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AUTHOR	Hale, Gordon A.; Stevenson, Edward E., Jr.
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ABSTRACT

An assessment was made of 5- and 8-year-old children's performance on a short-term memory task under two auditory and two visual distraction conditions, as well as under a nondistraction condition. Performance under nondistraction was found to be superior to that under distraction ($p<.001$), indicating that the extraneous stimuli had a generally detrimental effect on performance. The comparison between nondistraction and distraction did not interact significantly with age, suggesting little developmental change in distractibility over this age range. The data also indicated a reduction in the effects of the distractors following their initial presentation, implying an adaption to the presence of extraneous stimulation. (Author/DB)

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FIVE- AND EIGHT-YEAR-OLD CHILDREN'S RESPONSE TO AUDITORY AND VISUAL DISTRACTION

Gordon A. Hale

and

Edward E. Stevenson, Jr.

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Gordon A. Hale and Edward E. Stevenson, Jr.

Educational Testing Service

Abstract

This study assessed 5- and 8-year-old children's performance on a short-term memory task under two auditory and two visual distraction conditions, as well as under a nondistraction condition. Performance under nondistraction was found to be superior to that under distraction ($p < .001$), indicating that the extraneous stimuli had a generally detrimental effect on performance. The comparison between nondistraction and distraction did not interact significantly with age, suggesting little developmental change in distractibility over this age range. The data also indicated a reduction in the effects of the distractors following their initial presentation, implying an adaption to the presence of extraneous stimulation.

FIVE- AND EIGHT-YEAR-OLD CHILDREN'S RESPONSE TO AUDITORY AND VISUAL DISTRACTION[1]

Gordon A. Hale and Edward E. Stevenson, Jr.

Educational Testing Service

Among reasons for their relatively poor learning ability, young children are commonly believed to be highly distractible, a conception whose theoretical grounding dates back at least to the writings of William James (1890). Thus, children's tendency to be distracted by extraneous stimulation has been hypothesized to decline with increasing age (e.g., Maccoby & Hagen, 1965; Turnure, 1970; Turnure & Zigler, 1964). Only a few studies, however, have provided data bearing directly on the issue of developmental changes in distractibility. Poyntz (1933), using speed of performance on a pegboard as a criterion measure, observed that the effects of various auditory and visual distractors were of comparable magnitude for children at ages 3, 4, and 5. (The direction of these effects is indeterminate, however, due to a failure to counterbalance distraction and nondistraction conditions.) Hagen (1967) and Maccoby and Hagen (1965) found that an auditory "vigilance" distractor--i.e., stimulation the subjects were required to monitor--impaired performance on a short-term memory task to an equal degree for children at ages 6, 8, 10, and 12. Turnure (1970) noted a decrease in rate of learning an oddity problem with the presentation of recorded songs and stories but no developmental change in this effect from ages 5-1/2 to 7-1/2. Of cases in which age differences have been observed, Turnure found that the presence of a mirror

impaired performance on an oddity problem for 5-1/2-year-olds, had no effect for 6-1/2-year-olds, and tended to facilitate performance for 7-1/2-year-olds (although not significantly). In another study, Turnure (1971) observed that the rate of learning a two-choice discrimination task was reduced in the presence of typing noises for children of age 3:3, but was slightly enhanced for children of ages 3:9 and 4:9.

Perhaps this evidence might best be summarized as equivocal, offering only minimal support for the hypothesis that children become less distractible with increasing age. An adequate test of this hypothesis, however, will require greater variation of procedures than has been attempted in research on the topic thus far. For example, many investigations to date have employed only a single distractor, thus limiting the generality of the results to a specific type of extraneous stimulation. Systematic comparison of various distractors is necessary in order to develop a sufficient measure of the construct "distractibility" and to provide an appropriate test of developmental changes therein.

The present study, as an initial step in this direction, examined the effects of four different types of distraction upon children's performance in a short-term memory task. This type of criterion task was chosen because of the presumed sensitivity of the memorization process to the influence of extraneous stimulation, along with evidence suggesting the appropriateness of such a procedure in this connection (e.g., Hagen, 1967; Maccoby & Hagen, 1965). Performance was assessed in children of ages 5 and 8, in order to identify developmental trends in distractibility over the early school years, a period suggested

by informal observation to be important in the development of children's ability to resist distraction.

