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INTERNAL-EXTERNAL LOCUS OF CONTROL, PERCEPTION
OF TEACHER INTERMITTENCY OF REINFORCEMENT
AND ACHIEVEMENT

THESIS

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This study measured the relationships between locus of control, students' perception of the schedule of teacher reinforcement, and academic achievement. The Intellectual Achievement Responsibility questionnaire, Perception of Teacher Reinforcement scale, and Wide Range Achievement Test were used to measure these variables. All subscores of the Intellectual Achievement Responsibility questionnaire correlated significantly with achievement for the females, but no relationships were found for the males. Perception of the teacher as partially rewarding was significantly correlated with reading, spelling, and total achievement for the males, and with reading and arithmetic achievement for the females. Perception of the teacher as partially punishing was significantly correlated with arithmetic achievement for the males, but was not related to achievement for the females.

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INTERNAL-EXTERNAL LOCUS OF CONTROL, PERCEPTION
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Locus of control has been defined as follows:

. . . internal control refers to the perception of positive or negative events as being a consequence of one's own actions and thereby under personal control; external control refers to the perception of positive or negative events as being unrelated to one's own behaviors in certain situations and thereby beyond personal control (Lefcourt, 1966, p.207).

The relationship between this concept of controlling one's own reinforcement and academic achievement has been established in many previous studies. Children who feel as though increased academic effort will result in better grades and positive recognition from teachers and parents are likely to work harder in the classroom, and therefore achieve at a higher level. Many studies have found statistically significant relationships between locus of control and various measures of achievement. These results differed greatly depending on the sex and age of the subject. Examples of related findings were offered in a study by Crandall, Katkovsky, and Crandall (1965), who used the Intellectual Achievement Responsibility questionnaire [IAR] as their locus of control measure. Their subjects were males and females, grades three to twelve. These authors found significant relationships between total Intellectual Achievement Responsibility scores

and achievement test scores and school grades for both sexes in third, fourth, and fifth grade students. Acceptance of responsibility for successes was correlated with achievement and school grades for females in grades three and four. Acceptance of responsibility for failures was correlated with achievement and school grades for fifth grade males. In sixth, eighth, tenth, and twelfth grades, locus of control scores were only occasionally related to achievement test scores, with no consistent patterns emerging. School grades were consistently related to locus of control in these upper grades. The authors noted that different achievement tests used at lower and upper grade levels may have been responsible for differing correlations to locus of control.

The above study also found interesting contrasts between males and females with regard to development of locus of control. Most aspects of responsibility for one's own behavior were already established by third grade, with only slight increases after this age in acceptance of responsibility for both successes and failures. From grade six on, girls gave more self responsible answers on the locus of control questionnaire than did boys. By sixth grade girls had already assumed greater responsibility for negative events than boys achieved by twelfth grade. Girls then continued to increase in responsibility for negative events from sixth to twelfth grade. Between the tenth and twelfth grade boys actually showed a significant decrease in assumption of responsibility.

for positive events. This study suggests that responsibility for failures is more stable across time than is responsibility for successes. The above results led the authors to conclude that assumption of responsibility for positive and negative events may be learned separately, rather than as the inverse of one another as was previously assumed. Finally, the study suggests that locus of control is at its best as a predictor variable in situations where the task is within the ability of most students, and motivation accounts for a large percentage of the difference in performance.

A recent study by Nowicki and Segal (1974) also found differences in prediction of achievement on the basis of locus of control. These authors used the Nowicki and Strickland I-E Scale (Nowicki and Strickland, 1973) as their locus of control measure. Using high school seniors, they found that internality was associated with higher achievement test scores for the boys and with greater frequency of extracurricular activities and higher school grades for the girls. The authors theorized that while males gain greater achievement potential from an internal orientation, because of sex role expectancy, the females gain greater social competence. This is also reflected in females' grade point averages, which indicate not only assimilation of knowledge, but also an awareness of social behaviors in the classroom which lead to good grades.

Analogous findings were presented in a study by Clifford and Cleary (1972). Their locus of control instrument was the Academic Achievement Accountability scale, which discriminates

between children's belief in self accountability for academic reinforcement and their belief in no accountability or fate as the determinant of reinforcement. Using fourth, fifth, and sixth graders as subjects, they discovered that self accountability was positively correlated with achievement for the boys, and that this relationship was frequently stronger than that between achievement and I.Q. However, for the girls, self accountability frequently had no relationship to achievement, while the relationship between I.Q. and achievement was consistently strong.

