

## Effects of Formal "Grammar" and "Direct Method" Training on the Number of Errors in Compositions Written by Sixth-Graders<sup>1</sup>

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### ABSTRACT

This study evaluated the effectiveness of "formal grammar" and "direct method" training designed to reduce the number of errors in capitalization, conjunctions, subject-verb agreement, incomplete sentences and incorrectly joining independent clauses, that nine sixth-graders accumulated in their composition.

The children were exposed to a sequence of (a) "formal grammar" training which consisted of a logically organized program of traditional grammar instructions through the parts of speech, with stress on the function of the words, using a grammar textbook; (b) generalization writing sessions, and (c) writing sessions under "direct method" training in which no textbook or grammatical terminology was used; however, the elements of sentence building and structure were treated as the teacher confronted them while the children were writing.

The sequence, "formal grammar-direct method" training and "direct method" training, were effective procedures in reducing the children's rate of errors compared to their baseline rates. These results suggest that "formal grammar" alone was not effective enough to reduce the children's rate of errors. However, the sequence, "formal grammar-direct method" training, proved to be a practical and efficient procedure to improve children's writing.

<sup>1</sup> This study is based upon a thesis submitted by the senior author to the Department of Human Development, University of Kansas in partial fulfillment of the M.A. degree. An early version of the paper was presented at American Psychological Association Convention held in Chicago, Illinois, September 1975.

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## RESUMEN

*Este estudio evaluó la efectividad del entrenamiento de "gramática formal" y "método directo", diseñados para reducir el número de errores en la escritura de mayúsculas, conjunciones, acuerdo sujeto-verbo, oraciones incompletas y unión incorrecta de cláusulas independientes, acumuladas por nueve niños de sexto año de primaria al efectuar composición.*

*Los niños se sometieron a una secuencia de:*

*a) Entrenamiento de "gramática formal", que consistió en un programa lógicamente organizado de instrucciones gramaticales tradicionales en las distintas partes del lenguaje, con hincapié en la función de las palabras, empleando un texto de gramática;*

*b) Sesiones de generalización de la escritura, y*

*c) Sesiones de escritura bajo el "método directo" de adiestramiento en que no se utilizó ningún texto o terminología gramatical; sin embargo, los elementos de la construcción y estructura de la oración se trataron a medida que la maestra los confrontaba mientras los niños escribían.*

*La secuencia, "gramática formal-método directo" y el "método directo" de entrenamiento, fueron procedimientos efectivos para reducir la tasa de errores de los niños en comparación con sus tasas de la línea base. Estos resultados sugieren que la "gramática formal" sola no fue lo suficientemente efectiva para reducir la tasa de errores de los niños. Sin embargo, la secuencia de entrenamiento "gramática formal-método directo", probó ser un procedimiento práctico y efectivo para mejorar la escritura de los niños.*

## Introduction

In 1961 the Executive Committee of the National Council of Teachers of English appointed an *ad hoc* Committee on the State of Knowledge about Composition. As a result of this, *Research in Written Composition* (Brad-dock, Lloyd-Jones and Shoer, 1963) was published. This report is an excellent source of information on research in written composition, which includes most of the relevant research done in this area up to the early sixties. Other papers have been published in this area, e.g., Schroeder (1973) analyzed the effects of two types of written teacher comments on the performance of fourth-grade children with respect to four specific writing behaviors. Taylor and Hoedt (1966) investigated the effect of praise in written remarks in relation to creative writing in fourth-grade children. Sullivan, Okada and Needermeier (1974) developed a sequenced composition program for first-grade children. The authors compared this program with normal composition instruction along eight variables. Favorable results were obtained in six of the eight variables.

Other authors have been more interested in developing procedures to evaluate children's writing ability, e.g., Veal, Bresbrock, and Bush (1967) and Wyatt-Sundbye (1970).

Behavior analysts have done some research in different aspects of composition. Brigham, Graubard and Stans (1972) used a multiple baseline design in increasing total number of words, number of different words and

number of new words in the compositions of 13 students in a fifth-grade remedial classroom. In this study, subjective judgements on creativity on the children's compositions were correlated with the "number of words" and "new words" conditions. Blase and Hopkins (1973) manipulated some compositional variables written by fourth, fifth, and sixth-grade students. They increased the number of different adjectives, action verbs and sentence beginnings in the children's compositions. Two independent raters evaluated the compositions from the experimental conditions as more creative than the compositions from the baseline. Blase-Maloney, Jacobson and Hopkins (1975) carried out successfully a systematic replication of the study mentioned with third-grade students. Van Houten, Morrison, Jarvis and McDonald (1974) increased the number of words per minute written by a group of second-graders and two fifth-grade classes. Explicit timing and public feedback were used as intervention procedure.

