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RESEARCH ARTICLE

The Effects of Literacy Messages in an Educational Television program: A Content Analysis and Experiment

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Educational television programs have the potential to promote literacy affect as well as literacy skills in young children. This study involved a content analysis and field experiment to investigate the impact of the literacy messages conveyed in an educational children's program on preschoolers' and kindergarteners' attitudes about literacy. The content analysis showed that program included many positive messages about literacy, especially the power of reading and the encouragement of literacy activities. However, the results of the experiment did not show statistically significant differences between participants who viewed the program and those who did not. Trends did emerge, particularly related to gender. These trends, along with implications and limitations of the current investigation, are discussed.

Keywords: television, early literacy development, literacy attitudes

Even in the midst of new and innovative media products, television remains a steadfast companion for young children (Rideout & Hamel, 2006). Children between birth and age 6 watch, on average, an hour and a half or more of television and videos per day (Rideout & Hamel, 2006), and decades of researchers have found that television has measureable effects on

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young children (Pecora, Murray, & Wartella, 2007). Television can successfully affect one important area of children's development, their language and literacy development (Moses, 2008). Although gains in literacy skills are critical, skills are not enough. Children must also hold positive attitudes about literacy and perceive aspects of literacy and language as useful, interesting, and/or enjoyable. Although more is known about the impact of television on children's literacy skills, little is known about how television impacts children's attitudes about literacy.

Television and Literacy Skills Development

Television can have a positive impact on children's literacy and language skills development, including increasing their vocabulary knowledge, letter recognition, phonemic awareness, concepts of print and more (for review, see Moses, 2008; Fisch, 2004). For example, television programs that aim to teach specific words can increase young viewers' knowledge of those words (Naigles & Kako, 1993; Rice & Woodsmall, 1988). Child viewers of educational television programs, in particular, have shown improvements in their vocabulary acquisition and knowledge (Duffy, Fox, Horwood, & Northstone, 2004; Linebarger & Walker, 2005; Silverman, 2009a; Silverman, 2009b). Moreover, children's "talk" (i.e., vocalizations, words, multiple words) around the content featured during viewing sessions also increases (Anderson et al., 2000; Crawley et al., 2002). These are just a few examples of the impact that educational television can have on young children's early literacy skills.

Although positive effects have been found, children's programming is not created equal. Extant research indicates that different types of programming (educational vs. non-educational) influence children in different ways (Gola, Mayeux, & Naigles, 2012). More specifically, watching educational programming has been linked to more positive literacy and language outcomes, whereas watching non-educational (e.g., entertainment) programs has been linked negatively to literacy and language outcomes (e.g., Anderson, et al., 2001; Ennemoser & Schneider, 2007; Wright, et al., 2001). With a greater focus on children's literacy achievement across childhood, this places a priority on children's exposure to educationally-oriented programming.

In addition to content, children's television programs also vary in how well characters, storylines and features (sound effects, visual effects, pacing, etc.) appeal to young viewers, which in turn has implications for their learning from television. Horton and Wohl (1956) first conceptualized a "seeming face-to-face relationship between spectator and performer" (p. 215) as a parasocial relationship formed from parasocial interactions. In this case, characters on screen address the child viewer by directly looking at and talking to the camera and, from the child's point of view, this feels as though the character is talking directly to him/her. When embedded within educational content, a parasocial interaction can facilitate learning. For example, research on *Blue's Clues* suggests that children do interact with the characters both verbally and nonverbally (Crawley, Anderson, Wilder, Williams, & Santomero, 1999) and, moreover, that with repeated exposure to the program, children's interactions with the educational portions of the program increase (Crawley et al., 2002). Similarly, with *Dora the Explorer*, another preschool television program that utilizes parasocial interactions, Calvert and her colleagues (2007) found that active engagement with the content predicted children's comprehension of the central story. In addition, research suggests that interaction with an on-

screen character leads to increased intrinsic motivation for the learner (Kawachi, 2003). Therefore, appeal and interaction with characters play a role in children's engagement with content and, hence, their learning when the content is educational.

