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Do Young Children Get the Message? The Effects of Repeated Video Viewing on Explicit and Implicit Information¹.

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ABSTRACT

The aim of this study was to explore the effects of repeat viewing on comprehension of explicitly and implicitly presented information in an animated movie. Seventy-three pre-school children watched an animated film and were tested for comprehension after either their single or fifth viewing. Only children's comprehension of explicitly presented information was facilitated by repeat viewing. However, post hoc analyses revealed that children's explicit and implicit comprehension of a central character *Thunderbolt* significantly increased across viewing conditions, whereas, repeat viewing only facilitated children's explicit comprehension of the central character *Patch*. The theoretical and practical implications of these findings are discussed.

INTRODUCTION

Interest in early childhood television viewing is not a new phenomenon. Indeed, research on this topic is prolific (see Singer & Singer, 2001) and this is not surprising given that a television set is present in most young children's lives (Marsh et al., 2005; Skouteris, Sleeman, Taylor, & Kelly, 2002). Whilst the positive effects of educational television have been documented

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extensively (see Anderson, Huston, Schmitt, Linebarger, & Wright, 2001; Fisch, 2002), there is only a small amount of research on the impact of video viewing on young children. Yet, Australian children and children from other countries around the world watch videos regularly. In fact, US children aged between 2-4 years of age were reported as spending 1.5 hours watching videos per day (Mares, 1998) and the findings of an Australian study revealed that the majority of children, aged between 3-6 years, watched videos daily or several times a week (Skouteris et al., 2002). Large numbers of parents also report that their children “almost always” watch videos repeatedly, sometimes viewing the same video several times in one day (Mares, 1998; Sell, Ray & Lovelace, 1995; Skouteris, Kelly, Lazaridis, & Dalla Riva, 2003). Surprisingly, little empirical research has explored the effects of repeat viewing on young children’s comprehension of television or videos.

It has been argued that repeat viewing of television programs facilitates children’s understanding and comprehension. Huston and Wright (1983) proposed in their theory of engagement, that repeat viewing gradually makes initially incomprehensible stimuli understandable, increasing children’s level of engagement and their ability to process information about the story. Similarly, others have argued that familiarity with a program and its content, as a result of repeat viewing, may speed up and facilitate basic information processing (Harris, Durso, Mergler & Jones, 1990), reducing required attentional resources, which then allows children to work with the content in more elaborate ways (Allen & Spilich, 1997; Crawley, Anderson, Wilder, Williams, & Santomero, 2002).

The first empirical study to investigate the effects of repeat viewing on young children’s comprehension of television was conducted by Sell et al. (1995). Sell et al. asked 40 4-year-old children to watch a 19-minute edited episode of the curriculum based program, *Sesame Street’s Alphabet Treasure Hunt*, once a week for three weeks. Children’s comprehension of this episode was assessed following each viewing by asking the question “How do you play Alphabet Treasure Hunt?”. This question targeted explicitly presented information, where explicit information is defined as an action, event or fact that provides information essential to the plot that is obvious and clear and does not have to be implied or inferred (Collins Wellman, Keniston, & Westby, 1978). Sell et al.’s findings indicated that repeated viewing of the program facilitated children’s ability to comprehend explicit information. However, asking the same comprehension questions after each viewing may have primed the children to focus on the script of the game and enhanced their comprehension performance.

Crawley et al. (1999) replicated and extended Sell et al.’s (1995) study. They examined 3- to 5-year-old children’s comprehension of the educational television program *Blue’s Clues*. Children were exposed to an episode of this television show either once only, or once a day for five consecutive days. Comprehension testing was carried out after children’s single or fifth viewing of the program. It was found that children who had been exposed to the program repeatedly performed better on comprehension of explicit information; hence, even without priming children’s comprehension was still enhanced by repeat viewing.