Harris (1962) attempted to evaluate the functionality of teaching "formal grammar" and its effects on children's writing ability. The author compared a "formal grammar" against a "direct method" procedure. The "formal grammar" procedure followed a logically organized program of traditional grammar instructions, through the parts of speech, with stress on the function of words, using a grammar textbook. In the "direct method" no textbook or grammatical terminology was used; however, the elements of sentence building and structure were treated as the teacher confronted them while the children were writing. The author reports in general, more improvement in the children's compositions that were trained with the "direct method".

The present experiment was carried out with the purpose of teaching sixth-graders to use certain grammar and style rules in their writing. One of the procedures used in the experiment might be classified as "formal grammar" training. Basically, it consisted of a series of proofreading exercises which were very similar to the exercises contained in the regular grammar textbooks. However, the other procedure used during the experiment might be considered as a "direct method". This latter approach relies on the fact that the teacher has to deal with the elements of sentence building and structure as she confronts them in the children's actual writing.

## **Method**

### *Subjects and Setting*

Nine of twenty seven sixth-grade children attending a public school located in the Midwest, participated in the study. These children were selected because of their deficient writing skill. However, all twenty seven children were exposed to the procedures. The area of the classroom was equal to the size of two regular classrooms. Different academic activities were conducted in both sections of the classroom, depending on the type of activity and the location of the equipment.

### *Materials*

During the experiment different sets of materials were developed for pretests, training and post-tests for three different grammar skills.

*Capitalization.* The pre- and post-tests on capitalization were constructed using forty sentences with miscapitalized words. The sentences were written covering ten rules of capitalization and assigned randomly to one pre- and one post-test. The same number were assigned to each test. For example, one of the rules was that the names of streets should be capitalized. For this rule, four sentences with miscapitalized names of streets were written. Two of the sentences were randomly assigned to the pre-test and two to the post-test. The same procedure was followed with all ten rules, with the exception of one rule in which only one sentence was assigned to the pre-test and one to the post-test. The following rules were included:

#### *Rules of Capitalization*

1. Capitalize the first word of a sentence. For example: The boy was running. There was silence in the room.
2. Capitalize in a direct quotation. Ex: "Are you coming?" he asked. She shook her head and answered, "No, it is too late."
3. Capitalize personal names. Ex: John Miller, Susan Rogers, James White.
4. Capitalize titles preceding personal names. Ex: Admiral John Smith, Governor Robert Jones.
5. Capitalize always Mr., Mrs., Prof., Dr., Miss or Ms.
6. Capitalize geographic names. Ex: Asia, Italy, the United States, New Jersey, San Francisco.
7. Capitalize the names of oceans, seas, lakes, and rivers, mountains, peninsulas, islands, deserts, and valleys. Ex: the Great Lakes, the Mississippi River, the Pacific Ocean, the Rocky Mountains.
8. Capitalize the names of streets, roads, squares, parks, zoos, bridges, and tunnels. Ex: Columbus Avenue, Forty-Second Street.
9. Capitalize the pronoun I always.
10. Capitalize dates: a) months Ex: January, February, etc. b) days of the week Ex: Monday, Tuesday, etc.) c) holidays and holy days, such as the following: Bastille Day, Christmas, the Fourth of July, Holy Week, New Year's.

A training exercise in capitalization was constructed by randomly selecting one page from the book *The New Days and Deeds* (Gray, Monroe, Sterl and Hill, 1962). Only the first nine lines from the page were used to construct the training exercise. In those lines, all the capitalized words intentionally were not capitalized. The children received the following instructions:

“You are going to read some sentences with mistakes in capitalization. You should correct all the mistakes, following these rules: a) Underline the word in which you find a mistake. b) Write the capital letter above the letter that is not capitalized.”

*Conjunctions.* The pre- and post-tests were constructed using two pages randomly selected from the book *The Story of Thomas Alva Edison, Inventor* (Compere, 1964). The first twelve sentences of each page were grouped into three paragraphs making only four long sentences, using “and”, “so”, and “then” as connectors. The children received the following written instructions:

“Make three sentences out of each of the following paragraphs by crossing out some words and putting in the correct punctuation.”

A training exercise was developed in the same way as the pre- and post-tests.

*Subject-Verb Agreement.* The pre- and post-tests were constructed by writing fifty eight sentences in which the verb was left out. In each case, the verb was given in its infinitive form at the right hand side of the page. For example:

“They \_\_\_\_\_ talking about that when she came into the room.” (to be)  
 “Did you \_\_\_\_\_ your car for five hundred dollars? ” (to sell)

The sentences covered the following tenses: simple present, continuous present, simple past, continuous past, simple future and continuous future. The verb “to have” was omitted from testing and training. Each pre- and post-test was twenty nine sentences long. The sentences were randomly assigned to the pre- and post-tests.

