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ABSTRACT

Five primary classrooms with educable mentally retarded (EMR) students were observed during four 20 minute periods to determine the number of correct oral responses given by the students during group instruction. The number of correct responses per child per minute was compared to those of five EMR children placed in a one-to-one instructional setting. The data indicated that individual EMR students are capable of emitting approximately 46 correct responses per minute in a one-to-one instructional setting, yet in a group setting, i.e., a special education class, they emit less than one correct oral response per minute. Additional data revealed that increased elicitations of correct responses increased learning efficiency. The need for more group work with all children responding in unison to the teacher's instruction is discussed. (Author/CL)

Increasing Learner Efficiency through the Increased Production of Correct Responses

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Paper presented at the Annual Convention

of the

Council for Exceptional Children

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ABSTRACT

Five primary EMR classrooms were observed during four 20 minute periods for the purpose of recording the number of correct oral responses given by the students during group instruction. This number of correct responses per child per minute was compared to those of five EMR children placed in a one-to-one instructional setting. The data indicated that individual EMP students are capable of emitting approximately 46 correct responses per minute in a one-to-one instructional setting, yet in a group setting, i.e., a special education class, they emit less than one correct oral response per minute. Additional data generated in this study revealed that increased elicitations of correct responses increased learning efficiency. A discussion of the data explores the implications for classroom instruction.

A Comparison of Correct Oral Response Rates of Young Retarded Children in Group and Individual Instructional Settings

Denny's Elicitation Theory as developed by Denny and Adelman (1955) view learning as a phenomenon that occurs when a response is consistently elicited. The response to be learned is elicited in close temporal contiguity with a particular stimulus. Denny and Adelman (1955) have pointed out that the frequency of the correct responses is important to learning in that it impacts on the consistency of the elicitation.

Denny (1966) extended the elicitation theory to the retarded learner and concluded that the learning deficiency of the retarded child is characterized by slow learning and short-term memory deficits. These deficiencies have three components: short attention span, inhibition deficiency, and a deficiency in verbal control over motor responses. Denny (1964) views the attention deficiency as an inability to self-initiate learning where instructions are not provided in addition to the child's inconsistent responses to every stimulus change. The child has difficulty in maintaining a continuous response set. These attentional deficiencies cause problems in incidental learning. The inhibition deficiency is manifested in continuous responses during extinction, problems in discrimination learning, and problems in

discrimination learning, and problems in controlling eliciting effects of competing stimuli. Inadequacies in verbal control over motor behavior is seen in difficulty following verbal directions, confusion in comprehension of verbal instructions, and a need for repetition of instructions during a task to maintain correct, consistent responses.

The majority of the research into this area has been related to the over-all hypothesis of the incidental learning deficiency (Mercer & Snell, 1977). Hardman and Drew (1975) stressed the importance of incidental learning in the school setting. Baumeister (1963) and Singer (1964) found that incidental learning deficiency in retarded children is specific to the task. In addition, research indicates that mentally retarded children have potential for incidental learning (Deich, 1974; Logan, Prehm, & Drew, 1968).

Even though Denny and Adelman (1955) believe that learning occurs as a function of the frequency of the elicitation of the correct responses, no research to date has specifically delineated the maximum number of times a retarded child can respond to a given stimulus in a specified amount of time. If learning depends upon the elicitation of a response, and if it needs to occur often and consistently, then one component of the teaching process would be the elicitation of as many correct responses as possible in a given time frame.

This study was undertaken to compare the rate of correct responses in a one-to-one situation with the number of correct responses being elicited from EMP children in public school special education classrooms in group settings. In addition, data were generated to examine the relationship between learning efficiency and increased elicitation of correct responses. It appears evident that professionals who work with retarded children need to know what children are capable of doing, i.e., response capability, then build an instructional model around these known abilities.

Method

Phase I

Phase I was the observation of five elementary EMP classrooms and the recording of the number of correct oral responses given by the children to any stimulus presented by the teacher. Four 20 minute observational periods were spread over four consecutive days. The time periods were chosen by the teachers themselves as times when group oral instruction was taking place. The children ranged in chronological ages from five to nine with a mean age of seven years, three months. Their mean IQ was 64. All correct responses for the group were recorded and the average number of correct responses per child per minute was determined. A correct response was defined as any correct response elicited by the child's

teacher, e.g., the teacher would ask a question and the child would respond. Only correct oral responses by the children were recorded. All children were screened for speech and hearing handicaps which could impact on their ability to respond orally.

