DOCUMENT RESUME

ED 102 472 CG 009 568

AUTHOR Schutz, Samuel R.; And Others
TITLE Self-Control of Mental Distractions.
PUB DATE Aug 74
NOTE 14p.; Paper presented at the Annual Meeting of the American Psychological Association (82nd, New Orleans, Louisiana, August 1974)
AVAILABLE FROM Samuel R. Schutz, Department of Psychology, Gordon College, Wenham, Massachusetts 01984

EDRS PRICE MF-$0.76 HC-$1.58 PLUS POSTAGE
DESCRIPTORS *Attention; *Behavior Change; Behavior Development; *Conditioned Response; Performance; Research Projects; Self Evaluation; Speeches; *Students; *Training Techniques

ABSTRACT

This study analyzed the mental distractions of students while reading a text. Ss were asked to press a switch to record mental distractions as they occurred, and a treatment was designed to attempt to reduce the number of distractions. The hypothesis related to the treatment effect was that students given explicit training to reduce distractions would show greater mental concentration than controls that were given familiarity with the textbooks, or experience with distractions self-reporting, or both. Results indicated that the distractions were decreased by the self-reporting procedure and by training in techniques of distraction reduction, but not through familiarity with the text. Questions raised by this study are offered as bases for further research in the area of learning and distraction. (Author/PC)

SELF-CONTROL OF MENTAL DISTRACTIONS

Samuel R. Schutz[1,2] Douglas Porter

Gordon College Harvard University

and Gary Barnes

Gordon College

Presented at the 82nd Annual Meeting of the American Psychological Association, New Orleans, Louisiana, August 30 - September 3, 1974

ABSTRACT

SELF-CONTROL OF MENTAL DISTRACTIONS

While reading a textbook, Ss reported mental distractions by pressing a lever. Distractions were decreased by the self-reporting procedure and by training in techniques of distraction reduction, but not through familiarity with the text.

SELF-CONTROL OF MENTAL DISTRACTIONS

It is ironic that a large proportion of the literature on student learning outcomes is not focused directly on the student. Instead, educational psychologists generally have devoted major effort to the design and analysis of instructional materials relative to specified instructional objectives (Anderson, 1970). On the other hand, there is also a research tradition that relates to student learning strategies, particularly in the area of concept formation (Bruner, Goodnow, & Austin, 1956). And, more recently the ongoing studies of Rothkopf (1970) and colleagues demonstrating the effects of question placement on what students select to learn from text, re-emphasizes the importance of activities within the learner that can play a critical role in the learning process.

Even among those concerned with student learning strategies, seldom have the internal mental events themselves comprised the dependent variable. Rather, a mediational paradigm has usually been followed, with certain covert activities hypothesized from student performance on some other behavioral event, such as errors on a concept formation problem, or multiple-choice test scores. There are advantages to a mediational design (e.g., Kendler & Kendler, 1962), but there are also severe limitations. From an instructional point of view, it would be preferable to have more direct observation of a particular strategy in order to facilitate controlled management of the covert behaviors involved.

Perhaps the greatest obstacle in the past to the immediate investigation of students' covert learning has been the unavailability of the relevant activities to systematic observation. However, Homme (1965) suggested in this regard that internal mental events may not in fact be as elusive to the student as they are to the researcher; if the student can consistently observe and record some aspect of his own internal behavior, then this may constitute a public record for further analysis.

Following Homme's notion, one area of mental behavior that might be investigated is those covert activities related to "concentration." Although the experimenter cannot see what a student is thinking when he is looking at the pages of a book, it is a common experience among all students that there is a difference between time spent in concentration, i.e. study-related thinking, and time spent on mental distraction, i.e. non-study-related thinking.

The present investigation was concerned with the analysis of mental distractions as reported by students while reading a text. Ss were asked to record mental distractions as they occurred by pressing a switch, and the data were analyzed to establish whether such a measure is stable enough to be utilized in subsequent investigations. A treatment was also designed to attempt to reduce the number of distractions (if the measure initially proved to be stable). The hypothesis related to the treatment effect was that students given explicit training to reduce distractions will be superior to controls that are given familiarity with the textbook, or experience with distraction self-reporting, or both. The experiment also provided opportunity to examine whether students

given the mere experience of self-monitoring distractions will decrease the number of distractions reported over time.

Method

Ss were 80 freshmen attending Gordon College, who volunteered hoping to improve their study habits by distraction reduction; they were randomly selected from a larger pool of 124 volunteers. The students worked alone in a laboratory, reading Durant's The Story of Philosophy (1970) and reporting distractions each time they felt distracted, by pressing a lever. The number of distractions reported during pre- and posttest sessions served as the dependent variable.