Several other studies have discussed the value of locus of control as a predictor of academic success. In a 1972 study with fourth grade students, Messer discovered a positive relationship between internality and various measures of achievement. His locus of control measure was the Intellectual Achievement Responsibility questionnaire. This study also indicated that acceptance of responsibility for successes was the better predictor of achievement for the boys, while acceptance of responsibility for failures was the better predictor for girls.

Another study by Buck and Austrin (1971) which used the Intellectual Achievement Responsibility questionnaire as the measure of locus of control focused on the relationship between locus of control and achievement with a group of eighth grade Negro students, whose schools had been designated "poverty level". They found a general relationship between internality and adequate achievement. Responsibility for successes

followed general predictions of previous research in that it was related to achievement for both sexes. However for boys, responsibility for failures made no contribution to prediction of achievement, while adequately achieving girls were significantly higher in responsibility for failures than were under achieving girls.

It should be noted that nearly all of the studies in this field have taken their achievement scores from standardized tests of achievement. The problem with this method is that locus of control may also affect achievement test performance, determining whether or not a child will do his best on such a task. It has been demonstrated that children with an internal orientation use their time more wisely because they see a greater chance for success (Gozali, Cleary, Walster, and Gozali, 1973). They would therefore tend to do better on achievement tests, not because they are more advanced academically, but because they put down more of what they know on the test protocol within the allotted time. Such factors may greatly distort the results obtained in a study of this type, and lead one to believe that obtained differences in achievement test performance are real; actually, they may be the result of different test taking attitudes.

Several variables have been isolated which may influence the child's locus of control. One of these is parental disciplinary practices. Katkovsky, Crandall, and Good (1967) hypothesized that positive reinforcers cause a child to maximize the possibility that he caused the event, while negative

reinforcers encourage the child to deny responsibility. They also discovered that negative parental behaviors such as dominance, rejection, and criticism were negatively correlated with an internal locus of control.

Another variable which might affect achievement and/or locus of control is the schedule under which a child is reinforced, either positively or negatively. Most standard learning texts (e.g. Deese, 1958) quote schedules of reinforcement which facilitate acquisition and maintenance of learned responses in the laboratory setting. Schedules involving intermittent or partial reward have typically produced considerable response persistence, while schedules involving intermittent punishment have produced persistent response suppression.

There are some instances in which this partial reinforcement effect does not appear to hold. The James and Rotter (1958) study disclosed surprising relationships between locus of control and reinforcement schedules. In this study 100 per cent [continuous] reinforcement and 50 per cent [intermittent] reinforcement were contrasted under two conditions. The first group was told that reinforcement was dependent upon skill [analogous to an internal locus of control]. The second group was told that only chance would determine reinforcement [analogous to an external locus of control]. In actuality, both groups of subjects were reinforced on a chance basis. Different groups of subjects were

used for the four possible combinations of variables [continuous reinforcement vs. intermittent reinforcement, and skill instructions vs. chance instructions]. The authors discovered that the extinction curves of subjects reinforced under chance instructions followed the predictions of standard learning theory; subjects under 100 per cent reinforcement extinguished more rapidly than did subjects under 50 per cent reinforcement. However, subjects learning under skill instructions did not follow the same pattern. In these groups the usual superiority of intermittently reinforced subjects in resistance to extinction was not present. The 100 per cent reinforcement group was slightly more resistant, although this trend did not reach significance. Results of this study suggest that there is an interaction between schedule of reinforcement and perceived locus of control.

A review of the existing literature turned up no replications of the interesting results obtained in this study. Neither were any similar studies found in which the interaction of these variables with children in a natural setting was measured. This paper will deal with the effects of locus of control and perceived schedule of teacher delivered reinforcements for academically positive and negative behaviors in a natural setting, the school.

Method

Subjects

The subjects were 108 fourth, fifth, and sixth grade students enrolled in a public elementary school in suburban Sacramento, California. Table 1 shows the breakdown of subjects by grade and sex.

