*SELF-SELECTION OF STANDARDS BY CHILDREN:
THE RELATIVE EFFECTIVENESS OF PUPIL-SELECTED AND
TEACHER-SELECTED STANDARDS OF PERFORMANCE*

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This study examines the effects of contingent reinforcement under conditions of pupil-selected and teacher-selected performance standards upon pupils' academic response rates. The academic response rate was measured by the number of correct responses emitted per session. Thirty pupils (15 second-graders and 15 third-graders) were randomly assigned to one of three experimental groups, based on matched triplets. One group worked under pupil-selected standards; the second group worked under standards selected by the experimenter with each pupil yoked to a member of the pupil-selected standards groups. Both groups participated in the calculation of their daily earnings. The third group served as a no-contingency control group. Baseline academic response rates on writing and math tasks were determined. During the experimental sessions reinforcement was provided in the form of points which were later traded for tangible rewards. The pupil-selected standards group showed a significantly greater number of correct responses in the writing and math tasks than the externally selected standards group.

DESCRIPTORS: academic behavior, self-management, teacher-imposed contingencies, response rate, elementary school children

Recent evidence indicates that the origins of self-control lie in the environment (Bandura & Walters, 1963; Gewirtz, 1971; Kanfer & Phillips, 1970; Skinner, 1953). Skinner (1953) hypothesized that people control their own behavior in much the same manner as they control the behavior of others, namely, by controlling the consequences of their own behavior. Empirical evidence for Skinner's hypothesis has been a long time coming: Self-management research has grown rapidly only in the last decade. Excellent reviews of this research as applied to children may be found in O'Leary and Dubey (1979) and in Rosenbaum and Drabman (1979).

'Self-management' may be defined as any response made by an individual to maintain or to change his or her own behavior. The conceptual models of Bandura (1971) and of Kanfer (1971, 1975) provide a framework for research in this area. Their framework identifies self-monitoring, self-evaluation, and self-reinforcement as crucial components in any self-management regimen. 'Self-reinforcement' refers to a process by which individuals increase and maintain their own behavior with rewards that they control whenever they attain self-prescribed standards (Bandura, 1976). Self-selection of standards is an integral part of the self-reinforcement process, and the focus of this research.

Self-selection of standards by children has been investigated in several major studies. These studies demonstrate that self-selected standards are at least as effective as externally determined standards imposed by the experimenter or teacher.

Eight studies conclude that self-selected and other-selected standards are equally effective in

The authors express their gratitude to Mr. Donald Emberlin, formerly principal, Rita Erl, Counselor, and the second- and third-grade teachers of Seth Lewelling School, Milwaukie, Oregon, where the study was completed. Point values for each toy and pupil point-total forms may be obtained from the authors upon request. Reprints may be obtained from Carol F. Creedon, Department of Psychology, Reed College, Portland, Oregon 97202.

maintaining performance (Bandura & Perloff, 1967; Brownell, Colletti, Ersner-Hershfield, Hershfield, & Wilson, 1977; Felixbrod & O'Leary, 1973, 1974; Glynn, Thomas, & Shee, 1973; Johnson, 1970; Liebert, Spiegler, & Hall, 1970; Switzky & Haywood, 1974). This was true in both classroom and nonclassroom settings, and for academic, motor, and matching-to-sample tasks. Only one study, based upon a single subject (Lovitt & Curtiss, 1969) found pupil-selected standards to be more effective than teacher-selected standards in maintaining academic performance. Several of the earlier studies were limited by relatively small samples, student(s) from special rather than regular classrooms, the absence of a between-groups design which is unconfounded by potential order effects, too few sessions, or a single task. Three of the studies cited which are particularly pertinent to the present study will be more fully described.

Felixbrod and O'Leary (1973) compared the effects of contingent reinforcement under conditions of self-determined and externally imposed performance standards. Students were tested individually on a math task. Children in the self-determined condition selected standards from a list every session and in this way decided how many correct problems would be worth a point. Points were exchanged for tangible reinforcers daily. The yoked experimenter-determined group was told what standards would be in effect. A no-reinforcement control group was included. The results of this study showed that the self-determined standards were as effective as externally selected standards.

In a later study, Felixbrod and O'Leary (1974) replicated their earlier findings that self- and externally determined academic performance standards are equally effective in the performance of a math task. Again, as in their earlier study, Felixbrod and O'Leary found, in contrast to Bandura and Perloff (1967), that children tend to select lenient performance requirements.

