Television program comprehensibility and distractibility in 24 month olds

John E. Richards & Michael Stevens
http://jerlab.psych.sc.edu/jerpdf/ICIS2018Comprehensibility.pdf

UNIVERSITY OF SOUTH CAROLINA

Background

Distractibility during television viewing may be used to examine children's attention. There is increasing cognitive engagement that holds fixation towards the television as long as attention is engaged by the program content. The program comprehensibility or age-appropriateness are determinants of attention engagement. The present study examined the effect of program comprehensibility on distractibility in 24-month-old children by using a variety of audio-visual television programs.

Methods

Participants:
Infants of English-speaking parents at 24 months of age

Stimuli and Procedure:
The conditions were the presentation for 6 min of a known comprehensible and age-appropriate Sesame Street program (FTB: "Follow that Bird"), and the presentation for 6 min of one of several audio-visual stimuli that varied in language and format. These include programs such as: Backward speech FTB; Spanish-language FTB; English-Elmo; Mandarin-Elmo; Richard Scarry; Blues Clues; synchronized geometric patterns and audio wave file sounds.

Distractors (computer generated patterns, or another "Sesame Street" movie) were presented on an adjacent TV screen at irregular intervals for 5 s.
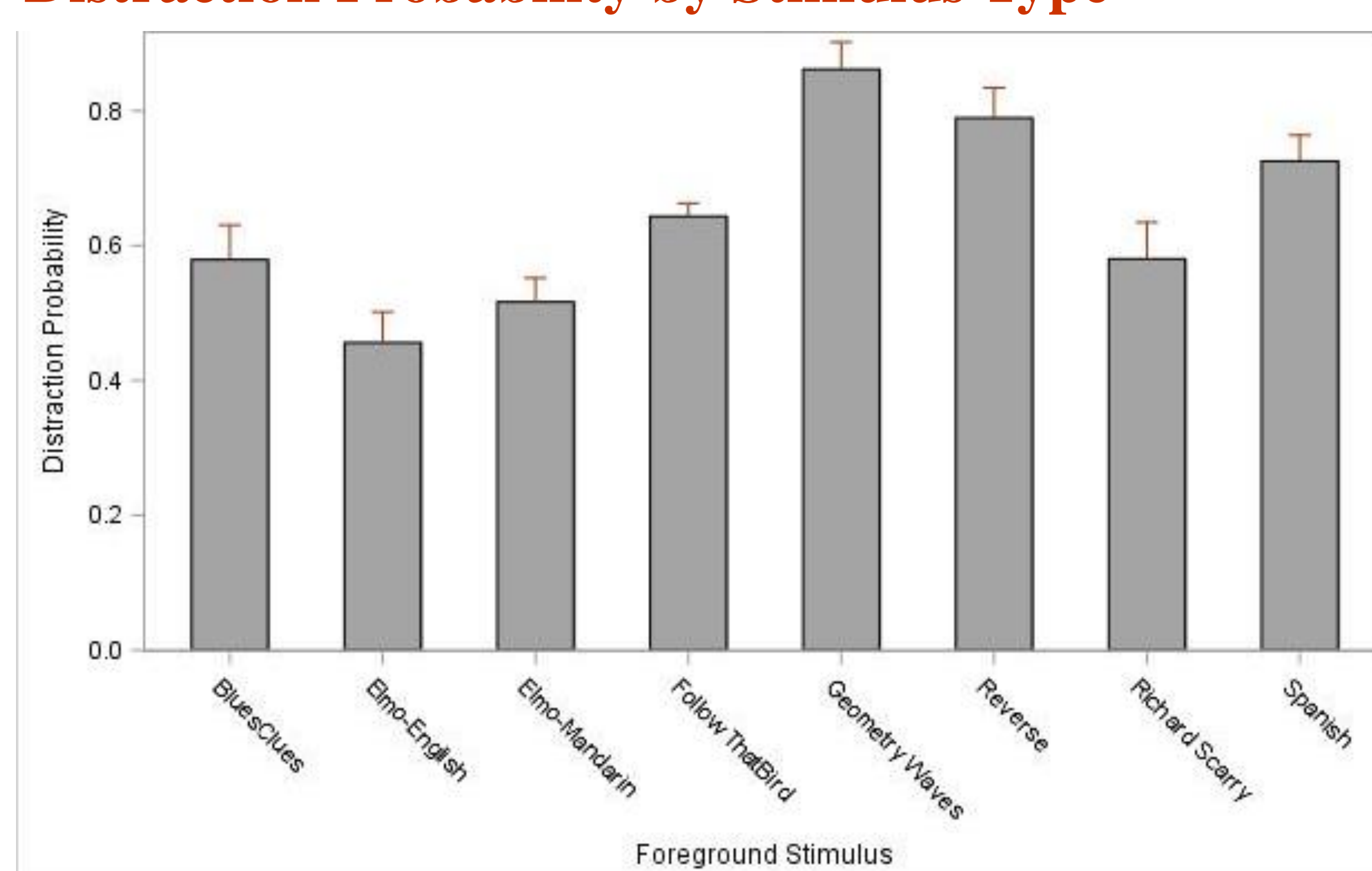
Central Stimuli
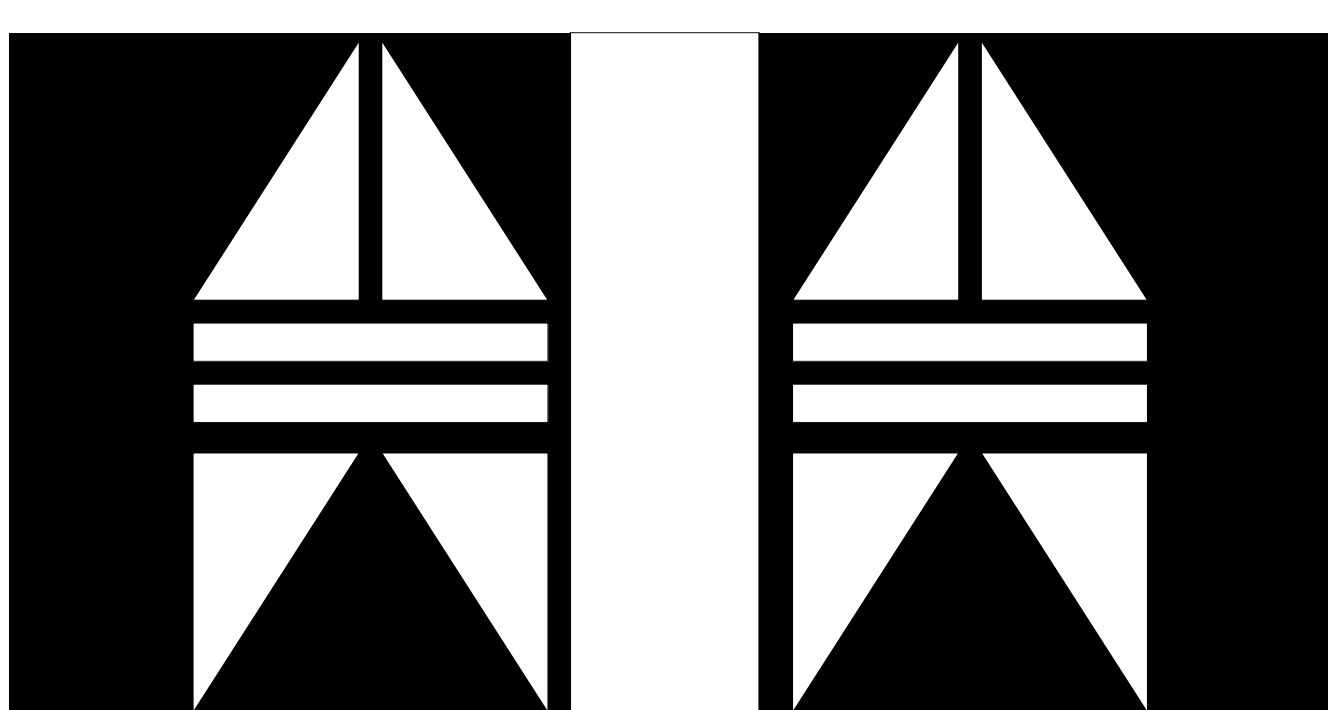
Distractors
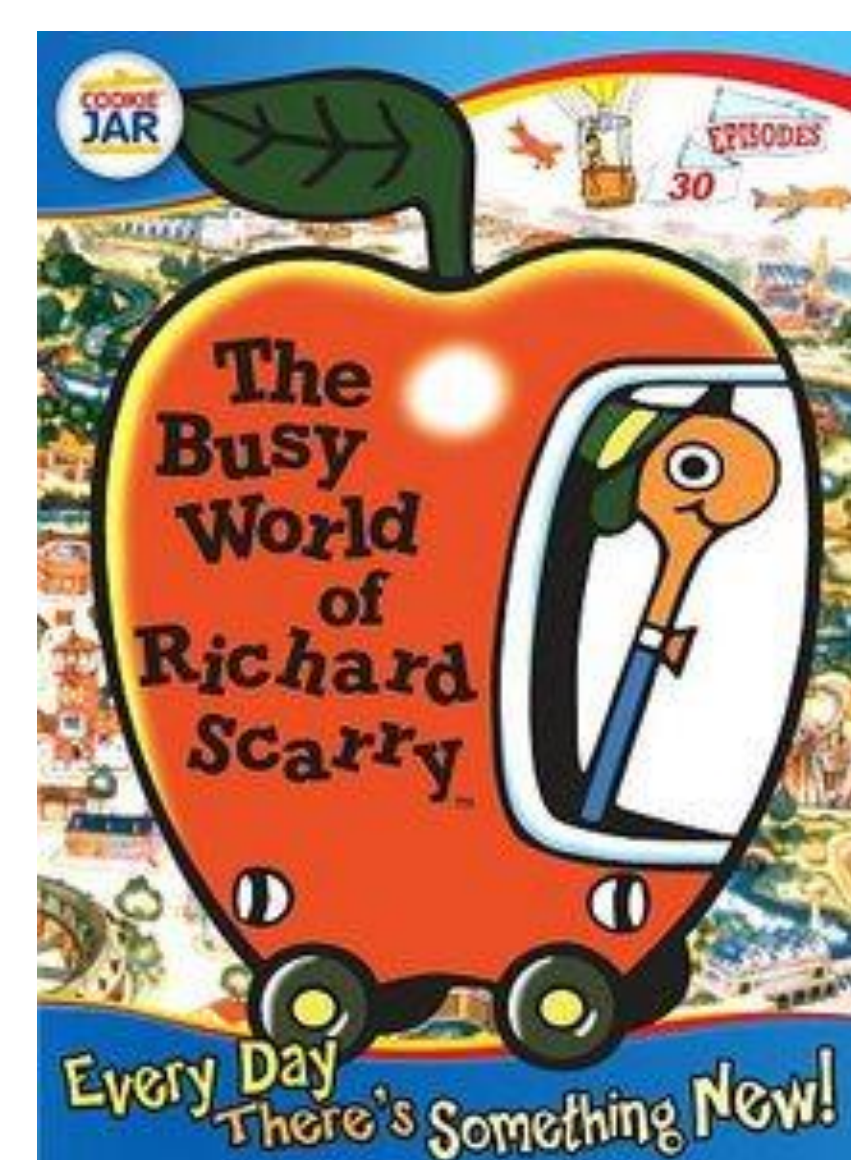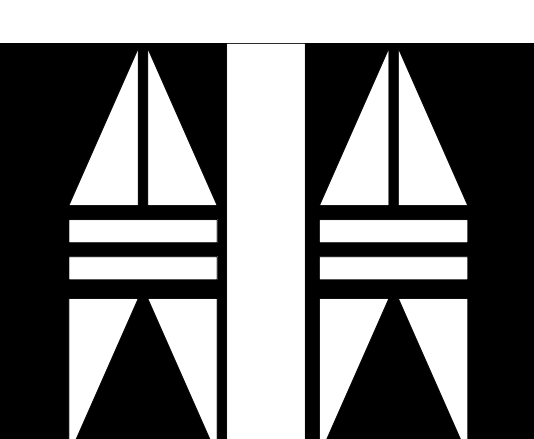
Results: Distraction Latency, Probability

