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ABSTRACT

Research examined the learning effects that encouraging Israeli mothers to co-observe Sesame Street with their five-year-olds had. The mechanism which mediated such effects was also investigated. A total of 93 kindergarten children, drawn about equally from lower and middle class families, was divided between mothers' encouraged and non-encouraged conditions. Encouraging mothers had a profound effect on the amount the lower socio-economic status (SES) children watched the show and particularly on their enjoyment of the program. This in turn had an effect on their learning, attenuating significantly the original SES differences. It was concluded that encouragement of mothers to co-observe television had significant effects on the development of specific skills, mediated by increased positive affect on the lower SES, but not in middle class children. Findings were interpreted as suggesting a decrease in experienced uncertainty and hence increased pleasantness as a function of mothers' active participation in viewing the program. (Author)

Effects of Encouraging Israeli Mothers to Co-observe Sesame Street with their five-year-olds

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A B S T R A C T

The study examined the learning effects that encouraging Israeli mothers to co-observe Sesame Street with their five-year-olds had, and the mechanism which mediated such effects. Ninety three kindergarten children, about half of whom were of lower and half of middle class, were divided between mothers' Encouraged and Not-Encouraged conditions. Encouraging mothers had a profound effect on the amount lower SES children watched the show and particularly on their enjoyment of the program. This in turn had an effect on their learning, attenuating significantly original SES differences. It was concluded that a weak intervention as encouragement of mothers to co-observe television had significant effects on the development of specific skills, mediated by increased positive affect in the lower SES, but not in middle class children. Findings were interpreted as suggesting a decrease in experienced uncertainty and hence increased pleasantness as a function of mothers active participation in viewing the program.

Effects of Encouraging Israeli Mothers to Co-observe Sesame Street with their five-year-olds

One witnesses currently a growing number of preschool and early school intervention programs in which the mothers of the target-children are becoming increasingly involved. Several of these programs have moved the intervention activities into the childrens' homes and mobilized the mothers to serve as the sole or main agents of guided tutorship (e.g. Karnes, Teska, Hodgins & Badger, 1970; Levenstein, 1970). Such programs appear to be modestly successful in producing specific developmental changes. When lower SES mothers are involved, as is the case in the majority of programs, the mothers' success seems to be related to their better control of both stimuli and rewards (Gray, 1971). Their behavior becomes less reactive as well as more supportive.

The success of such programs depends, among other things, on two major factors: (a) the quality of the mothers' training, and (b) the extent to which the skills and behaviors to be developed in the children have been shown in previous research to be trainable. Thus, for instance, Henderson and Garcia (1973) trained Mexican-American mothers to cue, model and reinforce question-asking behavior in their children. Research has shown already that this behavior is amenable to training, and that cueing, modeling and reinforcing are facilitating procedures (e.g. Rosenthal Zimmerman & During, 1970).

Mobilizing mothers to tutor their children could become more nebulous when instead of providing relatively well structured training in highly specific tasks, they are asked to make more active use of available materials and stimuli. Such materials, particularly television programs, could be useful sources of stimulation with possible developmental potentialities (Borton, 1971). And yet, as both daily observations as well as research show, this extra stimulation to which children are extensively exposed, is not very beneficial to many of them (e.g., Cazden, 1966). Even when a program such as Sesame Street (Palmer, 1969; Lesser, 1972), is highly entertaining and specifically geared to the attention span, televiewing habits, and aptitudes of lower SES, disadvantaged children, it is the middle class, initially more skilled child who benefits more from exposure to the program (Ball & Bogatz, 1970).

Exploiting the available potential stimulation in television programs may thus be an area in which mothers could play a major role. It should be noted however, that neither one of the two conditions for success, mentioned above, is applicable in the present case. Mothers can not be given specific training, nor are there any specific behaviors or skills to be developed in the children which have been shown under controlled conditions to be modifiable. There are here, in fact, two unknowns: (a) If mothers are encouraged to watch particular programs with their children, what effects may this produce? (b) What may account for these

effects? After all, no specific structured tutoring, which follows previously tested procedures, takes place under such conditions.

