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BRINGING ABOUT AND MAINTAINING
A MATURE SENTENCE STYLE
IN UNDERGRADUATE STUDENTS

by

Mary Beth Tillema

A Thesis
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Faculty of The Graduate College
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of the
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Mary Beth Tillema

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BRINGING ABOUT AND MAINTAINING
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A recent article in Newsweek (December 8, 1975) stated "If your children are attending college, the chances are that when they graduate they will be unable to write expository English with any real degree of structure and lucidity . . . According to the National Assessment of Educational Progress, the majority of Americans of all ages tend to use only the simplest sentence structure and the most elementary vocabulary when they write."

Clearly, there is a need to teach students to write better. But two problems have blocked the way in the past: defining what "better" writing is and then finding a way to teach it. Behaviorists have already begun to tackle both of these problems. With regard to finding effective teaching methods, Miller and Weaver (1976) used a concept programming textbook and a Personalized System of Instruction (Keller, 1968) course to bring the academic behaviors of undergraduate psychology students under conceptual control. McMichael and Corey (1969) demonstrated that undergraduates enrolled in a PSI psychology course did significantly better on a final exam than control students enrolled in a similar but traditionally structured course. More specific to the area of composition, Maloney and Hopkins (1973) modified the sentence structure of elementary school students using reinforcement procedures and employed independent raters to judge the "creativity" of the results. In general, these raters found students' compositions were more creative when they used action verbs in their sentences. Brigham,

Groubard, and Stans (1972) analyzed sequential reinforcement contingencies on aspects of composition, using male students in a fifth-grade adjustment classroom. They applied contingencies to the subjects' number of words used, number of new words used, and number of different words used. Performance changed most on the number of words used, with equivocal results for the number of new and different words subjects used. These experimenters also employed independent raters, who assessed the quality of student compositions. Generally, these raters found the quality higher when the subjects used more and new words in their compositions, though the relationship between these findings and the experimental procedures does not appear to be "a simple direct one."

As shown from these findings, basing courses and textbooks on behavior principles helps answer the question, "how to teach?", while bringing about quantifiable changes in writing and then having independent raters assess the quality of those products is one way to answer the question, "what to teach?". But there is another, perhaps more valid, way to decide what to teach--and that is by gathering normative data from the writing of persons many already consider to be good writers--from professional writers.

A respected grammarian and teacher, Francis Christensen examined the writing of non-professional, semi-professional, and professional writers (1968) and found two correlates of professional writing--free modifiers and cumulative sentences. Free modifiers, or nonrestrictive modifiers, are modifiers of constructions, not words, that are set apart from the sentence by junctures or punctuation. Cumulative sentences are those with particular positionings of free modifiers, those with

all or most of the free modifiers at the sentence's end.

Christensen found that professional writers used an average of almost a third of their total words in free modifiers, about 32%. Half of those free modifiers occurred at the end of their sentences, as opposed to standing before the subjects of the sentences or within the base clauses (subject-predicate-object/compliment). Furthermore, the non-professional and semi-professional writers Christensen studied used far fewer of their total words in free modifiers and used more free modifiers at the beginning of their sentences, standing before the sentence subjects instead of at the ends of their sentences. Christensen concluded that using many free modifiers and cumulative sentences are marks of a mature writing style, one that says much in few words but says it in a way that is easy to understand.

Like the aspects of composition Maloney and Hopkins (1973) and Brigham et al. (1972) studied, free modifiers and cumulative sentences are easily quantifiable, making them accessible for teachers to specify, observe, and apply behavioral contingencies to (Malott, 1972). Therefore they seem like they would be possible to teach, as well as being desirable to teach. But one more question, less obvious than the first two, now needs to be answered: will students continue to use free modifiers and cumulative sentences in the way professional writers do, assuming we can teach them how to use them in the first place?

Several studies in behavior analysis suggest that instructions and consequences together will control behavior better than instructions used alone (Allyon and Azrin, 1964; Madsen, Becker, and Thomas, 1968; O' Leary, Becker, Evans, And Saurdagas, 1969; Burgess,

Clark, and Hendee, 1971; Kohlenberg, Phillips, and Proctor, 1976).

This study is designed to investigate whether we can bring undergraduate college students to use free modifiers and cumulative sentences. It will also assess the maintenance of those behaviors, if they are brought about.

METHOD

Subjects and Setting

Twelve undergraduate college students served as subjects in this study. They were psychology majors and minors, ranging in class status from second-semester freshmen to second-semester juniors. All were enrolled in The Student Centered Education Project (SCEP), a program for psychology majors and minors at Western Michigan University (Malott, Hartlep, Keenan, and Michael, 1972).

SCEP was a student-run program, with a staff of student proctors and administrators, both undergraduates and graduates. A faculty member oversaw the project. SCEP had two, one-semester programs, the first (SCEP I) involved two of the introductory psychology courses required for a psychology major and minor. The second SCEP program (SCEP II) consisted of two, intermediate courses required for a psychology major or minor, Psychology 251--Behavior Modification I: Abnormal Behavior and Psychology 351--Applied Behavior Analysis, I. In addition SCEP II students took an English Course, Report Writing 542, offered by the Business Education Department. All subjects in the study were enrolled in SCEP II.

Of the approximately 60 students enrolled in SCEP II at the time of the study, the experimenter selected twelve subjects using two criteria: (1) the students expressed a desire to participate in the study after reading a description of it, and (2) they received a perfect score on a short placement test that all SCEP II students received. The placement

test consisted of 15 problems, five to show whether the student could correctly underline the subject of sample sentences, five to show whether the student could correctly underline the predicate of sample sentences, and five more to show whether the student could distinguish between complete and incomplete sentences. These three behaviors were to be prerequisite skills for an instructional manual that the students would use. The mean score on the placement test was 12.33. Only one student who received a perfect score chose not to participate in the study.