Interestingly, gender also plays a role in children's appeal to characters and, subsequently, their learning from characters. Hoffner (1996) found that boys were more likely to select same-sex characters as their favorite character than girls and that parasocial interactions with same-sex characters were different for boys than for girls. Almost a decade later, Wilson and Drogos (2007) found similar results with preschool children. Preschool boys chose same-sex characters as their favorite more frequently than girls, but girls had a stronger desire to be like their favorite character than boys. In addition, gender was not predictive of parasocial interaction (Wilson and Drogos, 2007). Similarly, Calvert and her colleagues (2007) found that girls identified with the Hispanic female character (Dora) more than boys, and girls benefited more from interactions with Dora. As such, gender seems to have implications for character appeal as well as viewers' learning outcomes.

Television Messages about Literacy

Educational programming, by definition, aims to promote learning in children, whereas entertainment and other non-educational programs do not. However, educational programs vary in which outcomes they aim to foster in young viewers, from social-emotional skills to content knowledge (math, science, language arts, etc.) to physical development. Although educational programming has generally been linked to positive literacy and language outcomes, a small number of studies suggest that programs do not present or portray literacy equally. Content analyses have found that not every program contains positive messages about literacy, even educationally oriented programs (Moses & Other, 2008; Mates & Strommen, 1995). Many programs fail to include characters interacting with literacy at all or characters say very little about how they feel or think about literacy. A few even contain negative messages about literacy (Moses & Duke, 2008; Mates & Strommen, 1995). Moses and Duke (2008) found 464 literacy messages across 44 hours of the top 10 most viewed programs by 2- to 5-year-olds. They found that 20% of literacy messages portrayed literacy positively, that is, characters engaged with print and showed it to be interesting, useful or enjoyable (e.g., a character reading a book for pleasure). Approximately 3% of literacy messages that they coded, though, were negative, in which reading or writing print was portrayed as not interesting, not useful, or not enjoyable (e.g., characters distracting each other from reading a book).

Although positive and negative messages were found, the vast majority (77%) of the interactions that characters had with print did not portray literacy in a positive or negative way; rather, characters remained neutral about the enjoyment and necessity of literacy. In addition to neutral messages, researchers have noted "missed opportunities" to convey to young viewers the power and purpose of print (Moses & Duke, 2008; Mates & Strommen, 1995). These missed opportunities included: (a) a lack of print on artifacts that would typically have print, such as a map or newspaper, (b) illegible print on artifacts, or (c) print that was absent completely from a interaction in which it could have been included. Such findings cut across the most popular programs for young viewers and suggest that different literacy content (positive versus negative) may affect young viewers' feelings about literacy differently.

Television and Literacy Attitudes

Children's attitudes or beliefs about literacy are an essential component to their literacy achievement (Baker & Wigfield, 1999). Children as young as 3 years old differ in how they feel about literacy (i.e., not all young children have positive attitudes about literacy), and their literacy attitudes have been found to develop over time (Saracho & Dayton, 1991). In addition, some have found that boys and girls differ in their attitudes about literacy, with girls reporting more positive attitudes about reading than boys (e.g., McKenna, Kear, & Ellsworth, 1995). Because attitudes develop early and likely lay the foundation for later attitudes about literacy, children need early, positive models of literacy and experiences with literacy.

Literacy attitudes are an important element of children's overall literacy development. Yet, very little is known about how television impacts children's literacy attitudes. Evidence from Linebarger (2001) suggests that children vary in whether they view television as a learning tool and whether they see themselves as able to learn new information from it. She found that their beliefs related to their reading scores as a result of viewing a children's television program (with or without captions and narration) and that gender mattered, too. Results demonstrated that when boys perceived television as a learning tool and/or believed that they could learn new information from it, they scored higher on an oral reading measure (after exposure to the target television programming). Their scores contrasted with boys who did not see television as a useful learning tool and/or felt that they could not learn new information from television. Beliefs about television and one's ability to learn from did not appear to help girls, as they scored higher on the oral reading measure when they had lower beliefs about television and/or their ability to learn from it. While these data indicate gender differences with regard to attitudes about television, only one known study has examined television's impact on children's attitudes about reading and writing.

That study indicated that participants' feelings about literacy did not change after watching either positive or negative clips that were 1 to 4 minutes long (Moses, 2011). However, participants did comprehend the nature of the messages, that is, that positive clips portrayed literacy in a positive way and that negative clips portrayed literacy in a negative way.

The current investigation aimed to extend this line of research through two studies: 1) a content analysis of an educational program called *Super WHY!* for messages about literacy, and 2) a field experiment to examine the impact of the program's literacy messages on young children's attitudes about literacy. The hypothesis for Study 1 was:

> **Hypothesis 1:** *Super WHY!* will contain many positive, explicit messages per episode about literacy, with a particular focus on reading rather than writing or other literacy activities.

