

*BRIEF EXPERIMENTAL ANALYSIS OF STIMULUS
PROMPTS FOR ACCURATE RESPONDING ON
ACADEMIC TASKS IN AN OUTPATIENT CLINIC*

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Brief multielement designs were used to examine the effects of specific instructional strategies on accuracy of academic performance during outpatient evaluations of 4 children with learning disorders. Instructional strategies that improved accuracy on academic tasks were identified for all participants. These results suggest that the application of experimental analysis methodologies to instructional variables may facilitate the identification of stimulus prompts that are associated with enhanced academic performance.

DESCRIPTORS: instructional strategies, stimulus prompts, structural analysis, learning disorders

Antecedent events have been manipulated via multielement designs (structural analyses) to evaluate the conditions that occasion aggressive or disruptive behavior of severely disabled students (Carr & Durand, 1985). More recently, structural analyses have been applied to the identification of antecedent variables, such as length of task and type of instruction, that occasion appropriate behavior in both classroom (Dunlap, Kern-Dunlap, Clarke, & Robbins, 1991) and outpatient clinic settings (Harding, Wacker, Cooper, Millard, & Jensen-Kovalan, 1994). A similar approach to identifying antecedent variables that function as stimulus prompts for accurate academic responding appears to have merit for developing effective instructional practices for students with learning problems. To determine whether available instructional strategies function as stimulus

prompts for accurate academic responding, a brief structural analysis might be conducted within a multielement design. This investigation provided a preliminary analysis of this methodology and was conducted in an outpatient clinic with children who had diagnosed learning disorders.

METHOD

Participants and Setting

The 4 participants, who were regularly scheduled patients in a university-based outpatient clinic, were referred for an evaluation of poor academic performance. Participants were 2 girls and 2 boys between the ages of 7 and 10 years who had average intelligence and were enrolled in regular education classes, but who had diagnosed learning disorders. Two children had difficulty with spelling (Wendy and Jacob), and 2 had difficulty with reading comprehension (Ali and Brian). The assessments were conducted individually in clinic examination rooms.

Design and Measurement

The assessments alternated two or more instructional strategies within a brief multielement design (Cooper et al., 1992). The in-

This investigation was completed as part of the requirements for a PhD degree in Special Education by the first author. The authors express their appreciation to the students who participated in this project, to Agnes DeRaad for her assistance in editing this manuscript, and to Brenda Cruikshank and Anne Hartson for their support and encouragement.

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Table 1
Description of Instructional Strategies

Academic area	Strategy	Procedure
Reading comprehension	Follow along/sound out (FA/SO)	Participant places pointed instrument at beginning of written word and follows along from beginning to end of each word while reading. Participant phonetically sounds out each unfamiliar word and pauses each time a comma or period is reached.
Reading comprehension	Follow along/sound out/note taking (FA/SO/N)	Participant implements strategy described above and writes down new words. Participant determines meaning of new word from context of paragraph and writes summary phrase at end of each paragraph.
Reading comprehension	Verbal rehearsal (VR)	Participant reads passage, then verbally describes details of passage including main idea.
Reading comprehension	Verbal outline (VO)	Instructor verbally describes main idea, setting, and characters in passage to participant before he reads it.
Spelling	Rhyming words (RW)	Instructor provides words that share some commonality (e.g., words that have the same ending vowel and consonant) to the participant.
Spelling	Rhyming words/sample spelling (RW/SS)	Instructor provides the participant with a model (the written spelling) of one word that rhymes with a subsequently verbally presented group of words to be spelled independently.
Spelling	Rhyming words/sample spelling/self-generated (RW/SS/SG)	Instructor verbally presents a word to the participant, who is required to name a rhyming word. The spelling of the rhyming word that the participant names is written as a model for the subsequently verbally presented group of words to be spelled independently by the participant.

instructional strategies (summarized in Table 1) were selected based on modifications of the strategies that had been reportedly employed unsuccessfully in the participant's classroom or on recommendations provided via previous neuropsychological evaluations. Assessment always began with a baseline condition, in which spelling words were verbally presented or students were instructed to read the passage orally; no strategy was introduced. Next, one strategy was introduced at a time, beginning with the strategy that required the least

amount of adult assistance. The participants were not allowed to study the spelling words or to refer back to the passage in any condition. When a strategy resulted in improved academic responding compared either to baseline or to another strategy, the more effective strategy was repeated to form a mini-reversal design. The target response was accurate completion of a 10-item exam. Spelling exams were administered verbally and required written responses. Comprehension exams consisted of verbally administered open-ended ques-

tions that required verbal responses. Interrater agreement was obtained by two independent examiners, and point-by-point occurrence agreement was calculated by dividing the total number of agreements by the total number of agreements plus disagreements and multiplying by 100%. Interrater agreement was calculated on at least 44% of each participant's exams, and agreement for all exams was 100%.