While the previous studies investigated the effect of repeat viewing on children’s comprehension of educational television programs, more recently Mares (2006) examined the effects of repeat viewing on children’s comprehension of the film *The Sword in the Stone*; the children in her first study were school aged as opposed to pre-schoolers, 6- to 9-year-old’s. The comprehension of children who had already seen the film was compared to that of children who saw the film once only at the time of testing. Children in the former group (the prior exposure group) were better at character identification, chronological sequencing of events in the film, and making “near” inferences that “required information to be integrated from within a scene or from two adjacent scenes” (p. 225). In contrast, prior exposure to the film did not improve comprehension of “far” inferences that involved integrating information across multiple scenes” (p. 225).

In Mares' (2006) second study children were 4-8 years of age. They watched one of two versions of a short story; in one version the main character was an old woman who was attractive but mean and in the second version there was an old woman who was ugly yet very kind. Whilst all the children watched the video four times, half of the children were tested for comprehension of the story after one exposure and the other half were tested after the fourth viewing. Those who were exposed to repeated viewing were better at comprehension of main events, explicit motives, explicitly presented emotions, and at evaluating the old woman based on her behaviour rather than whether she was attractive or ugly. Mares' findings suggest, therefore, that repeat viewing clearly facilitates comprehension of explicit messages and content in a film or short story. Repeat viewing did not necessarily improve comprehension of messages that needed to be inferred; this only occurred if the information required to make the inference was available in the actual scene the children watched or in the scene before or after it.

Similarly, Skouteris and Kelly (2006) investigated the effect of repeat viewing of an animated film on young children's comprehension. Unlike Mares (2006) however, Skouteris and Kelly randomly allocated 4- to 6-year-old children to a viewing group (single/repeat) who were then systematically exposed to the film *101 Dalmatians 2: Patch's London Adventure* either once or five times over a period of one week; no child in their study had seen this film previously because it had yet to be released to the general public. After the children's single or fifth exposure to the film they were asked 33 open ended questions. Of these 33 questions, 26 questions focused on events that took part in the movie (e.g., "How many episodes of "Thunderbolt" had Patch seen?" and "What did Lightning tell Thunderbolt about the next show?") and seven questions focused directly on character identification and on an understanding of the good versus bad characters in the movie. As part of the "good" and "bad" character questions, children were required to identify the different good and bad qualities of one of the main characters, *Thunderbolt*.

Skouteris and Kelly (2006) reported on comprehension overall for the 33 questions, comprehension for character identification, comprehension of the "good guys", the "bad guys" and of *Thunderbolt* as a central character. They found that repeat viewing of the film enhanced children's overall comprehension, character identification and questions related to the character *Thunderbolt*. The questions they asked covered explicit as well as implicit information presented in the video; however, Skouteris and Kelly did not differentiate between these two different types of information in their comprehension scores. Implicit information has been defined as an action, event or fact relevant to the plot that is not portrayed clearly and in an obvious manner but instead must be inferred or implied (Collins, 1983; Collins et al., 1978). Whilst, Mares (2006) explored children's comprehension of both "near" and "far" inferences, she did not report how many times the children had seen the film (just that they had previously seen it) nor when they saw it last. It is possible that if children are required to watch the same film repeatedly over a one week period, that the effects of repeat viewing on comprehension of "far" inferences may be different to those reported by Mares even for younger children.

Interestingly, children's comprehension of explicit versus implicit information in television has been researched widely, but never in relation to repeat viewing (Collins 1983; Collins, Sobol, & Westby, 1981; Collins et al., 1978). Dramatic programs, including feature length films, consist of relevant information that in some cases is explicitly presented and in others implied by events shown on the screen (Collins, 1983). Thus, program comprehension requires continuous efforts during viewing to select and order information to create inferences about the narrative that go beyond what has been presented on the screen (Collins et al., 1978). Collins et al. (1978) argued that limited processing space and inefficient selective attention skills combine to make it unlikely that pre-school aged children will acquire the information required to understand implicitly presented material.

Empirical support for this theory was provided by Collins et al. (1978) when they investigated 7- to 13-year-old children's ability to make inferences about a 25 minute action-adventure program. The 7-year-old children correctly recognised only 47 % of the implicit

information displayed in the program, as opposed to 66% of the explicit content, whereas the older children had little difficulty identifying the former. It is not surprising therefore, that Collins et al. (1981) and more recently Mares (2006) both suggest that the ability to make complex inferences about a story appears to fully develop only after ages 7 or 8 years.

