposure to age-appropriate content, to new and familiar words, and which offers possibilities for interaction and adult co-viewing and teaching. Factors associated with a positive viewing experience include the following: minimal visual or auditory stimuli for programmes targeting infants, a balance between new and familiar words, interesting material for adults to encourage co-viewing, use of some sophisticated language, formats that offer possibilities for interaction and participation through songs and

questions, and the age-appropriateness of the programmes. Conversely, the factors associated with a negative viewing experience include excessive visual and auditory stimuli (for under-twos), complex narratives, the presence of older siblings during viewing, language-poor content and extensive co-viewing with adults of adult programming. Co-viewing with adults is not necessary for vocabulary development when children are viewing high-quality and age-appropriate programming and confronted with familiar words and their meanings. Some evidence suggests, however, that co-viewing aids oral ability and comprehension of unfamiliar words and meanings. Where televisions are located in a child's bedroom, this is associated with reduced opportunities for co-viewing with parents and also with increased viewing of general or adult programming. The newness of the trend means that research has yet to fully explore the effects of children's viewing and behaviour patterns while watching television in their bedrooms. Repetition of content by video has been shown to support learning from educational programming. The optimal quantity of video viewing, however, is yet to be identified. The quantity of television that enhances or detracts from language development - - - A variety of studies have demonstrated that children who are heavy viewers of television are more likely to be linguistically underdeveloped, although a direct causal relationship has not been established. Children's consumption of television increases as a result of children's age, the availability of the television in the home, particular family circumstances (low education of the parents, young parents, low socio-economic status of the family, low IQ and male gender of the child), children's time spent in the home, carers' positive views on the role of

television, and high frequency of parent-child co-viewing of general audience programmes. Reduced exposure to educational television is associated with low time spent at home, presence of older siblings, low socio-economic status, children's poor language ability and male gender. The correlation between high quantity of general television viewing and poor language ability may be attributable to the quality of content viewed and/or the time spent viewing. More research is required to understand what happens in situations where children are not attending to television when it is on for extended periods in a day. Similarly, more research is required on the effects of decreased interactions with adults who are heavy viewers of television. More research is required on the optimal quantity of both educational and general audience television. 5 The kinds of activities in the home that maximise benefits and minimise the adverse effects of television - - - The literature has not identified specific activities in the home that work best to maximise benefits and minimise the adverse effects of television, although some conclusions can be drawn on ways to ensure an optimal viewing experience and to regulate the quantity of viewing. Carers should select high-quality, age-appropriate educational programming in television and video formats; programmes that offer opportunities for verbal responses and a balance between familiar and new content. They should select children's programmes that can be enjoyed by both adult and child, and programmes with minimal stimuli, such as a single adult speaker, for children under two. Carers should ensure that younger siblings are not prevented by their older siblings from viewing age-appropriate educational programming. Carers should interact with children while viewing, explain and model familiar

words, repeat content by way of videos, and locate the television in a room where co-viewing is likely to occur. Carers should limit exposure for the under-twos in favour of other one-to-one language enhancing activities, encourage viewing of high-quality, age-appropriate educational television for children aged two to five, choose educational programming over children's entertainment programmes, limit adult and family viewing of general audience television, and make television less readily available in the home.

Conclusion - - - - Although there are many promising findings from the studies conducted on children over two, more needs to be learned about the relationship between television viewing and language development for the under-twos. The research has yet to identify either the effects or implications of a medium that does not modify its output in response to child verbalisations on either receptive or expressive language compared to conversational settings. More research is required on the optimal quantity of both educational and general audience viewing for children, and the effects of sustained exposure to background television. Specific effects and causal relationships, such as whether heavy television viewing actually harms language development, require further study. Comparative analysis of programme content to identify the markers of high-quality programming should also be undertaken. Television, although beneficial under certain conditions, should be seen as one of many activities that offer opportunities for language learning. Television can promote talk, but this talk needs to be harnessed by an adult if the learning experience is to extend beyond the airing of a programme. At the same time, until optimal quantity is known, television viewing should be closely monitored to keep it to a minimum,

especially for the under-twos. Given the uncertainty within the literature, the cautious guidance of the American Academy of Pediatrics, which advises strictly limiting the exposure of under-twos to television, seems prudent. 6 1.