A training exercise was developed by selecting one page at random from the same book used for capitalization. The first twelve lines from each page, which usually contained six to eight sentences, were selected and all the verb tenses were changed. The training exercises were preceded by these instructions:

“In the following paragraphs you will find that some of the verbs have been changed. These changes are not correct and you will have to write the verb in its correct tense or person. For example:

I *plays* football with Henry.  
 Mary *drink* coffee all day long.”

### *General Procedures*

The research procedures were implemented by the classroom teacher who received verbal instructions from the experimenter.

*Testing.* During the experiment, six sessions of testing were conducted at different points on time during the experiment, in which three different grammar skills were evaluated. A sequence of pre-test, training and post-test

was used for each grammar skill. In the testing sessions the teacher explained to the children that they were going to be evaluated in a particular grammar skill. The teacher asked the children to move their desks away from each other to prevent copying. They were also informed that any communication among them was not permitted. During these sessions the teacher did not interact with the children except for any clarification of the instructions.

*Training.* Five training sessions were conducted for each grammar skill trained during the experiment. A total of three grammar skills were trained using the materials previously described. During each of these sessions, the teacher instructed and praised the children for appropriate work and correct responses. In each training exercise, the children had to achieve ninety percent accuracy. If they did not reach that level, they were asked to work harder until they had reached criteria. The teacher used a plastic sheet with the correct answers, that allowed her to grade and give immediate feedback to the children. As it was mentioned above, pre-tests always preceded the training sessions which were followed by the post-tests. This was done in order to evaluate the training effects.

*Writing.* Writing sessions were carried out approximately twice a week. At the beginning of each session, the teacher asked the children to move to the back of the room with a sheet of paper and a pencil. The children received the following instructions:

“You are going to see a picture on the screen. I would like each of you to write a ten-sentence story using the picture as a theme for your story. However, you can write about anything that you want.”

Some of the classroom lights were then switched off and the class viewed a color slide projected on a screen. A different slide was shown each day. Slides were presented in random order from a series of photographs of colored pictures taken from the Follet Educational Corporation's *The World of Language*, Books 2, 3 and 4. The slides contained mainly human characters in “unusual” situations (e.g., a child trying to escape from a big glass). The projector was left on for the entirety of each session. The teacher instructed the children to leave a line between each sentence on their compositions. When each child had completed his ten-sentence story, he had to continue with his other assignments for the day, since the class was managed mainly on an individualized basis. In these sessions the teacher was asked to praise and instruct only general work behavior, and neither praise nor instruct any particular grammar skill. For example, “Nice beginning” “John, thanks for starting right away.” These sessions were carried out in order to observe any effect of the training sessions.

*Writing under direct instructions.* In these writing sessions, the same procedures were followed as in *Writing*. However, in these sessions the teacher praised and/or instructed the children in a given grammar skill while they were writing their compositions. For example, “That is right; you capitalized the first word of each new sentence, but you have missed some of those. Why don't you check it again?” “Nice work Susy. You don't have

any errors in capitalization.” “George, check your sentences; you have some ‘garbage’ words at the beginning. This was the only exception to the procedures in the previous section.

### *Experimental Conditions and Design*

A combination of a multiple baseline across behaviors and a reversal design with intra- and inter-subject replication was used in this experiment.

*Writing 1.* During the first three days of the experiment, the procedures for writing sessions were in effect. On each of these days, the children had to write one composition.

*Pre-Test Capitalization.* On the fourth day, the teacher administered the pre-test on capitalization following the procedures described before on testing.

*Training in Capitalization.* The children received five training exercises in capitalization using the materials previously described, and following the procedures mentioned previously.

*Post-Test Capitalization.* The post-test on capitalization was administered on day five following the same procedures as in the pre-test.

*Writing 2.* Three more writing sessions, days 6-8 were carried out after the post-test. The same conditions as in *Writing 1* were maintained in order to observe any possible generalization effect from the training sessions to the writing sessions.

*Writing under direct instructions. Capitalization.* In these writing sessions, days 9-11, the teacher began instructing and/or praising the children who were correctly applying the capitalization rules in their compositions.

*Pre-Test Conjunctions.* On day 12 the teacher administered the pre-test on conjunctions following the general procedures of testing.

*Training on Conjunctions.* Five training sessions on conjunctions were given to the children following the procedures established for training.

*Post-Test Conjunctions.* The teacher applied the post-test on conjunctions following the general procedures of testing on day 13.

*Writing 3.* After the post-test, one writing session was carried out on day 14. The same conditions as in *Writing 1 and 2* were maintained in order to observe any possible generalization effect from the training sessions to the writing sessions.