The hypotheses for Study 2 were:

> **Hypothesis 1:** Exposure to multiple positive, explicit messages about literacy in *Super WHY!* will positively affect 4- to 7-year-olds' attitudes about reading.
> **Hypothesis 2:** Boys will have a higher reading attitude score than girls.
> **Hypothesis 3:** Children who like the program and/or program characters will have higher reading attitude scores after viewing the program.

STUDY 1: METHODS

Design

Following a line of content analysis of children's programming focused on language and literacy, Study 1 utilized a content analysis methodology in which *Super WHY!* episodes were coded for messages about reading, writing and other aspects of literacy. Forty-three episodes from the second and third seasons of *Super WHY!* were selected for analysis. DVD copies and episode scripts of these episodes were obtained from the program's producers.

Materials

Super Why! is a popular educational children's television program, which airs on the Public Broadcast Service (PBS) during times targeted for young viewers. The program is geared toward 3- to 6-year-olds and aims to promote a set of early literacy skills that predict later reading achievement (http://www.pbs.org/parents/superwhy/program/index.html). Its first season was evaluated for the program's impact on early literacy skills, and results showed that viewing *Super WHY!* episodes increased preschoolers' symbolic representation and phonemic awareness, letter recognition, and speech to print matching (Linebarger, McMenamin, & Wainwright, 2009).

Although studies have shown that other children's programs can positively affect children's early literacy skills (Moses, 2008), few contain positive messages about literacy, as mentioned earlier (Moses & Duke, 2008). *Super WHY!* has not previously been analyzed for messages about literacy, however, initial viewings of the program informed Hypothesis 1 for Experiment 1, and the intention was to use the results from Experiment 1 to inform the selection of episodes utilized in Experiment 2.

Procedure

A codebook was developed to include code labels, definitions and examples of each code to use when analyzing episode scripts (see Table 1). The first version of the codebook contained predetermined codes and definitions based on past research (Moses & Duke, 2008; Linebarger & Piotrowski, 2010). The first author trained a primary coder, and they piloted the codebook on scripts randomly selected from the first and second seasons in order to refine and finalize the codebook. The codebook was updated until no new codes emerged. In the final step, the first and primary coder established sufficient inter-coder reliability on a set of scripts that had not been used previously and were not included in the final sample. They reached a Cohen's kappa of .91, indicating a high level of agreement and completing coder training.

With a finalized codebook, the primary coder coded the 43 episodes from seasons 2 and 3. She used the episode scripts as the main source for coding; however, if any questions arose about an interaction or action around a literacy message, then she consulted the DVD copy. An inter-rater coder was also trained to code a subset of the sample to assess the reliability of the codebook. For 30% of the overall sample, inter-coder reliability reached a Kappa of .927, which indicates a high level of agreement between the primary and secondary coders. The primary and

secondary coders discussed all disagreements and resolved them before final analyses were conducted.

TABLE 1
Codes and Accompanying Definitions Used to Analyze Episodes for Affective Messages about Literacy

Code	Definition
R_pow, W_pow, Lit_oth_pow	Literacy gives you power to solve a problem, save the day
R_use, W_use, Lit_oth_use	Literacy is useful for accomplishing a task
R_nec, W_nec, Lit_oth_nec	Literacy is necessary to complete a task
R_aff, W_aff, Lit_oth_aff	Having positive feelings about literacy
R_means, W_means,	Literacy is a means to an end
R_hap, W_hap, Lit_oth_hap	Literacy make someone else happy
R_enc, W_enc, Lit_oth_enc	Giving encourage to another character or viewer to engage in
R_praise, W_praise,	Giving another character or viewers praise after engaging in literacy
R_eff, W_eff, Lit_oth_eff	Having positive feelings about effort towards literacy
R_adv, W_adv, Lit_oth_adv	Reading takes you on an adventure that is exciting

Coding

Each episode script was coded for affective messages about literacy, and this was operationally defined as any verbal statement made by a character that mentioned his/her feelings or beliefs about print literacy, including reading print, writing print, and signing or talking about letters, words or sounds connected to print. With respect to the third code (singing or talking about letters, words or sounds), one example is when the character Alpha Pig encourages viewers to sing an alphabet song by saying "ABC…sing with me!"; this was coded as "lit_other_enc". Statements that did not mention the character's feelings or beliefs about print were not coded, even if it related to an aspect of literacy, such as a character naming a letter and/or sound that appears on screen without further commentary (e.g., "And now a Y. It sounds like 'eeee' in this word.").