Moreover, given the absence of precise guidelines, it is not impossible for the low SES mother to fall back on established practices such as providing much negative feedback, or providing reinforcements which are directed more towards inhibiting behavior than toward the encouragement of exploratory activities (Gray, Klaus, Miller & Forrester, 1966; Schoggen & Schoggen, 1971). In that case, encouraging the mothers to watch TV programs with their children may accentuate SES differences, rather than reduce them (Lombard, 1973).

The study presented here was an exploratory attempt to answer the above two questions. It was part of a larger research project whose major purpose was to examine the cognitive and educational effects of Sesame Street on Israeli children[1]. The general hypothesis of the larger study was that since Sesame Street employs television messages of a type unknown to Israeli children, specific cognitive developments may result as a consequence of the program's novel demands on information processing.

A second issue to which the study addressed itself, and to which this report is devoted, was concerned with the encouragement of mothers of kindergarten age children to watch the program with their children. More specifically,

it was suggested to the mothers to discuss the program and to elaborate on its contents with their children, although they were not required to do so. However, they were urged to sit and watch the program with their children. Technically, that meant freeing themselves from routine duties, houskeeping activities, and the like for two hours a week. It also meant, rescheduling specific activities according to the child, a change which appeared to be rather unusual for several mothers.

The specific questions asked were as follows. (a) Given a number of skills which according to our reasoning could be affected by exposure to Sesame Street, how much difference in their development does the encouragement of mothers make? Put in other words, does the encouragement of mothers make a difference in terms of these skills beyond the effect of exposure to the program? (b) Granting that encouraging mothers does make a difference, what may account for it? What could be seen as the major factor mediating between the mother's co-observing the program, and the child's enhanced mastery of the measured skills?

It could be reasoned that encouraged mothers encourage their children to watch more of the program. Should the program have the expected effects, such children would be expected to gain more as a direct function of their increased exposure. The question is however, what effects encouragement of mothers has beyond increased amount of exposure. It would be reasonable to hypothesize that this additional effect, beyond the increased

amount of exposure, is manifested in more sustained attention of the child to the presented messages, and hence his better comprehension of them (Leifer, Gordon & Graves, 1973). As a study by Grusec (1973) suggests, five year olds are more influenced by a model in the presence of a co-observer. This could be the result of more attention given to particular aspects of the presentation which are highlighted by the co-observer.

Becoming more attentive to particular aspects of the program as a by-product of mothers' co-observing would be expected to result in increased meaningfulness of the program. This would seem particularly crucial given the novelty of the message formats which faces Israeli children who watch Sesame Street. One would expect that program to entail much complexity and hence lead to much response uncertainty particularly for children of relatively poor mastery of relevant mental skills.

If co-observing mothers aid their children in imposing structure and meaningfulness on the presented stimuli experienced uncertainty would be expected to decrease and pleasantness to increase (Berlyne, 1969). With increased meaningfulness also preference for the more variable, or complex, messages would increase (Munsinger & Kessen, 1966). In general, then, co-observing mothers would be expected to facilitate learning from the program through the mechanism of increased enjoyment, or pleasantness of the show.

M E T H O D

Subjects

Ninety three Israeli children in four kindergartens in the Jerusalem area took part in the study. The mean age of the subjects was 5.48 (SD = 0.44). About half of the children (N=43)

were of middle class homes, with fathers of a mean of 13.6 years of schooling (SD = 3.42), and with 2.32 siblings on the average (SD = 0.61). The remaining 50 children were of lower SES, oriental homes with fathers of 9.2 years of schooling on the average (SD = 2.51), and with 4.46 siblings on the average (SD = 2.75). All the middle class subjects were in two kindergartens located in well-to-do neighbourhoods, while all the lower SES ones were in profoundly poorer neighbourhoods.

Treatments, tests and procedures

The four kindergartens involved in the study were randomly divided into two groups. Two kindergartens, one of lower and one of middle SES were assigned by toss of a coin to the encouragement treatment (N=50), while the other two kindergartens were similarly assigned to the not-encouraged condition (N=43).