*Writing under direct instructions. Conjunctions.* During days 15-17, the teacher was told to instruct and praise the children while writing for the non-use of conjunctions at the beginning of the sentences. During these writing sessions, no instruction or praise was given in relation to rules of capitalization.

*Pre-Test Subject-Verb Agreement.* On day 18, the teacher followed the same procedures as in the pre-tests on capitalization and conjunctions.

*Training on Subject-Verb Agreement.* Five training exercises were given

to the children following the same procedures as in the two previous conditions.

*Post-Test Subject-Verb Agreement.* The same procedures as in the post-tests on capitalization and conjunctions was followed on day 19.

*Writing 4.* During two writing sessions the teacher did not make any comment in relation to any compositional variable to observe any generalization effect from the training on subject-verb agreement given previously. This was done on days 20 and 21.

*Writing under direct instructions. Subject-Verb Agreement.* During four writing sessions, days 22-25, the children were praised and/or instructed for using the rules of subject-verb agreement in their compositions. During these days, the teacher did not mention any other grammar rule except those in relation with subject-verb agreement.

*Writing under direct instructions. Incomplete sentences and incorrectly joining two independent clauses.* During four writing sessions, days 26-29, the teacher praised and instructed the children in these two skills.

Training was not provided for these skills in order to evaluate if the teacher's instructions were powerful enough to change children's writing behavior in these skills. During this conditions, no instructions or praise was given on the previously trained grammar skills.

*Writing under general direct instructions.* During days 30-32, the teacher instructed and praised the children for correctly using all of the grammar skills previously trained in their compositions.

The sequence of introduction of each experimental condition is summarized in Table 1.

### *Response Measures*

Each composition written during the experiment was scored for a number of compositional variables by a scorer who was not informed of the purposes or procedures of the experiment. The response definitions employed for each of the compositional variables were the number of errors in the following grammatical categories.

*Capitalization.* Any word that should have been capitalized and was not.

*Conjunctions.* Any conjunction (so, then, and) used at the beginning of a sentence.

*Subject-Verb Agreement.* Any error in any sentence in which the verb did not agree in number, tense or person with its subject. For example, "He get his car." "They was coming with me." This category did not include errors with the verb "to have".

*Incomplete Sentences and Incorrectly Joining Independent Clauses.* Incomplete sentences were those in which the subject or the verb was absent. Dependent clauses were also considered part of this category. Errors in independent clauses were defined as when two independent clauses were joined without proper punctuation and/or conjunctions. When more than three inde-



TABLE 1. The mean percent errors, averaged over sessions, of individual students on the indicated grammatical categories during each experimental condition.

Stu- dent	CAPITALIZATION										Pre Post Tests
	Writ. 1	Writ. 2	Writ. Direc. Instr. Cap.	Writ. 3	Writ. Direc. Instr. Con.	Writ. 4	Writ. Direc. Instr. Sub-Verb A.	Writ. Direc. Instr. Incom-Sen Ind. Claus	Writ. Direc. Instr. & All Beh.		
1	2	21	0	8	8	10	12	27	0	24	15
2	26	5	1	1	1	6	18	20	0	24	9
3	14	9	2	0	2	7	33	29	5	37	9
4	63	22	11	0	14	20	9	38	3	34	6
5	8	28	0	18	2	0	4	3	0	17	12
6	40	46	1	23	22	3	12	4	4	13	0
7	26	28	1	0	2	10	18	6	2	24	0
8	33	25	0	0	0	14	4	12	0	10	6
9	0	2	1	0	3	0	1	3	0	31	0
	CONJUNCTIONS										
1	33	36	35	40	3	0	2	0	0	100	0
2	33	48	41	33	3	0	14	20	0	100	8
3	54	45	17	33	0	4	25	2	0	100	0
4	0	7	15	0	0	18	11	6	0	58	0
5	32	33	42	9	3	18	32	20	0	83	0
6	48	33	41	0	0	0	5	7	4	50	0
7	27	31	19	10	3	13	2	0	0	100	0
8	80	72	44	33	0	3	0	14	0	100	8
9	16	41	17	20	0	9	10	22	0	66	0

TABLE 1. Cont

SUBJECT-VERB AGREEMENT										
Stu- dent	Writ. 1	Writ. 2	Writ. Direc. Instr. Cap.	Writ. 3	Writ. Direc. Instr. Con.	Writ. 4	Writ. Direc. Instr. Sub-Verb A.	Writ. Direc. Instr. Incom- Sen Ind. Claus	Writ. Direc. Instr. & All Beh.	Pre Post. Tests.
1	18	36	2	10	9	4	0	2	0	20
2	3	0	9	-	0	17	0	0	0	24
3	8	8	5	25	33	52	5	14	8	6
4	3	0	0	0	0	4	1	2	0	24
5	8	3	3	0	3	0	0	14	0	27
6	2	12	0	20	3	0	0	2	0	31
7	0	25	0	0	3	4	2	0	0	13
8	14	18	19	41	9	14	0	4	2	20
9	26	9	2	0	0	9	0	2	0	34