Introduction There is growing concern that children's language abilities on entry to school have declined over the last ten years (NLT and NAHT, 2001). This is matched by concern that there may be negative effects of increased exposure to television and other media among children in the early years (BBC, 2003). Since the 1950s there have been some fundamental changes in western culture which have placed television media at the epicentre of family life. Over the course of the last 50 years, television technology has changed with larger and higher-resolution screens, clearer audio, and greater affordability: all of which have improved the quality of the viewing experience and increased viewing. It is becoming commonplace to have more than one television in a household and televisions in children's bedrooms. Producers of children's educational programmes are also now working closely with software companies to produce educational software (Revelle, Medoff and Strommen, 2001). More recently, television technology is in evolution with the introduction of digital interactive services, which, if applied, may enhance some of the instructional qualities of children's educational programming (DTI and DfEE, 2001; DTI, 2003). All this points to a certain urgency for understanding the implications of the television medium for language development in young children in the changing technological environment which is influencing home practices. This report reviews international research on the relationship between television and language development in children from birth to age five. It also considers the

implications of the quantity of television viewing for language development and the role of carers in either realising potential benefits or mitigating the negative effects of television. The terms of reference for the study were to investigate the following questions: " What does international research tell us about the relationship between television viewing by children under five and their language development? " " Is there any evidence about the quantity of television viewing and the role of parents and carers which would be helpful in either maximising the benefits (or mitigating the dis-benefits) of television viewing in the birth-to-five period? " Research into these questions yielded less literature than was expected for a subject as important as language development. To carry out the research, the ERIC database served as the main source for document retrieval, particularly for journals and publications before the mid-1990s, when documents were not electronically stored or available through EBSCO. At the time of search and retrieval, 2, 837 titles appeared for television research, and approximately 85 titles for television, language development and children. Most of the research covered primary school children with surprisingly few studies addressing pre-school children aged three to five. Fewer titles still were found for children under the age of three. Search terms for television included television, media and video as well as children's television, educational television and television research. For language, terms included language skills, speech skills, speech communication, oracy, oral communication, language acquisition, language development, language disability, comprehension and vocabulary development. Terms searched for the age range included infant, pre-school, and early childhood. Searches were made of popular children's programmes

such as Teletubbies and Sesame Street. The field is heavily dominated by research on educational programmes, particularly Sesame Street, which targets children aged three to five, while little research pertains to more general audience viewing and potential effects. Moreover, research on children under two was particularly limited as children's programmes, such as Teletubbies, have only relatively recently become available for this age group. Furthermore, research on this age group is methodologically very complicated and may explain why so few studies have been conducted. The question of quantity of viewing for this age group is an area that is also under-researched, overshadowed by the paucity of research on general audience viewing. Meanwhile, the literature provides some indication of the ways in which carers can maximise benefits and minimise disadvantages of television. It is acknowledged that the birth-to-five age range covered in this review spans different linguistic stages. Infants (birth to one) bring to their television viewing different skills than toddlers (one to three) and pre-schoolers (three to five) who, under normal circumstances, have greater linguistic capability when confronted with televised information. Language, that is speaking, listening, comprehension and vocabulary, is learned mostly through interaction with the environment and with adults. The extent that television provides similar interactive support and prepares children for literacy is a subject which preoccupies the literature. Research on language learning in naturalistic settings (as opposed to television) has demonstrated the importance of children's verbal interaction with adults at each stage of development. Evidence suggests that low opportunities for verbal interaction in the early years is associated with poor vocabulary and elevated risk of

later difficulties in the primary grades when higher comprehension is required (Snow, Barnes and Griffith, 1998, p. 122). The correlation between adult interaction and early language is therefore very strong and persists long after a child enters school. In the early stages, when infants begin communicating by smiling, blinking and crying, adult input that stimulates language, or 'mother-to-child input,' may be auditory (intonation, pitch and other cues that help the child to focus and prompt a response) (Sachs, 1977) or visual (facial expressions etc) and physical closeness. This input helps to develop the child's attention and, over time, an understanding of communication (Bruner, 1983). Research has suggested that mothers are programmed to respond to their children's sounds in a way that encourages language development (Snow, 1972). Language will develop in a child regardless of this input, but current brain development theory argues that adult input stimulates the brain activity necessary for developing language and enables individuals to fulfil their potential regardless of their genetic makeup (Zero To Three, 2001). During the phase of rapid vocabulary development starting at between 12 and 18 months, environmental factors, particularly those in the home, continue to nurture the acquisition of language (Paley, 1986; Wells, 1987). The kinds of language-enhancing activities language specialists promote are songs, rhymes, imaginative play, book reading, one-to-one parental interaction and conversation (Wells, 1987; Bruner, 1983; Crain-Thoreson, Dahlin and Powell, 2001; Crain-Thoreson, Bloomfield, Anthony, Bacon, Phillips and Samwel, 1999). These will help prepare pre-school children for school by developing pre-literacy skills associated with oral language — " knowledge of word meanings, an

understanding that print conveys meaning, phonological awareness, and some understanding of how printed letters code the sounds of language" (Snow et al, 1998). As a pre-literacy strand, oral language involves speaking/listening, phonological awareness, narrative, de-contextualised talk and talk about texts. This 'strand of literacy experience' along with reading and writing requires adults to provide children with opportunities, recognition, interaction and models (the ORIM framework developed at the University of Sheffield) (Hannon, 2000). As a result of the perceived importance of verbal interactions in the home for early language, language specialists have traditionally recommended limited exposure to television, particularly for children under two (Snow, Barnes, Chandler, Goodman and Hemphill, 1991, pp. 63, 64; American Academy of Pediatrics, 2004).