Phase II

Randomly selected children (one from each of five classrooms) were put in a one-to-one learning situation and presented five shapes to name. When a child did not know the name of a shape, that shape was selected as the stimulus to be presented in a stimulus-response setting. The average IQ of the five children was 62 and the average chronological age was seven years and four months.

The elicitation of the correct response was done through the following dialogue:

Teacher: John, this is a triangle.

Teacher: What is this?

Student: Triangle

Teacher: What is this?

Student: Triangle

Teacher: Is this a triangle

Student: Yes

Teacher: Point to the triangle

Student: (points to triangle)

Then the process is repeated.

This language for teaching is a modification of the first-order statement advocated by Bereiter and Englemann (1966) as the approach for a beginning language program. A first-order statement represents the irreducible statement of a teaching language. These statements identify in a verbal way what a child recognizes in a point-and-word statement.

The number of correct responses for each student was recorded during one five minute session and the number of correct responses per child per minute was computed.

Phase III

Phase III was designed to test the hypothesis that increased elicitation of correct responses will increase learning efficiency. The five children used in Phase II were chosen as the subjects for this phase. These children were asked to read the Dolch Word List. The words that could not be read by each child were presented to the same child in two stages. The first stage involved a two week period. Each child was presented with 20 words on flashcards four times a day. These presentations were scheduled an hour apart. The child was told what the word was, then he/she was asked to repeat the word aloud while looking at the flashcard. At the end of two weeks, the words were presented in random order, and each child was asked to identify the word. The number of correct responses was recorded. The second stage of this phase increased the elicitation

of correct responses. Another 20 words were presented 10 times a day at 30 minute intervals for two weeks. The same procedure used in the first stage was used in the second stage. As in the first stage, each child was told the word on the flashcard, then asked to name the word on the flashcard. This procedure insured the correct response. At the end of two weeks each child was presented with the words one at a time in random order and asked to read the words aloud. The number of correct responses was recorded.

Results

The results of Phase I are presented in Table 1.

Insert Table 1 about here.

Table 1 reveals that retarded children in special classes are emitting less than one correct response per minute while in a group instructional setting. In these group settings, approximately six correct responses are being emitted by the group per minute. There are certain children who emit more correct responses than others, and certain instructional periods produce a higher frequency of correct responses, but the average number of correct responses emitted per minute per child in these group settings was less than one.

The results of Phase II are presented in Table 2.

Insert Table 2 about here.

Table 2 reveals that when EMR students are organized in one-to-one instructional settings, they are capable of emitting approximately 46 correct responses per minute. This number of correct responses appears to be due to the one-to-one instructional setting in addition to the use of first-order statements. These first-order statements present the correct response to the child before the correct response is elicited, thereby increasing the probability of a correct response on the part of the subject. The first-order statement and required responses are structured to insure one and only one interpretation of the elicitation of the desired response.

There was a significant difference between the number of correct oral responses per minute per child in group settings (.42) and individual instructional settings (46.08), $\underline{t}$ = 22.42, $\underline{p} <$ .0001. A measure of teacher efficiency was also determined as the mean number of correct responses per minute by teachers in groups (5.42) and individual settings (46.08). The difference was significant, t = - 17.88, $\underline{p} <$.0001.

The results of Phase III are presented in Tables 3 and 4. The results of the first stage are presented in Table 3. The table reveals

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Insert Table 3 about here.

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that the children averaged 4.0 correct responses as a group after the two week training session. Table 4 reveals that after the second stage, the children

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Insert Table 4 about here.

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increased the number of words that they could read. The group now averaged 7.4 words correctly identified with no cue. The increase from 4.0 to 7.4 correct responses was significant using a 1-tailed test in the expected direction, $t = 2.01$, $p < .10$. The learning efficiency of these retarded children was increased by eliciting more correct responses in a learning situation.

Discussion

The data indicate that there is a significant difference between how many correct responses EMR children are capable of emitting in one-to-one learning environments and how many they are presently emitting in their special education classes during group instruction. A primary EMR child appears capable of emitting approximately 46 correct responses per minute when a structured first-order statement is used to elicit the correct response, yet

when these same children are put into group settings, i.e., special education classes, the number of correct responses emitted per minute drops to less than one.