The SCEP staff ran all psychology courses using a modified self-paced system (Keller, 1968). To a large extent, students could progress at their own pace, taking unit quizzes that covered one or two chapters of assigned reading. The student could retake quizzes up to three times if they did not master the material at a criterion of 90% or above. However, students had to meet staff-determined deadline dates for taking certain numbers of quizzes, this being the "modified" or "instructor-paced" feature of the otherwise self-paced system. Students also had to work in an applied laboratory setting in conjunction with the Psychology 351 course, serving either as teaching apprentices in one of the Department's introductory psychology courses or as therapists at the Kalamazoo Program for the Severely Mentally Impaired. The English course was more traditionally structured and was geared toward helping students improve their technical writing skills, particularly with their lab reports, which were written using data gathered from their applied laboratory experiences.

The SCEP setting itself consisted of three classrooms and an office.

One classroom was the "quiz room," where proctors administered unit quizzes. The second classroom was the "quiet room," where students could study either alone in study carrels or in groups, with or without the assistance of proctors, who circulated through the room answering student questions. In the SCEP office, the staff graded most of the quizzes, filed student records and conducted their various program maintenance duties.

Instructional Materials

The students used a 96 page instructional manual designed to teach them to identify and use free modifiers (grammatical constructions often called nonrestrictive modifiers) and cumulative sentences (a particular style of patterning free modifiers in a sentence so that most of the free modifiers fall at the end of the sentence). (See Appendix A for some sample pages from the manual.) The manual consisted of several short sections, each containing one or more definitions, examples illustrating the definitions, self tests, and answer keys to the self tests. The self tests were geared toward assisting the students by giving them practice at identifying free modifiers and cumulative sentences, and the directions instructed the students to go back over the section definitions and examples if they did not get 90% of the self test problems correct, according to the answer key.

Each student had a copy of the instructional materials and studied one of the manual's three sections as a SCEP reading assignment each week for three consecutive weeks. Each week, on an assigned day, the students received a ten point quiz over the section of the manual they had most recently read. (The quizzes given in SCEP over the instructional

materials replaced three regular quizzes. The students decided which SCEP quizzes they would replace after receiving a list of options--options based on quizzes the student could miss without losing essential information.

With one exception, all students passed each manual quiz at the 80% criterion requested. One subject required two attempts to achieve mastery on the second quiz. (For a more in-depth discussion on the administration of the instructional materials, see Appendix B. See Appendix C for information regarding the field testing of the manual before the study.)

Dependent Variables

The SCEP II program ran approximately 15 weeks (one semester). For 11 out of those 15 weeks, SCEP II students wrote one homework assignment per week, as part of the requirement for their Psychology 251 grade. They wrote at least 250 words per homework assignment, following instructions given them in a homework manual. In their assignments, the students were generally asked to use a specified behavioral procedure, design, or method of recording to correct a hypothetical problem. For instance, they might be asked to use a reinforcement procedure to help a hypothetical student doing poorly in school. In addition to following the guidelines for the specified procedures, the students had to earn part of their homework assignment points by using correct grammar and typing.

Throughout the six weeks of the study, I recorded the percentage of free modifiers and cumulative sentences the subjects used on their homework assignments.

Free Modifiers

For the purposes of this study, a free modifier was any word or words that stood before the subject of the sentence. A free modifier was also any medial or final sentence word or words set off by commas, dashes, or parentheses, with the exceptions of coordinating conjunctions, like "and" and "but," and coordinate structures in the base clause, like compound subjects and predicates.

Cumulative sentences

For the purposes of this study, a cumulative sentence was one that did not contain any medial free modifiers and had all or most of the words in free modifiers at the end of the sentence, rather than before the subject.

Design

The twelve subjects were randomly assigned to two groups. (One subject's data were later dropped because of excessive absences.) All subjects were told that they would be expected to place 32% of their words in free modifiers and 50% of their sentences in cumulative form on some upcoming homework assignments. Then I used a modified multiple baseline design across the subjects in group one and group two, so that while one group was under baseline conditions, the other was under treatment conditions. Every two weeks, the conditions were altered. The study lasted six weeks; group one had baseline conditions twice (baseline-treatment-baseline), and group two had treatment conditions twice (treatment-baseline-treatment).

Baseline

During baseline, the subjects completed their homework assignments in accord with the specifications described in the SCEP II homework manual. They could earn up to 20 points for following all instructions in the homework manual (approximately 80 points were available each week). During this condition, the students were told they could not receive contingent points for meeting the 32% free modifier criterion and the 50% cumulative sentence criterion.

Treatment

During treatment, the subjects completed their homework assignments in accord with the specifications described in the SCEP II homework manual. However, the students could earn six of the 20 possible homework assignment points as follows: two points for putting 50% of their sentences in cumulative form and four points for putting at least 32% of their words in free modifiers.

Observational System and Reliability

I served as the primary observer for this study, collecting the following data on each homework assignment: the total number of words used on each paper, the total number of sentences, the total number of words in free modifiers, and the total number of cumulative sentences. Then I calculated the percentage of words in free modifiers and the percentage of cumulative sentences for each paper. Sentence fragments, constructions punctuated as sentences but not having a complete subject and predicate, did not count into the number of words or sentences, nor did mispunctuated sentences--those requiring a judgement about "what the

student meant to say."

A secondary observer learned to identify free modifiers and cumulative sentences by reading the same instructional materials the students read. Then, for two sessions, we met and independently assessed the percentage of free modifiers and cumulative sentences in ten student-written homework assignments, ranging from 250-900 words in length. This was accomplished by having a photocopy of each paper. After each session, we compared overall scoring and then went over each paper for a sentence-by-sentence analysis of free modifiers and cumulative sentences, and I gave feedback as needed.