Statements were one sentence or phrase in length. A character could repeat the same statement about literacy more than once, and each instance was counted (e.g., "The Super Readers save the day" was repeated three times during the closing song, and this statement was coded as three instances of "R_pow"). Every statement that indicated a character's feelings or beliefs about print was coded for three characteristics: 1) the affective quality of print or a stated belief about the purpose of print mentioned by the character (reading is powerful, writing is useful, etc.); 2) the type of literacy activity referenced by the character (reading, writing, or singing or talking about print [referred to as "literacy other"]); and 3) the type of statement made by the character (an explicit or direct statement about the character's feelings or beliefs about print, or an implicit, or indirect, statement about the character's feelings or beliefs about print).

STUDY 1: RESULTS

Results show that *Super WHY!* episodes contain many positive, explicit statements about the affective qualities and purposes of reading, writing, and other literacy activities. In fact, across the 43 episodes that were coded, 2,727 statements about reading, writing, or other aspects of literacy were found. Table 2 includes the frequency and percentage of each message type for both seasons. Across the two seasons, the number of messages coded ranged from 48 to 79 per episode, and there were, on average, 63 affective or purpose statements per episode.

TABLE 2
Frequency and Percentage of Literacy Messages in Seasons 2 and 3 of Super WHY!

Code	Frequency	Percentage
Reading encouragement	749	27.5
Reading is powerful	527	19.3
Reading is useful	279	10.2
Other literacy encouragement	260	9.5
Writing encouragement	198	7.3
Reading praise	189	6.9
Reading is a necessity	132	4.8
Reading is a means to an end	86	3.2
Writing is useful	84	3.1
Writing positive affect	74	2.7
Reading makes someone happy	60	2.2
Writing praise	44	1.6
Other literacy praise	23	.8
Reading affect	13	.5
Writing makes someone happy	3	.1
Other literacy affect	2	.1
Other literacy effort towards literacy	2	.1
Reading takes you on exciting adventures adventures	2	.1
Total	2727	100.0

With respect to literacy messages season by season, the number of literacy messages per Season 2 episodes ranged from 53 to 79 and, on average, Seasons 2 episodes contained 65 statements. The number of messages in Season 3 episodes ranged from 48 to 72 messages and, on average, Season 3 episodes contained 62 messages.

As Table 2 indicates, just over 80% of the statements (2,202 out of 2,727) focused on six specific codes. Although the frequency of occurrence differed somewhat between seasons, the six most common messages/themes to appear in both seasons include: 1) Reading encouragement (749 statements), 2) Reading empowerment (527 statements), 3) Reading usefulness (279 statements), 4) General literacy encouragement (260 statements), 5) Writing encouragement (198 statements), and 6) Reading praise (189 statements).

The messages about the affective quality and purposes of reading, writing and other literacy activities were stated in both explicit and implicit ways by characters in the program throughout the episodes. However, the vast majority of the statements about literacy were stated explicitly (2,484 out of 2,727 or 91% of affective or purpose statements) rather than implicitly (243 out of 2,727 or 9% of affective or purpose statements).

Super WHY! characters used their literacy skills in different ways – they could be seen reading, writing, singing and talking about print in each episode. Many of the messages about literacy, though, involved statements about reading (2,035) rather than writing (402) or other literacy activities (289). This trend is similar when looking at Season 2 versus Season 3, with characters engaging with reading (approximately 74% and 75%, respectively) far more often than writing (approximately 16% and 14% respectively) and other literacy activities (approximately 11% for both).

STUDY 1: DISCUSSION

Findings from the current content analysis indicate that when emerging readers and writers watch *Super WHY!*, they are exposed to a multitude of positive, explicit messages about literacy. Across Seasons 2 and 3, no negative messages about literacy were found. In addition, *Super WHY!* viewers witness characters explicitly discussing many positive feelings about literacy and positive reasons for being literate. Positive, explicit statements put a spotlight, in particular, on literacy as being powerful, useful, and something to be encouraged or praised.