However, acceptance of television as a learning tool has been aided by the growing body of research surrounding educational programming, particularly arising from the 8 Sesame Street phenomenon and its 30 years of supporting research (Fisch and Truglio, 2001; Snow et al, 1998, pp. 310-11). Advocates of educational television argue that many language-enhancing activities thought to be associated with parent-child interaction can be replicated at least in part by educational television. Parent-child shared book reading, for example, was identified by the Committee on the Prevention of Reading Difficulties in Young Children in the US as a beneficial activity that promotes verbal interaction, vocabulary learning and knowledge of print in infants and toddlers (Snow, Burns and Griffith, 1998). Mabel Rice identified many similar characteristics of book reading in Sesame Street (Lemish and Rice, 1986). She said about Sesame Street's educational success that it " closely

resembles that of a mother talking to her child, with simple sentences, much talk about the here and now, repeated emphasis on key terms, and an avoidance of abstract terminology" (Rice et al, 1990, p. 422). This review looks at the extensive body of literature on educational television and these surrounding claims of educational benefits for pre-school children. However, it also reviews literature on noneducational and general audience programming to investigate whether content, as well as quantity, may influence language ability. Section 2. 1 concentrates on the relationship between television viewing and language development, looking at children's programming and general audience viewing. Television's wider impact on subsequent literacy skills, overall educational achievement and cognitive development was also considered. The review did not investigate the effects of television on health or wellbeing, unless there were links made with language development. Several categories of language are examined including attention and comprehension, vocabulary, expressive language, grammar and other pre-literacy skills associated with oral ability such as phonological awareness, knowledge of narrative and talk about texts. These last three pre-literacy skills are grouped together under one heading because there are limited research findings to report on them. Section 2. 2 identifies the characteristics of quality programming and of an optimal viewing experience for early language development. The study reviewed published material on the main factors that contribute to beneficial (or unsatisfactory/harmful) television viewing from the point of view of language and literacy development. Factors included the nature of supervision and interaction by carers during viewing, the location of the television in

children's bedrooms where there is likely to be no parental supervision, and the distinction between television and video viewing in respect to opportunities for repeat viewing with the latter. Section 2.3 concentrates on the question of whether or not there is an optimal quantity of television viewing for children between birth and age five. The review considered the optimal quantity/frequency of television viewing for children's language development and, conversely, any adverse effects of excessive or insufficient television viewing on their language development. Lastly, section 2.4 identifies in greater detail the role of parents/carers in maximising the benefits and minimising the disadvantages of television. Both the role of carers in providing an optimal viewing experience and in ensuring that the quantity of television is optimal are considered.

2. Review Findings

In order to address the terms of reference for this study, the findings of the review have been analysed under the following headings:

- the kind of relationship that exists between television viewing and language development in the early years
- the characteristics of television programmes that stimulate or hinder language development in their target audience
- the quantity of television that enhances or detracts from language development
- the kinds of activities in the home that maximise benefits and minimise the adverse effects of television.

2.1 The relationship between television and language development

To investigate the relationship between television viewing and language development, the review considered the aspects of television viewing associated with children's and general audience programming. There were several categories of language development within the birth-to-five age group that were of interest, namely attention and comprehension,

vocabulary development, expressive language, grammar, and pre-literacy skills of phonological awareness, knowledge of narrative and of literacy. These skills are associated with toddler and pre-schooler language ability and reflect the main body of research in this field. Most of the research on these aspects of language has also come as a result of increased availability of educational programming for children aged two to five. Infant communication skills such as attention, interaction, visual and vocal responses (and babblings) are included where appropriate in the above language categories under children's television.

2. 1. 1. Children's television

'Children's television' is often classified as being either educational or entertaining, but these categories are not as straightforward as they may seem. Educational programmes, the most famous being Sesame Street, serve to promote school readiness in children between the ages of three and five. Much of the research on educational television reviewed in this report was American. In the American research, children's entertainment programming also typically implies commercial cartoons targeting children older than five, such as Scooby-Doo. The cartoon format, however, is currently used for a range of programmes targeting pre-schoolers which have not yet appeared in the academic research. These programmes include Thomas the Tank Engine, Bob the Builder, Postman Pat, etc. Hence, 'cartoons' in the context of the report refers to commercial cartoons as presented in the American research and discussion of their impact on children's learning is also included under general viewing. In the UK, the categories of education and entertainment are blurred as Teletubbies, which targets the under-fours, also falls into the category of entertainment even