The secondary observer took four reliability checks on each student's homework assignments, with the exception of two students, for whom the clean, photocopy of their homework assignments was lost (the data from these subjects were checked three times instead of four). The reliability observer calculated the percentage of words in free modifiers and cumulative sentences once for each student's paper during each two week condition, treatment and baseline, except for the two exceptions noted above. In addition, she calculated the reliability on one of the five homework papers each subject wrote prior to the beginning of the study. Again, incomplete sentences and mispunctuated sentences were omitted from the analyses.

The percentage of agreement on each paper was the larger score divided into the smaller score. Then for both free modifiers and cumulative sentences, the gross total reliability score was the sum of the agreement scores divided by the number of agreement scores. The gross total reliability score was 98.7% for cumulative sentences and 97.2%

for free modifiers

Because gross total scores may not reflect item by item agreement, I randomly selected five homework assignments, on which the secondary observer had done a reliability check, and made a point-to-point reliability check. That is, I compared my scoring with her scoring on a sentence-by-sentence basis. If both of us scored the sentence in the same way (i.e. the same words in free modifiers and the same mark of cumulative or noncumulative), I counted it as an agreement. Total agreement, calculated in the way just described, was 97.8%, suggesting the validity of the main gross total reliability procedure.

RESULTS

Figure 1 shows the percentage of words in free modifiers that the students used under baseline conditions (A), where they could not earn points for meeting the 32% free modifier criterion, and under treatment conditions (B), where they could earn points for meeting or exceeding the 32% free modifier criterion. Open circles indicate the score that the secondary observer calculated on a corresponding assignment.

The percentages of words generally increased when course points were available for meeting or exceeding the 32% free modifier criterion. Forty-eight of the 66 data points (73%) were consistent with the hypothesis that students would use greater percentages of free modifiers when they could earn points for doing so. The reader should note that these data points are not independent; still, their patterning indicates that the contingent points generally increased the percentage of free modifiers students used. This was especially true of students with low baselines, those who met or exceeded the free modifier criterion on less than half of their total baseline chances (Subjects Four, Five, Six, and Seven). However, the students with higher baselines, those who met the free modifier criterion on half or more of their total baseline opportunities, predicatably did not show this effect as clearly, generally having more overlapping data points between conditions (Subjects One, Two, Three, Eight, Nine, Ten, and Eleven). Subjects One, Three, Nine, and Ten did not use more words in free modifiers when they could earn points for doing so. It is not surprising that students with high baselines did not improve as much, since they were not differentially

reinforced for improving.

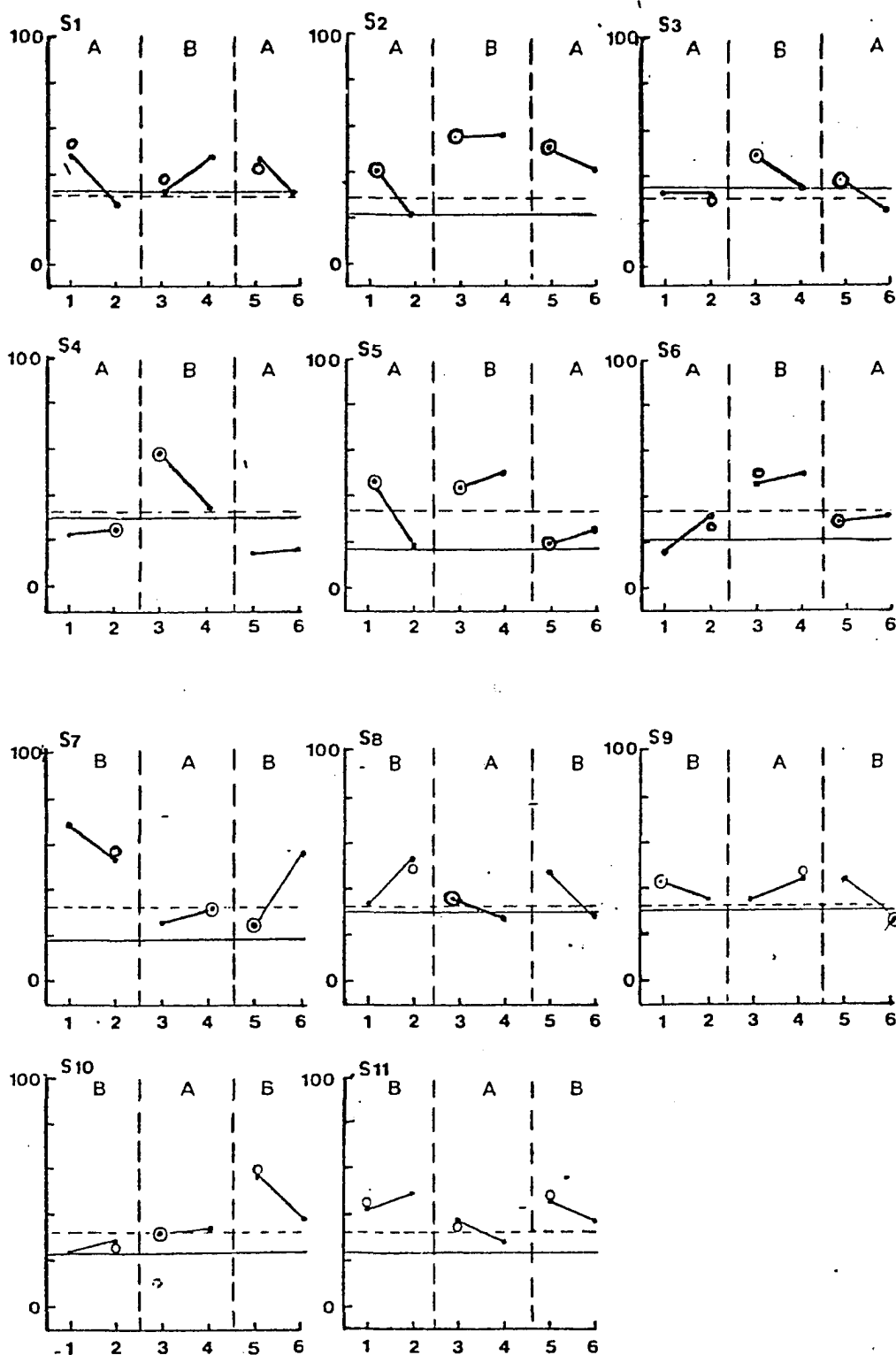
The solid horizontal lines in Figure 1 show the median percentage of free modifiers each student used on five homework assignments prior to the onset of this experiment. Six of the eleven students began to use greater percentages of free modifiers during baseline conditions than they had in the five pre-baseline homework assignments. This might suggest that the contingencies had some nonreversible effects for some subjects or perhaps that some confounding took place.