This contrasts extant research in that very few of the most popular children's programs include messages about literacy. With its concentration of positive and explicit messages about literacy, *Super WHY!* appears to have the potential increase young viewers' attitudes about literacy. Yet, the question remained whether exposure to these messages about literacy over time would impact children's attitudes about literacy. This is especially a concern for children who may not readily develop positive feelings and perceptions about literacy. Therefore, Study 2 was conducted to address questions of effects.

STUDY 2: METHODS

Design

The second study involved an experimental design in which participants were randomly assigned to one of two conditions: the experimental group who viewed 20 episodes from Seasons 2 and 3 of *Super WHY!* and the control group who did not view any programming. Control participants served as a monitor of literacy attitudes in children with similar demographic characteristics as the participants in the experimental group.

Sample

One hundred and sixty-five children between the ages of 3 and 7 years were initially recruited from three elementary schools and seven child care centers in a Midwest, urban city. The

research team recruited from local child care centers and schools in low income neighborhoods with a large non-white population. Of the 165 children initially recruited, 16 children were withdrawn from the analysis because of incomplete data. Of the remaining 149 children, 56% of the 75 preschoolers were girls, and 40.5% of the 74 Kindergartners were girls.

Once receiving parental consent, classrooms were randomly assigned to either the control or experimental condition. Child participants completed all project-related tasks in their school or child care center, including viewing episodes (for the viewing condition) and all child assessments. Parent surveys to assess the family demographics were sent home with the children and returned by mail.

Stimuli

Episodes were selected based on the results of Study 1's content analysis. The average frequency of literacy messages, as they appeared in each episode, was calculated. Episodes were selected in which the 6 prominent literacy messages from the content analysis appeared at or above the mean. Twenty-three episodes met the initial criteria. In order to maintain the integrity of the coding scheme and daily viewing for the participants in an organized manner (1 episode per day for 4 weeks), 20 of the 23 episodes were selected.

Measures

For the children, an assessment of their attitudes about literacy was administered at both pre- and post-testing sessions. In addition, for children in the experimental viewing group and children in the control group who could correctly identify the name of the program from a logo of the *Super WHY!* program, an assessment of the child's appeal of the characters and the show was completed at post-test. Appeal measures could only be given at post-test because the children needed to gain familiarity with the show and characters before expressing their liking of them.

Reading Attitude Measure. The Reading Attitude Measure (RAM) consisted of two parts: 1) open-ended General Reading Attitude questions and 2) a modified version of the Elementary Reading Attitudes Survey (McKenna and Kear 1990; McKenna, Kear, and Ellsworth1995). The open-ended questions asked children to articulate their reasoning for why it is important to read and write. One question asked about reading and the second asked about writing. A modified version of the Elementary Reading Attitudes Survey was developed in order to be able to use the same scale with both preschooler and kindergarteners. The original scale consists of 20 questions on a 4-point scale, displaying the cartoon character of Garfield in various states of emotion. Of the 20 questions, 12 questions were selected (See Table 3). Because the original scale was created for children between first and sixth grade, some of the questions were not included for the RAM. Items were excluded because they asked about reading activities typically associated with older, and presumably independent reading, children (e.g., "How do you feel when you read aloud in class?" and "How do you feel when it's time for reading class?"; McKenna, Kear, & Ellsworth, 1995). While the 4-point scale was maintained, different pictures, which did not involve the Garfield character, were utilized. The pictures ranged from a smiley face making a "thumbs up" gesture to a smiley face making a "thumbs down" gesture. Data analyses of the scale revealed that reliability of the scale increased to $\alpha =$

.760 with the removal of two items (See Table 3); therefore, the RAM was calculated as a sum of scores for the remaining 10 items.

TABLE 3
Items for the Modified Reading Attitudes Survey

Item Number	Item
1*	How do you feel when you read a book on a rainy Saturday?
2	How do you feel when you read a book in school during free time?
3	How do you feel about reading for fun at home?
4*	How do you feel about getting a book for a present?
5	How do you feel about spending free time reading?
6	How do you feel about starting a new book?
7	How do you feel about reading instead of playing?
8	How do you feel about going to a bookstore?
9	How do you feel about reading different kinds of books? *[Prompt: "a story, or a book that tells you information about the world around you, or book with the alphabet in it, different kinds of books"]*
10	How do you feel when the teacher asks you questions about what you read?
11	How do you feel about reading in school?
12	How do you feel about learning from a book?