The study included two types of auditory and two types of visual stimulation, as research with both children and adults has suggested that the sense modality of a stimulus may be a critical determinant of its distractiveness (Evans, 1916; Poyntz, 1933). Within the auditory modality, the two distractors were selected to differ primarily in their meaningfulness, a dimension emphasized in recent analyses to underlie the effectiveness of auditory distraction (e.g., Sen & Clarke, 1968; suggested also in data of Morgan, 1916; Weber, 1929; Baker & Madell, 1965). These two types of stimulation--a humorous children's story and a story played at a slow speed--were both presumed to be of interest to the children but differed in the degree to which they involved understandable discourse. The two visual distractors were chosen to differ on more than a single factor; since few studies with children or adults have investigated the effects of extraneous visual stimulation, it was believed desirable to demonstrate the differential effectiveness of widely varying visual distractors prior to isolating the factors responsible for such effects. The two distractors selected--pictures flashing in the periphery of the visual field and a pattern flashing over the task stimuli--differed primarily in (a) meaningfulness and (b) spatial separation from the stimuli to be learned.

Method

Subjects

The study included 36 boys and 36 girls at each of ages 5 and 8 (mean CAs = 5.6 and 8.7 years, respectively). These subjects were enrolled in kindergarten and third-grade classes in two public schools

in a middle-class area of New Jersey. Thus drawn from the same population, the 5- and 8-year-old subjects were presumed to be comparable in general background. Scores were available for the majority of 8-year-olds on the California Test of Mental Maturity and the California Achievement Test, which had been administered by the subjects' teachers at the end of the previous school year.

Criterion Task

The criterion measure was a short-term memory task based on that devised by Atkinson (Atkinson, Hansen & Bernbach, 1964). The subject sat facing a milk-glass screen, 25 cm. high and 22 cm. wide, the lower half of which was divided into a two-row by three-column matrix of "windows." The stimuli, line drawings of common objects, were rear-projected into these windows with an automatic slide projector. (Data from a comparable sample of 5-year-olds indicated these line drawings to be readily identifiable.) On each of 36 trials the subject viewed a matrix of stimuli in the windows for 12 seconds. Following this, one of the stimuli from the matrix was presented as a "cue" above the windows, and the subject was required to point to the window (now blank) in which he had seen that stimulus. After 8 seconds, he was required to respond similarly to a second cue stimulus from the matrix. Eight seconds later, the next trial began with presentation of another matrix.

On half the trials, six stimuli were presented in the matrix, one per window, and on the other trials four stimuli were presented, with the center windows remaining blank. Chosen from a total set of 12 stimuli, the matrix on each trial contained no more than three stimuli in common with that for the preceding trial; across the entire task, the 12 stimuli were presented equally often in each window. The cue stimuli

presented on each trial were randomly selected with the constraints that all 12 stimuli would be presented an equal number of times across the task and that no stimulus would appear as a cue on more than two trials in succession.

Distraction Conditions

In each condition to be described the extraneous stimulation was applied only during the 12-second periods in which the stimulus matrices appeared. Only one distraction or nondistraction condition was presented on a given trial, and the same condition was presented over a block of successive trials. Each subject received all conditions, in an order that was counterbalanced across subjects. The two types of auditory stimulation were presented via a two-channel tape recorder, with speakers situated to the left and right sides of the subject, while the visual distractors were rear-projected from a second slide projector. Automatic timing devices controlled the presentation of the distractors and the stimuli of the criterion task.

Story (auditory distraction 1). A record containing a humorous children's story had been transcribed onto tape for this condition. The story was presented slightly above a normal level of audibility, and the source of the sound alternated from the left to the right speaker every three seconds on the average.

Noise (auditory distraction 2). For this condition, the story described above was played at a slower speed so as to be unintelligible. This distractor was also presented at a level of audibility slightly above normal with the source of the sound alternating from left to right every six seconds on the average.

Pictures (visual distraction 1). Line drawings of eight objects not included in the criterion task were flashed, one at a time, above the windows of the matrix. A given picture was presented for 1-1/2 seconds, and each picture was followed by a blank period of 1 or 3 seconds. The pictures appeared in either of two positions at the left and right sides of the screen, separated from the center position reserved for the cue stimulus; the position in which the pictures were presented varied randomly from left to right.

Pattern (visual distraction 2). Diagonal striped lines were flashed across all six windows for 1-1/2-second periods, alternated with blank periods of 1 or 3 seconds. The stripes were thus superimposed on the task stimuli but at a reduced level of illumination so that they would not affect recognition of the stimuli.