Figure 2 shows the percentage of cumulative sentences that the subjects used under baseline conditions (A), where they could not earn points for meeting the 50% cumulative sentence criterion, and under treatment conditions (B), where they could earn points for meeting the 50% cumulative sentence criterion.

As shown in Figure 2, the percentage of cumulative sentences increased in all but one case (Subject Nine) when the students could earn points for meeting the 50% cumulative sentence criterion, though there were two other instances of overlapping data points (Subjects Seven and Ten). Of the 66 data points plotted on the graph, 59 of them (89%) represent assignments on which students used greater percentages of cumulative sentences during treatment conditions relative to baseline conditions. Again, the patterning of these data points indicates a functional relation between contingent points and the students' use of cumulative sentences, though the data points are not independent and would be difficult to analyze statistically.

The solid horizontal lines in Figure 2 show the median percentages of cumulative sentences each student used on five homework assignments prior to the onset of the experiment. Four of the eleven students

PERCENTAGE OF WORDS IN FREE MODIFIERS



HOMework ASSIGNMENTS

Fig. 1 The percentage of free modifiers each subject used in the homework assignments during each condition. The criterion is shown by the broken horizontal lines. Open circles indicate reliability checks; vertical broken lines show condition changes. Horizontal solid lines show the median percent of words in free modifiers each subject used on five pre-experimental homework assignments.

students began to use greater percentages of cumulative sentences during baseline conditions than they had in five pre-baseline homework assignments. Again, this may suggest a nonreversible effect of the contingencies or a possible confounding of some variable with the experimental contingencies.

Figure 3 shows the median percentage of free modifiers and cumulative sentences each group of subjects used, group one being composed of individuals receiving treatment in the ABA order (Subjects one through six) and group two being composed of individuals receiving treatment in the BAB order (Subjects seven through eleven). The median for each group showed a greater percentage of free modifiers and cumulative sentences when the students were under treatment conditions, where they could earn contingent points for meeting the two criteria.

The median percentage of cumulative sentences the students used increased most when they earned contingent points for meeting the criterion--an effect the individual data also showed. The difference between conditions ranged from 26% to 39% in the ABA group and from 24% to 32% in the BAB group. The median percentage of words in free modifiers that students used also increased when they could earn contingent points for meeting the criterion.

In summary, the point contingency generally caused an increase in the percentage of words in free modifiers that students used, with 73% of the data points supporting this effect. Students with high baselines, those meeting the 32% criterion on half or more of the baseline homework assignments, generally showed smaller increases than students who had lower baselines. Four students with high baselines did not appear