Table 1
BREAKDOWN OF SUBJECTS BY SEX AND GRADE

| Grade | Females | Males | Total |
|-------|---------|-------|-------|
| 4 | 24 | 21 | 45 |
| 5 | 16 | 15 | 31 |
| 6 | 21 | 11 | 32 |
| Total | 61 | 47 | 108 |

Almost one third of the subjects were children of minority descent; these included 26 Negro children, and 7 children of Mexican ancestry. The population of this school comes primarily from lower and lower-middle income families. It is an open space school, with much of the instruction conducted in small, informal groups.

Instruments

Three instruments were used. The Wide Range Achievement Test measured academic achievement. This test is widely used for individual and small group testing in the school systems.

It consists of three sections. These are reading recognition, spelling, and arithmetic computation. Level I, the section for children 12 years of age and under, was given to all children in this study.

Test-retest reliability for the Wide Range is given in the test manual (Jastak and Jastak, 1965). Correlations range from .92 to .98 for the reading and spelling sections, and from .85 to .92 for the arithmetic test. Validity correlations were generally adequate, falling in the .70 to .80 range when the Wide Range was correlated with other measures of achievement such as teacher's ratings, grades, and comparable sections of the New Stanford Achievement Test.

The Individual Achievement Responsibility questionnaire measured locus of control. This scale was developed by Crandall, Katkovsky, and Crandall (1965), and has been widely used by these and other authors to assess locus of control in intellectual-academic situations. It consists of 34 forced choice items. Each presents an instance in which a child may be either rewarded or punished within the school context. The child is asked to choose from two alternatives, one internal and the other external, the one that best describes his explanation of the reason he received the reward or punishment. The scale is scored for number of responses which indicate internal control. Three scores are obtained: the total number of internal responses to positive events, the total number of internal responses to negative events, and the total number of both positive and negative internal responses.

Test-retest reliability with middle grade school children for the Intellectual Achievement Responsibility questionnaire has ranged from .66 to .74, depending upon which subscore is under consideration (Crandall, et al., 1965). The same type of reliability data for older subjects is somewhat lower. With regard to validity, there are some indications that the Intellectual Achievement Responsibility questionnaire is measuring a different set of variables than are other locus of control measures (MacDonald, 1971).

The third scale, Perception of Teacher Reinforcement, was developed by this author. It measures the child's perception of the schedule of teacher delivered reinforcement. Each item stem describes either an academically positive or an academically negative behavior in which a child might engage in school. The child is asked to indicate whether the teacher continuously or intermittently dispenses rewards for the academically positive behaviors and punishments for the academically negative behaviors. The two alternatives indicate either partial reinforcement or continuous reinforcement. The following is a sample test item:

When a student does not finish class work on time, the teacher:

- A. usually gives him a bad grade.
- B. sometimes gives a bad grade, and sometimes does not.

The scale is scored in the direction of partial reinforcement so that three subscores are obtained. These are

Partial Reward, the number of items dealing with rewards that were answered in the more intermittent direction, Partial Punishment, the items dealing with punishment which were answered in the more intermittent direction, and Partial Total, indicating the total number of questions answered with the more intermittent response.

Procedure

Testing was completed during the fall semester of the school year. The Intellectual Achievement Responsibility questionnaire and Perception of Teacher Reinforcement scale were administered in December, just prior to the holiday recess. These two scales were given to each class as a group. The Intellectual Achievement Responsibility questionnaire was given first, then followed a day or two later by the Perception of Teacher Reinforcement scale. Due to low reading skills of some students, the scales were read aloud by the examiner. Each student was given a copy of the questionnaire so that he could follow along as the questions were read. Students were also given a separate answer sheet on which to mark their responses. Before the scales were administered, the teacher left the room and the children were told by the examiner that their answers would be used for research purposes only, and would not be shown to their parents or teachers.

All sections of the Wide Range Achievement Test were administered in January, immediately following the holiday recess. First each child was given the reading subtest, individually. Then the spelling and arithmetic sections were administered in

one session to groups of no more than 10 children at a time, following directions for group administration given in the Wide Range testing manual. Make up sessions for children who were absent during administration of the Intellectual Achievement Responsibility questionnaire, Perception of Teacher Reinforcement scale, and reading subtest were provided on days that the spelling and arithmetic tests were given.