Note: Items removed from analysis

Appeal. In order to assess children's interest and liking of characters and the program and whether that influenced their attitudes about literacy, appeal was assessed in two ways: 1) program appeal (i.e., how much children liked the program as a whole, how it compared to children's favorite programs, etc.) and 2) character appeal (i.e., how much children liked the 4 main characters and identified characters as a friend or being like a friend). In addition, children were asked to nominate one of the Super Readers as their favorite and articulate why.

Procedures

After obtaining parent permission and child assent, children completed individual pre-test sessions with research team members. Once the testing was completed for the classroom, viewing classrooms watched 20 episodes of *Super WHY!* (1 each day for 4 weeks). Following the 20-day viewing period, all children participated in individual post-test sessions with research team members.

STUDY 2: RESULTS

With respect to Hypothesis 1, a between-subjects ANOVA was run to examine whether experimental participants differed from control participants on their attitudes about reading at posttest. It also examined whether differences existed between males and females in preschool versus kindergarten. No significant differences were found for the main effect of condition ($F(1, 146) = .957$, $p = .330$, $\eta\rho^2 = .007$) or grade ($F(1, 146) = .014$, $p > .905$, $\eta\rho^2 = .00$.) but trended

toward significance for gender ($F(1,146) = 2.78$, $p = .098$, $\eta\rho^2 = .02$). (Note that groups did not differ in their reading attitudes scores at pretest along any of these variables.) Although not statistically significant, both male and female participants in the experimental group tended to score slightly higher on the posttest reading attitudes measure than their control counterparts

A repeated measures ANCOVA was conducted to examine whether differences existed by condition (experimental versus control) over time (pretest versus posttest reading attitudes) and by gender (male versus female), when controlling for grade (preschool versus kindergarten). No significant differences were found for the main effect of time ($F(1,136) = .72$, $p = .789$, $\eta\rho^2 = .001$), the interactions between time and condition ($F(1,136) = .148$, $p = .701$, $\eta\rho^2 = .001$) or time and gender ($F(1,136) = .616$, $p = .434$, $\eta\rho^2 = .005$).

Although not statistically significant, experimental participants' scores increased slightly from pretest to posttest whereas control participants' decreased slightly from pretest to posttest. That is, children's reading attitudes scores went down, on average, for children who had not seen *Super WHY!* whereas a slight increase was noted for children who had viewed the *Super WHY!* episodes.

Further analyses involved Chi-Squares tests to examine whether there were significant relationships between two categories: condition (experimental versus control) and attitudes (high versus low). The frequency of participants' reading attitudes scores at pretest and posttest were analyzed and split into approximately two equal groups (higher attitude scores versus lower attitude scores). Chi-Square tests did not show statistically significant relationships at pretest [χ^2 (1, $N = 142$) = .095, $p = .758$], but did trend toward significant at posttest [χ^2 (1, $N = 146$) = 2.78, $p = .096$]. Similar to the trend noted in the univariate ANOVA analysis, more experimental children had higher reading attitudes scores than control children after the treatment of 20 episodes of *Super WHY*! Also, the number of control children who had lower reading attitudes scores increased from pretest to posttest, whereas the number of experimental children with lower reading attitudes scores decreased from pretest to posttest. Table 4 displays the number of children at pretest and posttest in each condition and attitude category (note that the sample size for pretest was lower than at posttest by 4 children).

TABLE 4
Total Number of Experimental and Control Children with Low versus High Reading Attitudes Scores at Pretest and Posttest

	Pretest Reading Attitudes Scores		Posttest Reading Attitudes Scores	
	Low	High	Low	High
Control	35	40	43	34
Experimental	33	34	29	40

Results from the ANOVAs and repeated measures ANOVCAs provided an initial answer regarding Hypothesis 2, but they also indicated that gender may be playing an important role. Data suggest larger mean differences for boys than girls, in that males in the control group experienced a decrease in their reading attitudes scores from pretest (M =31.67 , SD = 6.46) to posttest (M = 30.28, SD = 7.07)whereas males in the experimental group experienced a slight increase in their reading attitudes scores from pretest to posttest (M = 31.03, SD = 5.35, M =

31.34, SD = 5.67, respectively). Females in the control group experienced a slight increase in their attitudes scores from pretest (M = 31.68, SD = 6.96) to posttest (M = 32.50, SD = 6.06), and females in the experimental group remained the same in their attitudes scores after viewing episodes of *Super WHY*! (M = 32.72, SD = 5.41, M = 32.72, SD = 5.24, respectively).