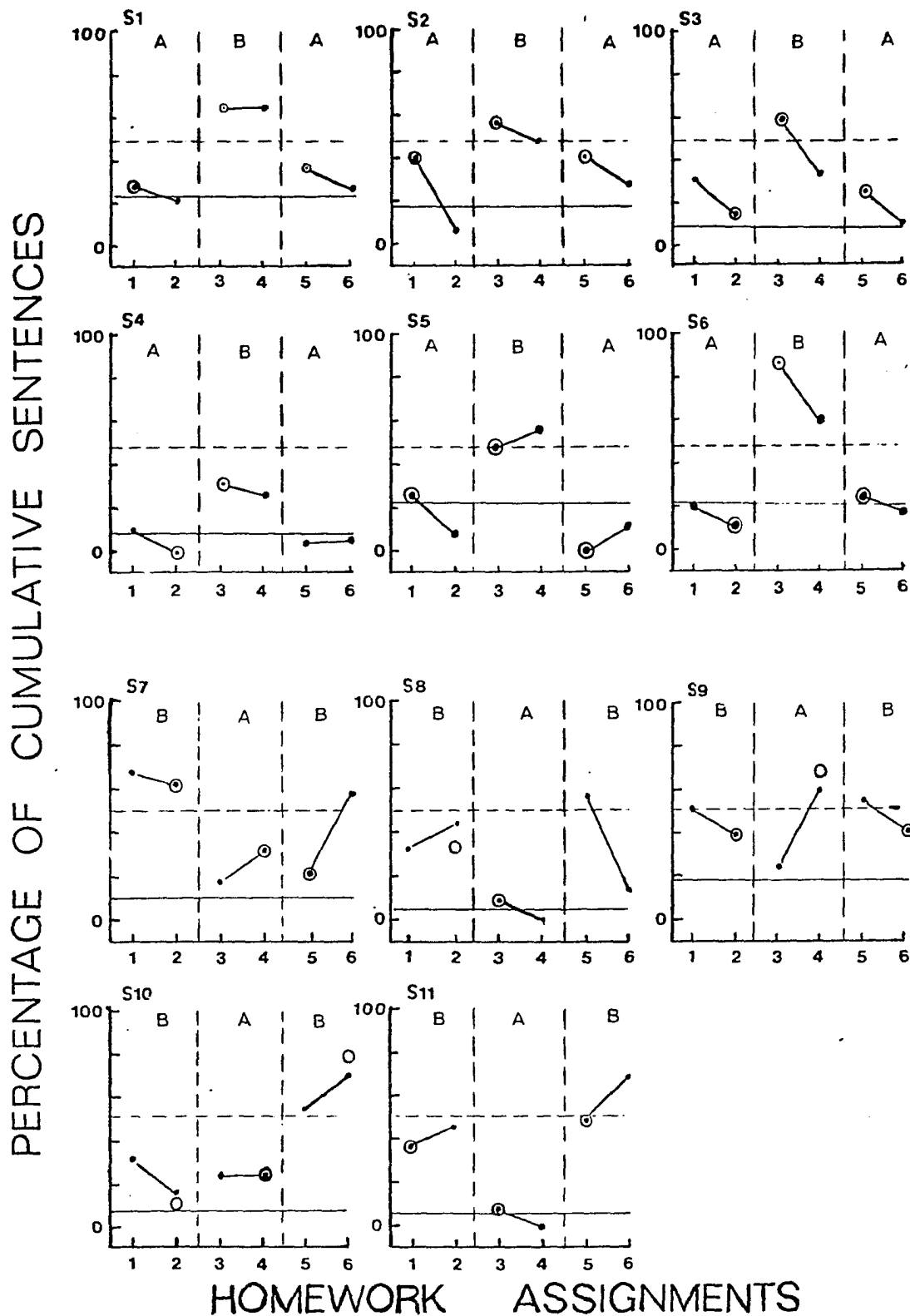


Fig. 2. The percentage of cumulative sentences each subject used in the homework assignments. Criterion is shown by the broken horizontal lines. Open circles indicate reliability checks; vertical broken lines show condition changes; horizontal solid lines show the median percent of cumulative sentences each subject used on five preexperimental homework assignments.

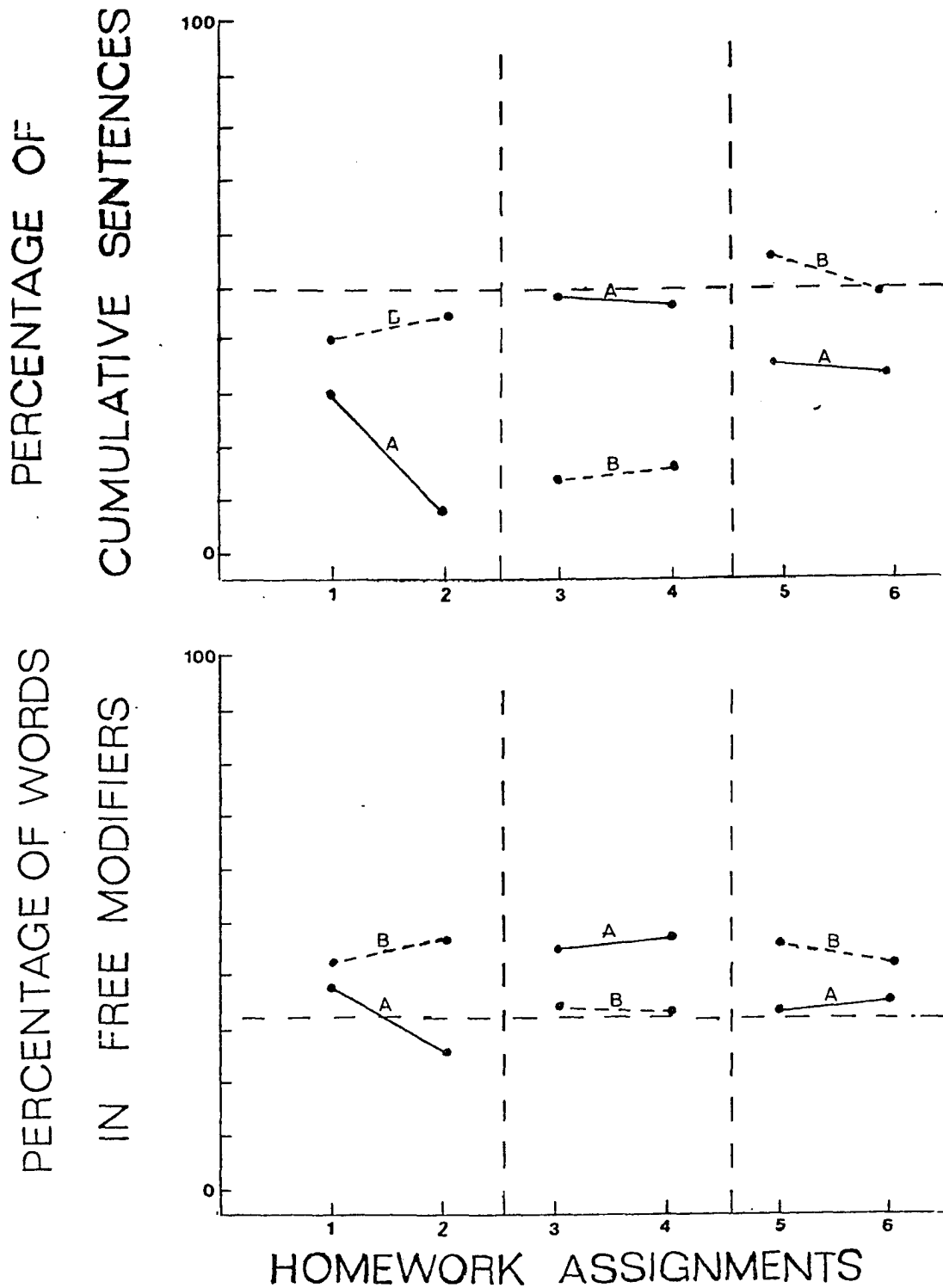


Fig. 3. The median percentage of free modifiers and cumulative sentences used by group one, who received conditions in the BAB order (broken line) and by group two, who received conditions in the ABA order (solid line). During B conditions students earned points for meeting the free modifier and cumulative sentence criteria, shown by the broken horizontal lines; vertical lines show condition changes.

affected by the contingency. There was a stronger effect when contingencies were applied to the students use of cumulative sentences, with 89% of the data points supporting this. Only one student's data did not support this trend.