Results and Discussion

Table 2 contains the means and standard deviations of all variables separately for the males and females of the sample. Wide Range Achievement Test scores are expressed in standard scores with a mean of 100 and a standard deviation of 15.

TABLE 2
MEANS AND STANDARD DEVIATIONS OF VARIABLES

| | Males | | Females | |
|---|-------|--------------------|---------|--------------------|
| | Mean | Standard Deviation | Mean | Standard Deviation |
| Wide Range | | | | |
| Reading | 98.68 | 19.29 | 100.02 | 17.29 |
| Spelling | 90.89 | 13.07 | 96.13 | 13.77 |
| Arithmetic | 89.68 | 8.20 | 92.26 | 10.83 |
| Total | 93.09 | 12.22 | 96.14 | 12.37 |
| Intellectual Achievement Responsibility | | | | |
| Positive Events | 12.94 | 2.17 | 12.95 | 1.75 |
| Negative Events | 10.28 | 3.21 | 11.28 | 2.60 |
| Total | 23.21 | 4.08 | 24.23 | 3.51 |
| Perception of Teacher Reinforcement | | | | |
| Partial Reward | 5.77 | 2.47 | 5.34 | 2.55 |
| Partial Punishment | 6.09 | 2.66 | 7.49 | 3.21 |
| Total | 13.30 | 3.78 | 15.16 | 4.70 |

Table 3 contains the intercorrelations among the variables with the sample broken down by sex. Correlations for females are presented above the diagonal, while correlations for males are presented below the diagonal.

There were no significant relationships among any of the Intellectual Achievement Responsibility questionnaire subscores and achievement measures for the males. In contrast, all correlations of these scales with achievement measures reached significance for the females. There was no relationship between acceptance of responsibility for positive events and acceptance of responsibility for negative events for the males, while this correlation did reach significance for the females.

A review of the current literature reveals no clear-cut pattern of relationships between locus of control scales and achievement measures. Crandall, et al. (1965), using the Intellectual Achievement Responsibility questionnaire, found acceptance of responsibility for successes unrelated to achievement for fifth grade males, findings analogous to those obtained in the present study. However, using the same locus of control measure, Kinley (1973), Messer (1972), and Buck and Austrin (1971) each found positive relationships between locus of control and achievement for sixth, fourth, and eighth grade males, respectively. Buck and Austrin (1971) failed to find a relationship in males between acceptance of responsibility for failures and achievement, as did the present study. Kinley (1973) and Crandall, et al. (1965)

TABLE 3

INTERCORRELATIONS OF VARIABLES

| | Wide Range Achievement Test | | | Intellectual Achievement Responsibility | | | Perception of Teacher Reinforcement | | |
|---|-----------------------------|--------|--------|---|-------|-------|-------------------------------------|---------|-------|
| | Rdg. | Spell. | Arith. | Pos. | Neg. | Total | Reward | Punish. | Total |
| Wide Range Reading | .49** | .86** | .94** | .38** | .23* | .36** | .24* | .06 | .20 |
| Spelling | .59** | .53** | .91** | .44** | .28* | .43** | .16 | .04 | .14 |
| Arithmetic | | .53** | .67** | .28* | .36** | .42** | .31* | .08 | .26* |
| Total | .97** | .58** | .32* | .42** | .32* | .45** | .26* | .06 | .21* |
| Intellectual Achievement Responsibility | | | | | | | | | |
| Positive Events | .06 | .02 | .12 | .05 | .28* | .71** | .15 | .13 | .17 |
| Negative Events | -.02 | -.06 | .06 | -.02 | .11 | .88** | .14 | .05 | .12 |
| Total | .01 | -.04 | .13 | .01 | .62** | .85** | .18 | .10 | .17 |
| Perception of Teacher Reinforcement | | | | | | | | | |
| Partial Reward | .37* | .29* | .21 | .34* | .17 | .07 | .31* | .85** | .76** |
| Partial Punishment | .21 | .07 | .30* | .21 | .07 | .01 | .10 | .76** | .76** |
| Total | .40** | .25 | .35* | .37** | .14 | .06 | .76** | .72** | .72** |

Note. -- Correlations for males presented below the diagonal, for females above the diagonal.

