Learning from Television
With Interactive Toy Characters
As Viewing Companions

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Abstract

This poster reports on studies examining children's engagement with two television programs (*Barney and Friends* and *Teletubbies*) when watching normally (alone) vs. with an interactive toy character as a "co-viewer" who commented on and participated in program content in educationally appropriate ways. Results indicate that for both programs, children were significantly more engaged with program content when watching with the toy character than when watching without.

Introduction

This poster presents the theory and research behind a television-based learning technology for children currently available through all PBS stations in the United States. With this technology, children watch a television program together with an interactive toy character that supports children's understanding of program content by responding to the program, commenting on and reacting to what is being viewed in educationally appropriate ways (for an overview of the design of these interactive characters, see Strommen, 1998, Strommen and Alexander, 1999). The toy character's interactions are specific to each episode of the program and broadcast into the home as part of the program itself, then transmitted to the toy character via a wireless radio link.

The form and content of the comments made by the interactive character are based on findings from two empirical and theoretical traditions. The <u>first</u> is media research on 'co-viewing,' or the effects of comments made by other viewers on children's understanding of what they watch (for example, Collins, Sobol, and Westby, 1981; Haefner and Wartella, 1987). The <u>second</u> is the Vygotskian model of the role of language in promoting mental growth, particularly its use in guided learning contexts (e.g. Diaz and Berk, 1992; Vygotsky, 1978). Building on this theory and research, the interactive characters use verbal comments to direct children's cognitive activity during viewing by doing such things as focusing the child's attention (e.g. "Watch this!" "Did you hear that?"), and asking questions (e.g. "What do you think will happen next?" "Did that ever happen to you?"). They also model participating in onscreen activities by doing such things as counting along with onscreen characters, singing along with songs, and reacting to onscreen events with appropriate affect.

Study Design

The effect of this interactive supplement to educational programming was assessed for two television programs: *Teletubbies* and *Barney and Friends*. Two groups of children watched the same episode of each program. In the INTERACTIVE GROUPS, children watched the program with an interactive plush doll. In the CONTROL GROUPS, children watched with a plush doll of the same character as was used in the Interactive groups, but the plush doll was not interactive. Children in both conditions viewed the program in a simulated living room like setting with one or both of their parents.

Subjects

All participants were regular viewers of the program being tested. N = 27 children for the Barney study (12 for the control group, 15 for the interactive group, mean age = 39 months) and N = 25 for the Teletubbies study (12 for the control group, 12 for the interactive group, mean age = 26 months).

Program episodes and character interactions

CHARACTER INTERFACE	**Barney Interactive Doll**	**Laa-Laa Interactive Doll**
EPISODE SUMMARY	**#308, "On the Move." A boy moves into a new neighborhood and makes new friends.** **Seven songs.**	**#107, "Blowing bubbles." Po has a blowy day, the Teletubbies watch children blowing bubbles, and Laa-Laa plays with her ball indoors.** **One dance.**
CHARACTER INTERACTIONS WITH PROGRAM	**Asks questions, sings along with songs, counts along with onscreen characters, reacts to events onscreen.**	**Repeats onscreen speech after characters in the program speak, or speaks in unison with onscreen characters. Music plays from the character during dance sequence.**
TOTAL PHRASES (both programs are 27 minutes in length)	**207**	**93**

Results

Scoring

In the INTERACTIVE groups, children's responses to character comments were scored for each comment into one of six behavioral categories. In the CONTROL groups, children's behavior during viewing was sampled at the same points where children's reactions to speech were observed in the interactive condition.

After scoring, each behavior was then assigned a value of +1 (child is physically or verbally responding to program content), 0 (child is watching but not actively interacting with the program), or –1 (child is distracted, ignoring the program) and an average <u>engagement score</u> for each child computed. These scores were then summarized for each group, and tested for group differences in level of engagement.

