JOURNAL OF APPLIED BEHAVIOR ANALYSIS 1975, 8, 387-398 NUMBER 4 (WINTER 1975)

# *BEHAVIORAL SELF-MANAGEMENT IN STORY WRITING WITH ELEMENTARY SCHOOL CHILDREN*[1]

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The effect of self-management procedures on objective writing responses and on the subjectively assessed quality of children's writing was investigated. All experimental procedures were applied to each of the 37 children in a regular Grade 3 class, and 14 of these children were randomly selected for data collection. Following baseline conditions, self-assessment plus self-recording of writing responses was introduced. This did not increase the number of sentences, number of different action words, or number of different describing words, or improve the quality of the stories. Self-determined and self-administered reinforcement was added to the self-assessment and self-recording procedures contingent on each of the writing responses in turn. Rates of responding were substantially increased and the stories received higher subjective ratings of quality from two independent judges. An increase in on-task behavior was correlated with self-reinforcement of writing responses.

DESCRIPTORS: self-management, self-control, self-reinforcement, writing skills, composition, classroom research

Written expression is an important area of the school curriculum and the complex responses it involves have been shown to be amenable to functional analysis and to modification. Brigham, Graubard, and Stans (1972) applied reinforcement contingencies to three objective aspects of written composition (total number of words, number of different words, and number of new words), increasing writing output, and improving the subjectively assessed quality of students' stories. Maloney and Hopkins (1973) showed that reinforcement contingent upon the use of different adjectives, different action verbs, and different sentence beginnings, increased these components in students' stories. In addition, two independent raters reliably assessed the stories produced in the reinforcement phases as more creative than those written during baseline conditions.

Such findings might encourage teachers to apply techniques of contingency management to children's story writing. However, written expression is complex in nature, and its selection as target behavior in programs designed for the regular classroom poses problems.

If teachers are to function independently of outside assistance, they must be able to monitor children's behavior, keep records of responses, and deliver reinforcement consistently (Lewis, 1973). Where performance on academic materials is the criterion, it may be impossible for a teacher to assess the work of each child and provide prompt feedback and contingent reward.

Self-management procedures suggest one solution to these difficulties. Teaching children to observe, record, and reinforce their own re-

[1]This paper is based on a thesis submitted by the senior author to the University of Auckland in partial fulfilment of the requirements of the Diploma in Educational Psychology. The authors wish to thank L. Whatman, Principal of Glen Taylor School, for his valued assistance and interest in the study; Avril Crook for her skilled management of the experiment with her class; A. Pine for help with reliability checks on data analysis; H. L. Whitworth and T. McNamara for subjective assessments of the stories; and T. Fitzgibbon, Head of the English faculty, North Shore Teachers' Training College, who arranged for these assessments to be carried out. Reprints may be obtained from Keith D. Ballard, Psychological Service, Dept. of Education, P.O. Box 2612, Christchurch, New Zealand.

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sponses both reduces demands on the teacher and provides children with skills of considerable educational importance (Lovitt and Curtiss, 1969). These skills may be more amenable to maintenance and generalization than those taught in programs relying on externally manipulated contingencies (Drabman, Spitalnik, and O'Leary, 1973; Glynn, Thomas, and Shee, 1973; O'Leary and Drabman, 1971).

Glynn *et al.* (1973) suggested that an individual's modification of his own behavior involves self-assessment, self-recording, self-determination of reinforcement, and self-administration of reinforcement. In the present study, reinforcement was partially self-determined, both the amount of reinforcement per response and the type of reinforcement being predetermined by the experimenter.

The present study sought to assess the effectiveness of self-management in increasing the quantity children write, and in modifying components of written expression shown by Maloney and Hopkins (1973), to be related to judgements of creativity in writing. The effects of the procedures on the subjectively assessed quality of the children's stories was examined. In addition, the effect of contingencies applied to academic responses on on-task behavior was assessed.

There is evidence that self-monitoring affects behavior independently of self-reinforcement (Broden, Hall, and Mitts, 1971; Johnson and White, 1971; Palkes, Stewart, and Kahana, 1968). In the present study, the effects of self-assessment and self-recording alone were therefore investigated before reinforcement was included in treatment.