* - Significant at the .05 level, two tailed test.

** - Significant at the .01 level, two tailed test.

did discover significant relationships between acceptance of responsibility for failures and school achievements for males. Nowicki and Segal (1974) and Clifford and Cleary (1972) who studied twelfth graders and fourth, fifth, and sixth graders, respectively, each found a relationship between total level of internality and objective achievement test scores for the males.

Most of the studies listed above also report contradictory results with regard to the prediction of the achievement behavior of females from locus of control measures. Three studies found no relationship between locus of control and academic achievement for the females (Nowicki and Segal, 1974; Clifford and Cleary, 1972; and Kinley, 1973). Another study (Messer, 1972) showed achievement to be related to acceptance of responsibility for failures for fourth grade girls, and not to responsibility for successes. Still another (Crandall, et al., 1965) obtained exactly the opposite results for girls of the same grade level. The present study did replicate the findings of Buck and Austrin (1971). These authors used the Intellectual Achievement Responsibility questionnaire as their locus of control measure with eighth grade Negro girls from predominantly low income families. In both studies, achievement measures were related to each of the locus of control subscores at a significant level.

Contradictory results listed in the above studies may

have been due to varying types of subjects. The socialization process and sex role expectancy may vary according to region of the country, ethnic group, and socioeconomic status. An example of possible effects of the above listed variables is the contrast between results of the present study and those of Kinley (1973). Subjects in the Kinley (1973) study were almost exclusively white and middle class. In this study locus of control was related to achievement for the males only. Subjects in the present study, in contrast, were almost exclusively of lower or lower-middle class, and a large proportion of the subjects were of minority descent. The results of the present study were exactly opposite to those of Kinley (1973); locus of control was related to achievement for the females only.

The Perception of Teacher Reinforcement scales did have a significant relationship to achievement for the males. For both males and females, reading and total achievement were significantly correlated with perception of the teacher as intermittently rewarding. There was a trend in this direction for arithmetic, which reached significance for the females, but not for the males. Perception of the teacher as partially punishing was significantly related to arithmetic achievement of males, with a trend in this direction for reading which did not reach significance. Perception of the teacher as partially punishing was not significantly related to any achievement measures for the females. The

partial total score was significantly related to arithmetic and total achievement for both sexes, and to reading achievement for the males.

In this study intermittent reinforcement was positively correlated with achievement, a finding consistent with previous research dealing with the effects of intermittent reinforcement. Results of this study are consistent with the hypothesis that teachers who intermittently reward positive academic behaviors and punish negative academic behaviors create greater persistence in positive behavior and more persistent suppression of negative behavior in their pupils. Examples of positive academic behavior sampled by the Perception of Teacher Reinforcement scale include turning in homework, attending to the teacher, finishing work on time, doing extra work, and helping other students. Examples of negative academic behavior sampled by this scale include failure to turn in homework, losing a book or homework paper, disturbing others in the class, starting a fight with another student, and failure to attend to the teacher. Increased persistence of positive academic behaviors and more persistent suppression of negative academic behaviors are assumed to lead to increased achievement in the pupils, which is reflected in the achievement test scores.

It should be noted that only intermittent reward was significantly related to achievement for the girls, while both intermittent reward and intermittent punishment were related

to achievement for the boys. A possible explanation is that, due to previous reinforcement history, girls enter the classroom with fewer negative behaviors than do boys, and therefore require mostly positive reinforcement to maintain desired academic behavior. In the case of boys, however, the teacher must not only maintain desired behaviors with positive reinforcement, but also must suppress undesirable behaviors with negative reinforcement.

Results of the Perception of Teacher Reinforcement scale suggest that intermittent teacher reinforcement may be more efficient in maintaining persistent positive academic behaviors and in producing persistent suppression of negative academic behaviors than is continuous reinforcement. Schedules, intermittent or continuous, should of course be contingent. Results of the Kinley (1973) study suggest that non-contingent punishment may lead to reduced achievement, at least for males.

The lack of correlation between the Perception of Teacher Reinforcement scale and Intellectual Achievement Responsibility questionnaire suggests that these instruments are measuring different constructs, and that each makes a unique contribution in assessment of the child's perception of the academic situation. This lack of correlation fails to support the findings of James and Rotter (1958), whose results suggest that the two variables may be inter-related.