Parents of all subjects in the Encouraged condition were gathered on two occasions, once at the start of the broadcasting season, and a second time two months later. The broadcasting season of the program lasted for four months. In both meetings the general objectives of the program were explained and the mothers were asked to avail themselves at the times the program is aired. They were asked to always co-observe the show with their five year olds. The Not-Encouraged subjects watched the program as they pleased.

No direct observations of how mothers co-observed the program were taken since it was decided that such observations would interfere with the natural course of events. However,

many mothers complained that co-observing the program interfered with their routines. It became evident that mothers did in fact co-observe.

All subjects were individually pretested by trained testers, and background information was gathered from the childrens' files as well as parents' questionnaires. All the subjects were posttested again five months later.

Background measures were concerned with parents' occupation, education, number of siblings, the family's country of origin, exccessibility to TV and movies, mastery of English, and the like.

The pre- and posttests consisted mainly of tests constructed by ETS (Ball & Bogatz, 1970) for their evaluation of Sesame Street in the U.S. The following tests were employed in the present study, after specific modifications were made to accomodate their use in Israel: Matching of Letters (Cronbach Alpha reliability, .65), Matching of Numbers (rel., .81), Matching of Pictures (rel., .74), Relational Concepts (rel., .37), Classification (rel., .85) and Part & Whole (rel., .82). To these two other tests were added: A modified version of the Childrens' Embedded Figures Test, CEFT (rel., .69) and a test of Picture Ordering according to some logic imposed by the child (rel., .61). Pretesting preceded the broadcasting of Sesame Street, which was shown twice a week for about four months. Posttesting took place about a month after the end of the broadcasting season.

Measures of Exposure: During the four months of broadcasting

three measures of exposure to the program were taken by individual interviewing on six occasions. On each occasion a child was asked (using illustrations as aids) how much of the program he viewed "yesterday", and how much he enjoyed it. These became the measures of Viewing and Enjoyment. Reliability of these self-reported measures was ascertained by correlating them with the reports of a separate sample of parents who were asked about their childrens' amount of viewing and enjoyment. The correlations were .69 and .72 (N=106). Validity of the self-reported measure of Viewing was established by correlating it with the subjects' responses to 4-5 multiple-choice content questions concerned with "yesterday's" program, which were part of each of the six interviews. Correlations between self-reported amount of viewing and correct responses to the questions ranged from .47 to .85 (Median r = .70). It was concluded that the childrens' self-reports could be used as relatively valid and reliable data. The number of correct answers to the content questions was used as another component of exposure and termed Knowledge of the show. To supplement the above, a Test of Sesame Street contents was administered at the time of posttesting (rel., .87). It was composed of 12 content questions sampled from all shows.

R E S U L T S

The prime method of data analysis employed here was that of multiple regressions with a fixed, predetermined order of entering the variables (Cohen, 1968; Darlington, 1968). Doing so, it became possible to partial out posttest variance which was due to background and pretest scores, and to examine the "net" contribution of exposure to the subjects' posttest scores. Following this it became also possible to examine the additional contribution of mothers' encouragement to posttest variance.

The multiple regression analyses for each measure, separately for lower and middle class subjects, are presented in Table 1[2]. The amounts of variance accounted for by each

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Insert Table 1 about here

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block of independent variables are given in percentages. It should be noted that these percentages are subject to the position given to each variable in the equation. Thus, would a variable be entered earlier or later, the amount of variance it accounted for would have changed. However, given a fixed order of entering the variables, uniform for all subjects and groups, comparisons between groups become highly useful.

The first thing to note, in passing, is that large amounts of posttest variance, ranging from 32.1% to 74.9%, are accounted for by background and pretest measures. It is also interesting

to note, in passing, that exposure to the program accounts in the middle class group for more variance on tests of synthesis and inference-making (Part & Whole, and Classification), when compared with the lower SES group. In the latter group exposure seems to account for more variance on analytic amd perceptual-matching test (e.g. Matching Letters, Matching Numbers).