Implicit information appears to be more difficult for young children to comprehend than explicit content. The overall goal of the current study, to explore the effects of repeat viewing on comprehension of different types of information presented in an animated movie, was based on this premise. The specific aim in this study was to re-analyse the data of Skouteris and Kelly (2006) in order to explore the effects of repeat viewing on comprehension of explicit and implicit information. In accordance with the findings of the previous repeat viewing research, it was hypothesised that children's comprehension of explicit messages revealed in the *101 Dalmatians 2* video would be facilitated by repeat viewing. Moreover, on the basis that repeated exposure to television content has been shown to enhance children's encoding and information processing abilities (Harris et al., 1990) and in accordance with Huston and Wright's (1983) theory of engagement, it was predicted that children's comprehension of implicit information would be enhanced by repeat viewing. However, it was also predicted that overall, comprehension of explicit information would be better than that of implicit information due to the ease with which explicitly presented content is attended to by young children (Collins et al., 1981).

METHOD

Participants

The data of 73 children of the 77 participants in Skouteris and Kelly's (2006) study, with answers to every question in the comprehension test, were re-analysed for the current study. There were 38 females and 35 males (M age = 62.1 months, SD = 10, age range = 46-82 months) who were born in Australia, had English as their first language and were predominantly recruited from middle-class families residing in the northern and south-eastern suburbs of Melbourne. The children were allocated randomly by Skouteris and Kelly to one of two groups. One group of 38 children (M age = 62.42 months, SD = 10.65) watched the animated movie *101 Dalmatians 2* once. The other group of 35 children (M age = 61.80 months, SD = 10.48) watched *101 Dalmatians 2* five times over a period of one week.

Materials and Procedure

Skouteris and Kelly (2006) developed a comprehension test for the movie *101 Dalmatians 2* to examine children's understanding of the characters and events in the movie. The test consisted of 33 open-ended questions. Participants were asked these questions following either their single or fifth viewing of the film.

The data obtained by Skouteris and Kelly (2006) were re-analysed in the present study to assess each participant's performance on two specific types of information (explicit and implicit) based on definitions derived from previous literature (Collins 1983; Collins et al., 1978) as outlined above. Six questions from the comprehension test regarding participants' favourite films and interests were omitted from the current study's analysis and one of the comprehension questions was divided into two parts, resulting in a total of 28 comprehension questions. Sixteen of these questions (maximum score of 45) were based on explicit information and 12 on implicit information (maximum score of 24)³.

³ The total scores for the questions pertaining to explicit and implicit information differed because the first question in the former category involved showing children 8 character faces and asking them to name the characters. They scored 0 for no name or the wrong name, a score of 1 for a name that was close but not absolutely correct (e.g., Lars was also named as a "painter") and a score of 2 for the correct name. Hence, this one question made up 16 of the 45 possible marks for the explicit category.

Six of the researchers coded 10 questionnaires from Skouteris and Kelly (2006) to record participants' responses and allocate specific explicit and implicit comprehension scores. Groups of 10 questionnaires were swapped and re-coded by another researcher in order to establish inter-rater agreement which was, overall, very good, $r = .95$; any small discrepancies in the scoring were discussed and resolved.

RESULTS

Table 1 presents the mean percentage scores and standard deviations for the questions relating to both explicit and implicit information across the two viewing conditions (single and repeat).

Table 1: Implicit and Explicit Mean Comprehension Percentage Scores and Standard Deviations for the Animated Film across Viewing Conditions

Times Viewed	Single			Repeat		
	M	SD	n	M	SD	n
Explicit	35.50	14.03	38	53.21	18.45	35
Implicit	46.16	16.28	38	52.26	15.00	35