though the goal is to promote “ learning through play” (BBC, 2004). Although the emphasis is on entertaining young children, the suggestion that children will learn through play implies an educational outcome that, like research on Sesame Street, some researchers have sought to measure. For children between the ages of two and five, research suggests that high-quality educational television can aid many aspects of language development, while there is conflicting evidence about what children under two are acquiring from both educational and entertainment programming. 10 Positive effects of educational television depend largely on the age of the child, his/her pre-existing cognitive and language development as well as the age suitability of the content viewed. Some of the findings have been: - - - - - prior to 18-22 months, children may not learn effectively from television compared to live situations (Barr and Hayne, 1999; Krcmar, Grela and Lin, 2004) children imitate songs and speech from television between the ages of 18 and 24 months (Kodaira, 1990) parents believe that their children learn language from television at 30 months. In an Australian study, parent interviews of children at 30 months showed that 86 per cent of 103 children in the study learned language; 52 per cent learned music/rhymes/song (Cupitt et al, 1989) pre-school children learn some pre-literacy skills from specific programmes such as Sesame Street children who view Sesame Street between the ages of two and three have higher scores on language, maths and school readiness at age five. Bickham, Wright and Huston (2001) found that watching educational television such as Sesame Street between ages two and three predicted higher scores on measures of language, maths and school readiness at age five four-year-olds who are frequent viewers of

Sesame Street are more likely than non-viewers to identify colours, count to 20, recognise letters and tell connected stories when pretending to read (Zill, 2001) children viewing educational television show signs of having an interest in learning and a positive perception of school learning. This is retained into high school (Bickham, Wright and Huston, 2001) viewing educational television between the ages of two and three can have long-term positive results. Viewing at age four and beyond does not affect later scores (Bickham, Wright and Huston, 2001) the 'Recontact Study' (15 to 19-year-olds) found similar evidence that there are positive long-term effects of educational programming such as Sesame Street (Anderson, Huston, Smith, Linebarger and Wright, 2001) co-viewing of informative educational programmes with children aged three to seven was positively related to children's attention to television, receptive vocabulary and use of print (St Peters, Huston and Wright, 1989). These findings are detailed more fully below in the following language categories: attention and comprehension, vocabulary development, expressive language, grammar development, and the preliteracy skills of phonological awareness, narrative and storytelling, and knowledge of literacy. Attention and comprehension Much research has focused on understanding why and how children attend to television and whether viewing behaviours are age related. This has included an examination of how attention to television may relate to linguistic comprehension. There is a large body of research on children's viewing patterns, their attention to television and their comprehension of televised information. Research has found a strong correlation between attention to television and comprehension. That is, children require a certain

comprehension of language to attend to television so that attention increases between birth and age five (Anderson and Levin, 1976; Anderson, Lorch, Field, Collins and Nathan, 1986). Others have argued that attention to television raises comprehension of television and improves receptive vocabulary in pre-school children (St Peters et al, 1989). The pre-school child 11 is also able to selectively attend, search for comprehensible content and absorb information from viewing (Rice and Lemish, 1986; Rice, Huston and Wright, 1982). Infants, according to the Anderson and Levin (1976) research, have lower attention levels, although they will attend to some educational television, because of their undeveloped language ability. These findings and those for older children relate to programme content and its ability to interest and engage young viewers for sustained periods. They have looked at educational programmes such as Sesame Street which have been designed to encourage children aged three to five to attend to television. The content of Sesame Street, according to Rice and Lemish (1986), is effective in drawing the attention of even younger children (ages six months to three years) and, depending on factors such as age, linguistic maturity, volubility and parent responsiveness to the child, such a programme may encourage young children to talk. Programmes for audiences younger than four, such as Teletubbies and Barney and Friends, use similar techniques to sustain children's attention. According to Anderson and Evans (2001), however, a reading of research for under-tuos points to low attention and little benefit from television for children under one. They suggest that children's ability to acquire information from television appears at age three. The question of low infant attention was investigated by New Zealand

researchers Barr and Hayne (1999) who studied whether infants acquire information from television. Specifically, they looked at infants' ability to imitate actions from video in order to understand what children aged 12, 15 and 18 months might learn from television. Imitation is one way infants communicate before they develop language comprehension or the ability of language production. Research methods included the use of puppets to simulate age-appropriate content that might be found in a children's programme and simple actions, such as shaking the puppet, to produce an outcome (ringing bells) which participating infants might imitate. The actions were modelled in both live and video settings, using children's home television. They found that children aged 12, 15 and 18 months were all able to imitate actions when modelled live but that there were differences in ability when the same actions were modelled in video. Children aged 15 and 18 months imitated some actions from video but the performance was better in live conditions. Younger children, those 12 months old, were unable to imitate from video. Children did show signs of being entertained and interacting with video as indicated by their vocalisations but the evidence, according to the researchers, suggests that young children have difficulty encoding and using information from television compared to live one-to-one interaction with adults. One explanation for this is that infants have underdeveloped memory, which improves with age and is enhanced through live interaction with adults. It was found, for example, that 15-month-old children had less difficulty remembering actions from live demonstrations compared to those in video conditions. Krcmar et al (2004) also found that children under 22 months could not learn from television compared to live