Thus, it appears, that exposure has a differential effect on five year olds, a possibility that has been overlooked in the American evaluation of Sesame Street (Ball & Bogatz, 1970).

It is reasonable to hypothesize, with regard to the differential effects of the program, that while the middle class subjects were sufficiently ready to gain in areas of synthesis and inference-making, lower SES subjects had to gain <u>first</u> in areas of analysis. This speculation is supported by cross-lagged panel correlations which show that early mastery on the analytic and perceptual tests predicted later gains on the tests of synthesis <u>but not vice versa</u>[3].

Turning to results more pertinent to the issues dealt with here, one should notice the nearly total absence of any posttest variance accounted for directly by mothers' encouragement beyond what is accounted for by exposure. The only exception is CEFT where encouragement made a significant difference for middle class ($F=5.17$; $df=1,18$; $p < .05$) but not for lower SES subjects. Thus, it appears that with respect

to that measure, encouragement accentuated class differences.

However, while encouragement did not affect directly posttest scores, it did affect patterns of exposure to the program in the lower SES, but not in the middle class group. Encouragement accounted for 8.5% of the lower SES Viewing variance, after 63.5% of the variance were removed due to other sources ($F=8.72$; $df=1,29$; $p<.01$). It accounted for only 3.5% of the Viewing variance in middle class group. The difference is largest with respect to the measure of Enjoyment. While 23.6% are accounted for in the lower SES group ($F=25.19$; $df=1,29$; $p<.001$) only 0.2% of the variance are accounted in the middle class group. Knowledge of the program's content follows a similar pattern (6.1% vs. 0.4% respectively).

If Encouragement did not have a direct effect on learning beyond its effects on the amount the lower SES subjects viewed the program, it had an indirect effect on them in as much as it made their social class affiliation become less significant a predictor, as shown in Table 2.

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Insert Table 2 about here
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Examination of the amounts of posttest variances accounted for by SES in the Encouraged and Not-Encouraged groups shows a differential pattern. While SES accounts for relatively large portions of posttest variance in the Not-Encouraged group, it

accounts for <u>far less</u> variance in the Encouraged group. Thus, e.g. whereas SES differences accounted for 36.5% ($F=24.19$; $df=1,41$; $p<.001$) of the Classification test variance in the Not-Encouraged group, it accounted for only 16.5% ($F=9.29$; $df=1,47$; $p<.01$) in the Encouraged group. The same pattern can be seen in most other tests.

The only exception is the CEFT where Encouragement accentuated SES differences in favour of the middle class. This has been noted already in Table 1, and will be discussed later on.

Thus, with respect to most of the posttest measures, one finds that encouraging mothers attenuates rather strikingly the predictive power of SES. It appears as if the psychological correlated of SES differences become either completely irrelevant or at least far less relevant when mothers are encouraged to co-observe the program with their children.

The lessened predictive power of SES differences under the Encouragement condition could be due either to generally lowered posttest scores of the middle class subjects, or due to a general increase in the scores of the lower SES ones. To examine this, another analysis was done in which the Encouragement factor was entered into the multiple regression <u>without first partialing out the contribution of the four measures of Exposure</u> (Table 3).

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Insert Table 3 about here

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This analysis allows Encouragement to covary with Exposure, to the extent that they correlate.

It becomes evident from Table 3 that Encouragement had a profound effect on the learning of the lower SES subjects, whereas it had hardly any effect on the middle class subjects. The only exception is, again, the CEFT.

It appears, then, that Encouragement decreased SES differences through its facilitating effect on the lower SES subject, bringing them somewhat closer to the middle class level of skill mastery. Since, however, the facilitating effect of Encouragement could be detected only when the contribution of Exposure was not removed, it becomes apparent that Exposure served as the mediating mechanism between encouragement and learning. And among the Exposure measures, it was the increased enjoyment which served as the prime mediator, although also Viewing and Knowledge were significantly affected by mothers' encouragement.