Ss were randomly assigned to one of four treatment groups: DRT ("Distraction-Reading Training"); DRC ("Distraction-Reading Control"); DC ("Distraction Control"); and RC ("Reading Control"). DRT, the main treatment group, first received three distraction pretests, then read the text thirty minutes a day for eight days with training in techniques of distraction reduction, and then was given two distraction posttests. The other three groups were all given distraction posttests, preceded by one of the following control treatments: DRC, to control for the interaction effect of (a) familiarity with the procedure of self-reporting of distractions, and (b) reading of the text without distraction reporting, was given the distraction pretests, read an equivalent amount of time as DRT, and was given the distraction posttests; DC, to control for the familiarity with the self-reporting procedure alone, was given the distraction pretests, then returned to the laboratory only to take the distraction posttests; RC, to control for reading alone (without influence of the distraction reporting experience) was not given any distraction pretests but read an equivalent amount of time as DRT and DRC, and then

was given the posttests. The three pretests were administered on three successive days, 25 minutes per day; the two posttests on two successive days, 25 minutes per day. There was an eight day interval between pre- and posttests, and for DRT, DRC, and RC, for which laboratory activity occurred during this interval, it was for 30 minutes per day.

Training for DRT consisted of three parts: a brief explanation of the idea of successive approximations -- working gradually toward the reduction of distractions by setting successively higher goals for not being distracted; learning by demonstration how to graphically plot the change in number of distractions; and, continued reading of the text while attempting to meet successively higher standards of non-distraction. The distraction criterion was gradually shifted both in the number of permitted distractions per time unit and in the length of the time interval during which the distractions were counted. Ss started at a level of seven distractions or less for each of three consecutive three minute intervals (based upon normative data obtained during pilot studies). The criteria for performance were increased by successively increasing the time intervals by one minute increments up to eight minutes, and successively decreasing the number of allowed distractions by increments of two, until a terminal level of one distraction per eight minute interval was attained. All Ss worked for the same period of time, 30 minutes per session, with individual Ss reaching different levels of terminal performance.

Results

An index of the reliability of the distraction measure was obtained by calculating the product-moment correlation between scores on the first and second distraction tests administered to all Ss (for DRT, DRC, and DC,

the first and second pretest; for RC which had no pretest, the first and second tests taken). With N = 80, the reliability is .874, suitably high for reasonably stable measurements.

Group performances on pre- and posttests are shown in Table 1.

Insert Table 1 about here.

Since pilot studies evidenced large between-groups variability, it was determined in advance to employ covariance analyses, using means of the pretests as the covariates (for DRT, DRC, and DC). Analyses of mean differences between the main treatment group, DRT, and each of the other treatments show that distraction reduction was greater for DRT than any other group: analysis of covariance between DRT and DRC ($F = 4.19$, $df = 1/37$, $p < .05$); analysis of covariance between DRT and DC ($F = 19.82$, $df = 1/37$, $p < .01$); and analysis of variance between DRT and RC ($F = 8.52$, $df = 1/18$, $p < .01$). These findings give evidence that the training received by DRT produced a self-control effect beyond that resulting from any psychological set factors that may have been produced by the distraction testing procedure, or by familiarity with the text.

The analysis of covariance between DRC and DC indicates that DRC was superior ($F = 9.15$, $df = 1/37$, $p < .01$) as a result of reading without distraction reporting between the distraction pre- and posttests. A more adequate understanding of this result may be obtained by further analysis of the data. One plausible explanation of the finding is that the distraction pretest may have induced a psychological set in Ss to continue monitoring their own distractions while reading, even though actual distraction reporting was not in effect. Another possible explanation

for the greater decrease in distractions for DRC over DC is that DRC Ss simply became familiar with the text, through extended reading (four hours) and thus were better able to handle the content. A way of examining the latter hypothesis is provided by group RC, which read the text an equivalent amount of time as DRC without receiving any set-inducing distraction pretest and then was given a distraction posttest. Decreased distractions should be reflected in Test 1 for RC, as compared with a pre-reading distraction test. Since RC could not be given a pre-reading distraction test without possibly inducing a set to reduce distractions, it was decided (prior to the experiment) that the best estimate of the pre-treatment status of RC could be obtained from the pooled Pretest 1 scores for groups DRT, DRC, and DC (Mean, 23.47; SD, 18.39). The mean of the first test for RC (i.e., "Posttest 1") is 20.20, with a standard deviation of 11.52. Using the separate variance model t test (Cochran and Cox, 1950) to compare these means, $t = .933$ with df = 59/19; since t must reach a one-tailed critical value of 1.687 for a probability of .05, it cannot be claimed, in this case, that familiarity with the text reduces distractions.

Improvement of mean performance over testing sessions was demonstrated for each treatment group except RC by separate repeated analyses of variance (DRT, $F = 27.73$, df = 4/76, $p < .01$); DRC, $F = 15.98$, df = 4/76, $p < .01$; DC, $F = 7.01$, df = 4/76, $p < .01$; RC, $F = 1.99$, df = 1/19, n.s.). The fact that DC, which received distraction pre- and posttests only, shows a decrease in distractions without special training suggests that the self-reporting procedure of the distraction tests may have encouraged self-control of distractions by Ss through simply making them "aware of," and observant of their own behavior. Similar effects on self-reporting

upon study behavior and talking out of turn in class are reported by Broden, Hall, and Mitts (1971).