Only one study to date (Lovitt & Curtiss, 1969) provides evidence for the superiority of

self-determined standards over externally determined standards. Their experiment was conducted with one pupil (a 12-yr-old) in a classroom for children with behavioral disorders. The pupil was first exposed to teacher-determined standards, then allowed to select his own standards, and finally teacher-determined standards were once again imposed. Self-determined standards proved to be more effective than teacher-determined standards as measured by the number of correct responses to an academic task.

With regard to the inconsistent findings as to whether children select stringent or lenient standards, it should be noted that Bandura and Perloff's (1967) study in which high standards were initially selected was conducted in a single session, whereas Felixbrod and O'Leary (1973, 1974) observed increasingly lenient standard setting over several sessions.

The present study is a replication of the Felixbrod and O'Leary studies (1973, 1974). Certain procedural changes have been introduced in order to identify the conditions under which self-selection of standards may increase academic performance above that achieved by externally determined standards. The study used a relatively large sample of children (30) enrolled in regular classrooms in a between-groups design over five baseline and five treatment sessions. In addition to a self-selected and a yoked external standards group, a no-contingency control group was included. The study was also designed to permit comparison of the effects of pupil- and teacher-selected standards on two academic tasks, writing and math, in case the effects of self-selection versus other-determination are task related. If this turns out to be the case, such information would have useful applications in the classroom in determining which academic tasks might better be teacher-determined or self-determined so far as standards selection is concerned. These particular tasks were chosen because they are universally incorporated into daily school work. Finally, sessions were conducted in small groups rather than individually to conform more closely to a classroom situation.

On the basis of procedural changes in the Felixbrod and O'Leary studies (1973, 1974) and the results of the Lovitt and Curtiss study (1969), it was predicted that: (a) the total number of correct responses in writing and math tasks would increase significantly above baseline for the pupil-selected standards group and for the teacher-selected standards group, (b) the pupil-selected standards group would increase its total number of correct responses above that of the teacher-selected standards group, and (c) the no-contingency control group would show no significant change in performance between baseline and experimental sessions.

METHOD

Pupils

The participants were 30 children, 19 boys and 11 girls, drawn from three regular classrooms for a lower middle-class public school. There were 15 second-grade and 15 third-grade children.

The 30 children were divided into 10 groups of three pupils, each group matched on grade level, abilities in math and writing, according to teachers' judgments, and by sex. The three children within each group were randomly assigned to either an experimental or a control group.

Procedure

Each of two experimental groups and one control group contained 10 pupils. These groups consisted of (a) a pupil-selected standards group (PS) whose members chose their own standards, (b) a teacher-selected standards group (TS), and (c) the no-contingency control group (NCC). The second group was termed the teacher-selected group because the experimenter (E.A.D.) was introduced as a "teacher." Each member of this group was yoked to a member of the first group. Thus, the experimenter specified the standards (which had previously been selected by a pupil in the first group) for each yoked pupil in the second group. The first two groups participated daily in the calculation of their point earnings.

Baseline phase. All sessions were conducted in small groups of five in a utility room provided by the school. The pupils sat at a table and were instructed to work on their writing for the first 10 min of each 20-min baseline session. The writing exercises were long enough to ensure that the children could not complete the task before the end of 10 min. The experimenter collected the papers at the end of 10 min and distributed each child's math packet. The children then worked on their math exercises for 10 min and returned them to the experimenter at the end of the session.

Throughout the entire study, the experimenter sat at a table facing away from the children in order to minimize extraneous experimenter influence. The experimenter corrected other children's papers during each session and made no verbal comments or eye contact with the pupils.

The children's papers from one group were corrected during the next group's session and then returned, so that the pupils obtained feedback about their performance within 25 min. Writing exercises were corrected by counting the number of correct words written. The experimenter wrote at the top of the page "(#) words correct." For the math exercises the number of problems correct were counted. The experimenter indicated the number of correct problems by writing at the top of the first page of work "(#) problems correct." The correction procedure was explained to the children prior to the first session.

Each 10-min baseline session for every group was conducted according to the above procedure. The baseline phase lasted for 5 days.

Experimental phase. After completing the baseline phase, each pupil was brought to the experimental room to talk privately with the experimenter. Each pupil in the no-contingency control group was told the following:

I would like to thank you very much for helping me so far. We are going to keep doing what we've been doing for the next five days. My teacher told me that she might be able to

give me some prizes to give to all the kids who are helping me when I'm all finished, but I don't know for sure yet. Do you have any questions?

Prizes were mentioned to the no-contingency control group pupils so that they would not be surprised if other children in their class, but not in their own group, mentioned prizes.