The "Follow that Bird" had the longer RTs and smaller distraction probability than the "Geometry-Waves", Richard Scarry, or Backward-FTB. The larger RT and smaller distraction probability indicate more attention engagement to the FTB. Somewhat surprising, both the Elmo-English and Elmo-Mandarin TV programs showed the most attention engagement for all stimuli. The FTB program showed more attention engagement than the less comprehensible program for all but the Elmo video. Second, for all stimuli types, the longer the look was in progress before distractor onset, the less likely the infants were distracted by the peripheral presentation.

Distraction Time by Stimulus Type
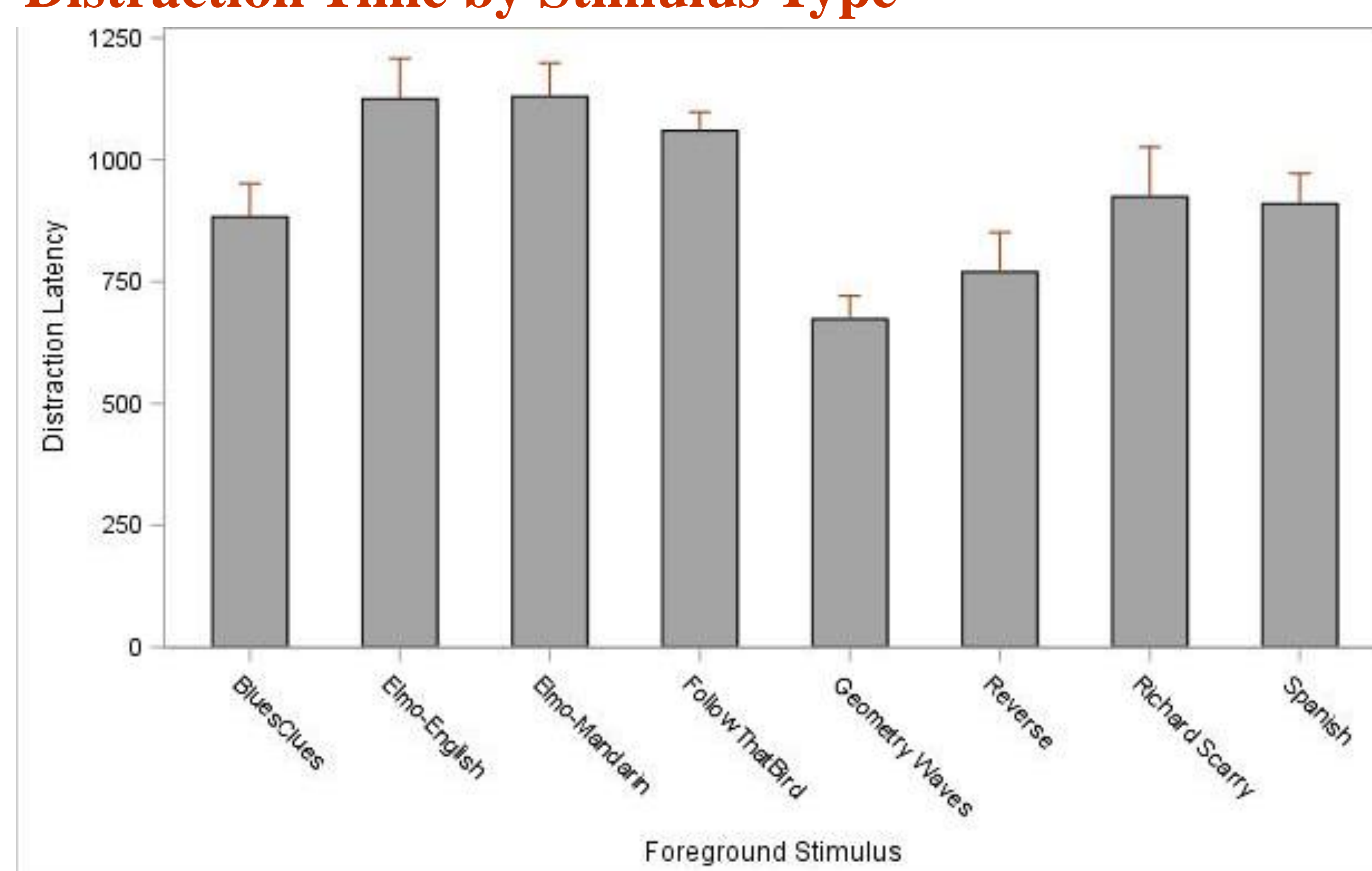
Distraction Probability by Stimulus Type

Results: Look Length Before Look Away

For all stimuli types, the longer the look was in progress before distractor onset, the less likely the infants were distracted by the peripheral presentation. The distraction probability as a function of the duration of the look at distractor onset was calculated separately for the comprehensible FTB and the other stimuli. The pattern of lower probability with increasing look duration was similar for both stimulus types. A measure of response bias, the signal detection parameter, c, was computed as a function of the duration of the look. There were decreasing negative values across look durations for both comprehensible and incomprehensible stimuli. The decreasing negative values across look durations indicate a bias against responding. The bias against responding (b, c) increased as a function of look length, whereas measures of sensitivity (d') were not different across prior look duration or comprehensibility conditions.