Procedures

Tasks and exams were chosen from Standard Reading Inventory (SRI) spelling lists and reading exercises; different passages and exams were used for each assessment. Each participant's performance was assessed using grade-level material. No direct instruction occurred for spelling assessments. Instead, rhyming words were arranged into lists of comparable difficulty, and a spelling strategy was defined as the manner in which the rhyming words were presented to the participant: without a written model (RW), with a written model (RW/SS), or with a written model of a student-generated word (RW/SS/SG). Wendy was required to write the spelling of each word. Jacob, who had a diagnosed visual-motor disorder, was permitted to use a word processor during the first six conditions of the assessment but then was required to use a pencil to spell the words during the last three sessions.

Prior to each new reading strategy assessment, the experimenter provided direct instruction and practice in the use of the pertinent strategy. A reading strategy was defined as the methods the participant used to improve his or her understanding and recall of information presented in a reading passage: systematic approach to word attack (FA/SO), systematic approach to word attack and written information summary (FA/SO/N), verbal information summary (VR), or prereading information about the passage (VO). For each reading assessment, Ali and Brian were required to read a brief

passage aloud and to use the assigned strategy before the exam. After each exam, praise and descriptive feedback about the number of items correctly answered were provided. No participant refused to use a strategy, and the participants attempted all exam items. Time was not limited, each condition lasted between 5 and 20 min, and each strategy assessment was completed in less than 2 hr during a single afternoon.

RESULTS AND DISCUSSION

Figure 1 shows that immediate changes in academic performance often occurred with the introduction of a specific instructional strategy. For example, Wendy responded immediately with errorless performance during both conditions in which the RW/SS/SG instructional strategy was provided, compared to accurate responding of 50% or less in all other conditions. Despite some variability of his performance with the RW/SS strategy, Jacob consistently performed best when that strategy was in place. Although Ali's comprehension appeared to improve over the course of the assessment, she consistently performed with 100% accuracy when she used the FA/SO/N strategy. Despite some initially undifferentiated performance across baseline and strategies, Brian's performance improved to 80% accuracy when he used the VO strategy, and these results were replicated in the mini-reversal.

The brief nature of the assessment, the variability in responding within and across conditions, and the possible multiple treatment interference make definitive conclusions impossible, but the results suggest that the manipulation of specific instructional strategies within multielement designs may be useful for identifying effective stimulus prompts. In some cases, this identification may be possible with very brief analyses, whereas more extended analyses with more replications will be needed in other cases. The absence of data on