DISCUSSION

The present study begins to provide some preliminary answers about how to teach free modifiers and cumulative sentences. The results suggest that we can induce students to use free modifiers and cumulative sentences by using contingency management procedures, where we specify, observe, and consequence the desired behaviors. Further, the results suggest we should use contingency management procedures to maintain the students' use of free modifiers and cumulative sentences after they begin to meet the desired criteria.

Seven out of eleven subjects in this study used greater percentages of free modifiers when the point contingency was in effect. The students who improved the most were the four students with the lowest baselines (less than half of their data points meeting the 32% free modifier criterion). In other words the students most improved were those who most needed to increase their percentages of words in free modifiers to professional levels. In addition, two other students used a greater percentage of free modifiers when the point contingency was in effect even though they already were close to meeting the 32% free modifier criterion.

Four subjects did not clearly use a greater percentage of words in free modifiers when they could earn points for meeting the criterion. However, this may not mean that the contingency was not effective, since on a total of twelve opportunities to lose points for not meeting criterion, these students only lost points on a total of three occasions. All of these subjects had high baselines, meeting the 32% criterion at least half of the time--and during both conditions combined, they fell

below baseline on only six out of the 24 opportunities as a group. Thus, a lack of effect between conditions for these students may have occurred because they were only reinforced for meeting the 32% criterion, and were not differentially reinforced for exceeding their baseline levels.

The contingency on cumulative sentences had an even more powerful effect than the contingency on free modifiers. Ten out of the eleven subjects in the study used greater percentages of cumulative sentences when they could earn course points for doing so, whereas none of the students ever met criterion without the contingency.

The instructions and consequences seem responsible for the observed changes in the students' use of free modifiers and cumulative sentences, since those changes generally occurred after condition changes and were replicated both within and across subjects. Instructions and consequences were introduced as a training package, so their separate effects cannot be assessed here. The research in behavior analysis, however, generally supports the notion that instructions alone would have had a much smaller effect than the combination of instructions and consequences (Allyon and Azrin, 1964; Madsen, Becker, and Thomas, 1968; O'Leary, Becker, Evans, and Saudargau, 1969; Burgess, Clark, and Hendee, 1971; Pommer and Streedbeck, 1974; Kohlenberg, Phillips, and Proctor, 1976).

Some students did appear to increase their use of free modifiers and cumulative sentences when points were not contingent on that use. Subjects Two, Five, Six, Nine, Ten, and Eleven began to use more free modifiers during baseline conditions once the study began, compared to the median percentage of free modifiers they used on five homework assignments prior to the onset of the study. Subjects Three, Six, Nine, and Eleven used more cumulative sentences during baseline conditions than they did on

their cumulative sentence use in their first five homework assignments. One way to explain these data might be that there was instructional control operating for some subjects even during baseline conditions, causing them to use more free modifiers and/or cumulative sentences than they otherwise would have. Another variable that might account for this change is that these subjects may have tried to do better as a result of being in an experiment. They also may have realized that the experimenter would be analyzing their papers in terms of free modifiers and cumulative sentences, though they were never told this. In any event, verbal instructions may well have been a cue in its own right in this study.

There are a number of possible reasons why some students failed to meet the two criteria. First, the number of points they received for meeting the criteria may have been too small to induce them to use more free modifiers and cumulative sentences. The students could earn around 80 course points per week, only six of which they could earn for meeting the two criteria.

Subject Nine, who received the contingencies in the BAB order, did not use fewer free modifiers or cumulative sentences in the baseline condition. These noneffects might have occurred because improvement in the contingent points condition established instructional control that carried over into the baseline condition. It may also be that the desired behaviors generalized into the baseline conditions because they produced reinforcers during the contingent points condition. Subject Two's data for free modifiers could also support either of these notions, since this subject used far more free modifiers in the second baseline condition than in the first.

Another reason why instructions and points did not affect some subjects might have been that some students never adequately learned to use free modifiers and cumulative sentences, or that they did not understand the criteria. At the end of the study, two subjects reported they had not understood the criterion for cumulative sentences at the beginning of the study, saying they thought that 50% of their sentences containing free modifiers were supposed to be cumulative, rather than 50% of their total sentences. Thus, the treatment effect may have been enhanced had the subjects received more extensive instructions about the criteria or had the instructional materials been more clear.

A final reason why some students did not meet the free modifier and/or cumulative sentence criterion might have been that the experimenter did not require them to calculate their own percentages of free modifiers and cumulative sentences. At the end of the study, three students reported in an anonymous questionnaire that they had lost points because they merely underestimated their percentages, because they had failed to calculate them in order to get more exact feedback. Therefore, the treatment effect may have been larger if the students were required to calculate their percentages of words in free modifiers and cumulative sentences, prior to handing in their homework assignments.

The results of this study suggest that it may be fruitful for others to conduct research with free modifiers and cumulative sentences, perhaps with a younger population, like high-school students, as well as with other college students. If such studies were conducted, the researchers might try to look at the students' writing for other classes, to see if generalization of their use of free modifiers and cumulative sentences occurs.

Also it would be highly desirable to have independent raters subjectively assess the quality of the subjects' papers when they meet the free modifier and cumulative sentence criteria; in other words, does using a greater percentage of free modifiers and cumulative sentences really make their writing "better"?

Further, the results of this study suggest that researchers might bring about and maintain other complex areas of composition through contingency management procedures, like punctuation or paragraph construction, all of which would be beneficial to the students involved as well as to the widespread impact of behavior analysis and modification.