interactions with adults. They raised concerns that Teletubbies offered more stimuli than children under 22 months could process or learn from. Krcmar and Grela (2004) proposed that children's enjoyment of Teletubbies reflects the age group's fascination with visual stimuli more generally. They, along with Barr and Hayne (1999), raised questions about the benefits of television for this age group as television may provide entertainment but not necessarily informational learning. In contrast, recent research on Teletubbies in Australia suggests that children at 18 months will attend to television in the same way as older children. Roberts and Howard (2004) argue that when content is interesting to young children, as in the case of Teletubbies, then children actively attend and interact with television while they attempt to "make cognitive sense of the world". Based on observations of children's behaviour while viewing Teletubbies, they argue that attention (making sense) and attention (pleasure) are directly related aspects of infant viewing behaviour. Their study 12 provides rich data about children's responses to the programme, but it is not yet clear from their research whether these responses actually mean that children understand the content. Some further testing of some of the issues raised by Roberts and Howard (2004), namely the link between affective responses and cognition, is required before conclusions about what children learn from television can be drawn. Children younger than one also appear to attend differently to visual and auditory television stimuli. Hollenbeck and Slaby (1979) tested the visual and verbal responses of six-month-old infants to television. They considered visual and verbal responses in situations of picture alone, sound alone, and picture and sound. A control condition of unpatterned sound-plus-

picture was administered against the standard condition of patterned picture-sound. Infants attended to television more in the standard viewing condition of patterned picture-sound than the picture alone, sound alone, or control unpatterned picture-sound condition. Their results for six-month-olds' visual attention to television were similar to that found in one-year-olds by Anderson and Levin (1976): that is, that educational television could sustain visual attention for brief periods. Barr and Hayne (1999) also noted that children aged 12 to 18 months showed signs of attending and being amused by videos, while not necessarily comprehending the content. Hence they question the significance of attention for comprehension. Hollenbeck and Slaby (1979) also noted differences in infant verbal responses to the different television conditions. They were higher during the picture-only condition but lower during the auditory condition. They interpreted their findings as suggesting that auditory stimulation might inhibit infant vocalisation. This theory, they argue, would require testing using baseline measures of vocalisation. Some explanation is also needed for this variation between visual and verbal responses in the different conditions before any conclusions can be drawn about television's effects on child visual and verbal behaviour. These studies suggest that there are gaps in our knowledge of the relationship between attention and comprehension in children under two. Future research should continue to identify the meaning behind infant vocalisations in response to television as they learn and are entertained. Research has begun to look at these infant interactions with age-appropriate television, but the implications for linguistic comprehension are still far from understood. Secondly, in response to the Hollenbeck and Slaby research, it

would appear that more research is needed on how infants respond to visual and auditory stimuli from television. In particular, their study has raised the important question of whether or not there are any risks that auditory stimulation from television may inhibit infant vocalisations. Another question is whether there are different risks when children are attending to television compared to when they are exposed to background media. Anderson and Evans (2001) expressed particular concern that there may be dangers of background media for children's private vocalisations during play, which are associated with children's development of verbal thought and internalised selfcontrol of behaviour (Vygotsky, 1978). The long-term implications for language must be assessed. Vocabulary development Where researchers have found a positive relationship between television viewing and language development is in the vocabulary development of pre-school children aged two to five. Vocabulary is both receptive and expressive. Receptive vocabulary is the comprehension of spoken words (such as nouns or adjectives) and expressive vocabulary is word production. Vocabulary relates also to 13 syntactic ability (the complexity of sentences) and lexical ability (word diversity). These skills relate broadly to toddlers and pre-school children who have this varied vocabulary capability. The research points mainly to educational television's positive correlation with increased scores in receptive vocabulary of pre-school children. This research has centred on Sesame Street, which targets that age group and claims to develop vocabulary. In fact, much educational programming has a wide range and significant amount of vocabulary on offer to promote children's learning of vocabulary (Klein, 1997). A recent literature review by Naigles and Mayeux

(2001) concluded that research has demonstrated that children learn vocabulary and extend understanding of familiar words through educational television such as Sesame Street and the more recent Barney and Friends. For the purpose of this report, the key questions are, what aspects of vocabulary development have been evaluated and under what circumstances has vocabulary been found to be enriched by children's television? Furthermore, are there any cases where vocabulary has not been enhanced by children's programming? The following considers research on television's relationship with receptive vocabulary development in both pre-school children and the younger infant age group. Naigles and Mayeux's (2001) analysis of the literature on vocabulary concluded that there is evidence of lexical development in pre-school children as a result of educational television. In this case, the researchers are concerned with the child's ability to distinguish individual words and their meanings as they are spoken. The process of lexical development is aided by adult speech that provides examples of word pronunciation, emphasis and meanings. This is particularly helpful for learning verbs. They identify the work of Mabel Rice and her colleagues (Rice, 1984; Rice and Haight, 1986) during the 1980s on Sesame Street as indicating that educational television can facilitate children's learning of new words. Her work revealed that the programme's use of words that are prosodically stressed, or spoken louder than other words in a sentence, enables children to distinguish words from the rest of a sentence. Programmes are also designed to provide referents for children to enable them to interpret the meaning of unfamiliar words. Rice and Woodsmall (1988) found that children can 'fast map' new words (object,