Nondistraction. The task was presented with no experimentally imposed distractions during two separate trial blocks to provide a relatively stable baseline for comparison with the distraction conditions. Although identical, these two cases are described below as two separate conditions for clarity of discussion.

Counterbalancing of Conditions

The task was divided into six blocks of trials, each block containing three four-stimulus trials and three six-stimulus trials, in the order 6, 4, 4, 6, 6, 4. Each of the six conditions described above (including two Nondistraction conditions) was assigned to one trial block, the same condition being imposed for all trials within a block. The temporal order in which the six conditions were presented was counterbalanced across subjects according to six orders. These six orders were formed according to a Latin-square design, which ensured that (a) across all orders, a given condition was assigned to all trial blocks and (b) for

every pair of conditions, each was preceded by the other in three orders. Each order was assigned to six of the 36 subjects in each Age x Sex subgroup.

Procedure

The subject was seated facing the screen and was told that he was to play a kind of learning game. All but one of the subjects at each age level had participated in an earlier study using the same apparatus with an unrelated task (incidental learning with colored shapes), and they were thus familiar with the concept of learning spatial positions associated with stimuli appearing on the screen. The subject was told that he would see some pictures in the windows and would be asked to remember the windows in which the pictures appeared. It was explained that he would do this over and over again, and that the pictures would change from trial to trial. It was also explained that he might hear some things or see some things other than the pictures in the windows, but that he was to ignore them and pay attention only to the windows. Three practice trials were then given, using the same stimuli as those of the main trials, followed by the 36-trial criterion task. The task was administered with no breaks except for an interval of approximately 1-1/2 minutes between the third and fourth trial blocks.

Data Analysis

For every subject, a separate score was derived for each of the six conditions. The score for a given condition was the total number correct for that trial block; with six trials per block and two responses per trial, the maximum score for each condition was 12 correct. These scores underwent an arcsine transformation for variance stabilization and the transformed scores were subjected to an analysis of variance with Age, Sex,

and Order of Presentation as between-subject variables and Conditions as a within-subject variable. The effect of Conditions was broken down into four orthogonal contrasts, and interactions of these contrasts with the between-subject variables were examined. These contrasts were: (1) Nondistraction versus distraction, (2) auditory versus visual distraction, (3) Story versus Noise (auditory distractors), and (4) Pictures versus Pattern (visual distractors). The first contrast indicated the degree to which these distractors impaired the children's performance, while the other three provided information about the relative distractiveness of these various types of stimulation.

Results

Analysis of Variance

Table 1 presents the number correct in each condition for the two age levels, with the Nondistraction conditions combined. These data

Insert Table 1 about here

were analyzed in the manner described above, and the first results to be considered are those involving the four contrasts alone. The difference between Nondistraction and the combined distraction conditions was significant ($F(1,120) = 47.22$, $p < .001$), indicating that performance was generally impaired by the presentation of these extraneous stimuli. Performance under auditory stimulation was lower than that under visual stimulation ($F(1,120) = 4.47$, $p < .05$), and while no difference was observed between the two auditory conditions (at .05 level, two-tailed test), performance under the first visual distractor, Pictures, was significantly worse than that under the second visual distractor, Pattern ($F(1,120) = 17.48$, $p < .001$). These last effects are apparently

due to the relative ineffectiveness of the Pattern distractor, which was indicated in a post hoc comparison to have produced only a slight reduction in performance relative to Nondistraction ($p = .09$).

None of the first-order interactions between the contrasts and Age of subject was significant. Of particular importance is the lack of a significant interaction between Age and the first contrast, Nondistraction versus distraction ($p = .18$), indicating that the magnitude of the distraction effect was no greater for the 5-year-old subjects than for the 8-year-olds. This result suggests little developmental change in distractibility over this age range; however, discussion of this issue will also consider the fact that overall performance increased significantly with age ($F(1,120) = 136.36$, $p < .001$).