A 2 x 2 Analyses of variance (ANOVA) was conducted on this data to investigate the difference between participants' performance on comprehension and the number of times the film was viewed. Whilst a significant main effect for type of comprehension and number of viewings was revealed, $F(1, 71) = 8.304, p < 0.005, \eta^2 = .11$, and $F(1,71) = 12.65, p < 0.001, \eta^2 = .15$, respectively, there was also a significant interaction effect, $F(1, 71) = 11.85, p < 0.001, \eta^2 = .14$. Simple main effects revealed that children's comprehension of explicit information increased significantly with repeated viewing of the animated film ($p < 0.001$, cohen's $d = 1.09$), whilst comprehension of implicit information did not ($p > .05$). In addition, the mean comprehension percentage score for implicit information was significantly greater than the mean percentage score for explicit information for the single view condition ($p < 0.001$, cohen's $d = .70$) but not the repeat view condition ($p > 0.05$).

The result that children's comprehension of explicit information was facilitated by repeat viewing only was not expected. Moreover, the finding that children's comprehension of implicit information was better than it was for explicit information after a single viewing, $t(73) = 5.057, p < 0.001$, cohen's $d = .70$, was also not expected. It is possible that these findings reflect the nature of the questions on the comprehension test. All of the questions covering implicit information involved the main characters *Thunderbolt* and *Patch*, whereas almost one third of the explicit questions (5 of 16) involved more peripheral, non-main characters.

We reasoned that children may have been able to answer the questions regarding the implicitly presented content better after a single view because these questions were completely based around the two central characters in the film. According to Fisch (2002), educational content in a program that is integral to the narrative enhances children's overall understanding and processing, such that comprehension of the narrative simultaneously contributes to comprehension of the educational content and events that are closely linked to this. Furthermore, events at higher levels in the hierarchical structure of the narrative are more likely to be remembered and understood than those at lower levels (Van den Broek, Lorch, & Thurlow,

1996). In relation to *101 Dalmatians 2*, hierarchically important events often involved the central characters *Thunderbolt* and *Patch*; thus, it is possible that children were able to answer the questions relating to implicit information because these questions referred to the central characters and their role in important events within the film.

To explore this hypothesis, post hoc analyses were conducted to determine whether the findings above were noted for questions regarding the main characters *Thunderbolt* and *Patch* only. There were a total of five questions that related to the central character *Thunderbolt*, three of which were regarding implicit information. Eighteen questions were centered on the character *Patch*, seven of which were in relation to implicit information. The mean comprehension percentage scores for both explicit and implicit information and their standard deviations for questions concerning the two main characters across both viewing conditions are displayed in Table 2.

Table 2: Mean Percentage Comprehension Scores for Implicit and Explicit Information About Thunderbolt and Patch across Viewing Conditions

Times Viewed	Single			Repeat		
	M	SD	n	M	SD	n
Thunderbolt Total	38.30	21.87	38	57.78	20.31	35
Thunderbolt Implicit	33.55	30.36	38	65.71	32.13	35
Thunderbolt Explicit	58.68	20.16	38	70.00	16.09	35
Patch Total	40.32	14.55	38	55.10	19.90	35
Patch Explicit	31.97	15.66	38	50.14	22.64	35
Patch Implicit	61.18	19.88	38	67.50	24.48	35

A 2 x 2 ANOVA was conducted on the *Thunderbolt* data to examine the effect of repeat viewing on implicit and explicit content specific to this central character. There was a significant main effect for the viewing condition $F(1, 71) = 26.902, p < 0.001, \eta^2 = .27$, and for comprehension, $F(1, 71) = 11.761, p < 0.001, \eta^2 = .14$. However, a significant interaction effect was also found, $F(1, 71) = 5.906, p < 0.018, \eta^2 = .08$. Simple main effects revealed that whilst repeat viewing of the animated film significantly fostered children's comprehension of implicit *Thunderbolt* information ($p = 0.01$, cohen's $d = .62$), comprehension of explicit *Thunderbolt* information improved to a greater extent with repeat viewing ($p < 0.001$, cohen's $d = 1.03$). In addition, the mean comprehension percentage score for implicit *Thunderbolt* information was significantly greater than the mean percentage score for explicit *Thunderbolt* information for the single view condition ($p < 0.001$, cohen's $d = .97$) and whilst the mean implicit score for the repeat view condition was greater than the mean explicit score this difference was not statistically significant ($p > 0.05$).