INCOMPLETE SENTENCES & INDEPENDENT CLAUSES

Stu- dent	Writ. 1	Writ. 2	Writ. Direc. Instr. Cap.	Writ. 3	Writ. Direc. Instr. Con.	Writ. 4	Writ. Direc. Instr. Sub-Verb A.	Writ. Direc. Instr. Incom- Sen Ind. Claus	Writ. Direc. Instr. & All Beh.	Pre Post. Tests.
1	28	63	44	10	21	57	21	16	0	0
2	6	9	16	-	20	21	7	0	0	0
3	2	8	27	16	5	21	27	10	10	0
4	6	2	28	0	16	27	19	2	2	0
5	20	53	32	45	10	63	6	8	0	0
6	67	42	26	40	16	10	12	0	0	0
7	9	50	11	30	12	4	0	6	3	0
8	11	4	16	16	9	14	9	0	5	0
9	20	29	10	10	3	4	4	0	0	0

pendent clauses were joined with conjunctions, the fourth, fifth and so on were counted as errors.

Besides these compositional variables, the teacher's behaviors were recorded during the writing sessions in two main categories.

*General Teacher Interaction* was recorded as any interactions in which the teacher praised and/or instructed children's general work behavior.

*Specific Teacher Praise or Interaction* was recorded as any verbal comment in which a component of a specific grammar skill, such as capitalization, subject-verb agreement, etc., was mentioned. For example: "Kansas' should be capitalized." "You do not need 'so' at the beginning of the sentence." "Good work, you don't have any errors with your verbs."

All of these teacher interactions were recorded using a list with all the names of the children. In this list in front of each child's name, there were ten spaces to write the time of each teacher/child interaction.

The time was recorded in minutes and seconds. This was obtained by reading a digital clock, and another clock with a second hand. These clocks were hung on a wall in the classroom. A code was developed with four categories to identify each kind of teacher/child interaction. Each category corresponded to one of the four skills trained. For example, the data sheet had annotations like these:

J. Smith	34' 45''	39' 50'' <sup>B</sup>
M. Campbell	44' 50''	50' 55'' <sup>B</sup>

In this case, the general interactions were identified only with the minutes and seconds. The numbers with the letter "B" referred to instructions and/or praise for the correct use of conjunctions.

### *Reliability*

Reliability measures were taken by an independent observer for each of the dependent variables of writing by scoring xeroxed copies of the stories. Checks were taken at least one time per condition, per variable for a total of nine reliability checks for each compositional variable.

Overall reliability ranged from 100 to 50 percent with an overall mean reliability of 92 percent. Reliability was computed by multiplying the number of agreements by 100, then dividing this product over the number of agreements plus disagreements. The mean reliability score was 92 percent for capitalization with a range of 97 to 88 percent. For conjunctions, reliability was 100 percent. Interscorer reliability was 78 percent for subject-verb agreement, ranging from 50 to 100 percent. For incomplete sentences and correctly joining independent clauses, it was 84 percent, ranging from 66 to 95 percent.

An independent observer also took reliability measures on the recording of the independent variables of types of teacher praise and/or instructions.

The reliability was computed as 100 times the number of agreements, divided by the number of agreements plus disagreements. A total of seven reliability checks were made on each variable, with at least one check per condition. The only exception was in capitalization and conjunctions in which no reliability checks were taken in one condition in each variable. Agreement was defined as when the observers had recorded a particular interaction with the same number of minutes and the number of seconds varied by fifteen or less, and both observers had written the same code. Mean reliability was 95 percent agreement, with a range of 91 to 100 percent.

In addition, reliability measures were taken in the scoring of the pre- and post-tests administered to the children. This was done by asking an independent rater to score the tests with the appropriate code for each one. Mean agreement was 98 percent, with a range of 97 to 99 percent.

