Educational television? Children's potential to learn verbs from television

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INTRODUCTION

Can children under age three learn language from video displays? Despite the prevalence of toddler-directed educational programming (Zimmerman, Christakis & Meltzoff, 2007), and the established ability of older children to learn words from television (e.g., Reiser, Tessmer & Phelps, 1984; Singer & Singer, 1998), only a handful of studies have investigated whether children under three years can learn words from television. These studies have yielded mixed results and suggest only that children learn object words from video displays and that they learn better through *responsive* and *interactive* exchanges with adults and other children than by passive viewing (Krcmar, Grela & Lin, 2007; Naigles, Bavin & Smith, 2005). The current research extends this literature by exploring the utility of television for early verb learning.

RESEARCH QUESTIONS

(1) Can young children learn a novel verb from television with optimal learning conditions (**TV + Live**)?

(2) Can young children learn verbs from video alone (**TV Only**)?

(3) Do social cues help when they come from a televised experimenter (**Televised Experimenter**)?

METHOD

SUBJECTS

- TV + Live Interaction: (20) 30- to 35-month-olds and (20) 36- to 42-month-olds
- TV Only: (20) 30- to 35-month-olds and (20) 36- to 42-month-olds
- Experimenter on TV: (16) 30- to 35-month-olds

PARADIGM AND PROCEDURE

- Interactive Preferential Looking Paradigm (Hirsh-Pasek & Golinkoff, 1996), counterbalanced
- Training Trials (depending on condition):
  - Children were trained on the novel verb with one of 3 methods:
    - TV +Live Interaction
    - TV Only
    - Experimenter on TV
- Test Trials:
  - Four test trials showed two actions on a split-screen
  - All test trials used a new actor, requiring children to extend their knowledge
- Following the four Test Trials, the entire sequence was repeated for a second novel verb

Training Trials:

"Look at Dad *blicking* Elmo!
He's *blicking* him! Dad is *blicking* Elmo!"

(bouncing on knee)

Test Trials:

"Where is *blicking*?
Can you find *blicking*? Look at *blicking*!"

(bouncing on knee)

(swinging back and forth)

Figure 1. Sample video clips.

Video Sequence

Intro Trial:	"This is Cookie Monster. Do you see Cookie Monster?"
Salience Trial:	"Hey! Look up here! What's going on up here?"
Training Trials (for each condition)	
TV + Live	**TV Only**	**Experimenter on TV**
2x Live, 2x Sesame Video	*4x Sesame Video*	*4x Experimenter Video*
"Look at Cookie Monster wezzling! He's wezzling! Cookie Monster is wezzling!"	"Look at Cookie Monster wezzling! He's wezzling! Cookie Monster is wezzling!"	"Look at Cookie Monster wezzling! He's wezzling! Cookie Monster is wezzling!"
Test Trials (for all conditions)	
Test Trial 1	
"Where is *wezzling*? Can you find *wezzling*? Look at *wezzling*!"	
Test Trial 2	
"Where is *wezzling*? Can you find *wezzling*? Look at *wezzling*!"	
Test Trial 3 New Label Trial	
"Where is *spulking*? Can you find *spulking*? Look at *spulking*!"	
Test Trial 4 Recovery Trial	
"Where is *wezzling*? Can you find *wezzling*? Look at *wezzling*!"	

CODING

Each child's head and shoulders were videotaped for offline coding of gaze duration. Gaze direction was also coded during phases where the child saw a split-screen. Significant results differed from the chance looking rate of 50% to either side.

EVIDENCE OF VERB LEARNING

This is a strong test of verb learning. In the *Extension Test* of word learning, children must extend their knowledge of a verb to a new actor performing the action. In the *Stringent Test* of word learning, children are required to also use the principle of mutual exclusivity (Golinkoff, Mervis, & Hirsh-Pasek, 1994; Markman et al., 2003) to label a new action during the New Label Trial, and to look again at the original action when it is asked for by name in the Recovery Trial. A child who truly learns a verb should evidence a quadratic pattern of looking:

- At test, children should look toward the action that was named during training
- In the New Label Trial, they should look toward the action that was not named during training
- During the Recovery Trial, they should look again toward the originally named action

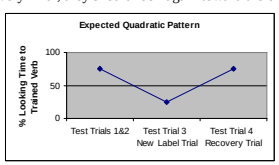

Figure 2. Expected quadratic pattern.

RESULTS

1) Can young children learn a verb from TV + Live Interaction? YES!

A 2 (age group: 30-35 months, 36-42 months) x 2 (verb position: 1st verb, 2nd verb) repeated measures ANOVA revealed a main effect of verb position, $p < .05$, but no main effect of age group, $p > .05$, and no interaction effect, $p > .05$.

Children looked equally toward the matching and non-matching action for the first verb, $p > .05$ but looked significantly *longer* to the matching action than the non-matching action for the second verb, $p < .001$. A significant quadratic pattern emerged, $p < .05$, indicating that children learned the second verb. Since the appearance of the verbs was counterbalanced across subjects, this means that children were capable of learning all verbs, but only when they appeared in the second block of trials

2) Can young children learn a verb from TV Only? ONLY OLDER CHILDREN

A repeated measures ANOVA revealed a significant main effect of age group on verb learning, $p < .01$, but no main effect of verb order, $p > .05$, and no interaction between age group and verb order, $p > .05$.

Only 36- to 42-month-old children looked significantly longer toward the matching than non-matching during Test Trials 1 and 2, $p < .001$. No quadratic pattern of looking emerged.

3) Do social cues help when they come from a Televised Experimenter? NO!

A one-way repeated measures ANOVA revealed no main effect of verb position. Paired-samples *t*-tests comparing looking time to the matching versus the non-matching actions revealed no significant looking patterns, *p*s>.05.

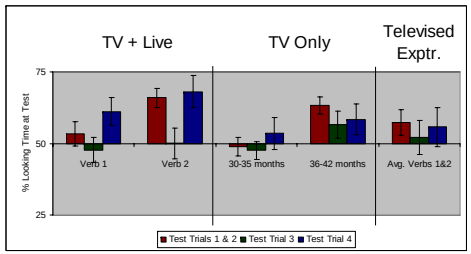

Figure 3. Percentage looking time at test.

DISCUSSION

- Children as young as 30- to 35-months are able to learn verbs from television, but only when live social interaction accompanies the video display.
- Even young children are able to pass a more stringent test of word learning when social interaction accompanies television
- Although older children are able to learn a verb from TV alone, they are unable to pass the stringent test of word learning without live interaction.
- Parallel to findings from Anderson and Levine (1976) and Troseth and DeLoache (1998), these results suggest that a developmental shift in the ability to learn from television occurs around 30 months.
- Finally, this study is consistent with prior research emphasizing the importance of social cues to word learning (Baldwin, 1991; Brandone et al., 2007; Sabbagh & Baldwin, 2001; Tomasello & Akhtar, 1995) and suggests that parents should watch television with their children.

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