



# NSW Speech Pathology Evidence Based Practice Interest Group

## Critically Appraised Paper (CAP)

**CLINICAL BOTTOM LINE:** For children who are moderately mentally retarded, the use of pictures does not tend to support literacy development, but rather presenting the written word alone (i.e. without pictures) is likely to be more efficient in terms of learning to read new words

**Clinical Question:** In children with disabilities, does the use of pictures support literacy development?

**Citation:** Singh, N.N. & Solmon, R.T., [A Stimulus Control Analysis of the Picture-Word Problem in Children Who are Mentally Retarded: The Blocking Effect.](#) *Journal of Applied Behaviour Analysis* 1990, 23, 525-532, Number 4 (Winter 1990)

### Design / Method:

- An alternating treatments design (used to compare the effects of four experimental conditions in word recognition)
- 70 five-letter nouns were chosen from the instructional reading level of the students. All words and the corresponding black and white pictures were tested twice for recognition.
- As a result 16 words were chosen as the stimulus words for the study, each beginning with a different letter.
- Each word was printed in lowercase black letters and along with its corresponding picture.
- The words were allocated in a random manner, four for each condition for each child. No two children had the same set of words in any one condition.
- The study was conducted in a special resource room at the subject's school.
- Two elementary school teachers were provided with additional training in the implementation of experimental procedures.

### Participants:

- Eight children (4 females, 4 males); ages 7 -9 years; able to read about ten words;
- Diagnosed as moderately mentally retarded based on the American association on Mental Deficiency criteria
- Each subject had received approx. 10 -15 minutes of individualised reading instruction three times per week on word recognition by a teacher or teacher's aide during the previous three months – this was discontinued for the period of the study.

### Experimental Group:

The four training conditions:

#### Condition A – Blocking of the word by the picture

- The first slide was a single stimulus, picture
- The second slide was a compound stimulus, the picture on the top 2/3 and the word on the bottom 1/3. (Picture was enhanced in size.)

#### Control B – Control for condition A

- A word presented as a single stimulus on the bottom 1/3 of slide (word 2.5cm)

#### Condition C – Reduction of the blocking effect of the picture

- Word presented as single stimulus on first slide
- Second slide, the word on the top 2/3 and the picture on the bottom 1/3 (word enhanced 5 cm)

**Experimental Group (cont.):****Condition D – Control for condition C**

- Single stimulus with word (5 cm, twice the size of condition B) on top 2/3 of slide without the picture
- Each session consisted of four experimental conditions and a daily post-test. This lasted no longer than 20 minutes.
- Intervention continued until each subject responded correctly to all four words in any one experimental condition during three consecutive post-tests.
- The experimental condition found to be most effective in the intervention phase for each student was substituted for the other three conditions in the remediation phase.
- Remediation was terminated when each student correctly responded to all 16 words during three consecutive post-tests.

**Control Group:** None**Results:**

- All students had the lowest rate of learning under condition A (the maximum blocking condition) in which the size of the picture was enhanced compared to the word.
- Six students had the fastest rate of learning when the word was presented alone (condition B or condition D).
- The remaining two students had the fastest rate under condition C (reduced blocking effect – reduced by enhancing size of word).
- Results indicate that prior association of the picture with its verbal equivalent inhibits the learning of an association between the same picture and its written equivalent (printed word)

**Comments:****Strengths**

- Study clearly presented
- Able to be replicated

**Weaknesses**

- No control group
- No statistical analysis

**Level of Evidence (NH&MRC):** Level IV**Appraised By**  
**Clinical Group:** AAC**Date:** August, 2007