action and attribute words) from children's television, not specifically educational television. 'Fast mapping', the ability to gain a quick and partial understanding of a word's meaning from a single exposure, is the first phase in lexical acquisition until children begin acquiring and storing more information with subsequent encounters with a word. Typically, children aged seven to 14 are capable of fast-mapping. The researchers studied the receptive vocabulary development in three and five-year-olds watching animation for children rather than educational television. They looked at children's processing of object, action, attribute and affective-state words to determine the ease and order of acquisition. The researchers found that children can learn something about novel object, action and attribute words while viewing television. However, while "these words were amenable to quick comprehension", "affective-state words were resistant to quick interpretation." (p. 426) They also found that overall, five-year-olds acquired more receptive vocabulary (object and attribute words), possibly due to prior linguistic knowledge and viewing experience. However, they found that television's positive effects were not limited to children with more advanced vocabularies. Overall, they concluded that because pre-schoolers acquire new words with minimum exposure and tutorial assistance, television is well suited to language learning. Rice and Woodsmall (1988) contend that "a minimum of overt salienceenhancing support is adequate for children to parse a new word and arrive at an initial at least partial comprehension of meaning." (p. 426) While it appears that the over-tuos 'fast map' vocabulary from television, children under two do not, according to a recent study. Krcmar et al (2004) investigated whether toddlers aged 15 to 24

months could learn first words from the children's entertainment programme Teletubbies. The experimental 14 study used a repeated measures design, and compared children's ability to learn novel words in five different conditions. These included the presentation and identification of a novel word by: an adult speaker via a live presentation when the toddler was attending (i. e. joint reference), an adult via live presentation when the toddler was not attending, an adult speaker on television, and an edited clip from Teletubbies. They found that children learned novel words best in a joint-reference situation, where the adult actively helps the child to focus on an object. Children under 22 months did not appear to learn novel words from television as effectively as from live conditions or an adult speaker on video. Children over 22 months did acquire some information from Teletubbies, suggesting that children can learn vocabulary from television once they already have some foundation in language. The researchers conclude that toddlers cannot acquire ' first words' from television compared to live one-to-one interactions with adults. The under-tuos might be able to acquire some information from television when there is little stimuli on offer in a programme, such as an adult speaker (Rice, 1983, 1984), which they suggest is not the case for Teletubbies. Results emphasised the importance of responsive language teachers and interactions with adults. While it appears that children over the age of two are able to learn some vocabulary quickly through ' fast mapping', what evidence exists that television can promote deeper lexical understanding? Naigles and Mayeux (2001) concluded that research does support the claim that, over time, children acquire considerable lexical knowledge, or information about word

meanings, from television viewing. They also investigated whether research reveals that repetition of words on children's programmes is responsible for gains in lexical knowledge or whether repetition of words by co-viewing adults is responsible for gains. Their reading of the evidence suggested that when language in children's programmes is pitched at the level of the child who is watching the programme, the child does not require adult co-viewing to acquire words. In situations where a child is exposed to many unfamiliar words or concepts, adult co-viewing may be more effective in vocabulary development when the adult provides explicit definitions, explanations for potential confusions and additional exemplars (Naigles and Mayeux, 2001). The most commonly-cited study reporting significant vocabulary gains is the Rice, Huston, Truglio and Wright (1990) longitudinal evaluation of children's vocabulary development while watching Sesame Street . The study used one-week diaries of children's television viewing over two years from two cohorts of children, aged three to five and five to seven. Child and family measures were taken of children's vocabulary skills, gender, presence of siblings, parent education, parent encouragement of Sesame Street and parent attitudes about television. From their findings it appears that children aged three to three-and-a-half who watch Sesame Street can learn new words from the programme independent of adult co-viewing and that this predicted language scores at age five. Viewing Sesame Street at age five, however, did not predict vocabulary scores at seven. Findings were directly related to particular attributes of Sesame Street which specifically target the three-to-five age group and confirm the potential benefits for children accrued through viewing high-quality, age-appropriate educational