Additional analyses involved Chi-Square tests to examine whether there were significant relationships between condition (experimental versus control) and attitudes (high versus low) by gender. Chi-Square tests revealed no significant relationships between conditions at pretest on girls' and boys' reading attitudes scores [χ^2 (1, N = 142) = .313, p = .576 for females; χ^2 (1, N = 142) = .644, p = .422 for males]. Chi-Square tests revealed no significant relationship between experimental and control females on posttest reading attitudes scores [χ^2 (1, N = 146) = .549, p = .459] but trended toward significant for males by condition [χ^2 (1, N = 146) = 3.065, p = .08]. In this case, a greater number of experimental males had higher attitudes about reading than control males at posttest, and the number of males in the higher reading attitudes category increased from pretest to posttest for experimental males but decreased for the control males. Table 5 displays the number of males and females at pretest and posttest in each condition and attitude category (note, again, the sample size difference at posttest by 4 children).

Table 5
Total Number of Males and Females by Condition and Attitude Category at Pretest and Posttest

		Pretest Reading Attitudes Scores		Posttest Reading Attitudes Scores	
		Low	High	Low	High
Control	Males	18	19	24	13
	Females	17	21	19	21
Experimental	Males	22	16	17	21
	Females	11	18	12	19

A final step in the analyses examined the differences between condition, gender and grade level for participants' attitudes about reading from pretest to posttest. Results from the repeated measures ANOVA did not reveal significant differences by time and condition (F (1, 133) = .120, p >.05) or the interactions of these factors (ps >.05), but examining the means and standard deviations reveals that, especially in kindergarten, males in the experimental group slightly increased in their attitude scores after viewing episodes as opposed to kindergarten males in the control group who experienced a slight decrease in their attitudes scores from pretest to posttest.

With respect to the third hypothesis about the appeal of characters and the program and literacy affect, analyses were conducted for those children in the viewing condition only. Results suggested that the program was well liked by almost all of the viewers: 91.3% reported that they liked the show "a lot". Only 2 preschoolers indicated they did not like the show. No significant differences were noted in appeal of the program by age or gender of the viewer, and no significant difference were noted in the appeal to the program and their reading attitude.

Although gender did not play a role in the appeal of the program, differences were noted with respect to the gender of the characters that the children identified as their favorite. Results indicated that girls were significantly more likely to select Princess Presto (94.7%) and Wonder

Red (85.7%) as their favorite characters than boys [χ^2 (4, N = 68) = 40.92, p < .05]. Boys were significantly more likely to select Super Why (89.7%) as their favorite character, and only boys (no girls) selected Alpha Pig as their favorite (see Table 6).

Table 6
Child Viewer's Selection of their Favorite Super Why! Characters

Gender of Child	Favorite Character					Total
	Super Why	Alpha Pig	Princess Presto	Wonder Red	More than 1 character	
Male	26 (89.7%)	2 (100.0%)	1 (5.3%)	1 (14.3%)	8 (72.7%)	38 (55.9%)
Female	3 (10.3%)	0 (.0%)	18 (94.7%)	6 (85.7%)	3 (27.3%)	30 (44.1%)
Total	29 (42.6%)	2 (2.9%)	19 (27.9%)	7 (10.3%)	11 (16.2%)	68 (100.0%)

Although gender was a factor in their selection of favorite characters, no significant differences were found between the appeal of a particular character and children's reading attitude. However, an examination of comments made by children for the reasons why they picked particular characters as their favorite revealed trends associated with literacy skills. Whereas some comments referred to the appearance of the character ("because he has green" for Super Why) or gender ("because they are girls" for Princess Presto and Wonder Red), other reasons related directly to the power exhibited by the character and the character's literacy skills ("Because he has the power to read" for Super Why and "Because she can spell" for Princess Presto). Interestingly, more comments about reading and literacy elements were associated with the Super Why character than with any of the other characters, and all of these comments were made by boys. Of the 37 comments made about Super Why, 21.6% of them were directly related to reading.

DISCUSSION

Developing literacy skills in the early childhood years is critical to a child's success in learning to read and writing as well as later schooling. Yet, as children learn the mechanics of reading, writing, speaking and listening, they are also developing attitudes and perceptions about literacy. If children feel positively about literacy and their ability to engage in literacy activities, then they will likely engage in reading more and become good readers and writers.