## METHOD

### *Subjects and Setting*

This study was conducted in a regular grade-three class in an East Auckland elementary school, and extended over the middle term of the school year. There were 37 children in the class. At the start of the study, one child was aged 11 yr two months, and the ages of the other 36 children ranged from 8 yr two months to 9 yr nine months ($x = 8.6$ yr). A sample of 14 children was randomly selected as experimental subjects. The treatment procedures were applied to every child in the class, although data were obtained for only the experimental subjects.

The teacher was an experienced junior-class teacher who had volunteered to participate in the study. In addition to her normal duties, the teacher was involved in supervising the practical classroom experience of trainee teachers, one of whom joined the class on Day 1 and left on Day 16; another joined the class on Day 23 and was present for the remainder of the experiment. Both trainee teachers occasionally helped children to spell words, but took no other part in proceedings, except that the second trainee took the class in the absence of the teacher on Day 36.

### *Experimental Design*

A multiple-baseline-across-behaviors design was employed (Baer, Wolf, and Risley, 1968). After a 12-day baseline phase, student self-assessment and self-recording procedures were introduced for eight days. Following this eight-day phase, reinforcement contingencies were added to the self-assessment and self-recording procedures. Reinforcement was contingent on number of sentences written for eight days, number of different action words for the following eight days, and number of different describing words for the final eight days.

Evidence from Maloney and Hopkins (1973) suggested that the selected response variables were independent to a degree that would allow employment of a multiple-baseline design (Kazdin, 1973). Viable alternative explanations for the observed effects of treatment were reduced by minimizing the extent to which instructions both to the teacher and to the children covaried with experimental conditions (Kazdin, 1973).

### *Response Measures*

Response measures were defined for the children by means of wall charts described below.

To avoid difficulties that young children could experience differentiating between adjectives and adverbs, these were combined into the single response class of describing words. Response definitions employed in the analysis of the stories, while essentially similar to those prescribed for the children, were elaborated in the interests of reliability. The definitions, essentially those used by Maloney and Hopkins (1973), were:

*Number of sentences.* A sentence was defined as beginning with a capital letter and/or on a new line, and/or having a period, question mark, or exclamation point at the end, and/or containing at least one subject and predicate. For cases where capital letters and periods occurred infrequently, a sentence was defined as a group of words that made sense as a sentence.

*Number of different action words.* These were action verbs that express an act, occurrence, or movement but not a mode of being, as any form of the verb "to be". "Different" here included a different tense of a word previously used in a story being counted as a separate response.

*Number of different describing words.* This was defined as the sum of number of different adjectives and number of different adverbs. An adjective was defined as a word serving as the modifier of a noun to denote the quality of the thing named, to indicate quantity or extent, or to specify a noun as distinct from something else. An adverb was defined as a word that modified a verb, adjective, another adverb, preposition, phrase, clause, or sentence, and expressed some relation of manner of quality, time, place, degree, number, cause, opposition, affirmation, or denial.

*On-task behavior.* This was defined as the percentage of 10-sec observation intervals in which an individual child's behavior was classified as on-task during the 25 min available for writing a story. On-task behaviors were writing a story (*i.e.,* the pencil or pen in contact with the paper and being moved purposefully across the page), using an eraser, using a dictionary, looking at the wall charts, seeking teacher help by raising a hand, and taking down the spelling of a word dictated by the teacher. Behaviors classified as off-task included inappropriate movement and verbalization, staring fixedly away from work, and reading a book.

### *Data Collection*

*Writing behavior.* Each day, the author scored the 14 children's stories in terms of number of sentences, number of different action words, and number of different describing words. After these data had been recorded, four stories were selected at random by an assistant and passed on to an independent scorer, who had no information about the design or purposes of the experiment. This procedure was followed on each of the 44 days of the study. There were therefore 176 reliability checks for each response measure. For each measure, interobserver agreement was computed as 100 × number of agreements divided by number of agreements plus disagreements (Maloney and Hopkins, 1973). Interscorer agreement for number of sentences ranged from 75% to 100%, with a mean of 97%. For different action words, mean interscorer agreement was 92%, with a range from 76% to 100%. Agreement for number of different describing words ranged from 66% to 100%, with a mean of 91% (falling below 70% on three occasions).