D I S C U S S I O N

The questions raised in this study were concerned with the encouragement of mothers to make more use of easily available, and possibly, developmentally stimulating materials to enhance their childrens' development. The broadcasting of Sesame Street in Israel provided an opportunity to examine the effects of such encouragement, as well as the mechanisms which may account for them.

Clearly, encouraging mothers to co-observe the program with their five year olds is one of the weakest possible interventions since it does not entail any training of mothers, nor does it provide clear and well structured guidelines for tutoring the children. It is in this respect that the study differs from most other projects in which mothers are mobilized as tutors.

Nevertheless, the encouragement of mothers had a relatively strong, but indirect effect on the development of skills in the lower SES, but not in the middle class group. This effect was mediated by the modes of exposure to the program. Encouraged lower SES subjects viewed more of the program and knew more of its messages (Tables 1 and 3). However, the component of exposure which was most strongly and directly affected by mothers' encouragement was the childrens' enjoyment of the program. While encouragement accounted for 8.5% of the Viewing variance

and 6.1% of Knowledge variance, it accounted for 23.6% of the Enjoyment variance. Indeed, Enjoyment was a significant contributor to learning in the lower SES, but not the middle class group. While enjoyment correlated non-significantly with the Exposure and posttest measures in the middle class group (median r = .15; range from -.09 to .29) it correlated much higher in the lower SES group (median r = .36; range from -.20 to .66). Moreover, whereas enjoyment correlated only moderately with the other measures in the Not-Encouraged lower SES group (median r = .28), it correlated far higher in the Encouraged lower SES group (median r = .48). Within the middle class group no such differences were found. It seems warranted to conclude that while enjoyment makes little difference for middle class children it is of much importance to lower SES ones.

It seems, then, that the encouragement of mothers had mainly an affective influence, which was negligible in the middle class group, but very functional for the lower SES subjects. For them, apparently, enjoyment, hence positive affect, may be very conducive for benefiting from a program such as Sesame Street. It makes them benefit nearly as much, and sometimes more than middle class children. This finding is in keeping with Berlyne's (1969) findings concerning the increased pleasantness of a stimulus with the decrease in its ambiguity or complexity.

Yet, there is the question as to why only low SES children benefitted from mothers co-observing in terms of increased

enjoyment and knowledge of the show while middle class children did not. A possible answer is that middle class children watch television with their mothers quite frequently and hence no change of situation and social atmosphere was experienced by them when mothers complied with our request. Indeed, their mean Viewing, Enjoyment and Knowledge scores were significantly higher than those of the low SES children, even without the addition of co-observing mothers. But this could not account for the fact that their CEFT scores (unlike those of low SES) were directly affected by the co-observation of mothers.

We may, however, safely assume that the mothers of all children were active co-observers and aided the children to structure the messages and attend to particular elements in the program. This was, quite likely, redundant for the middle class but not for the lower class children with regard to all measures but the CEFT. Here, the mothers' behavior of singling out specific elements in the program may have provided unplanned for, incidental, training which may have manifested itself in the childrens' performance on a test which measured a similar capability. Since the CEFT measures a cognitive style rather than a particular and more easily modifiable skill, it would be possible to hypothesize that it is the initially less field dependent child, observing a program with a more analytically oriented mother who benefits more from her participation.

FOOTNOTES

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1 For more details see: Salomon, G. et al. Educational Effects of "Sesame Street" on Israeli Children (Brief Summary), Jerusalem: The Hebrew University, 1972.

2 If not otherwise indicated, accounted for variance is in the possitive direction.

3 In these crossed lagged panel correlations pre- and posttest measures were intercorrelated. It was found that pretest scores of analysis and perceptual-matching (e.g. matching letters) predicted well posttest scores of synthesis (e.g. classification). The correlations ranged from .10 to .51 with a median r of .27. Predictions from pretest synthesis to posttest analysis yielded correlations of -.27 to .10 with a median r of .04. This tends to support Musinger and Kessen's (1966) hypothesis that only stimuli slightly more complex than a child's present conceptual structure can lead to cognitive change.