Independent Sample t-tests indicate that there is a significant difference between the two conditions for both programs:

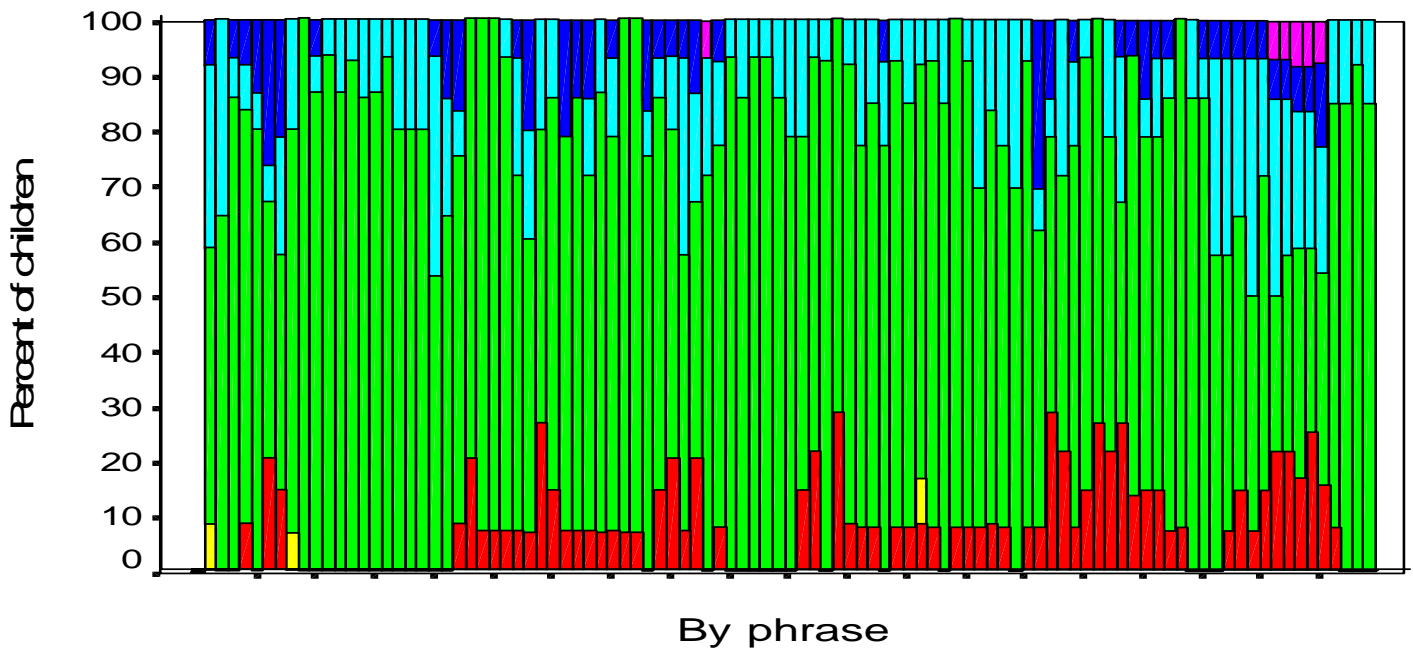|	Control	Interactive	t
Teletubbies	**-.35**	**-.05**	$t(23) = 4.39$***
Barney	**-.15**	**.07**	$t(25) = 4.46$***