For the other two groups, the prizes that would be available to the children were displayed on the table. In front of each display of toys, a card was placed indicating the point value of each toy ranging from 1 to 20 points.

All these pupils were privately told the following:

I would like to thank you very much for helping me so far. We are going to keep doing what we've been doing for the next five days. My teacher wanted to help thank you for helping me so she gave me some toys to give to the kids. I don't have enough though to give everybody one of everything so I thought up a good way to divide the toys. I will give you points for the work you do here, and then you can spend your points like money to get the prizes you want.

The experimenter then named each toy and its point value for each pupil.

Still in private the experimenter told the following to the pupils in the pupil-selected standards group (PS) after the first part of the instructions:

So now we need to decide how many words correct should be worth how many points, and how many math problems right should be worth how many points. What do you think would be best? How many words and how many points do you think it would be worth? (Wait for oral response.) Okay. How many math problems should be worth how many points? (Wait for oral response.) Okay. Let's write that down on a piece of paper, so we can remember what you said and keep track of the points you've earned.

A simple point-total form summarizing each

day's "earnings" was shown to each child and explained in detail.

The pupils in the teacher-selected group (TS) received the same explanation as the PS group except that they were told what their standards would be throughout the five experimental sessions. (These standards varied because each pupil in the TS group was yoked to a pupil in the PS group.)

The five experimental sessions were conducted in the same manner as during baseline with 10 min of writing and 10 min of math without interruption by the experimenter. Each pupil in the PS and TS group was shown his or her point-total sheet and the experimenter read the standards to each child privately before they entered the experimental room. The papers were corrected by the experimenter in the same manner as during baseline. Upon returning the papers to the PS and TS pupils 25 min later, the experimenter asked each pupil to help figure out the number of points earned for that day and then add it to the previous day's total. The experimental phase lasted for 5 days.

The day after the fifth experimental session, the pupils were once again brought individually into the experimental room and allowed to choose prizes. There were enough prizes to ensure that every child had access to all toys and could spend all accumulated points. Each child's choices were placed in a paper bag and given to the classroom teacher to be distributed at the end of the day.

RESULTS

Baseline and experimental measures of academic response rates were obtained on the 30 children who participated in this study. The academic response rate was defined as the number of correct responses emitted during the 10-min period per session for each task.

The following planned comparisons were used in the analysis of the results: (a) a baseline vs. experimental contrast of each of the three groups (pupil-selected and teacher-selected stan-

dards, and the no-reinforcement control), and (b) a contrast of the pupil-selected vs. the teacher-selected groups in the experimental phase. The error terms used in the comparisons were those recommended by Keppel (1973) for a two-factor repeated measures analysis of variance. A one-way analysis of variance found no significant differences among the three groups during baseline for the number of correct responses on either academic task.

Academic response rate for writing. The pattern of results was as predicted. Both the pupil-selected standards group, $F = 222.42$; $df = 1, 9$; $p < .001$, and the teacher-selected standards group, $F = 13.34$; $df = 1, 9$; $p < .01$, showed significant increases in the mean number of correct responses in the experimental phases above their baseline rates. Also as predicted, the pupil-selected standards group obtained significantly more correct responses to the writing tasks than the teacher-selected standards group, $F = 112.07$; $df = 1, 27$; $p < .001$. There was no significant change in the number of correct responses for the no-contingency control group, $F = 1.37$; $df = 1, 9$; $p > .05$.

Academic response rate for math. As predicted, the pupil-selected standards group showed a significant increase in correct math responses in the experimental phase over baseline,

Table 1

Mean number of correct responses to writing and math tasks by experimental and control groups.

Group	Phase	Writing		Math	
		M	SD	M	SD
PS	Baseline	26.02	1.61	5.48	2.28
	Experimental	40.26	4.36	15.52	1.76
TS	Baseline	27.88	2.53	7.66	.96
	Experimental	31.64	3.06	9.16	1.96
NCC	Baseline	28.28	4.34	5.86	1.32
	Experimental	26.22	1.65	4.92	1.34

Note: Each of the groups of 10 children who participated in this experiment worked under one of three conditions: pupil-selected standards (PS), teacher-selected standards (TS), or no-contingency control (NCC).

Table 2

Analysis of variance: Baseline vs. experimental contrasts.