*On-task behavior.* On-task behavior was observed on the last seven days of the baseline phase and the last three days of each subsequent phase. A pool of four observers (including the author) served throughout the study. Apart from the author, the observers were naive as to the design of the study. For purposes of checking reliability of data collection, two observers operated independently on 16 of the 18 observation days, their observations paced by an observation timer that emitted signals at 10- and 5-sec intervals. Two different tones were emitted, a high-pitched one at the end of 10 sec to signal the end of an observation interval, and a low-pitched tone at the end of 5 sec to signal the end of a recording interval.

The 14 subjects were observed in a random order that varied on each occasion. The observers watched the first child on the list for 10 sec and coded the subject's behavior as A (on-task) or 0 (off-task) in the ensuing 5 sec. For his behavior to be coded as A, the child had to be observed in on-task behavior for at least 7 sec of the 10-sec interval. The procedure was followed until all 14 subjects' behavior had been observed and coded. Observers then returned to the first child on the list, repeating the cycle until the end of the 25-min writing period.

Observer agreement was calculated in terms of number of intervals in which the two observers agreed divided by the total number of observation intervals × 100 (Wasik, Senn, Welch, and Cooper, 1969). Interobserver agreement ranged from 80% to 98%, with better than 90% agreement on 14 of the 16 days that two independent observers were operating. Mean observer agreement was 92%, significantly greater ($p < 0.05$) than mean base-rate chance agreement, which was 51% (Johnson and Bolstad, 1973).

*Subjective evaluation of the stories.* The story that each child had written on the last day of each phase was selected for subjective assessment. If a child had been absent on this day, the story written the day before was used. These 70 stories (five for each of 14 children) were typed with no identification of author or date. Two senior lecturers in the Faculty of English at a Teacher Training College independently evaluated typed copies of the stories. (This was a different college from that attended by the trainee teachers who were present in the classroom during the study.) The two judges were given no information about the study beyond the instructions:

1. There are 70 stories.
   The children who wrote these stories were in the 8-9½ year age range (average age 8 years 7 months). All the children had the same length of time in which to write a story.
2. Would you please give each story a qualitative rating using a 1 to 5 scale, with 5 indicating a *high* rating and 1 a *low* rating.
3. The stories are not in any order so you may handle them as you wish. The number on each story is only to identify the story with a child.
4. A short statement on your rating criteria would be very interesting and useful.

These procedures were intended to avoid prejudicing subjective judgement of the stories.

*Accuracy of children's self-assessment and self-recording.* Accuracy of the children's self-assessment and self-recording of number of sentences, number of different action words, and number of different describing words was computed as 100 × child's count divided by experimenter's count. When a child had over-estimated different action words or different describing words by including words that did not fall into these categories, then these inappropriately counted words were subtracted from the numerator in the formula.

### *General Procedures (In Effect Throughout the Study)*

A period known as "Writing time" was introduced into the class program at 1.00 p.m. four days each week. Three charts were prepared, and throughout each writing period, were displayed at the front of the classroom. The chart displayed in a central position measured 91 cm by 116 cm and read:

GOOD WRITING

1. Write in sentences.
   A sentence tells you something.
   It is a group of words that make sense.
   It begins with a capital letter and ends with a full stop.
2. Use describing words.
   There are two kinds of describing words.
   *Words that describe things:*
   A *green* leaf. What a *horrible* spider.

The cat was *fat.* A *beautiful* flower.
He is a *lazy* boy. A *big* rocket.

*Words that describe how you do something:*
She read *quietly.* The dog ran *quickly.* He was talking *loudly.* He went *slowly* to his desk. The man laughed *happily.*

3. Use action words.
Action words tell what you do.
They are doing words.
He *ran* for the bus. I am *jumping* a fence. She is *looking* for a pencil. He *read* a book.

To the right of this was a chart measuring 58 cm × 91 cm that read:

WRITING TIME
A quiet time for you to
do some writing.
Choose something to
write about.
A news event.
Something you have
done or plan to do.
Happenings at school.
A story.
Work by yourself.
Write about things
that interest you.