For both programs, viewers watching along with the interactive dolls showed significantly higher levels of engagement with the program.
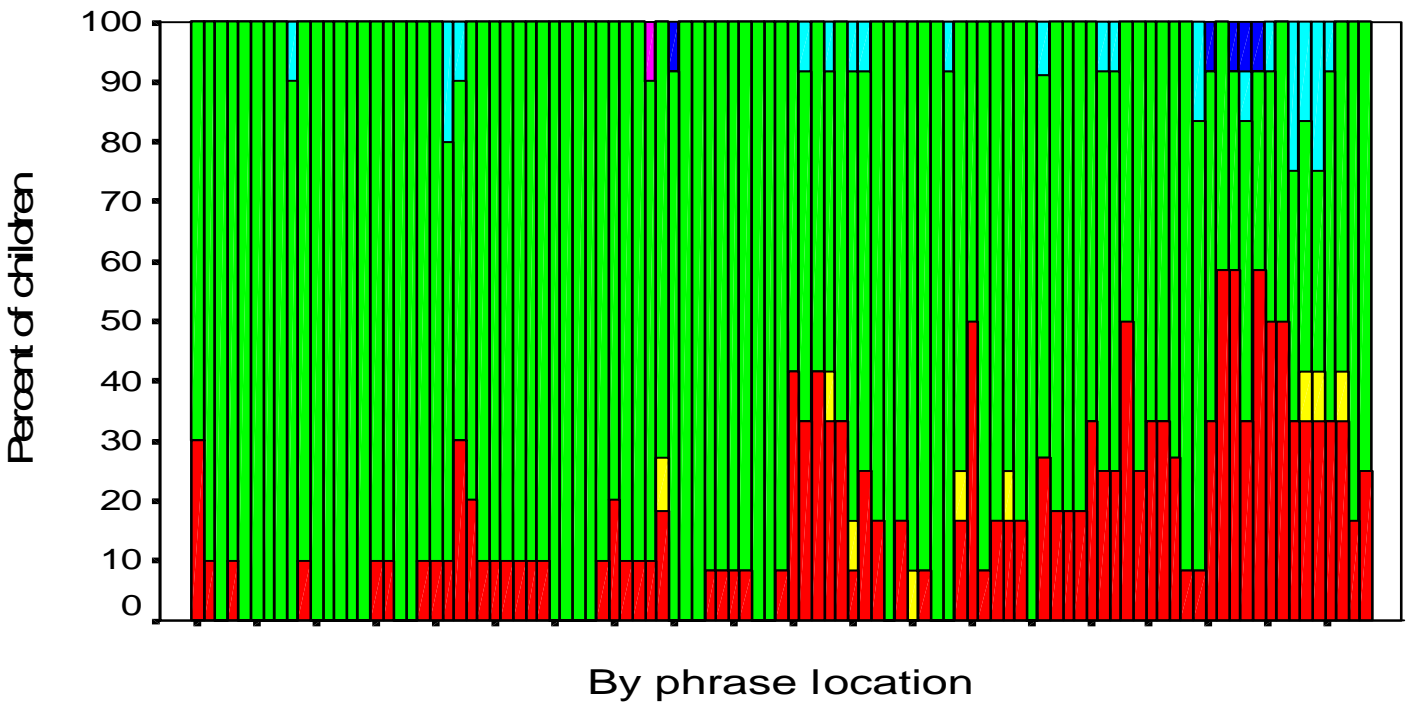
Engagement scores by group