Source	SS	df	MS	F
A. Baseline vs. Experimental Comparisons of Writing Performance				
PS group	1013.89	1	1013.89	222.34**
error	41.03	9	4.56	
TS group	70.69	1	70.69	13.34*
error	47.68	9	5.30	
NCC group	21.22	1	21.22	1.37
error	139.80	9	15.54	
B. Baseline vs. Experimental Comparisons of Math Performance				
PS group	504.01	1	504.01	14.26*
error	317.92	9	35.32	
TS group	11.25	1	11.25	1.74
error	58.29	9	6.48	
NCC group	4.42	1	4.42	1.61
error	24.64	9	2.74	

* $p < .01$.

** $p < .001$.

$F = 14.26$, $df = 1, 9$; $p < .01$, and exhibited a significantly higher number of correct responses than the teacher-selected standards group, $F = 275.99$, $df = 1, 27$; $p < .001$. Contrary to prediction, the increase in the number of correct responses to math problems shown by the teacher-selected standards group was not significant, $F = 1.74$, $df = 1, 9$; $p > .05$. There was no significant change in the number of correct responses from baseline to experimental condi-

Table 3

Analysis of variance: Pupil-selected vs. teacher-selected contrasts in experimental condition.

Source	SS	df	MS	F
A. Pupil-selected vs. Teacher-selected Comparisons of Writing Performance				
PS vs. TS	61,978.00	1	61,978.00	112.07**
error	14,931.82	27	553.03	
B. Pupil-selected vs. Teacher-selected Comparisons of Math Performance				
PS vs. TS	15,696.44	1	15,696.44	275.99**
error	1,535.59	27	56.87	

* $p < .01$.

** $p < .001$.

Fig. 1. Daily mean number of correct responses in writing and math for the experimental and control groups.

tions for the no-contingency control group, $F = 1.61$, $df = 1, 9$; $p > .05$.

Selection of Standards

The mean standard selected by the PS group was 2.4 correct words required for 1 point in writing, and 1 correct problem required for 1 point in math. The children selected standards that ranged from 5 correct words required for 1 point to only $\frac{1}{2}$ correct word for 1 point in writing, and from 2 correct problems for 1 point to only $\frac{1}{2}$ correct problem for 1 point in math. Thus, pupil-selected standards were more stringent for writing tasks than for math.

The groups varied considerably in the mean number of points earned during the five sessions of the experimental phase (see Table 4).

Mean Number of Correct Responses

The mean number of correct responses in writing and math for each baseline and experimental session for each of the three groups is presented in Figure 1.

Individual Results

All three groups showed great variation among pupils in the number of correct responses during baseline and experimental sessions for each task. In the PS group, 9 out of the 10 children increased over baseline by more than 50 correct words compared with the TS and NCC groups in which only one, and no children, respectively, showed a similar increase. In the PS group, 7 out of 10 children increased over base-

Table 4

Mean points earned in writing and math by experimental and control groups.

Group	Writing		Math		Total	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
PS	93.1	44.9	103.8	81.5	196.9	76.8
TS	65.8	43.9	56.0	38.1	121.8	67.7
NCC	...	...	...	...	...	...

line by more than 25 correct math problems compared with TS and NCC groups in which only one, and no children, respectively showed a similar increase.

DISCUSSION

The present investigation provides the first demonstration of the greater effectiveness of self-selected vs. teacher-selected standards on academic performance, except for the single subject research of Lovitt and Curtiss (1969). The superiority of pupil-selected standards was found for both writing and math tasks. The fact that this study demonstrates the greater effectiveness of self-selected standards in contrast to previous research (Brownell, et al., 1977; Felixbrod & O'Leary, 1973, 1974; Glynn, Thomas, & Shee, 1973; Johnson, 1970; Liebert, Spiegler, & Hall, 1970; Switzky & Haywood, 1974), with the exception of Lovitt and Curtiss (1969), may be attributed to differences in (a) experimental design and (b) procedures.

One difference between the present study and some of the earlier studies was the use of the between-groups design which prevented possible confounding by order effects. These effects may have weakened the influence of self-selected standards in some past studies.

Another procedural difference between this study and some of the earlier studies is the way in which students' academic abilities were determined. Ability assessment (in math and writing) was made by teachers' ratings (average, below, and above average) rather than by means of objective tests. Although the reliability of the teachers' ratings was not determined, we believe

them to be equally or more reliable than the more commonly used short tests, since the teachers based their judgments on daily contact with the pupils for 8 mo prior to the experiment.