No first-order interactions between the Contrasts and Sex of subject were significant, and as Sex was also found to be unrelated to overall performance, the boys and girls were combined in further analyses. Of the remaining interactions, the following were significant: (a) Order x Contrast 3 (Story vs. Noise), (b) Age x Order x Contrast 3, and (c) Sex x Order x Contrast 2 (auditory vs. visual) (all $p < .05$). Although these last interactions are not readily interpretable, one aspect of the data that may help to explain these effects is a general drop in level of performance over the duration of the task. For the 5-year-olds, the number correct dropped from 4.35 in the first trial block to 2.74 in the last, and for the 8-year-olds the scores fell from 6.22 to 5.63. To determine the strength of this effect, an additional analysis of variance was performed with Age and Order as between-subject variables and first vs. last trial block as a within-subject contrast. The contrast between blocks was found to be significant ($F(1,132) =$

24.02, $p < .001$) as well as the interaction between this contrast and age ($F(1,132) = 6.10$, $p < .05$). This evidence implies that factors such as fatigue and interference may play a significant role in performance on this task. While the data encourage further study of such factors, the greatest import of these results lies in emphasizing the need to control for order effects in research of this type.

Oth Analyses

As mentioned above, the magnitude of the difference between Nondistraction and distraction did not differ for the 5- and 8-year-old subjects which, by one means of interpretation, can be regarded as indicating little difference between ages in distractibility. By another orientation, however, distractibility is assumed to be reflected in the amount of performance reduction proportional to performance under Nondistraction as a baseline. To provide information in this regard, a proportion score was derived for each subject based on (a) the difference between mean Nondistraction and distraction scores, divided by (b) mean Nondistraction score. The median of these proportion scores was then computed, and a median test determined whether the numbers of subjects falling above and below this midpoint were different at ages 5 and 8. This analysis yielded a significant χ^2 of 9.00 ($df = 1$, $p < .01$), indicating that the reduction in performance produced by distraction was proportionately greater for the 5-year-old subjects than for the 8-year-olds.

Information bearing on the relation between ability level and distractibility in the 8-year-old subjects is provided in analyses involving scores on the California Test of Mental Maturity (CTMM) and California Achievement Test (CAT). The first analysis contained

two between-subject factors, CTMM (median split) and Order of Presentation, with the within-subject factor, Conditions, divided into the four contrasts described in the Method section. The second analysis was identical to the first but with CAT (median split) substituted for CTMM as the first between-subject factor. (The value of performing two separate analyses was indicated by the .72 correlation between the CTMM and CAT scores, suggesting some degree of independence of these measures.) In neither of these analyses was the measure of ability level found to interact significantly with any of the four contrasts ($p > .20$), thus providing no indication of a difference between high- and low-ability 8-year-olds in degree of distractibility. The children's scores on the California tests were highly related to their overall performance, however (CTMM: $F(1,58) = 20.49$, $p < .001$; CAT: $F(1,57) = 20.33$, $p < .001$); thus the nonsignificant interaction cannot likely be attributed to insensitivity in either the criterion task or these ability measures.

For the 5-year-olds a comparable analysis was performed, substituting chronological age for ability level as the first between-subject factor. According to this analysis, Age was related to overall performance ($F(1,59) = 7.02$, $p < .05$) but did not interact significantly with any of the four contrasts ($p > .20$). As with the effects of ability level for the older subjects, then, the data indicated little relation between chronological age and distractibility within the group of 5-year-olds.

A post hoc examination of the data revealed striking temporal changes in the effects of distraction. Each condition was broken into three segments of four responses, and variation in performance was observed across segments within each condition. The pattern of results under Nondistraction was found to be markedly different from that under

the distraction conditions, the difference lying primarily in changes occurring between the first and second segments. While performance under Nondistraction decreased within this period, performance under distraction increased, and this pattern was consistent across all conditions for both the 5- and 8-year-old subjects (performance then tended to drop from segments 2 to 3 in most cases, regardless of the nature of the condition). To determine the strength of this effect, a sign test compared the number of subjects whose scores increased from segment 1 to segment 2 with the number whose scores decreased over this period (the restricted range of scores in this case dictated the use of a nonparametric analysis). Scores for the two Nondistraction conditions were summed for this analysis, and the data were examined separately for each of the four distraction conditions and Nondistraction, with age levels and sexes combined. These analyses revealed that the decrease in performance under Nondistraction was significant ($\underline{Z} = 2.20$, $\underline{p} < .05$) as were the increases in performance for the Story and Pictures conditions ($\underline{Z} = 2.93$, $\underline{p} < .01$, and $\underline{Z} = 1.97$, $\underline{p} < .05$, respectively).

These results imply that the effects of the distractors were most marked with their initial presentation and declined somewhat thereafter. The detrimental effect of distraction did not disappear entirely, however, as indicated by an additional analysis of variance identical to that described in the Method section but using scores based on the last eight responses of each condition. The results were similar to those observed in the major analysis in indicating a higher level of performance under Nondistraction than under distraction ($\underline{F}(1,120) = 10.72$, $\underline{p} < .01$). The effects of distraction, then, were still evident after the initial

trials of each condition and thus cannot be attributed solely to the children's initial response to this stimulation.