A 2 x 2 ANOVA on the *Patch* data also revealed a significant main effect for comprehension and number of viewings, $F(1, 71) = 74.85, p < 0.000, \eta^2 = .51$, and $F(1, 71) = 9.068, p < 0.004, \eta^2 = .11$, respectively. Once again, a significant interaction effect was found, $F(1, 71) = 4.850, p < 0.031, \eta^2 = .06$. Simple main effects revealed that children's comprehension of implicit *Patch* information did not increase significantly across viewing conditions ($p = 0.229$), albeit the trend in the data was similar to the *Thunderbolt* data in that the mean comprehension score for the single view condition was lower than the repeat view condition. Comprehension of explicit *Patch* did increase significantly across viewing conditions ($p < 0.001$, cohen's $d = .94$). Finally, whilst the implicit *Patch* comprehension percentage score was greater than the explicit *Patch* comprehension percentage score in both the single ($p < 0.0001$, cohen's $d = 1.63$) and repeat view conditions ($p < 0.001$, cohen's $d = .74$), the difference was greater for the single view condition.

DISCUSSION

The results of the current study partially supported the proposed hypotheses. In accordance with expectations, children's comprehension of video content that was presented explicitly in the film was facilitated by repeat viewing. However, unexpectedly, repeat viewing did not facilitate comprehension of information that needed to be inferred across multiple scenes and was therefore implicit in nature. Similarly, the finding that children's comprehension of implicit information was higher than that of explicit information after single viewing was not expected.

The finding that comprehension of explicitly presented information improved with repeat viewing is not surprising given that similar findings that have been reported by previous research and curriculum-based television programs (Crawley et al., 1999; Sell et al., 1995). These findings also accord with those reported by Mares (2006) whereby primary-school aged children who had watched an animated film repeatedly were better at making "near" inferences or comprehending explicitly presented information than those who had watched the film only once. It has been argued that familiarity with recurrent stimuli reduces children's information processing demands and allows for greater understanding of the content (Crawley et al., 2002; Harris et al., 1990); indeed this is a plausible explanation for the finding that children's comprehension of explicit video content increased across viewing conditions.

Our findings in relation to comprehension of implicitly presented information appear to support Mares' (2006) findings that repeat viewing did not facilitate children's ability to make "far" inferences. However, in our study it was *not* the case that comprehension of messages that needed to be inferred was poorer than comprehension of explicitly presented information, as was the case in Mares' study. Indeed, comprehension of implicit information was better than comprehension of explicit information after single viewing. Even though overall, less than half of the questions were answered correctly, our findings suggest that the questions pertaining to implicitly presented information were not initially as difficult as those pertaining to explicitly presented information. Why might this have been the case?

As noted in the Results section, all of the comprehension questions covering implicit information involved the main characters *Thunderbolt* and *Patch*, whereas almost one third of the explicit questions involved more peripheral, non-main characters. Fisch (2002) argues that the processing and hence comprehension of televised narrative can be influenced by several viewer characteristics such as prior knowledge of characters and the story, their knowledge of the structure of stories and their interest in the type of program/film they are watching. We know that the children here had not seen the *101 Dalmatians 2* video prior to their participation in this study but 51 of the children (70%) had seen the original *101 Dalmatians* animated Disney video. This prior knowledge of some of the characters and story line may have facilitated children's ability to draw inferences and hence comprehend implicitly presented information. Moreover, we know that children at this age are experienced at watching videos (Buena Vista Kids Leisure Report, 2002), watch animated videos similar to *101 Dalmatians 2* daily or several times a week

(Skouteris et al., 2002) and that their parents rated them as having, on average, a moderate level of interest in these videos on a 4-point likert scale, from (1) no interest at all to (4) high interest (Skouteris & Kelly, 2006). Given that Fisch identified these factors in his capacity model of children's comprehension of televised programs, it is possible that they facilitated understanding of implicitly presented information. This may explain why, overall, comprehension of implicit information was greater than explicit after single viewing.