television. Positive gains in vocabulary as measured by the Peabody Picture Vocabulary Test (PPVT) remained strong after controlling for other potential influences such as parent education, family size, child gender and parent attitudes. Similar findings were previously reported by St Peters, Huston and Wright (1989) in their earlier two-year study of 271 children between the ages of three and seven, also watching Sesame Street. St Peters et al (1989) also found that receptive vocabulary in three to five-year-olds, measured by the PPVT, is encouraged by age-appropriate educational television independent of parent co-viewing. Singer and Singer (1998) also found that children acquire some aspect of word meanings from watching Barney, although they concluded that children who received some adult tutoring on unfamiliar words used in Barney learned more. 15 More recently, Wright and Huston (1995) pursued their investigation of the long-term benefits of educational television in the Early Window Study, 1990-3, looking specifically at low socio-economic status, ethnically-diverse children in urban mid-west America, at ages two to three and four to seven. The children's primary language was English. They investigated whether or not the effectiveness of educational programmes (Sesame Street) in teaching receptive language is determined by age and home factors such as socio-economic status or ethnicity. Does Sesame Street, for example, benefit advantaged children more than disadvantaged children and therefore increase the social divide? Measures for children's television viewing, home environment and language and school-readiness skills were taken. The two cohorts were studied in home and office visits and bimonthly time-use diaries were collected by telephone. On language measures, children were tested for vocabulary using

both the Primary Language Scale (PLS) for two-year-olds for an index of verbal skills and the Peabody Picture Vocabulary Test Revised (PPVTR) for four-year-olds, testing receptive vocabulary. For Spanish children, the PPVTR was administered in English and in Spanish in order to obtain comparative measures of language ability. However, researchers were mainly interested in whether Spanish children were acquiring English vocabulary from educational television. Overall, they found that there is a correlation between school readiness/vocabulary skills and viewing educational programming aged two to three. That is, regardless of the children's initial skills and the characteristics of their families (maternal education, income, primary language and home environments), children who watched Sesame Street from ages two to three gained in pre-academic skills up to and including age five (Wright, Huston, Scantlin and Kotler, 2001). Children with good language skills at age five tended to have watched more educational television and fewer entertainment programmes such as commercial cartoons in primary school years than children with poorer skills. From their findings, the researchers concluded that children from disadvantaged backgrounds do not watch enough educational programming such as Sesame Street (Wright et al, 2001). They also suggest that the key time for learning language from educational television is between the ages of two and three. From their longitudinal study, the researchers also concluded that the early effects of television viewing can be lasting. The Early Window Study was followed up with the Recontact Study which aimed to find out if the effects of pre-school television viewing were related to adolescent achievement, behaviour and attitudes (Anderson, Huston, Schmitt,

Linebarger and Wright, 2001). The viewing of Sesame Street in the pre-school years was associated with higher grades, reading more books, placing more value on achievement, greater creativity and less aggression (Huston, Anderson, Wright, Linebarger and Schmitt, 2001). All these studies would suggest that vocabulary development is directly related to television content. The evidence is strongest that for pre-schoolers aged three to five, content determines language acquisition of familiar and new words and meanings. The one study that was found on infant vocabulary acquisition suggested that content does determine vocabulary growth in infants but that, for the most part, the under-tuos do not benefit from the medium when learning first words compared to live one-to-one interaction with adults (Krcmar et al, 2004). More research is required on the under-tuos to confirm these conclusions. Similarly, the above research on pre-schooler vocabulary development concentrated on receptive vocabulary development at the word level and demonstrated that there are gains here. The studies did not provide data on children's comprehension at the sentence rather than word level. More research is required on this question of television's relationship with receptive language more generally in order to understand the implications for higher-level vocabulary development. 16 The suggestion made by Rice, Huston, Truglio and Wright (1990) that vocabulary learned from television does not require adult input, needs qualifying. It would appear that learning meanings of familiar words does not require adult input compared to learning unfamiliar words and meanings. In all other natural language learning conditions, language competency is associated with adult input (Weizman and Snow, 2001; Hart and Risley, 1992). Language

specialists Weizman and Snow (2001) have argued that children's improvement of vocabulary largely depends on "lexically rich, naturally occurring conversations early in life." They identified mealtime and playtime instead of shared book reading as the main contexts when "interesting, engaging, and vocabulary-expanding conversations" occur between adults and children. Future research might compare such orally rich adult-child language interactions that promote vocabulary with language-enhancing content on television. This may help to determine the content of television as well as the quantity of viewing that benefits vocabulary growth independent of adult input. Expressive language Far less researched is the relationship between television and expressive language, or language output. The above studies provided no data on the transfer of knowledge from receptive to expressive language. Expressive language is defined as speaking and any communication production that is both verbal or through gestures. Early expressive language and vocabulary are both associated with higher comprehension in later literacy learning (Snow et al, 1998). Yet, only a few studies have considered the relationship between television and expressive language. What evidence is there that children's television generates verbal responses and/or extends oral language? How confident are children in using words they acquire from television in conversations with other children and adults? Researchers have found that television does promote children's talk. Wells (1985) noted in home observations that children made verbal responses to television and that the frequency of these utterances peaked around two-and-a-half and remained stable up to age five. Children aged 18 months have been found to respond verbally to what is going on on screen