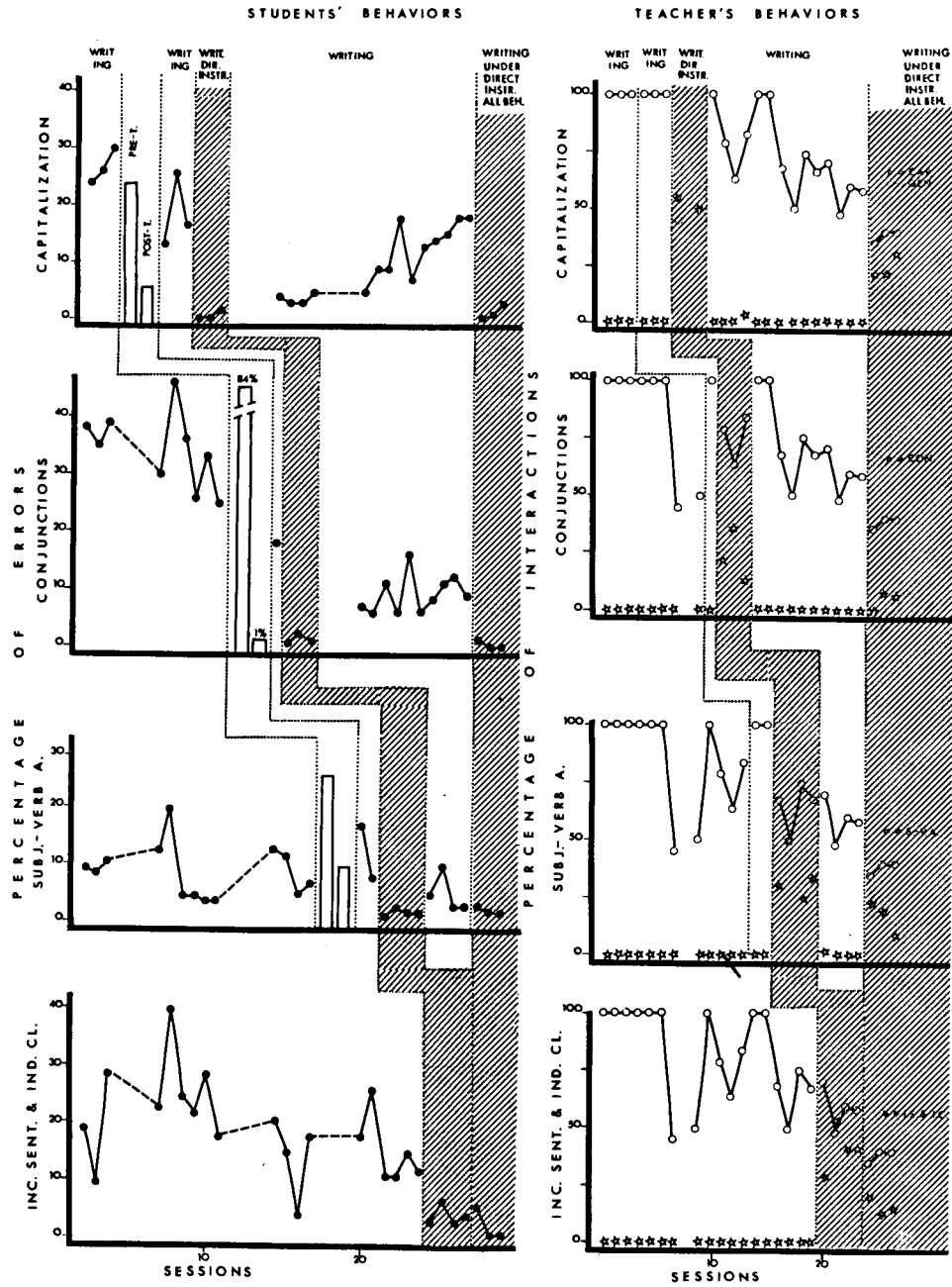
## Results

Figure 1 shows in the left side the percent of errors on capitalization, conjunctions, subject-verb agreement, incomplete sentences and incorrectly joining two independent clauses that the children accumulated throughout the experiment. It also presents the percent of errors that the children scored on the pre- and post-tests on the three grammar skills that were tested. The percent of errors on capitalization was obtained by dividing the number of words that were not capitalized into the number of words that should have been capitalized. On the other grammar skills, the following formula was used:

$$\frac{\text{Number of errors in the grammar skill}}{\text{Total number of sentences}} \times 100$$

During the first three writing sessions, 1-3, the teacher praised and/or instructed the children only for general work behaviors, and the mean percent of errors in capitalization was 25. After five training sessions, there was a reduction from 26 percent errors in the capitalization pre-test to 6 percent in the post-test. In the next three writing sessions, 6-8, the same conditions as in the first three sessions were maintained and the mean rate of errors was 20 percent. For the next three writing sessions, 9-11, then mean percent of errors in capitalization was reduced to an average of .7, while the teacher's rate of instructions and praises for the proper use of capitalization rules increased. During fourteen writing sessions, 12-29, the children did not receive any comments about the correct use of capitalization rules while they were writing. There was a 10 percent average of errors during this period.