A third chart displayed to the left of the other two measured 58 cm by 91 cm, was headed IDEAS, and contained 42 nouns (*e.g.,* farm, ship, horse, rain).

At the beginning of each lesson, the teacher wrote on the board and briefly discussed examples of sentences, describing words, and action words. She then read the Writing Time chart, and indicating the Good Writing chart said, "Remember to write in sentences, use describing words, and use action words". About 8 min were allowed for these introductory activities, the teacher timing herself.

The children were told to use the remaining time for writing, but if they should finish what they wanted to write they were to read quietly at their desks. They were also told that they could raise their hand if they wanted teacher help with spelling. Apart from this contact, the teacher was instructed to make no other comments to individuals or to the class as a whole during the 25 min allowed for writing.

As she told the children to begin writing, the teacher set a timer that rang a bell after 25 min had elapsed. All children stopped writing when the bell indicated the end of the allotted time. During the baseline phase, stories were collected when the bell rang, and the lesson ended with the charts being taken down and the teacher beginning the next lesson. During all subsequent phases, the timer was re-set for an 8-min period, during which children filled in record sheets and token booklets.

Each child was provided with a folder in which to keep his work. Stories were returned unmarked to children the day after they were written.

### *Experimental Phases*

*Baseline.* Over 12 days, baseline rates of the writing responses and on-task behavior were established. General procedures were in effect.

*Self-assessment plus self-recording.* The teacher explained to the children that checking their own work against the criteria presented in the Good Writing chart could help them improve their writing. Assessing aspects of their own stories was presented as a useful skill. The children had 8 min after the end of each writing period for self-assessment and self-recording.

Each child was provided with a "counting sheet" to complete and hand in clipped to his story. On the counting sheet he entered the number of sentences written, and listed describing words and action words used. After completing his counting sheet, the child wrote down the number of sentences, number of different describing words, and number of different action words in the story on a "record sheet" issued on the first day of this phase and subsequently kept fastened in the child's story folder, so that he

accumulated a record of his daily performance on the three variables.

*Reinforcement contingent on number of sentences written.* Each child was given a note book in which to record points. The children were told by the teacher that for each sentence they wrote they would be able to give themselves one point. They were told to continue to assess and record action words and describing words. After completing their counting sheets and record sheets, they were to write the number of points they had earned in their points book.

Children could choose to spend points at the rate of one point per minute in a contingent "earned time" period, or to save their points. Type of reinforcement was self-determined to the extent that children were allowed to choose their activities during earned time from a selection of books, art materials, and some games. Items used were all easily obtained in a regular elementary classroom. Children could exchange 15 points for the job of clock monitor during earned time. Also, 80 points could be saved and spent on having any one of the stories typed and displayed in the classroom for others to read.

At the beginning of earned time, the teacher assigned work to all children with fewer than 20 points to spend or who chose not to spend points that day. Children with 20 points to spend then went to the activity they chose, crossing out the points spent in their points book.

Two children could elect to be clock monitor. One of these children set the timer at 20 min and displayed a 25 cm by 28 cm card with the number 20 written on it. The child changed the card every 2 min so that 18 was next displayed, followed by 16, and so on. Children working at their desks raised their hand when they saw the card with the number equivalent to the number of points they had or wished to spend. The second clock monitor would go to each child, and if the individual had not completed any of the set work, would remind him of this requirement. The child was allowed to raise his hand again when he had done some work. In this case, points that could not be spent because of time elapsed while the child did some work could be saved and spent on another occasion.

The behavioral requirements of the children during earned time were displayed on a chart in the classroom during the 20-min period. During earned time, the teacher distributed the equipment children requested. While the teacher remained on hand to monitor the activities, her intervention was seldom required.

*Reinforcement contingent on number of different action words used.* The teacher told the class that they would no longer earn points for sentences. Instead, they could award themselves one point for each different action word they used in their stories. One point could be exchanged for 1 min of earned time. All other procedures were the same as for the previous phase, and children continued to assess and record numbers of sentences and different describing words, as well as different action words.