APPENDIX A:
SOME SAMPLE PAGES FROM THE INSTRUCTIONAL MATERIALS

The following pages contain some sample pages drawn from the instructional materials the students in this study received. The manual was based on definitions, examples, self tests and answer keys over the self tests

Presubject Free Modifiers

All words or constructions that stand before the first subject word or words in a sentence are free modifiers, except for coordinating conjunctions (which we'll deal with later in this manual).

Example: In desperation, I consulted the bulletin board.

Example: Superficially the place looked like a summer hotel.

Example: Coming down the gangplank of the Belle of Louisville after a Saturday night excursion, he tripped and broke his leg.

Example: At breakfast, he told mother and Lynn of his resolve.

Example: In Farmington, twenty miles from the line, after a long night driving, I pulled into a service station.

The underlined words in the five sentences above are free modifiers because they stand before the subjects of the sentences. Here are the subjects of each of the above sentences:

Example #1: "I"

Example #2: "the place"

Example #3: "he"

Example #4: "he"

Example #5: "I"

You may have noticed that sometimes a comma separates the free

modifier from the subject. This is especially true when the free modifier contains many words. Don't, however, look for the comma as the signal of a free modifier--look for the subject of the sentence.

Self test over presubject free modifiers

Please underline all the presubject free modifiers in the sentences below, but be careful, since some of the sentences won't contain any presubject free modifiers. When you finish, check your answers with those on the following answer key. If you get more than two sentences wrong, go back and review the definition of a presubject free modifier and the accompanying examples. (The sentences on these pages are from Joan Didion's book, Play it as it Lays.)

1. For days during the rain she did not speak out loud or read a newspaper.
2. The mothers were always reported to be under sedation.
3. When I first married Carter and my name began appearing in columns I received mail from mad people.
4. For the first week Maria would wash in the trickle that came from the shower and drink a Coca-Cola in the bathroom and then drive out to location.
5. Maria ate frozen enchiladas, looked at television for word of the world, thought of herself as under sedation and did not leave the apartment on Fountain Avenue.
6. For an instant Helene's face seemed to lose its animation.
7. At seven o'clock on a Saturday evening they would be standing in the checkout line reading the horoscope in Harper's Baazar.
8. Even from the dressing room Maria could hear the girl wheedling.
9. After he had gone to sleep she got dressed very quietly and walked out of the house.

10. When she got back to the Sands she looked at herself in the mirror for a long while, then called room service and asked for a double bourbon.
11. In the first hot month of the fall after the summer she left Carter (the summer Carter left her, the summer Carter stopped living in the house in Beverly Hills), Maria drove the freeway.
12. In the first hot month of the fall after the summer she left Carter, the summer Carter left her, the summer Carter stopped living in the house in Beverly Hills, a bad season in the city, Maria put seven thousand miles on the Corvette.
13. At four that afternoon, after a day spent looking at the telephone and lighting cigarettes and putting the cigarettes out and getting glasses of water and looking at the telephone again, Maria dialed the number.
14. In the past few minutes, he had significantly altered her perception of reality.
15. On film they might have seemed a family.
16. It was five o'clock in Los Angeles and eight in New York and he was drunk.
17. In a sense the day they ate spare ribs and drove to McCarran had ceased to exist, had never happened at all: she was the only one who remembered it.
18. Freddy had gotten in touch with one of the big savings-and-loan Democrats.
19. Early in the morning she called Freddy Chaikin from Los Angeles and asked him to pay her bill and bring back her clothes.
20. Most people think New Year's Eve is a bore but I love it.

Answer key to self test over presubject free modifiers

1. For days during the rain she did not speak out loud or read a newspaper.

"She" is the subject of this sentence, so all the words before it make up a free modifier.

2. The mothers were alway reported to be under sedation.

"The mothers" is the subject of the sentence; since no words stand before the first subject word, there are no presubject free modifiers.

3. When I first married Carter and my name began appearing in columns
I received mail from mad people.

The second "I" is the subject of the sentence; everything that stands before it is a free modifier.

4. For the first week Maria would wash in the trickle that came from the shower and drink a Coca-Cola in the bathroom and then drive out to location.

"Maria" is the subject of the sentence, and since the underlined words precede the subject, they compose a free modifier.

5. Maria ate frozen enchiladas, looked at television for word of the world, thought of herself as under sedation and did not leave the apartment on Fountain Street.

There are no presubject free modifiers in the sentence, since "Maria" is the subject of the sentence and nothing stands before it.

6. For an instant Helene's face seemed to lose its animation.

"Helene" is the subject of the sentence. The underlined words precede the subject, so, by definition, they must be a free modifier.

7. At seven o'clock on a Saturday evening they would be standing in the checkout line reading the horoscope in Harper's Bazaar.

The word "they" is the subject of the sentence, and the underlined words that stand before it compose a free modifier (and Harper's Bazaar is underlined because it's the name of a magazine).

8. Even from the dressing room Maria could hear the girl wheedling.

Again, "Maria" is the subject of the sentence. The underlined words precede the subject so they are a free modifier.

9. After he had gone to sleep she got dressed very quietly and walked out of the house.

The underlined words, preceding the subject of the sentence, "she," make up a free modifier.

10. When she got back to the Sands she looked at herself in the mirror for a long while, then called room service and asked for a double bourbon.

This sentence is similar to the third one you did. You can see that "she" is the subject of the sentence and that word "she" occurs twice in the sentence. Since the underlined words modify the second "she," you know they are a free modifier.

11. In the first hot month of the fall after the summer she left Carter (the summer Carter left her, the summer Carter stopped living in the house in Beverly Hills), Maria drove the freeway.

"Maria" is the subject of the sentence. The underlined words compose a series of free modifiers since they stand before the subject of the sentence.