The mean percent of sentences with errors on conjunctions was 34 percent, during the first nine writing sessions, 1-11. In these sessions, the teacher-children interactions were limited to general work behaviors. In the pre-test the percent of errors was 84. After five training sessions, the rate



**Figure 1.** Shows on the left side the children's (N = 9) rates of errors on capitalization, conjunctions, subject-verb agreement, incomplete sentences and incorrectly joining two independent clauses. It also presents on the right side the data on the teacher interactions with children. In each case the teacher-children interactions are plotted in general and specific grammar interactions. In writing session 8 the observer was absent. Therefore no data were taken in that session.

was one percent in the post-tests. Session 14 was under the same conditions as the first nine. The children's percent of sentences which included errors with conjunctions was 18. In the following three sessions, 15-17, the teacher praised and/or instructed the children for not using conjunctions as sentence beginnings, and the mean rate of errors decreased to 1.3 percent. During the next ten sessions, 18-29, the children did not receive any instructions and/or praises from the teacher. Their mean rate of errors was 9.2 percent for this period.

The mean rate of errors in subject-verb agreement was 8.3 percent during the first sessions of the experiment. During these, no comments were made to the children for the use of rules on subject-verb agreement. In the pre-test the error rate was 26 percent. After five training days, the rate was reduced to 11 percent in the post-test. For the next two writing sessions, 20-21, the mean rate of errors was very similar to the previous sessions. In the next four sessions, 22-25, the teacher praised and/or instructed the children in the appropriate use of subject-verb agreement rules, and their mean rate of errors was reduced to 1 percent. During the next four sessions, 26-29, in which the teacher withheld any comment in relation to this grammar skill, the mean rate was 4.2 percent.

For nineteen sessions, the teacher did not praise and/or instruct the children in reference to incomplete sentences and/or the appropriate way to join independent clauses. The mean rate of errors was 19.2 percent. The children did not receive training in these two grammar skills. During the next four writing sessions, 26-29, the teacher instructed and/or praised the children for writing complete sentences, and correctly joining independent clauses. The mean rate of errors was reduced to 4.2 percent.

For the last three writing sessions, 30-32, the teacher praised and/or instructed the children in all the grammar skills that had been previously trained. The mean rate in capitalization was 1.5 percent for this period; .3 percent for conjunctions; 1.3 percent for subject verb agreement; 2.6 percent for incomplete sentences and independent clauses.

The right side of Figure 1 also presents the data on the teacher interactions with children with respect to their use of each of the grammar skills trained. In each case the teacher-children interactions are plotted in two categories. These are general and specific grammar interactions. It should be noted that the teacher-children interactions with respect to any specific grammar skill never exceeded more than 60 percent of the total number of interactions. The teacher's data show that in fact the experimenter's instructions were followed by her as it was described in the method section.

Table 1 presents the mean number of errors made by each child in each of the experimental conditions on all grammar skills throughout the experiment.

The data in capitalization in writing 2 for students and 4 suggest a possible generalization effect from the training exercises to their writing behavior. However, this effect was not found in the rest of the students.

On the other hand, in the experimental condition "writing under direct instructions for capitalization" the mean rate percent of errors was lower than the rate from the previous condition.

The data on conjunctions also include a possible generalization effect from the training sessions to writing for students 5, 6, and 7 in the experimental condition "writing 3". When the teacher praised and/or instructed children in this skill the mean rate of errors decreased in all students to a lower rate from the previous condition.

No generalization effect occurred in subject-verb agreement from the training sessions to the writing sessions. However, when the teacher praised and/or instructed the mean rate of errors was lower than in the previous condition for all students with the exception of students 4 and 7. The variability on their data did not allow clear observation of the effects of the independent variables.

The data on incomplete sentences and incorrectly joining independent clauses show a reduction in the rate of errors for almost all students, when the teacher praised and/or instructed them in these skills. However, the variability of the data of students 1, 3, 4, 5 and 7 did not permit clear evaluation of the effects of the procedures. In the results of the pre- and post-tests there was a decrease in the percent of errors of all subjects across all behaviors, with the exception of 2 students, on subject-verb agreement.

## Discussion

The results of this study suggest that "formal grammar" training was not a powerful procedure to reduce children's rate of errors on capitalization, conjunctions and subject-verb agreement. On the other hand, the sequence "formal grammar-direct method" training resulted in a strong procedure to reduce children's rate of errors on the grammar skills above mentioned. The children's rate of errors on incomplete sentences and incorrectly joining independent clauses was reduced only by "direct method" training. On the other hand, there were some students whose rate of errors on capitalization and conjunctions decreased after the "formal grammar" training, but the majority of the students required the "direct method" to reduce their number of errors in all grammar skills included in this experiment. However, due to the sequential order of the experimental conditions, it was not possible the evaluation of the individual effects of the "formal grammar" and "direct method" training on the children's writing. Unfortunately, the grammar skills that were not under "formal grammar" training and only under "direct method" training, were at the end of the multiple baseline. For these grammar skills, the children did not write again under the conditions in which the teacher was praising and/or instruction general work behavior. This would have given more information in this respect.