On the last day of this phase, the teacher was unexpectedly absent and the trainee teacher had sole responsibility for the class. As the children asked to have the writing period as usual, the trainee teacher was given the regular instructions for the period and took charge of this session.

*Reinforcement contingent on number of different describing words used.* The teacher told the children that points could no longer be earned for action words but that each different describing word they used in their story was now worth one point. Otherwise, procedures were the same as those in the previous phases. The children continued to assess and record number of sentences and different action words, as well as different describing words.

## RESULTS

### *Writing Behavior*

The upper portion of Figure 1 presents the group mean results for the three response measures throughout the study. It is clear that the general procedures during baseline did not systematically influence response rates, and that

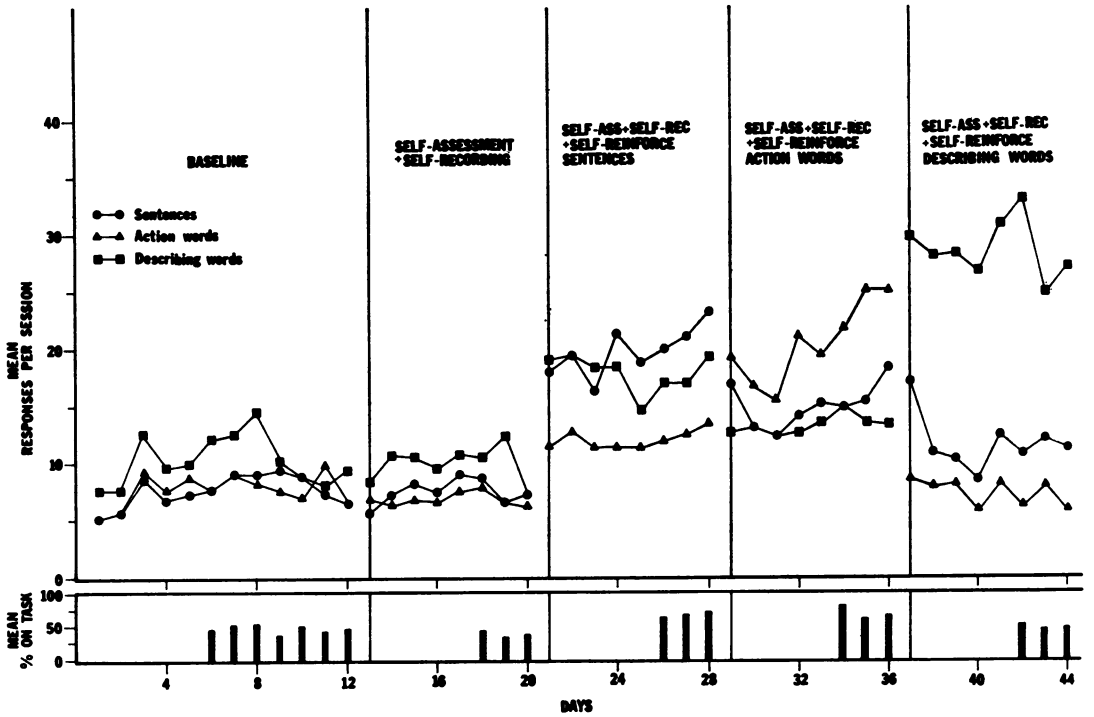


Fig. 1. Mean number of sentences, different action words, and different describing words, and mean per cent on-task behavior throughout the study.

self-assessment and self-recording alone had no effect on the target responses. With the addition of reinforcement contingencies for number of sentences, however, writing output more than doubled; the mean number of sentences written was 20, compared with a mean of seven in both the baseline and the self-assessment and self-recording phase.

While the increase in number of sentences was correlated with increases in number of different action words and number of different describing words used, substantial increases in different action words and different describing words were achieved when reinforcement contingencies were applied to them specifically. Mean number of different action words used in a story increased from eight at baseline to 20 in the self-reinforcement for different action words condition. Self-reinforcement for different describing words resulted in a mean of 28 different describing words per story, compared with a mean of 10 during baseline conditions.