Control vs. with doll, both programs
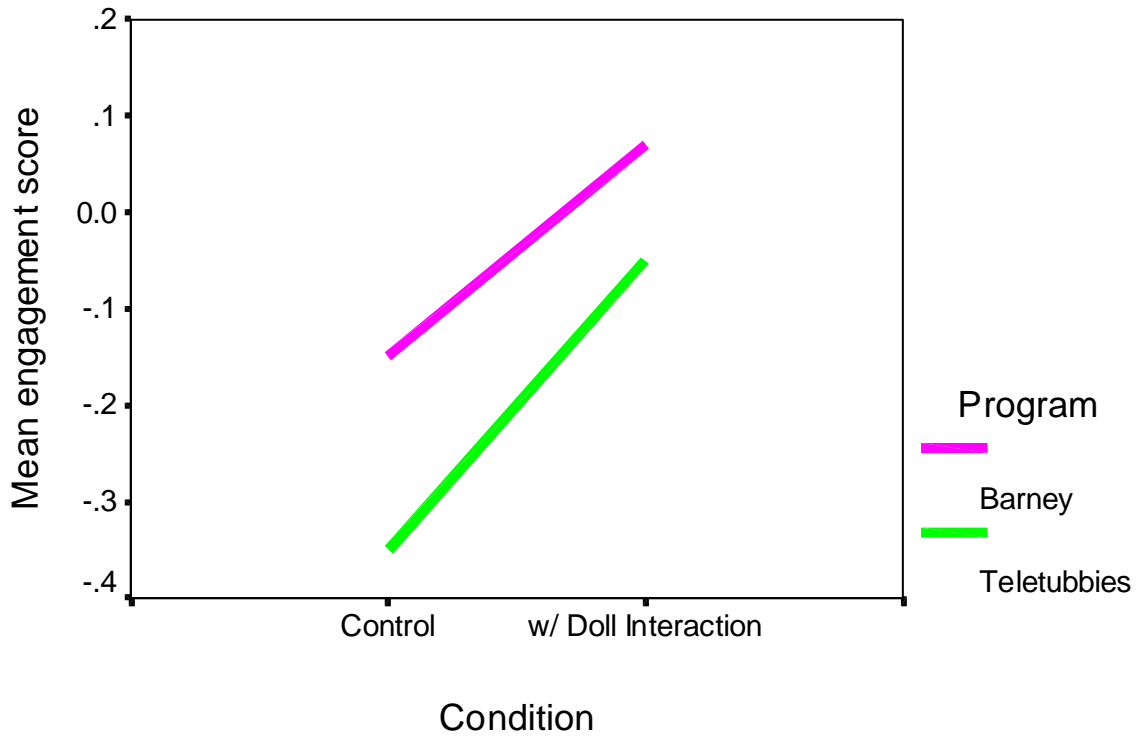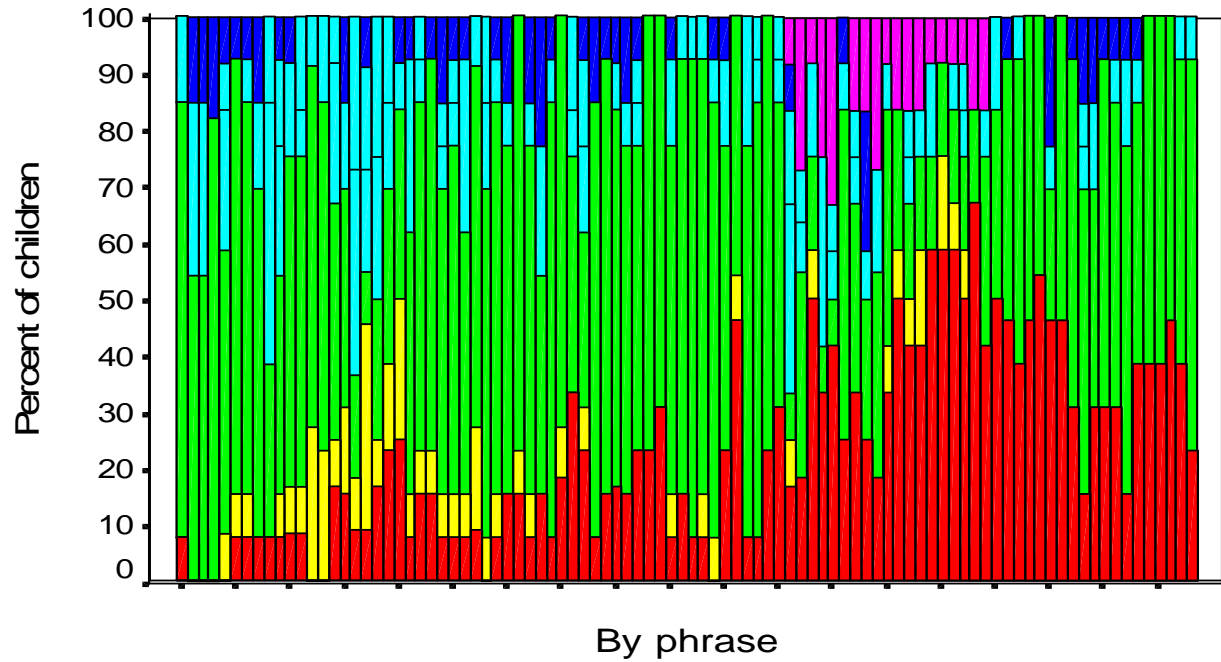
Barney: Behavior during program