A major procedural difference in the present study was permitting the children in the PS group to select standards from an unlimited range of possibilities rather than choosing them from a fixed range provided by the experimenter, as is often done in other studies. The novelty of being able to choose standards for themselves from an unlimited range may explain the higher performance rates achieved by these children. Finally, Felixbrod and O'Leary (1973, 1974) left the room while the children set standards and worked on their math tasks, and gave them permission to stop and leave when they wished to do so. Neither of these procedures was used in the present study. This difference in degree of social surveillance may have affected both standard setting and work output in favor of the more stringent standards and greater productivity found in the present study. The combination of a novel situation and an increase in social surveillance may explain the significant increase in the academic response rate for the children who selected their own standards when compared with children in the teacher-selected standards group.

A final procedural difference in the present study is that pupils worked on their tasks in small groups of five rather than individually, as in most of the other studies. Modeling influences may have influenced performance in all three groups, although not in the selection of standards because these were determined in the presence of the experimenter alone. Informal observations during the present study suggest that social facilitation may be a significant factor in promoting the efficacy of self-selected standards over other-selected standards. Members of the PS group increased their verbal criticism of each other for off-task behavior once standards were in effect. Off-task behavior was criticized by such statements as, "Can't you be quiet? We're supposed to be working," and "Leave me alone. I

want to work." An increase in self-praise was also observed in two of the five children in this group. These verbal behaviors may have contributed to the increased output above that in the other groups in which such verbal behavior did not occur. Whether self-selection of standards produced these phenomena cannot be determined from the present data. If the changes that occurred in the verbal interactions of the PS group were a result of the self-selection of standards, this procedure appears to increase self-praise and to decrease tolerance of inappropriate academic behavior in peers. If so, these may be significant "fringe benefits" of self-determined standards. Also, these "fringe benefits" could have led to an increase in the amount of social facilitation occurring in the PS group.

In addition, the children's attitudes towards the standards, whether self-selected or other-selected, may have contributed to the results of the present study. Children in the PS group may have felt a greater commitment to the standards they worked under because they chose them for themselves from an unlimited range of possibilities. Children in the TS group may have felt they were treated "unfairly" because of the different performance standards imposed upon this group. These standards may have been perceived as more stringent than the ones their peers received. This attitude could account for the lack of improvement in the performance of the TS group in contrast to that normally found in contingency reinforcement programs. These possible attitudinal differences need to be explored in postexperimental interviews in future research.

It is unlikely that population differences can account for the difference between the present findings and those reported by previous investigators because most of the samples studied, including the present sample, have been lower middle class, white second- and third-graders of average intelligence.

Because the experimenter who supervised the setting of standards was not blind to the experimental hypotheses, her expectations that the self-selected standards group would do as well

or better than the teacher-selected standards group may have biased the responses of the children. However, the experimenter avoided making any comments during individual standard-selection by the PS group, and avoided comments and eye contact during work periods.

An unexpected finding in the present study was the mean standard selected by the PS group of 2.4 correct words for each point, and 1 correct math problem for each point. These standards may be regarded as stringent, in terms of the stringency instructions given by Brownell et al. (1977) to their students to give themselves one, two, or three problems out of a possible 10. The selection of stringent standards by the pupils in the present study was surprising in view of Felixbrod and O'Leary's findings (1973, 1974) that children tend to select lenient standards. However, in the present study the experimenter did not leave the room during standard setting, and the children were allowed to set standards only once. These procedural differences may account for the selection of more stringent standards which may have contributed to the superiority of self-selected vs. teacher-selected standards in the present study. This is consistent with the finding of Brownell et al. (1977) that children working under self-selected stringent standards performed significantly better over time than children working under self-selected lenient standards.

The results of the present study suggest that one of the procedures sometimes used (Felixbrod & O'Leary, 1973, 1974) to demonstrate the efficacy of self-selected standards may be unnecessary, and possibly detrimental, i.e., the opportunity to select new standards at the start of every session. Another procedure employed by Felixbrod and O'Leary, namely, the daily exchange of points for toys and prizes, may be unnecessary. The results presented here suggest that points alone may provide sufficient back-up reinforcement if the tangible rewards are clearly in view throughout, even for second- and third-graders without any prior exposure to a token economy.

Future research should systematically compare the effects of self-selected standards on children's work in a small group setting vs. working alone. Aside from the social facilitation that may be provided by the small work group, this setting should be studied further because it is somewhat closer to the regular classroom than is working alone. This is part of the larger research question of identifying the conditions under which self-selected standards are more effective than externally selected conditions. In addition, research on the possible relationships between the self-selection of standards and self-praise may help to clarify how self-selected standards increase academic performance.

Self-selected standards, under certain conditions, are superior to externally imposed standards in their effects on children's performance of academic tasks. The task remains to determine how children can be taught to establish and maintain appropriate standards in regular classroom settings.

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Received October 11, 1979

Final acceptance April 14, 1981