Individual results are summarized in Table 1. The results for nine of the children were highly similar to the group mean shown in Figure 1; *i.e.,* they showed no increase in responding during the baseline and the self-assessment plus self-recording phases, and showed substantial increases in number of sentences, number of different action words, and number of different describing words when reinforcement contingencies were applied to them in turn. For the remaining five, Helga, Lisa, Lori, Stuart, and Stephen, treatment effects were observed, but response to treatment was not immediate or stable in every phase.

*On-Task Behavior*

The lower portion of Figure 1 shows the mean per cent on-task behavior across the study. During the baseline and the self-assessment plus self-recording phases, the group was on-task for an average of 48% and 40% respectively of the writing session. In the self-reinforcement for

Table 1

Mean number of sentences, different action words and different describing words, and mean per cent on-task behavior for individuals across phases (nearest whole number).

| | *Baseline* | *Self-Ass + Self-Rec* | *Self-Ass + Self-Rec + Self-Reinf Sentences* | *Self-Ass + Self-Rec + Self-Reinf Action Wds* | *Self-Ass + Self-Rec + Self-Reinf Describing Wds* |
|---|---|---|---|---|---|
| *Jeremy* | | | | | |
| Sentences | 7 | 6 | *27* | 19 | 15 |
| Action wds | 6 | 6 | 17 | *22* | 9 |
| Describing wds | 9 | 7 | 18 | 12 | *34* |
| % On-task | 32 | 28 | 71 | 78 | 66 |
| *Tanya* | | | | | |
| Sentences | 7 | 10 | *22* | 22 | 19 |
| Action wds | 9 | 11 | 20 | *32* | 12 |
| Describing wds | 15 | 14 | 25 | 27 | *50* |
| % On-task | 57 | 28 | 90 | 83 | 76 |
| *Helga* | | | | | |
| Sentences | 19 | 15 | *30* | 24 | 16 |
| Action wds | 19 | 16 | 26 | *31* | 16 |
| Describing wds | 22 | 18 | 30 | 31 | *46* |
| % On-task | 96 | 33 | 100 | 100 | 66 |
| *Lisa* | | | | | |
| Sentences | 16 | 16 | *42* | 26 | 19 |
| Action wds | 14 | 10 | 18 | *21* | 8 |
| Describing wds | 16 | 15 | 22 | 13 | *22* |
| % On-task | 64 | 47 | 81 | 85 | 38 |
| *Amanda* | | | | | |
| Sentences | 4 | 6 | *24* | 8 | 6 |
| Action wds | 6 | 5 | 6 | *23* | 1 |
| Describing wds | 8 | 8 | 20 | 4 | *21* |
| % On-task | 43 | 42 | 46 | 21 | 42 |
| *Bren* | | | | | |
| Sentences | 3 | 3 | *8* | 10 | 10 |
| Action wds | 5 | 4 | 10 | *20* | 7 |
| Describing wds | 5 | 4 | 10 | 12 | *25* |
| % On-task | 37 | 19 | 37 | 43 | 42 |
| *Teresa* | | | | | |
| Sentences | 7 | 6 | *12* | 14 | 11 |
| Action wds | 8 | 8 | 14 | *22* | 13 |
| Describing wds | 10 | 13 | 19 | 21 | *29* |
| % On-task | 54 | 47 | 71 | 60 | 76 |

sentences condition, the mean on-task behavior was 67%, in the self-reinforcement for different action words phase it was 66%, and in the self-reinforcement for different describing words phase, it was 51%. Hence, on-task behavior exceeded baseline levels in all reinforcement phases.

Table 1 summarizes individual results. The individual results for on-task behavior showed greater variability than for academic responding. The results of seven of the children were similar to the lower of the group mean graphs, Figure 1. The others showed more variation across phases. For two, Amanda and Bren, reinforcement contingencies for academic responses had no systematic effects on on-task behavior.