Interestingly, four additional viewings of the film did not improve children's comprehension of messages that needed to be inferred; it appears that there was a ceiling effect in terms of how much could be understood by this age group, irrespective of number of viewings. This finding appears to support Mares' (2006) argument that repeat viewing facilitates simpler comprehension (character identification, knowledge of main events and explicit content) more so than complex comprehension (theme identification and characters motives and thoughts). Indeed, comprehension of explicit *Thunderbolt* and *Patch* information improved to a greater extent with repeat viewing than did comprehension of implicit information pertaining to these two characters. It is possible that if children were initially primed to consider the questions concerning implicitly presented information because these questions involved the main characters, this may have impacted negatively on their performance on the comprehension test in relation to explicitly presented information after a single view. However, repeat viewing may have provided the opportunity for children to then focus on other relevant and more simply presented information (i.e., the explicitly presented information) leading to substantial improvement in explicit comprehension. Further research is needed to explore this possibility.

Whilst for both *Thunderbolt* and *Patch* the trend in the data was similar, in that the mean implicit scores for the two viewing conditions were greater than the mean explicit scores, repeat viewing fostered children's comprehension of *both* implicit and explicit information pertaining to *Thunderbolt*, but only for explicit information pertaining to *Patch*. The differing nature of the central characters and the ease at which children comprehended their particular behaviours and motives might explain these findings (Collins & Zimmerman, 1975). Throughout the film, *Thunderbolt* is presented as both a 'good' and 'bad' character, who initially appears benevolent, but is gradually revealed to be malevolent. The central character *Patch* only exhibited 'good' behaviour traits and motives. Whilst an understanding of the implicit questions pertaining to *Thunderbolt* was higher at single view than explicit questions, repeat viewing may have enabled children to acquire new information about *Thunderbolt*, allowing them to work with the content in more sophisticated ways (see also Crawley et al., 1999). Given that we know duplicity of character is more difficult for children to comprehend than simple, singular behaviour traits and motives (Berndt & Berndt, 1975; Collins & Zimmerman, 1975), it may not be surprising therefore, that the effect of repeat viewing was significant for *Thunderbolt* but not for *Patch*. Clearly, further research is needed to understand the effects of repeat viewing on comprehension of different types of information presented in films or television programs watched by young children. The findings presented here add further support to the facilitative role of repeat viewing but also reveal that implicit messages portrayed through familiar central or main characters may be understood more easily by young children even after a single viewing.

The findings of the current study whilst interesting must be treated with some caution given that the data analysed were obtained by Skouteris and Kelly (2006) who did not devise their questions to specifically analyse implicit comprehension. These questions were biased toward the main characters. More evenly distributed questions, encompassing all aspects of the story's themes, events, and central and peripheral characters, with similar proportions of questions about explicit and implicit information is needed to ensure the findings of this study are robust in relation to the effects of repeat viewing on comprehension of different types of messages and information.

Whilst, developmental theories of learning have little to say about the effects of repetition (Crawley et al., 1999), there is now a growing body of literature that suggests repeat viewing can

and does improve comprehension of television content. Repeat viewing of television content should be considered by Australian curriculum based programming officials and film executives as a potential facilitator of children's comprehension of important educational information or messages. Moreover, the potential for transfer of this understanding to real life problems and situations and the ability to learn pro-social behaviours from educational programming (Fisch, 2002; Mares, 1998) cannot not be ignored. Educational institutions should consider the use of repeat viewing to relay educational information to young children that connects the world of television to the "real world". Clearly, the mechanisms involved in understanding televised material that is presented repeatedly to children warrant further investigation. Understanding these and knowing whether repeat viewing of televised material can be used as a powerful educational tool will contribute both theoretically and practically to the vast research area of children and television.