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Table 1: Amount of variance accounted for by background variables, pretests, Exposure and Encouragement for each SES group

Variance Source of measure which was accounted for	Background variables		Pretests		Total		Exposure (combined)		Encouragemnet	
	Middle class	Lower SES	Middle class	Lower SES	Middle class	Lower SES	Middle class	Lower SES	Middle class	Lower SES
Exposure:										
Viewing	22.4%	37.4%	26.4%	26.1%	48.8%	63.5%	-	-	3.5%	8.5%*
Enjoyment	17.3	26.1	52.8	33.1	70.1	59.3	-	-	0.2	23.6 **
Knowledge	29.0	37.6	45.9	28.3	74.9	65.9	-	-	0.4	6.1 *
Test of SS	12.6	20.2	48.9	25.7	61.5	45.9	-	-	2.7	6.4
Posttests										
Matching of Letters	14.7	26.6	36.1	21.2	50.8	47.8	4.3	16.1*	6.7	0.8
Matching of Numbers	38.2	25.2	16.6	31.3	54.8	56.5	10.9*	17.7*	0.1	0.2
Matching of Pictures	14.1	16.8	38.5	45.2	52.6	62.0	10.1*	14.0*	1.8	0.8
CEFT	3.7	15.3	28.4	29.5	32.1	44.8	9.6	5.2	13.0*	5.7
Parts & Whole	19.0	20.1	17.8	28.4	36.8	48.5	18.3*	6.7	0.0	4.3
Relational Concepts	16.1	16.9	39.1	26.4	55.2	43.3	4.2	17.8*	1.9	0.1
Classification	30.1	8.2	24.3	52.3	54.4	60.5	14.3*	9.3*	0.1	3.1
Picture Ordering	29.1	14.0	28.9	27.3	58.0	41.3	7.4	5.2	0.0	0.2

* Increase in accounted for variance, $p < .05$

** $p < .01$

Table 2: Amounts of Exposure and Posttest variance accounted for by SES differences in the Encouraged and Not-Encouraged groups

	Encouraged Group		Not-Encouraged Group	
	R^2	F	R^2	F
Exposure				
Viewing	4.5%	2.21	27.6%	16.00**
Enjoyment	0.8	0.37	19.4	10.12**
Knowledge	5.5	2.72	31.2	19.01**
Test of Sesame Street	31.2	21.30**	25.7	14.53**
Posttests				
Matching of Letters	4.3	2.12	12.6	6.06*
Matching of Numbers	12.4	6.65	6.5	2.95
Matching of Pictures	0.9	0.45	34.0	21.65**
CEFT	21.7	13.04**	0.2	0.06
Part & Whole	3.6	1.78	0.1	0.02
Relations	5.6	2.80	19.8	10.36**
Classification	16.5	9.29**	36.5	24.19**
Picture Ordering	28.7	18.97**	44.0	33.02**

* $p < .05$

** $p < .01$

Table 3: Amounts of Exposure and posttest variance accounted for by Encouragement

	R^2	F
Exposure		
Viewing		
Middle Class	3.5	1.63
Lower Class	8.5	8.92 **
Enjoyment		
MC	0.2	0.22
LC	23.6	25.20 **
Knowledge		
MC	0.4	0.32
LC	6.1	6.28 **
Test of Sesame Street		
MC	2.7	1.65
LC	6.4	3.68
Posttests		
Matching Letters		
MC	2.2	3.37
LC	17.4	5.45 *
Matching Numbers		
MC	5.3	3.17
LC	18.1	8.70 **
Matching Pictures		
MC	2.5	1.48
LC	14.3	4.66 *
CEFT		
MC	18.4	8.19 **
LC	9.3	5.51 *
Part & Whole		
MC	3.4	1.46
LC	12.7	6.14 *
Relations		
MC	4.2	2.58
LC	18.0	7.86 **
Classification		
MC	3.5	2.49
LC	13.1	6.12 *
Picture Ordering		
MC	3.1	1.01
LC	5.3	3.21

* $p < .05$

** $p < .01$