### *Subjective Assessments of the Stories*

Of the 70 stories selected for subjective assessment, 24 received the same rating from both raters, 40 differed by one point on the scale, Rater B giving consistently lower ratings than

Table 1 *continued*

| | *Baseline* | *Self-Ass + Self-Rec* | *Self-Ass + Self-Rec + Self-Reinf Sentences* | *Self-Ass + Self-Rec + Self-Reinf Action Wds* | *Self-Ass + Self-Rec + Self-Reinf Describing Wds* |
|---|---|---|---|---|---|
| *Stephen* | | | | | |
| Sentences | 5 | 5 | 9 | 7 | 6 |
| Action wds | 5 | 5 | 9 | *11* | 5 |
| Describing wds | 8 | 9 | 12 | 7 | *16* |
| % On-task | 49 | 47 | 37 | 80 | 42 |
| *Michael* | | | | | |
| Sentences | 3 | 4 | *20* | 8 | 5 |
| Action wds | 3 | 4 | 7 | *11* | 3 |
| Describing wds | 4 | 3 | 12 | 5 | *10* |
| % On-task | 29 | 37 | 36 | 45 | 23 |
| *Iori* | | | | | |
| Sentences | 8 | 9 | *16* | 10 | 15 |
| Action wds | 8 | 7 | 7 | 9 | 12 |
| Describing wds | 13 | 15 | 15 | 12 | *30* |
| % On-task | 55 | 56 | 71 | 77 | 50 |
| *Stuart* | | | | | |
| Sentences | 5 | 5 | *8* | 10 | 9 |
| Action wds | 5 | 5 | 6 | *10* | 6 |
| Describing wds | 7 | 8 | 9 | 10 | *26* |
| % On-task | 34 | 47 | 66 | 63 | 62 |
| *Glenn* | | | | | |
| Sentences | 6 | 6 | *21* | 14 | 11 |
| Action wds | 6 | 3 | 13 | *18* | 7 |
| Describing wds | 6 | 5 | 18 | 10 | *29* |
| % On-task | 45 | 23 | 76 | 58 | 47 |
| *Grant* | | | | | |
| Sentences | 4 | 4 | *10* | 10 | 8 |
| Action wds | 2 | 2 | 4 | *21* | 2 |
| Describing wds | 6 | 9 | 15 | 10 | *24* |
| % On-task | 33 | 47 | 90 | 67 | 37 |
| *Alexandra* | | | | | |
| Sentences | 9 | 11 | *31* | 22 | 16 |
| Action wds | 10 | 9 | 20 | *32* | 5 |
| Describing wds | 14 | 16 | 30 | 16 | *31* |
| % On-task | 50 | 64 | 66 | 65 | 52 |

Note: Italic indicates introduction of reinforcement contingencies.

Rater A, and six stories were rated differently by more than one point on the five-point scale. There was little difference in the range of marks used in each phase. A Pearson product-moment correlation of raters' scores of 0.69 indicated sufficient difference between raters to warrant taking into account their separate ratings. The two ratings for each story were therefore summed. The mean summed rating of stories written in baseline was 4.0; for stories from the self-assessment plus self-recording phase, the mean rating was 4.3; self-reinforce sentences phase, 5.1; self-reinforce different action words, 6.2; self-reinforce different describing words, 5.5. The stories written under reinforcement conditions, therefore, were given higher subjective ratings than those written in either the baseline or the self-assessment plus self-recording phase. Highest subjective scores were given stories written in the self-reinforce different action words phase.

A one way repeated-measures analysis of variance was carried out on raw data in the form of the combined rater scores. The obtained F was significant beyond the 0.01 level ($F = 8.22$, df

4,52). Using the Newman-Keuls test on ordered pairs of total combined rater scores (Winer, 1962), subjective ratings over all phases were tested and ratings for stories written in the self-reinforce sentences condition differed significantly from those given stories written during baseline ($p < 0.05$). Both the ratings for stories written in the self-reinforce different action words phase and the self-reinforce different describing words phase also differed significantly from baseline ($p < 0.01$). There was no significant difference between baseline ratings and ratings of stories from the self-assessment plus self-recording phase.

### *Accuracy of Children's Self-Assessment and Self-Recording*

Table 2 presents the mean accuracy for the group across phases.

The accuracy with which each response was assessed and recorded increased in the phase in which reinforcement was contingent on that response. This was true for all individuals.

