Effects of Animation on Iconicity of Symbols by SLP students

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Abstract

• Animation offers a potentially beneficial technology to facilitate the understanding of actions and prepositions depicted by graphic symbols designed for augmentative and alternative communication (AAC). This project aimed to evaluate the effects of animation and graphic symbol type (ALP Animated Graphics Set, Picture Communication Symbols) on the transparency and translucency of verbs and prepositions by undergraduate and graduate students in speech-language pathology.

Background

• Graphic symbols are a low-tech necessity for most aided AAC systems
• Actions and prepositions may be difficult to represent
• Iconicity
  • Transparency: A symbol is guessable without instruction – a bonus because no teaching is required
  • Translucency: Degree to which a symbol represents its referent – a powerful predictor of symbol learning (Fuller, 1999; Lloyd & Fuller, 1990)
• Prepositions have not been studied in translucency tasks
• Graphic symbols: nouns more translucent than verbs (Bloomberg et al., 1991)
• Manual signs: verbs more translucent than nouns (Page, 1985)
• Role of Animation in AAC
  – Mineo, Peischl, & Pennington (2008)
    – TD preschoolers across three age groups identified actions from a four-choice array.
    – Stimuli involved animated symbols (video, line drawings) and static symbols (line drawings with cues that indicate a state of disequilibrium, and line drawings with movement cues).
    – (a) Animated line drawings were more effective than static line drawings with disequilibrium cues, (b) animated and static line drawings with movement cues were identified equally well, and (c) older children did better than younger children
  – Schlosser et al (2012)
    – TD preschoolers across three age groups guessed prepositions and actions from ALP Animated Graphics Set and identified the from a four-choice array
    – Children guessed more successfully when symbols were animated
    – Animation did not make a difference for identification
    – Older children did better than younger children
    – Effects of animation on translucency is unknown (related to but different from identification task)
    – Animation has not been studied with college students

Purpose

• What are the effects of symbol format (animated, static) and symbol type (ALP, PCS) on the guessability and translucency of graphic symbols for verbs and prepositions in college SLP graduate students?

Participants

• 134 SLP undergraduate and graduate students were recruited from: (a) Northeastern University, (b) Eastern Washington University, and (c) Texas Tech University Health Sciences Center.
• 18 years or older
• English primary language
• No uncorrected vision problems
• Unfamiliar with PCS/ALP (before taking AAC course)

Design and Measures

• Students were randomly allocated (in a concealed manner) to 4 conditions: ALP-animated; ALP-static; PCS-animated; and PCS-static.
  – In each condition, half the subjects received prepositions before verbs and the other half received the reverse order.
• Dependent variables
  – Mean % guessability, Mean translucency rating (0-7)

Procedures

• All participants will receive the transparency task first followed by the translucency task
• Transparency task identical to Schlosser et al. (2012)
  – Symbols preceded by a green screen along with the recorded instruction "get ready, watch the screen."
  – Accompanied by recorded "What's this?"
  – Displayed for 14 s before the slide turned red
  – 3-s inter-trial interval (ITI), 5 min break at end
  – Use response booklet to write response
• Translucency task
  • Each slide shows one symbol and its written gloss above symbol in upper and lower case letters
  • Displayed for 14 s
 • 3-s ITI
  • Use response booklet to circle rating

Materials

• Powerpoint to deliver task
• ALP symbols and PCS
• Animated symbols and static symbols
• 24 verbs and 8 prepositions

• Two transparency response booklets
  • Numbered sequence, from 1 to 24 (verbs)/1 to 8 (prepositions), and a blank line next to the number (to write the meaning of the symbol).
• Two translucency response booklets
  – Listing of word referent, along with a 7-point Likert Scale for rating the resemblance between the symbol and the referent: from 1 (no relation) to 7 (a very strong relation) and 4 (a moderate relation).

Animated ALP "throw" – sequence of still shots
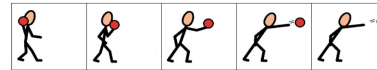
Animated PCS "throw" – sequence of still shots

Animated ALP "on" – sequence of still shots

Animated PCS "on" – sequence of still shots

Results

One-way within-subjects ANOVA
– Transparency *Prepositions*:
  – Main effect for condition, $F_{(3, 134)} = 37.264$, $p = .00$
  – Significant difference between ALP-Animated and :PCS-Animated (p=.000) as well as PCS-Static (p=.000)
  – Significant difference between ALP-Static and PCS-Animated (p=.000) as well as PCS-Static (p=.001)

• Transparency *Verbs*:
  – Main effect for condition, $F_{(3, 132)} = 33.761$, $p = .000$
  – Sign. diff. between ALP-Animated and: ALP-Static (p=.000) and PCS-Animated (p=.004) and PCS-Static (p+.000)
  – Sign. Diff. between ALP-Static and PCS-Animated (p=.000) and PCS-Static (p=.000)
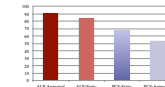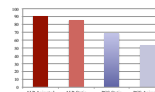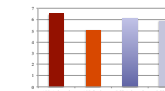

• Translucency *Prepositions*:
  – Main effect for condition, $F_{(3, 134)} = 19.364$, $p = .000$
  – Sign. difference between ALP-Animated and: PCS-Animated (p=.000) and PCS-Static (p=.000)
  – Sign. difference between ALP-Static and: PCS-Animated (p=.000) and PCS-Static (p=.002)
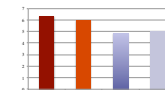
• Translucency *Verbs*:
  – Main effect for condition, $F_{(3, 134)} = 15.464$, $p = .000$
  – Sign. difference between ALP-Animated and: ALP-Static (p=.000) and PCS-Static (p=.007)
  – Sign. difference between ALP-Static and: PCS-Animated (p=.000) and PCS-Static (p=001)
  – Sign. Difference between PCS static and: ALP static (p=.001)

Discussion

• Symbol format & symbol type affect transparency & translucency of prepositions and verbs
• ALP-Animated condition played a front-runner role although it did not outdo all other conditions all the time

Key References

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