by labelling objects, imitating noises and naming characters (Roberts and Howard, 2004). Favourite programmes can provide sources of verbal routines for play (Marsh, 1999; Watson-Gegeo and Boggs, 1977) and adults can encourage more talk from pre-schoolers by using favourite programmes as references (Marsh, 1999). It has been argued that the television medium shares many of the properties of shared book reading in the kind of verbalisations (designating, questioning and describing content) that it generates between adults and children (Lemish and Rice, 1986). Lemish and Rice (1986) identified several contributors to the quality of verbal interactions between adults and children that centred on their shared television viewing. Those from the perspective of children from birth to age three were: opportunity of the child to participate independently, the appeal of the content which was a mix between familiarity and novelty, and the continuity of the shared activity. The researchers argued that there was a greater role for programme content that encourages child verbal interactions. When children aged six months to three years viewed Sesame Street, for example, they were more likely to engage in TV-related talk than in situations where they were viewing general audience programmes. More recently, Linebarger (2004) looked at the question of content as it generates talk in young children. She carried out a small study looking at the viewing of television programmes as an outcome and predictor of expressive vocabulary development in children at 30 months. The measures used included the MacArthur Communicative Development Inventory word production scale, Pre-school Language Scale — 3(PLC3), using the expressive language subscale only, and Early 17 Childhood Indicator (ECI) to observe

and record children's language production during a six-minute play session with a caregiver. Single words and multi-word combinations were reported. She found that expressive vocabulary is promoted by certain children's programmes. Blues Clues and Dora the Explorer were found to encourage interaction and give children opportunities to respond. Children responded orally to conversational shows such as Clifford and Arthur, which model speaking and language interactions. Arthur generated single word use while Disney movies generated more single and multiple words from children. Disney movies contain dialogue, which models language, and extensive vocabulary. Where Krcmar et al (2004) also considered Teletubbies to inhibit receptive language in the under-twos because of the programme's presentation of excessive stimuli, Linebarger found that Teletubbies and Barney were negatively correlated with multi-word use among toddler viewers, possibly as a result of poor modelling of language. Other research has found a negative correlation between general television and expressive language in pre-schoolers. Arraf (1990) considered the effects of the quantity of educational and general viewing on both receptive language and expressive language of 173 children aged three to five-and-a-half. The study utilised several measures including Test for Early Language Development, Peabody Picture Vocabulary Test Revised (for IQ), Hollingshead's Two-index of social position (for socio-economic status) and parent questionnaires and television logs. Children were divided into light and heavy viewers and the subjects were stratified on IQ, gender and socio-economic status (SES) for the purpose of comparisons between heavy and light viewers from each stratum. Regression analysis (Multiple Regression Procedure) was used to

analyse covariance between parental interaction, IQ, SES, gender and amount of viewing. Overall, heavy viewers (19 to 37 hours per week) had better receptive skills than expressive skills. Low SES boys, heavy viewers of general audience television such as sports, had poorer expressive language compared to girls. Consistent with studies on vocabulary development, content of programming predicted higher language scores: that is, educational television was correlated with higher language scores, while general audience programme content was correlated with lower language scores. However, as suggested by Naigles and Mayeux (2001), the problem with this study's correlational analysis is that it is not clear which variables are the cause and which are the effect so that one can not draw any firm conclusions about television's influence on expressive language development. Arraf's study does point to the need for further research on expressive language development among high viewers of general audience television. It would suggest that high exposure to programmes with poor content is responsible for underdeveloped language in some children. It may also mean that children who view television do not get enough interpersonal interaction that enables children to fine-tune and develop their speech. The suggestion that the expressive language development in low SES boys is poorer also requires further investigation. More recently, Duffy, Fox, Horwood and Northstone (2004) have found in their longitudinal study of 6,961 children under the age of three that there is a correlation between television viewing and children's word production and comprehension. Language was assessed using the MacArthur Communicative Development Inventories at 24 and 36 months and questionnaires on children's viewing

habits were collected at 18 and 30 months. Mothers were asked to report on how their children usually watched the television: while playing, watched attentively, ignored it or was not allowed to watch it. They hypothesised that those children who reportedly watch television attentively may show higher scores in word production and comprehension than those who watch it inattentively (while playing or ignoring it). It was also expected that the effect of attention to television which led to improved language would be evident as the children grew older. Instead, they found that children who did not watch television at all had the highest scores while children who watched television scored lower on language measures and these scores persisted over time. The 18 researchers suggest that higher language scores were related to children's involvement in language activities other than television viewing. Unfortunately for the purpose of this review, the data was not available for consideration while the researchers prepared their findings for publication. Their longitudinal study is potentially important for television research in the UK and may provide new evidence on the effects of television and its implications for children's development of expressive and receptive language. Another correlational study points to negative effects of television on speech development. In this case, Stowell (1992) conducted a small study to examine the relationship of early television viewing with communication apprehension, or anxiety of oral communication with a single person or small group. Communication apprehension can suppress normal oral communication. The condition often develops in the early years and is noticeable in many children at Reception. It may develop as a result of

genetic factors but, increasingly, evidence points to the environmental and social conditions which impede interaction attempts, skills acquisition