Discussion

The dependent variable in this investigation, distraction self-report, can be viewed as a possible measure of a specific class of internal mental events. The results obtained here show that such simple behaviors may be examined not only secondarily as mediating mechanisms but also as learning outcomes in their own right. From this point of view, the measure is of purely theoretical interest. In addition, distraction self-report may also be of applied value, as suggested by some more recent research. In a study reported elsewhere[3], it was shown that there is a strong positive relationship between distraction self-report and recorded deviant eye movement patterns while reading a text.

Many questions relating to application arouse one's curiosity. For example, are students able to classify the nature of distractions, perhaps by assigning particular mental events to certain categories such as food, personal relationships, recreation, etc.? Does frequency of distraction accelerate with increasingly difficult reading materials? What is the relationship between self-reported distractions and ability on various kinds of comprehension measures? Is there an optimal level of distractions, so that too few as well as too many distractions are disruptive to efficient learning? It would also be of interest to apply the same self-reporting technique to other mental events involving relatively simple behaviors within visual and auditory attention and other related phenomena.

The training given DRT had two main components: the setting of criteria of performance, and the graphic recording to monitor performance.

There is theoretical basis for the influence of both of these components. The setting of distraction criteria can be looked upon as establishing contingencies for differential reinforcement, and the graphing of performance as a form of knowledge of results that may function as reinforcement. The feeling of being distracted can be looked upon as a discriminative stimulus for pressing the distraction report lever, for emitting behavior that happens to decrease distractions, and as a negative reinforcer when the distraction criterion has been exceeded. Further research is necessary to establish the functional relationships implied by the above variables.

It is worth noting that results of this study show a reduction of mean distractions across treatments and across sessions. Inspection of Table 1 provides support of the systematic character of the results. The finding that both the training given and distraction reporting alone produced effects suggests two avenues for further research: pinning down the theoretical basis of the treatment variables, knowledge of results and criterion setting; and, explicating the behavioral mechanisms responsible for the apparent self-control induced by distraction reporting.

References

Anderson, R. C. Control of student mediating processes during verbal learning and instruction. Review of Educational Research, 1970, 40, 349-369.

Broden, M., Hall, R. V., and Mitts, B. The effect of self-recording on the classroom behavior of two eighth-grade students. Journal of Applied Behavior Analysis, 1971, 4, 191-199.

Bruner, J. S., Goodnow, J. J., and Austin, G. A. A study of thinking. New York: Wiley, 1956.

Cochran, W. G., and Cox, G. M. Experimental designs. New York: Wiley, 1950.

Durant, W. The story of philosophy. New York: Washington Square Press, 1970.

Homme, L. E. Perspectives in psychology -- xxiv: control of coverants, the operants of the mind. Psychological Record, 1965, 15, 501-511.

Kendler, H. H., and Kendler, T. S. Vertical and horizontal processes in problem solving. Psychological Review, 1962, 69, 1-16.

Rothkopf, E. Z. The concept of mathemagenic activities. Review of Educational Research, 1970, 40, 325-336.

[1] Requests for reprints should be addressed to Samuel R. Schutz, Department of Psychology, Gordon College, Wenham, Massachusetts 01984.

[2] Appreciation is expressed to the following individuals for their invaluable contribution and many hours of labor: Roy Vogel, John Hutchinson, Bob Harrison, Doreen Morris, Phil Sheesley, and Dave Staggers..

[3] Porter, D., Schutz, S. R., Staggers, D., and Harrison, R. Eye movements during mental distraction. Currently submitted for publication.

TABLE 1

PRE- AND POSTTEST DISTRACTION SCORES

Group	Distraction Test													
	Pretest 1		Pretest 2		Pretest 3		Pretest Total		Posttest 1		Posttest 2		Posttest[a] Total	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
DRT	20.70	12.99	17.65	12.86	13.00	12.49	17.12	11.98	7.55	8.64	5.95	3.87	6.75	6.02
DRC	17.60	10.39	14.00	9.29	11.10	8.19	14.24	8.64	7.25	3.13	7.55	4.41	7.40	3.40
DC	32.10	25.51	25.60	21.00	20.95	15.84	26.22	19.95	21.40	15.02	19.35	15.19	20.38	14.62
RC	-----	-----	-----	-----	-----	-----	-----	-----	20.20	11.52	18.15	12.61	19.17	11.63

[a]Combined posttest means for the analysis of covariance, adjusted by pretest scores, are: DRT < DRC, 6.18 < 7.07; DRT < DC, 9.43 < 17.70; and DRC < DC, 13.89 < 20.23. DRT vs RC was tested by analysis of variance, since RC had no pretest and no covariance was possible.