## DISCUSSION

This study demonstrated that self-management procedures effectively increased writing responses and improved the subjectively assessed quality of children's writing. Self-assessment plus self-recording of responses alone, did not modify writing behavior.

Stories written when reinforcement was contingent on number of different action words received the highest qualitative ratings overall. As the experimental design did not control for order effects, these findings warrant further investigation. Maloney and Hopkins (1973) found that stories written when contingencies required the use of different action verbs were in general rated as more creative than those written when reinforcement was contingent on different adjectives, or on the package of different adjectives, action verbs, and sentence beginnings. The use of action words in written expression could be investigated as a possible lead in specifying components of writing judged to be of commendable quality or creative, particularly as the present results were obtained in a different setting and with dissimilar procedures to those in the Maloney and Hopkins study.

The present study demonstrated that a regular class teacher can be freed from the task of trying to manage specific reinforcement contingencies for each of the 37 children in the class. All self-management procedures were carried out competently and efficiently by the children. Throughout the study, the teacher made no control remarks or other comments of any kind during the 25-min writing period, her only activity in this time being help with spelling for individual children. On the final day of the self-reinforcement for different action words phase, the teacher was absent. Mean rate of responding on the target behavior on this occasion was the same as for the previous day when the teacher was present, and on-task behavior was slightly higher than for the previous day. All procedures were carried out by the children in the usual manner. This single instance lends support to

Table 2

Mean per cent accuracy of children's self-assessment plus self-recording of number of sentences, number of different action words, and number of different describing words, across phases.

| Response | *Self-Ass. + Self-Rec.* | *Self-Reinf. Sentences* | *Self-Reinf. Diff. Action Wds* | *Self-Reinf. Diff. Desc. Wds* |
|---|---|---|---|---|
| No. of sentences | 84 | 86 | 80 | 77 |
| No. diff. action wds | 36 | 24 | 70 | 51 |
| No. diff. describing wds | 21 | 17 | 14 | 63 |

the overall impression that the children could manage their behavior effectively with minimal external supervision.

Treatment procedures were effective despite the fact that self-assessment was frequently inaccurate in an absolute sense, children failing to identify appropriate responses where they were not aware of some of the more abstract differences between target response classes and other classes of words. This was particularly true for describing words, especially adjectives. Future studies should consider providing feedback on the accuracy of self-assessment. Since accurate self-assessment would help subjects to maximize contingent reinforcement, it seems possible that feedback on accuracy could be an effective means of teaching a child to discriminate the dimensions of a required response. In the present study, accuracy of self-assessment of a response tended to improve when reinforcement was contingent on that response.

While there was no direct surveillance of self-reinforcement in the present study, children who deliberately awarded themselves too many points came to attention when discrepancies between the amount of earned time they were observed to take and frequency of responses in their stories were noticed. On this basis, it was observed that the children generally awarded themselves the reinforcement that their self-assessment indicated they were entitled to. This contrasts with the findings of Santogrossi, O'Leary, Romanczyk, and Kaufman (1973), and Felixbrod and O'Leary (1973), but is consistent with that of Knapczyk and Livingston (1973), who found students accurately and honestly maintained records of their own reading performance on which reinforcement was contingent.

Finally, the present study demonstrated that self-reinforcement contingencies applied to academic behavior were correlated with an increase in on-task behavior. Children who were not on-task at times during the writing period, however, were not necessarily being disruptive. They may have been reading a book, an appropriate activity when they had finished what they wanted to write. Sometimes they were observed to be reading through their work silently, or looking at the page or elsewhere, possibly generating ideas that were to be committed to paper.

In the last phase of the study, mean per cent on-task behavior was lower than in the previous two reinforcement phases. However, the rate of responding on the target behavior in each session during this phase was maintained at a level substantially above all previous phases. It was evident that children found they could write a story containing many different describing words in less time than the 25 min available for writing. Also, in this phase children tended to read parts of their stories to those sitting near them, and appeared to enjoy writing elaborate descriptions that were often amusing to others. Such behavior may be considered appropriate where student interaction is seen as contributing to learning (Winett and Winkler, 1972).

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*Received 15 January 1975.*
*(Final acceptance 20 May 1975.)*