Discussion

Prior to considering the developmental implications of the present results, it is important to discuss two general aspects of the data--first, the fact that performance was generally impaired by distraction, and second, that there were some consistent differences among the distractors in their effectiveness. The general impairment of performance indicates that it is possible to identify conditions under which extraneous stimulation will have a distracting effect for 5- and 8-year-old children in a learning situation. The significance of this seemingly obvious point lies in its contrast with evidence, generally obtained with subjects beyond about age 4 or 5, indicating that external stimulation can actually facilitate children's learning under certain conditions (e.g., Ellis, Hawkins, Pryer & Jones, 1963; studies by Turnure, 1970, 1971 also observed a facilitative effect that approached significance). Data of the latter type have been interpreted to indicate that as children grow older they tend increasingly to react to extraneous stimulation by redoubling their attention to the task at hand. It is likely, however, that such results are specific to the methods employed in these investigations. The three studies cited used relatively simple learning tasks--an oddity problem in the first two and a two-choice discrimination task in the third. The present study, on the other hand, employed a relatively difficult task requiring the subject to memorize information in the presence or absence of distraction. It is reasonable to hypothesize that this difference in task difficulty is a critical factor in determining the direction in which external stimulation will influence performance.

Such task differences will be a major consideration in further development of a distractibility measure.

Consistent differences in effectiveness of the four distractors are reflected in the contrasts performed within each modality. For both sexes at each age level, pictures flashing in the periphery of the subject's visual field (Pictures condition) were more distracting than stripes flashing across the stimuli to be learned (Pattern), which had only a marginal effect on performance. Either of two major factors is probably responsible for this difference. As the pictures were spatially separate from the stimuli to be learned, the fact that these pictures caused the subject to redirect his gaze away from the task may have contributed most significantly to their distractiveness. On the other hand, the meaningfulness or interest value of the pictures relative to the pattern may also have been an important factor. Research is currently in preparation to isolate the roles played by spatial separation, meaningfulness and other factors that may be critical in determining the potential distractiveness of a visual stimulus.

Regarding the auditory stimuli, both the 5- and 8-y r-old children apparently found the Noise condition to be as distracting as the Story. The "noise" used in this case (the story played at a low speed) was a type of auditory stimulus that children generally find quite amusing. In contrast to the type of background noise that has often been used in studies on this topic, then, this condition was expected to be of high interest value, and the major dimension of difference between these auditory distractors was their "meaningfulness," defined in terms of understood speech. The fact that no difference

was observed in the effects of these two conditions suggests that an auditory stimulus of sufficient interest value need not be highly meaningful in order to be distracting.

Regarding the major issue of the research, developmental changes in distractibility, the 5- and 8-year-olds were roughly equal in the magnitude of difference between their Nondistraction and distraction scores. Assuming this difference to be an appropriate indicant of distractibility, the present data are inconsistent with the hypothesis that children become less distractible with increasing age. Although these results do not rule out the possibility that developmental changes may occur prior to age 5, they suggest little abatement in distractibility over the early school years. In this respect, the present study is generally consistent with the research literature on this topic. Of developmental comparisons involving children above age 5, three have indicated a detrimental effect of distraction but no age difference in the magnitude of this effect (Hagen, 1967, and Maccoby & Hagen, 1965, ages 6 to 12; Turnure, 1970, 5-1/2 to 7-1/2-year-olds given auditory distraction). Only one study apparent has obtained a developmental difference over this age range (Turnure, 1970); the presence of a mirror as a distractor impaired learning for children at age 5-1/2 but not 6-1/2 or 7-1/2. In general, then, the evidence to date provides little support for the hypothesized decrease in children's distractibility over the early school years.

The present data can also be viewed in terms of a different model, however, which posits that distractibility is reflected in the amount of performance reduction <u>proportional</u> to performance under Nondistraction as a baseline. According to this model, the distractors in this study

would be seen as having a greater proportional effect for the 5-year-olds, who averaged 3.94 correct under Nondistraction than for the 8-year-olds who averaged 6.43 correct (a significant age difference in proportions according to a median test). It could be inferred on this basis that 5-year-olds tend to be more distractible than 8-year-olds, contrary to the conclusion implied by the absolute differences. Although a model of this type is less commonly accepted than that which deals with absolute effects, it may be regarded as an equally plausible way of treating data from groups differing in baseline level of performance, such as is true in the present case. Further clarification of this issue will be offered in research systematically varying the difficulty level of the criterion task.[2] If the difference in performance with distraction and with no distraction remains relatively constant through variation in task difficulty, support will be provided for using absolute differences as a means of comparison across age levels. On the other hand, if this difference proves to be highly related to task difficulty at a given age level, the more appropriate model for developmental comparison may be that based on proportion scores.