Many different factors in children's home and school environments influence the skills, attitudes and perceptions that they develop over time. During this critical time, children are exposed to many hours of television, and the content on television has been shown to influence a variety of academic and non-academic skills. Results of the first study revealed that *Super WHY*! characters offer viewers many positive, explicit statements about reading, writing and other literacy activities.

To test the impact of these statements, the second study examined whether the messages had an impact and whether characteristics of the messages (appeal) facilitated effects. Although the results showed no statistically significant differences between participants who viewed 20 episodes of the program, important trends emerged. First, children who viewed the program

tended to have slightly higher reading attitudes scores after watching the program than children who did not view the program. For the control children, scores tended to decrease from pretest to posttest. This may indicate a gap that could widen over time, as children's attitudes about literacy generally decrease as they get older (McKenna, Kear, and Ellsworth 1995). The results do not support the conclusion that the program made a significant impact; however, trends suggest that greater exposure may lead to stronger effects.

With regard to a second trend, it appears that gender may be playing a role in the ways in which the program might influence literacy attitudes. Past research has shown that boys and girls in the early childhood years do differ in their feelings about reading (McKenna, Kear, and Ellsworth 1995), with girls generally feeling more positive about reading and boys feeling less so. This gender gap has been found as early as first grade and widens as children progress through their schooling. Boys, then, seem more susceptible to negative feelings about reading, and this may have long-term consequences for their overall literacy success. Trends from the second investigation indicate that positive messages about literacy may help counter the decline in attitudes about reading that boys experience; with greater exposure, significant differences might have been found.

Finally, appeal of the program and particularly of specific characters may also be a factor for children's literacy attitudes. Linebarger and Wainwright (2007) identified familiarity with media characters as a strategy which may be particularly well suited to support learning. Moreover, Fisch (2004) also suggests that the "efficacy of educational content on television may be mediated by the character who delivers it" such that "viewers may attend more to the characters' words or action" which is expected to result deeper processing of the educational content (pp. 185-186). Although appeal to the show and specific characters did not have a significant effect on children's literacy attitudes scores, trends suggest that they were identifying with characters and that they were noticing the literacy messages embedded in the character. This seems particularly true for boys, who mentioned these literacy messages with the Super Why character more frequently than girls and who chose Super Why as their favorite character more frequently than girls. This suggests that a male character who portrays the power, enjoyment and usefulness of literacy has the potential to positively impact boys' literacy attitudes similar to findings in previous research (i.e., girls' interactions with and appeal to a strong female character benefited their educational outcomes when viewing a different preschool television program; Calvert et al., 2007).

Limitations

These findings must be interpreted in light of the limitations of the study. One limitation involves participants' exposure to the program. Children may not have viewed a sufficient amount of the program to significantly change their developing attitudes about reading. A longer period of regular viewing may have had a greater impact. Related to exposure, control children may have been exposed to the program outside of school and been influenced by the literacy messages in the program. Therefore, future research should consider this when designing a study of television's impact on literacy attitudes.

Related to exposure, participants only viewed a program that contained a multitude of positive, explicit messages about literacy. The assumption guiding this selection was that these messages would have the greatest chance of changing children's attitudes, if change was indeed

possible. Yet, negative messages about literacy may have a different or stronger effect than was found in Experiment 2. However, there was concern about finding a program with the same amount and magnitude of negative messages as well as a concern about intentionally showing young viewers negative messages for an extended period of time. Therefore, the current investigation only focused on a program with many positive, explicit literacy messages. Still, results could not speak to the impact of negative messages about literacy on young children's attitudes about literacy.

Another limitation relates to the measures utilized in this study. The literacy attitudes measures were not specific to *Super WHY*! content. Instead, participants were assessed on more general measures of reading attitudes developed in extant research. Assessments of messages specifically presented in the episodes may have yielded different (and significant) results that were not found with the RAM instruments. With respect to appeal measures, items used in this study's analyses relied on open-ended responses, and this may have been too difficult a task for participants, especially preschoolers.

CONCLUSION

Success in literacy is crucial for children's overall academic success. Educators and families continually look for and utilize resources, including media, that can support this development. Results, although not statistically significant, reveal potential for an educational program, such as *Super WHY!*, with explicit, positive messages about literacy to help promote positive attitudes about reading for young viewers. In particular, the program may buffer the noted decline in boys' attitudes about reading that develop early on and that seem to deepen over time.

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