Distraction Probability, Stimulus Comprehensibility, by Length of Time Before Look Away

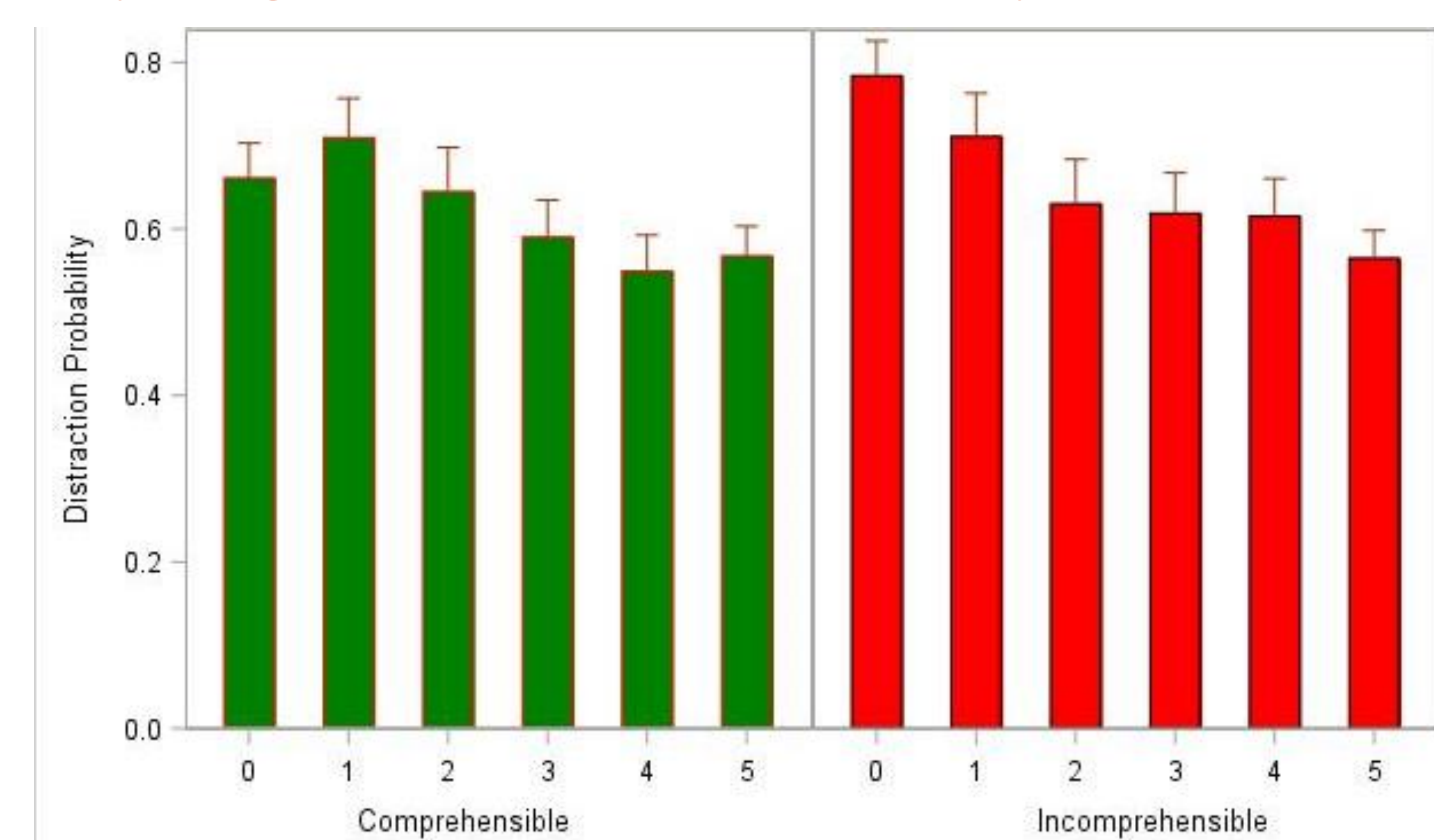### Signal Detection Response Bias, c, Stimulus Comprehensibility, Length of Time at Look Away

Summary

These results confirm the relation between distractibility and comprehensibility. The more comprehensible and age-appropriate stimulus, "Follow that Bird", elicited enhanced attention (distraction latency and probability) compared with the other stimuli. The exception to this were the "Elmo" videos. Perhaps these videos are especially age-appropriate, even so far as to over-ride the mismatch between the child's language and the Mandarin language. Signal detection analysis revealed an increasing bias against responding accounted for the look duration effect.