The learning efficiency of the retarded children was increased through increased elicitation of correct responses. The frequency of the correct responses given in an instructional setting is important to learning through its impact on the consistency of the elicitation. The results tend to confirm the theory of Denny and Adelman (1955). These results indicate a need for increased elicitation of correct responses in classroom activities. Through structured types of activities like the first-order statement, children can be introduced to material to be learned and become active in the learning process. The children can answer questions or respond to stimuli, and they can do it correctly. Educators must examine learning environments as they relate to the variables of correct response elicitation and the frequency of those elicitations. Based on the results of this study, teachers who structure the learning environment to insure frequent correct responses will increase the learning efficiency of retarded children. With this increased efficiency, the discrepancy between the number of correct responses elicited in a special education class and the number a retarded child is capable of emitting raises serious instructional questions.

Several explanations of these findings appear evident. There is more control of attention in a one-to-one instructional setting, group settings are inherently affected by individual distractors such as oral questions or acting out behavior, and in group settings there appears to be more of an emphasis on individual responses as opposed to group responses, e.g , unison group responses, counting out loud together, reading words together. This indicates that the teachers seemed to be reluctant to engage children in group instruction with responses given in unison. Children were isolated and taught individually while in a group setting, which obviously reduced the number of correct responses for the group because only one child was taught at a time. The teachers appeared to be more comfortable teaching individuals within the group--not the group itself. The teachers justified this approach by pointing out the need for individualized attention and instruction within the group setting. When interviewed, the teachers remarked that their teacher education training programs did not prepare them to teach groups but individual children within these groups.

However, to maximize the number of correct responses emitted by EMP children, or to elicit a number of responses closer to what they are capable of emitting, there appears to be a need for more group work with all children responding in unison to the instructions of the teacher. The key to the large difference in what EMP children are capable of doing in one-to-one situations and what they are

doing in special education classes or group settings appears to center around the individualized instruction that takes place within and during group instruction that allows only one child to be involved in the emission of a correct response. While the teacher works one-to-one with one child, the other children seem to be emitting no correct oral responses. This is obviously not a simple problem with simple solutions, but EMR children can do more than what they are being required to do in group instructional settings. If the group setting inherently limits the number of correct responses that can be elicited, then smaller groups or more one-to-one instruction seems called for and is emphasized as the correct instructional strategy in most teacher education programs. It appears that teachers are not trained in group teaching and group management to the point that they can maximize the students' emissions of correct responses based on the retarded child's abilities to respond correctly.

Additional research is planned for different age groups and at different IQ levels to see exactly what other EMR children are capable of doing. Follow-up research will be conducted on training these teachers to elicit more correct oral responses during given time frames and parallel research to study the effect of this increase on student achievement. Experimental designs might be developed which explore learning efficiency in group settings with u

unison responses as compared to one-to-one instruction within the framework of a group setting. Hopefully, this type of research will lead to strategies which will maximize the learning environment of the retarded child.

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Table 1

Responses of Subjects in 5 Special Classes

Number of Subjects in Each Class	Total Number of Correct Responses Observed in 80 minutes	Correct Responses/Minute	Correct Responses/ Minute/Child
14	330	4.11	.295
12	412	5.15	.429
11	512	6.40	.486
14	428	5.35	.382
12	486	6.07	.506
Means			
12.6	433.6	5.42	.420

Table 2

Responses of 5 Subjects in Individual Instructional Settings

Subject ID	Total Number of Correct Responses Observed	Minutes Observed	Correct Responses/ Minute
1	225	5	45.0
2	240	5	48.0
3	210	5	42.0
4	265	5	53.0
5	212	5	42.4
Means	230.4	5	46.08

Table 3

Responses of 5 Subjects After Four Correct Responses Per Day

Subjects ID	Number of Correct Responses Per Word Elicited With Cue	Number of Words Presented	Number of Correct Responses After 10 Days
1	40	20	3
2	40	20	5
3	40	20	4
4	40	20	5
5	40	20	3
Means	40	20	4.0

Table 4

Responses of 5 Subjects After Ten Correct Responses Per Day

Subjects ID	Number of Correct Responses Per Word Elicited With Cue	Number of Words Presented	Number of Correct Responses After 10 Days
1	100	20	7
2	100	20	8
3	100	20	6
4	100	20	7
5	100	20	9
Means	100	20	7.4