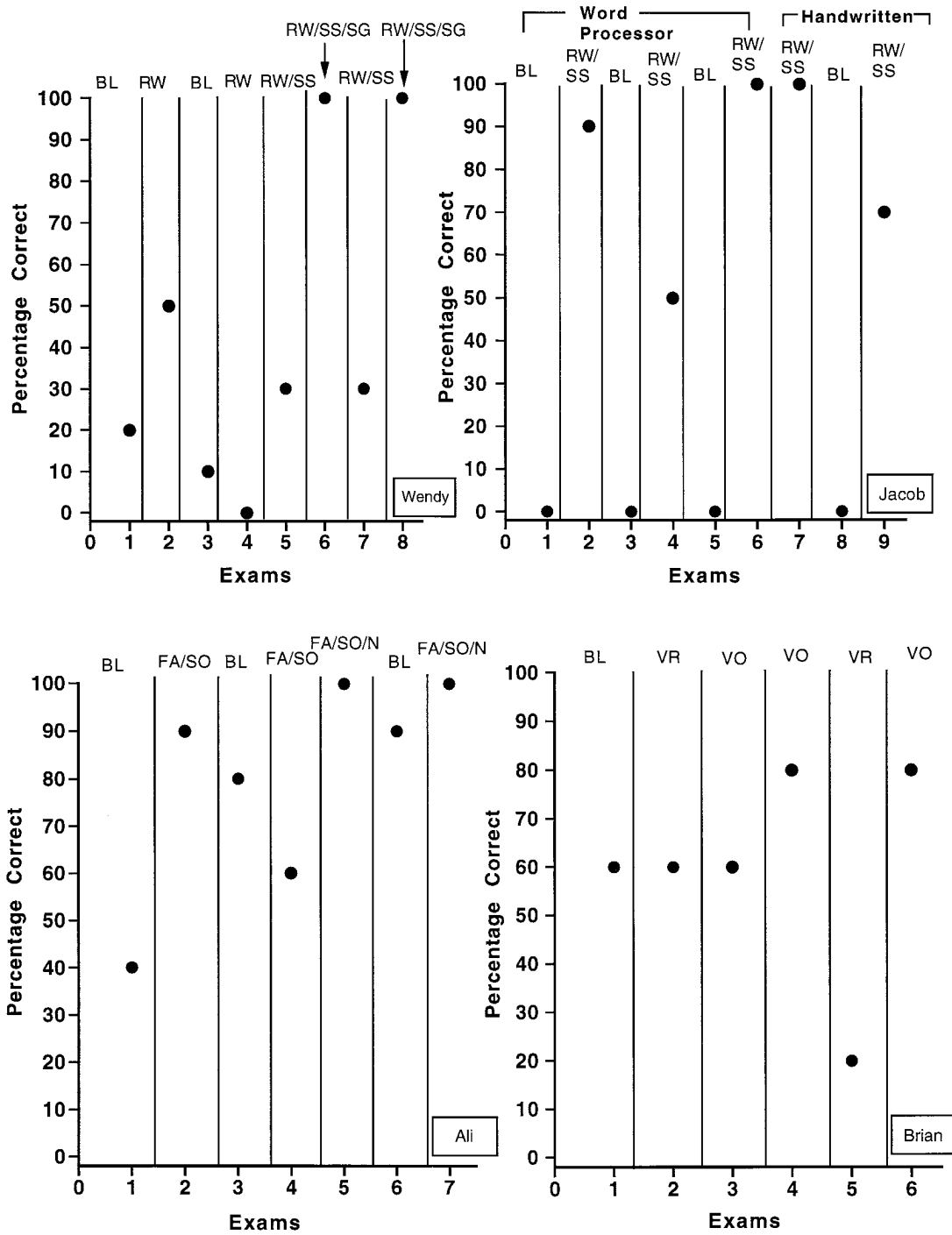


Figure 1. Percentage of correct responses on 10-item exams of spelling (Wendy and Jacob) and reading comprehension (Ali and Brian). Strategy abbreviations are defined in Table 1.

long-term treatment, procedural integrity, and social validity is also a limitation of this investigation. In future investigations, a systematic assessment approach for matching instructional prompts to specific students with learning problems may be possible and may lead to more effective individualized instruction. One logical next step is to develop specific hierarchies of instructional prompt procedures, such as those completed by Harding et al. (1994) for problem behaviors, and to evaluate the effectiveness of each strategy in a hierarchical manner.

REFERENCES

- Carr, E. G., & Durand, V. M. (1985). Reducing behavior problems through functional communication training. *Journal of Applied Behavior Analysis, 18*, 111–126.
- Cooper, L. J., Wacker, D. P., Thursby, D., Plagmann, L. A., Harding, J., Millard, T., & Derby, M. (1992). Analysis of the effects of task preferences, task demands, and adult attention on child behavior in outpatient and classroom settings. *Journal of Applied Behavior Analysis, 25*, 823–840.
- Dunlap, G., Kern-Dunlap, L., Clarke, S., & Robbins, F. R. (1991). Functional assessment, curricular revision, and severe behavior problems. *Journal of Applied Behavior Analysis, 24*, 387–397.
- Harding, J., Wacker, D. P., Cooper, L. J., Millard, T., & Jensen-Kovalan, P. (1994). Brief hierarchical assessment of potential treatment components with children in an outpatient clinic. *Journal of Applied Behavior Analysis, 27*, 291–300.

Received November 27, 1995
Final acceptance March 5, 1996
Action Editor, Brian K. Martens