Implications for future research in this area are numerous. The relationship of actual teacher schedules of reinforcement to the students' perception of the reinforcement schedule would be valuable in validation of the Perception of Teacher Reinforcement scale. A study, similar to the present one, but controlling race and social class effects, would aid in clarification of the effects these variables may have had in the present study. It would also be useful to determine the relationship between the child's perception of the teacher as intermittently reinforcing, and his perception of the teacher as contingently reinforcing.

APPENDIX

Perception of Teacher Reinforcement Scale

1. When a student does not finish class work on time, the teacher:
 A. usually gives him a bad grade.
 B. sometimes gives a bad grade, and sometimes not.
2. When a student does extra work, the teacher:
 A. almost always gives him a good grade.
 B. might give him a good grade, but not always.
3. If a student reads the wrong pages in the book for a class assignment, the teacher:
 A. sometimes gives him a bad grade, but not always.
 B. almost always gives him a bad grade.
4. When a student helps another child who is having trouble with a project, the teacher:
 A. usually smiles at him.
 B. might smile at him, but might not.
5. If a student promises to do a job and does not finish it, the teacher:
 A. frowns sometimes, but may not do anything.
 B. usually frowns at him.
6. When a student does not make any trouble in class, the teacher:
 A. almost always smiles at him.
 B. smiles sometimes, but not always.

7. When a student answers a question wrong, the teacher:
_____ A. usually corrects him.
_____ B. sometimes corrects him, and sometimes says nothing.
8. When a student loses a book or a homework paper, the teacher:
_____ A. usually scolds him.
_____ B. might scold him, but might not do anything.
9. When a student does better than usual on a test, the teacher:
_____ A. might say he did a good job, but might not say anything.
_____ B. almost always tells him he did a good job.
10. If a student finishes a job he promised to do, the teacher:
_____ A. sometimes smiles at him, and sometimes does not.
_____ B. usually smiles at him.
11. If a student talks too loudly in school, the teacher:
_____ A. frowns at him sometimes, but not always.
_____ B. almost always frowns at him.
12. When a student bothers someone who is studying, the teacher:
_____ A. usually frowns at him.
_____ B. frowns at him sometimes, but sometimes does not.
13. When a student does not turn in his homework, the teacher:
_____ A. almost always gives him a bad grade.
_____ B. may give him a bad grade, but may not.
14. When a student answers a question right, the teacher:
_____ A. sometimes gives him a good grade, but not always.
_____ B. almost always gives him a good grade.

15. When a student volunteers to help the teacher with a job, the teacher:
- _____ A. might smile at him, but might not.
_____ B. usually smiles at him.
16. If a student follows directions well, the teacher:
- _____ A. sometimes tells him that he did a good job, and sometimes does not say anything.
_____ B. almost always tells him that he did a good job.
17. When a student causes trouble in class, the teacher:
- _____ A. is sure to scold him.
_____ B. scolds him sometimes, but not always.
18. When a student finishes his class work on time, the teacher:
- _____ A. might give him a good grade, and might not.
_____ B. almost always gives him a good grade.
19. When a student turns in his homework, the teacher:
- _____ A. is sure to give him good grades.
_____ B. sometimes gives him good grades, and sometimes gives him bad grades.
20. When a student pays attention in class, the teacher:
- _____ A. almost always smiles at him.
_____ B. might smile at him, but might not.
21. When a student does not do as well as usual on a test, the teacher:
- _____ A. might scold him, or might not say anything.
_____ B. usually scolds him.
22. When a student starts a fight with another boy or girl:
- _____ A. is sure to scold him.
_____ B. may scold him, but may not say anything.

23. If a student does not pay attention in class, the teacher:
- A. is sure to frown at him.
 - B. might frown at him, or might not do anything.
24. If a student breaks something that belongs to the school, the teacher:
- A. might scold him, but might not say anything to him.
 - B. almost always scolds him.
25. If a student puts things away after he uses them, the teacher:
- A. is sure to smile at him.
 - B. smiles sometimes, but might not.
26. When a student comes to class early and gets right to work, the teacher:
- A. might smile at him, or might not do anything.
 - B. almost always smiles at him.

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