REFERENCES

- Allen, G. L., & Spilich, G. J. (1997). Children's political knowledge and memory for political news stories. *Child Study Journal*, 27, 163-178.
- Anderson, D. R., Huston, A. C., Schmitt, K. L., Linebarger, D. L., & Wright, J. C. (2001). *Monographs of the Society for Research in Child Development*, 66(1).
- Berndt, T. J., & Berndt, E. G. (1975). Children's use of motives and intentionality in person perception and moral judgement. *Child Development*, 46, 904-912.
- Buena Vista (2002). *Buena Vista kids leisure report*. Melbourne, Australia.
- Collins, A. W. (1983). Interpretation and inference in children's television viewing. In J. Bryant & D. R. Anderson (Eds.). *Children's understanding of television: Research on attention and comprehension*. (pp. 125-150). New York: Academic Press.
- Collins, A. W., Sobol, B. L., & Westby, S. (1981). Effects of adult commentary on children's comprehension and inferences about a televised aggressive portrayal. *Child Development*, 52, 158-163.
- Collins, A. W., Wellman, H., Keniston, A. H., Westby, S. D. (1978). Age related aspects of comprehension and inference from a televised dramatic narrative. *Child Development*, 49, 389-399.
- Collins, A. W., & Zimmermann, S. A. (1975). Convergent and divergent social cues: Effects of televised aggression on children. *Communication Research*, 2, 331- 345.
- Crawley, A. M., Anderson, D. R., Santomero, A., Wilder, A., Williams, M. K., & Bryant, J. (2002). Do children learn how to watch television? The impact of extensive experience with blues clues on preschool children's television viewing behaviour. *Journal of Communication*, 52, 264-280.
- Crawley, A. M., Anderson, D. R., Wilder, A., Williams, M., & Santomero, A. (1999). Effects of repeated exposures to a single episode of the television program 'Blue's Clues' on the viewing behaviours and comprehension of preschool children. *Journal of Educational Psychology*, 91, 630-637.
- Fisch, S. M. (2002). Vast wasteland or vast opportunity? Effects of educational television on children's academic knowledge, skills and attitudes. In J. Bryant & D. Zillmann (Eds.). *Media effects: advances in theory and research*. (2nd ed.). (pp. 397-426). Mahwah, NJ: Lawrence Erlbaum Associates.
- Harris, J. F., Durso, F. T., Mergler, N. L., & Jones, S. K. (1990). Knowledge base influences on judgements of frequency of occurrence. *Cognitive Development*, 63, 1423-1437.
- Huston, A., & Wright, J. (1983). Children's processing of television: The informative functions of formal features. In J. Bryant & D. R. Anderson (Eds.). *Children's understanding of*

- television: Research on attention and comprehension*. (pp. 35-68). New York: Academic Press.
- Mares, M. L. (1998). Children's use of VCR's. *Annals of the American Academy of Political and Social Science*, 557, 120-131.
- Mares, M. L. (2006). Repetition increases children's comprehension of television content-up to a point. *Communication Monographs*, 73, 216-241.
- Marsh, J., Brooks, G., Hughes, J., Ritchie, L., Roberts, S., & Wright, K. (2005). *Digital beginnings: Young children's use of popular culture, media and new technologies*. Literacy Research Centre: University of Sheffield. Report available at: <http://www.digitalbeginnings.shef.ac.uk/>
- Sell, M. A., Ray, G. E., & Lovelace, L. (1995) Preschool children's comprehension of a Sesame Street video tape: The effects of repeated viewing and previewing instructions. *Educational Technology Research and Development*, 43, 49-60.
- Singer, D. G., & Singer, J. L. (Eds.). (2001). *Handbook of children and the media*. London: Sage Publications.
- Skouteris, H., & Kelly, L. (2006). Repeated-viewing and co-viewing of an animated video: An examination of factors that impact on young children's comprehension of video content. *Australian Journal of Early Childhood*, 31, 22-30.
- Skouteris, H., Kelly, L., Lazaridis, M., & Dalla Riva, S. (2003). Children's responses to animated Disney films: A child's perspective. Unpublished report. La Trobe University.
- Skouteris, H., Sleeman, F., Taylor, M., & Kelly, L. (2002). Children's responses to animated Disney films: A mother's perspective. Unpublished report. La Trobe University.
- Van den Broek, P., Lorch, E. P., & Thurlow, R. (1996). Children's and adult's memory for television stories: The role of causal factors, story grammar categories, and hierarchical level. *Child Development*, 67, 3010-3028.

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