Interactive Condition
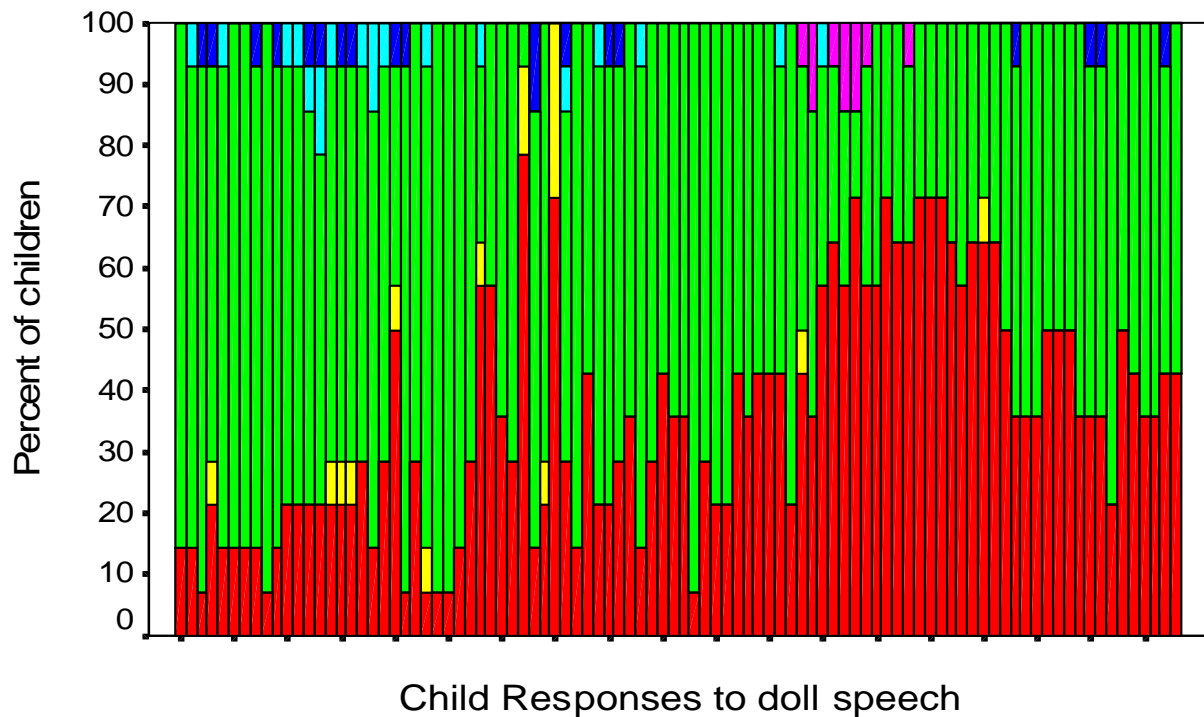

By phrase

Barney: Behavior during program

Control Condition

By phrase location

Teletubbies: Behavior during program

Interactive Condition

By phrase

Teletubbies: Behavior during program

Control Condition

Child Responses to doll speech

Albuquerque, New Mexico, April 15-18, 1999.

	KEY TO GRAPHS	
COLOR	**BEHAVIOR**	**ENGAGEMENT SCORE**
PURPLE	DANCES – Children dance to onscreen music or songs	**+1**
NAVY BLUE	VERBAL RESPONSE – Children repeated what the doll or a TV character says, answers a question posed by the doll, sings along, etc.	**+1**
LIGHT BLUE	NONVERBAL RESPONSE – Children hug the doll, nod their head, etc.	**+1**
GREEN	SILENT, INACTIVE WATCHING – Children sit and watch, no verbal or nonverbal responses to program content	**0**
YELLOW	PLAYING WITH DOLL – Child plays with doll, not watching program	**-1**
RED	NOT ATTENDING – Child is ignoring program and doll, and engaged in activity unrelated to TV program	**-1**

Conclusions

Children responded to the strategically placed comments of the interactive toy characters used in the present study as if they were other people sharing the viewing experience. Children with toy character "co-viewers" were significantly more engaged with the program than those watching without such interaction. Augmenting television viewing with "social" interactions from interactive toy characters who mimic human co-viewing behavior may be a valuable method for increasing the efficacy of educational viewing.

Future studies should evaluate if such "social" interactions by toy characters can promote increased engagement of children when interacting with other media, such as computers, in the same way it does with television.

References

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