Video Comprehensibility and Attention in Very Young Children

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ABSTRACT

Infants have increasingly become a target audience of video products. Yet, little is known about the extent to which very young children understand video. This study sought to determine the youngest age at which infants discriminate between normal and sequential or linguistic distortions of television content. Analysis of look length revealed that only by 24 months of age did infants make this discrimination, looking longer at normal video. Measures of heart rate support this finding insofar as heart rate deceleration (indicative of engagement) was associated with look length. Thus, very young infants appear to be insensitive to distortions of language and event sequences.

INTRODUCTION

The majority of infants today watch television[1], and many of the media products directed at infants have made educational claims[2]. To begin to understand whether young children can learn from video, we must first determine whether they comprehend even the most basic informational characteristics of television content, such as language or sequencing of shots. For older children, comprehension of these characteristics has been shown to drive attention to age-appropriate content[3]. However, not until the second year of life do infants appear to discriminate between a children's movie and random computer-generated forms and sounds[4].

Utilizing the method developed by Anderson and colleagues[3], this study extends previous work by using a program designed for infants and toddlers and more closely approximating the home viewing experience by making toys available.

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METHOD

Participants

- 6-month-olds (n=28, 13 females)
- 12-month-olds (n=25, 12 females)
- 18-month-olds (n=24, 11 females)
- 24-month-olds (n=26, 12 females)

Stimuli

- *Teletubbies*
- Two 10-minute trials, counterbalanced:
  - Comprehensible (normal video)
  - Incomprehensible (random shots or reversed speech)

Measures

- *Look length*: scale and shape parameters of the best-fitting lognormal distribution
- *Heart rate*: average inter-beat interval change for short (<15 sec.) versus long (>15 sec.) looks

RESULTS

Look Length Distributions (Fig. 1)

Scale (range of numbers in the distribution; related to skew)

Trial 1: Scale was greater for normal segments for 24-month-olds, indicating longer looks (i.e., more sustained attention)

Trial 2: No significant effects

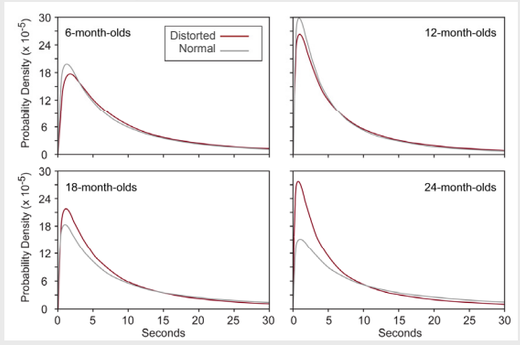

Figure 1. Look length for normal and distorted segments by age.

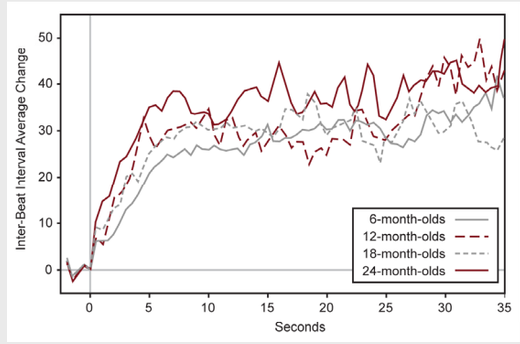

Figure 2. Average IBI change by age for long looks at distorted video.

Look Length Distributions (cont.)

Shape (represents the dispersion of the distribution)

Trial 1: No significant effects

Trial 2: Shape was greater for backwards speech segments than for randomly arranged shots

Heart Rate (Figs. 2 & 3)

Average IBI change was greater for looks >15 seconds. Although the pattern of results for heart rate paralleled looking, the age x condition interaction was not significant.

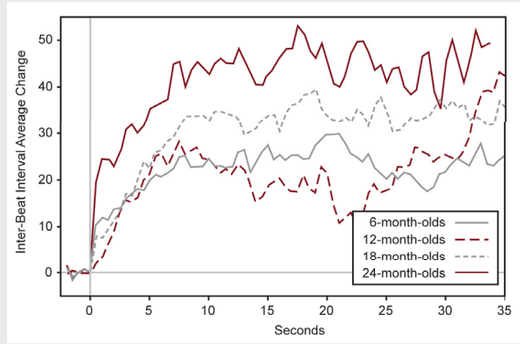

Figure 3. Average IBI change by age for long looks at normal video.

CONCLUSIONS

These findings extend earlier work by demonstrating developmental changes in the effect of video comprehensibility on look length and attentional engagement. Results for the lognormal scale parameter indicate that only the oldest children were sensitive to linguistic and sequential comprehensibility of age-appropriate content. Heart rate results supported this claim in that, regardless of age or condition, greater change was seen during longer looks which occurred primarily during normal segments for the oldest children.

Together with research indicating that infants learn more from real-life demonstrations than from equivalent video presentations, these findings suggest that the cognitive mechanisms necessary to extract meaning from edited video containing dialogue and narration may not be present until the second year of life.

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