The hypothesis that persons of relatively low mental ability are more distractible than are brighter individuals has been advanced in connection with several empirical analyses (e.g., Ellis, Hawkins, Pryer, & Jones, 1963; Hovey, 1928; Tinker, 1922). Evidence obtained in the present study provides no support for this notion, however, as the effects of distraction were unrelated to the 8-year-old children's scores on either the California Achievement Test or the California Test of Mental Maturity. These results agree with evidence obtained in relevant studies with adults, in which the effects of distraction were unrelated to scores on standard intelligence tests (Hovey, 1928, Army

Alpha test; Tinker, 1922, Otis test). Previous studies with children also provide little support for the hypothesized relation between ability level and distractibility. The effects of distraction were found to be unrelated to scores on the Minnesota Preschool Scale for 3- to 5-year-olds (Poyntz, 1933) and to "verbal IQ" for 9-year-olds (Bee, 1967, test not specified). In a study by Maccoby and Hagen (1965), in fact, the detrimental influence of di :action for children at ages 8 and 10 (but not 12) tended to be greater for the brighter children, rather than the duller children as the above hypothesis would predict.[3] Although some data exist suggesting a correspondence between mental age and response to distraction in severely retarded adults (Sen & Clarke, 1968), for subjects within the normal range of intelligence there appears to be little evidence for the hypothesized relation between distractibility and level of mental ability.

Continuation of the present research will be designed to increase the generality of the measure used here, one aspect of which will involve examination of changes over time in the effects of extraneous stimulation. In the present study, performance under distraction was found to improve after the initial exposures to such stimulation, in contrast with an observed decrement in performance under Nondistraction. Thus, as has been observed with adults (e.g., Morgan, 1916), children apparently adapt somewhat to the presence of an external stimulus, causing a reduction over time in its distracting effect. It should be noted, of course, that the detrimental effects of distraction were still apparent in data from the final two-thirds of the conditions employed in this study (and the initial rise in performance under distraction was often followed by a drop). Nevertheless, the fact that marked changes

in performance occurred within the relatively short six-trial periods used here suggests that further changes may likely occur beyond these periods as well; subsequent research will assess this possibility by examining children's performance under more extended periods of distraction.

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Footnotes

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[2]While this was the purpose of including both 4- and 6-stimulus trials in the present study, these two cases proved to differ little in difficulty; the average number correct under Nondistraction was 2.93 for the 4-choice trials and 2.29 for the 6-choice trials. This small difference was likely due to the procedure of alternating between the two trial types, rather than presenting them separately or to different groups. Separate analyses of variance were performed for the 4- and 6-stimulus trials nevertheless (identical to the analysis described in the Method section), and in both cases the contrast between Nondistraction and distraction was significant ($\underline{F}(1, 120) > 20.00$, $\underline{p} < .001$) but did not interact significantly with age ($\underline{p} > .30$).

[3]In the Maccoby and Hagen study, correlations between scores on the California Test of Mental Maturity and performance on the criterion task were reported separately for subjects given distraction and subjects given no distraction. The correlation for the former group was significantly negative, while that for the latter group was about zero at both grades 3 and 5 (although not 7); thus it can be inferred that at grades 3 and 5

the difference in performance between nondistraction and distraction was greater for subjects with high scores on the California test than for subjects with low scores.

Table 1

Mean Number of Correct Responses and Standard Deviation

(in Parentheses) for Each Condition at Each Age Level

	Condition				
	Nondistraction*	Story	Noise	Pictures	Pattern
Age 5	3.94	2.92	2.78	2.47	3.35
(N = 72)	(2.02)	(1.79)	(1.8)	(1.47)	(2.23)
Age 8	6.43	5.39	5.36	5.44	6.43
(N = 72)	(2.45)	(2.41)	(2.36)	(2.68)	(2.34)

*Combination of two Nondistraction conditions. Standard deviation is pooled SD for Nondistraction (square root of average variance).