In this experiment, the "formal grammar" and "direct method"

training played an important role in reducing children's errors. It seems possible that teachers could establish more writing sessions and during those give the children feedback on the spot ("direct method" training). Anecdotally, the teacher who carried out the procedures of this research mentioned that it was easier to instruct the children during the writing sessions when they have been previously exposed to "formal grammar" training than when they had not received any previous training.

It should be noted that due to a deficiency in the observational code, it was not possible to differentiate direct teacher requests to correct errors, and suggestive prompts when the children were writing under the conditions of direct instructions. So in a given moment it could be argued that the effects obtained in these conditions were due to direct teacher requests to the children e.g., "In the first sentence you should capitalized John". The observer who collected the teacher's data anecdotally reported that this was not the case. However, this alternative explanation remains open.

The three grammar skills under the sequence, "formal grammar-direct method" training, were under conditions in which the teacher praised and/or instructed general work behavior for different lengths of time. In capitalization and conjunctions the rate of errors did not go up immediately during this period. In both cases, the rate never reached the previous baseline level. In the case of subject-verb agreement the variability of the data and the shortness of the period did not allow for a prolonged observation of the phenomenon. The information available suggests teachers can establish intermittent checking procedures on behaviors previously trained and be able to maintain the rate of errors at an acceptable level. The last experimental condition supports this idea to a certain extent, since the rate of errors in all behaviors was reduced to levels comparable to the previous treatment conditions.

Recently, educators have been concerned with a new trend in individualized instruction. The two main assumptions about this idea are: (a) Children should have the option of learning at their own pace. (b) Children do not always have the same knowledge about some topics. For example, in this experiment, student 9 should not have been exposed to the procedures in capitalization since at least in his compositions he did not have many errors in this respect. During this time, he might have been able to learn other skills. Another illustration in this experiment might be student 3 who did worse in the post-test of subject-verb agreement than in the pre-test. His rate of errors in the writing sessions were not convincingly reduced in the two experimental conditions. In this case, he should have been recycled through the same or other procedures until he mastered this skill. Even through the procedures used in this experiment were not implemented on an individualized basis, this might have been possible with only a few changes in the procedures.



## REFERENCES

- Blase, K. and Hopkins, B. L. The modification of sentence structure and its relationship to subjective judgments of creativity in writing. *Journal of Applied Behavior Analysis*, 1973, 6, 425-433.
- Blase-Maloney, K., Jacobson, D. R., Hopkins, B. L. An analysis of the effect of lectures, requests, teacher praise and free time on the creative writing behaviors of third grade children. In E.A. Ramp and G. Semb (Eds.), *Behavior Analysis areas of Research and Application*. Prentice-Hall, Inc. Englewood Cliffs, New Jersey, 1975, pp. 244-250.
- Braddock, R., Lloyd-Jones, R., and Schoer, L. *Research in Written Composition*. National Council of Teachers of English, Champaign, Ill., 1963.
- Brigham, T. A., Graubard, P. S. and Stans, A. Analysis of the effects of sequential reinforcement contingencies on aspects of composition. *Journal of Applied Behavior Analysis*, 1972, 5, 421-419.
- Compere, J. B. *The Wizard of Menlo Park: The Story of Thomas Alva Edison, Inventor*. Scholastic Magazine, Inc., 1964.
- Gray, W. S., Monroe, M., Sterl, A. A., Hill, M. A. *The New Days and Deeds*. Scott, Foresman and Company, 1962.
- Harris, R. J. An experimental inquiry into the functions and value of formal grammar in the teaching of English, with special reference to the teaching of correct written English to children aged twelve to fourteen. Unpublished Ph. D. dissertation. University of London, 1962, 291 p. Summarized in Braddock, R., Lloyd Jones, R., and Schoer L. *Research in Written Composition*, National Council of Teachers of English, Champaign, Ill. 1963.
- Schroeder, T.S. The effects of positive and corrective written teacher feedback on selected writing behaviors of fourth grade children. Unpublished Ph. D. dissertation, University of Kansas, 1973.
- Sullivan, H. J., Okada, M., Needermeier, F. C. Effects of systematic practice on the composition skills of first graders. *Elementary English*, 1974, May, 630-641.
- Van Houten, R., Morrison, E., Jarvis, R. and Mc. Donald, M. The effects of explicit timing and feedback on compositional response rate in elementary school children. *Journal of Applied Behavior Analysis*, 1974, 7, 547-555.
- Veal, R. L., Bresbrock, E. R., and Bush, M. Evaluation Criteria for Children's Composition: A Summary List and Bibliography. English Curriculum Study Center, University of Georgia, Athens, Mimeographed, 1967, 5 pp.
- Wyatt-Sundbye, N. W. Evaluation guide for children's compositions. Unpublished paper, University of Kansas, 1970.