12. In the first hot month of the fall after the summer she left Carter, the summer Carter left her, the summer Carter stopped living in the house in Beverly Hills, a bad season in the city, Maria put seven thousand miles on the corvette.

"Maria" is the subject of the sentence, and since the underlined words are before the subject, they compose a free modifier.

13. At four that afternoon, after a day spent looking at the telephone and lighting cigarettes and putting the cigarettes out and getting glasses of water and looking at the telephone again, Maria dialed the number.

Once again, "Maria" is the subject of the sentence, and the underlined words standing before it are a free modifier.

14. In the past few minutes, he had significantly altered her perception of reality.

"He" is the subject of the sentence; the underlined words are a pre-subject free modifier.

15. On film, they might have seemed a family.

"On film" is a presubject free modifier, standing before the subject of the sentence, "they."

16. It was five o'clock in Los Angeles and eight in New York and he was drunk.

"It" is the first subject of the sentence, and no free modifier stands before the subject.

17. In a sense the day they ate spare ribs and drove to McCarran had ceased to exist, had never happened at all: she was the only one left who remembered it.

"The day" is the subject of the sentence. Since no words stand before the subject, the sentence contains no presubject free modifiers.

18. Freddy had gotten in touch with one of the big savings-and-loan Democrats.

"Freddy" is the subject of the sentence. Since no words stand before the subject, the sentence contains no presubject free modifiers.

19. Early in the morning she called Freddy Chaikin from Los Angeles and asked him to pay her bill and pick up her clothes.

"She" is the subject of the sentence, so the underlined words are a free modifier, since they stand before the subject.

20. Most people think New Year's Eve is a bore but I love it.

"Most people" is the subject of the sentence; there are no free modifiers before it.

APPENDIX B:
DETERMINING A NEED FOR THE INSTRUCTIONAL MATERIALS

Prior to giving the instructional materials to the students, I gave them a three page handout over identifying free modifiers and cumulative sentences and calculating their percentages in writing samples. The handout contained definitions and examples of free modifiers, cumulative sentences, and instructions for calculating their percentages. The students then received a short quiz over the handout, with five questions pertaining to identifying free modifiers and six questions pertaining to identifying cumulative sentences and calculating the percentages of free modifiers and cumulative sentences in a writing sample. The purpose of this handout and quiz was to serve as an informal pretest for the instructional materials, the rationale being that the students wouldn't need to read a 96 page manual if they could master the same concepts from a three page handout.

The students received course points for completing the quiz over the handout. The points were not based on the students' percentages of correct and incorrect answers, since the SCEP staff and I felt it was unfair to jeopardize the students' grades over a handout that may not have enabled them to do well on the quiz. The students did not receive feedback on their performance. Such feedback might improve their performance on quizzes over the instructional materials--an improvement not based on the quality of the handout.

After the students completed each of the first two sections of the instructional materials, they received quizzes that corresponded in content to the two parts of the quiz over the three page handout.

I then compared the students' percentages of responding on the quiz over the instructional manual to the corresponding part of the hand-out quiz, Part I of each testing the students' ability to identify free modifiers and Part II of each testing the students' ability to identify cumulative sentences and calculate the percentage of words in free modifiers and cumulative sentences.

The pretest scores and the corresponding quiz scores over the manual are listed in Table I. Of the 24 comparisons made, 22 showed improvement on the quiz over the manual. The two students who did not improve were already at 100%.

On the quiz over Part I of the manual, there was a 25% mean increase over the students' mean responding on the corresponding section of the handout quiz. On the quiz over Part II of the manual, there was a 52% mean increase over the subjects' responding on the handout quiz. These data suggest that the manual was more effective at teaching the desired concepts than the handout, especially helping those students who had initial low scores--that is, the students who most needed help. However, a serious confounding of these data may have occurred because the students received contingent points on the manual quiz. Also, it would have been desirable to have tested the students' ability to generate cumulative sentences after they received the handout, so that there could have been a comparison of the effectiveness of the third part of the manual.

The handout was similar to the way traditional educational systems attempt to teach students--that is, by giving them definitions and a few examples. The scores over the handout suggest this is not a suffi-

cient way to teach the free modifier and cumulative sentence concepts. The scores over the manual suggest that educators can achieve good concept mastery if they use many instances and noninstances of the desired concepts, as the instructional materials did.

Table I

The Individual and Mean Percentage Increases of the Instructional Manual Quiz Scores
over the Corresponding Pretest Quiz Scores

Subject	Pretest, Part I	Manual Quiz, Part I (first attempt)	Increase from Pre- test to Quiz	Pretest, Part II	Manual Quiz, Part II (first attempt)	Increase from Pre- test to Quiz
1	40%	80%	40%	33%	70%	37%
2	100%	100%	0%	33%	100%	67%
3	40%	90%	50%	33%	100%	67%
4	80%	90%	10%	33%	100%	67%
5	60%	100%	40%	50%	90%	40%
6	100%	100%	0%	66%	90%	24%
7	80%	100%	20%	50%	100%	50%
8	80%	90%	10%	50%	80%	30%
9	80%	100%	20%	33%	80%	47%
10	80%	90%	10%	33%	100%	67%
11	40%	90%	50%	33%	80%	47%
12	40%	90%	50%	16%	100%	84%
Total Mean Percentage	68%	93%	25%	39%	90%	52%

APPENDIX C
FIELD TESTING OF THE MANUAL

Prior to the students' use of the instructional manual, I tested the definitions, examples, and self tests on three college students, asking them to note parts of the materials that confused them. I then revised those parts they found confusing. The three students also received quizzes over the materials, and based on questions they missed, I revised corresponding parts of the instructional manual.

I then tested the revised manual on two more college students, having them read the manual and take quizzes over it, after which I revised the manual for the purposes of the study reported here. After the study, I revised the manual one more time, based on feedback from the twelve students in the study.

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