

# **INTENTIONAL/INCIDENTAL LEARNING CAPABILITIES OF RETARDED CHILDREN: A STUDY OF SOCIOECONOMIC, CHRONOLOGICAL AND MENTAL AGE FACTORS**

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## **ABSTRACT**

Mentally retarded subjects were compared to non-retarded subjects in two experiments on intentional and incidental learning. Experiment I examined intentional and incidental learning capabilities of retarded and non-retarded subjects of equivalent chronological ages. Results indicated that non-retarded children were significantly superior to retarded subjects on an immediate test of incidental learning in a free recall situation. No significant differences were found on the intentional learning task. Experiment II examined the influence of socioeconomic status on the intentional and incidental learning capabilities of retarded and non-retarded children with comparable mental ages. Results of the analysis of variance on the intentional and incidental learning task indicated that there were no significant differences between populations. No interactions were evident between the main effect variables (subject classification and socioeconomic status) in either analysis. Implications for practice and future research were discussed.

The incidental learning capability of mentally retarded children has been a topic of interest to special educators for some time. Some authors have been suggested that an incidental learning deficit is characteristic of mentally retarded individuals and contributes substantially to their overall learning problems (Denny, 1964). Inferences from such suggestions have often resulted in an assumption that an incidental learning deficit not only characterizes, but is a primary distinguishing characteristic of retarded children. A recent review of literature, however, indicated that such a premise is not based upon substantial empirical evidence (Hardman & Drew, 1975). These authors noted that the area of incidental learning, "...as it relates to mental retardation, has been grossly neglected by researchers" (p. 3).

Investigation and discussion of incidental learning has typically occurred in the context of intentional learning. This is due to the fact that incidental learning has been conceptualized in contradistinction to that learning which occurs intentionally. Additionally, there has been an interest in identifying potentially different performance patterns and relationships between incidental and intentional learning. Certain empirical support has been obtained for the

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existence of a relationship between intentional and incidental learning. It has been found, for example, that a high motivational level during directed instruction (intentional) tends to reduce incidental learning (Gardner & Brandl, 1967; Ross, 1970). Such Data provide support for the notion that incidental and intentional learning are related phenomena or components of the same process. This serves to re-emphasize the importance of studying these phenomena simultaneously. The limited research effort to date, however, leaves a substantial information gap concerning the nature of the relationship or interaction between incidental and intentional learning.

A number of variables influencing the intentional and incidental learning of retarded and non-retarded individuals have been investigated. Some studies have focused upon the inter-relationship of chronological and mental age with performance variables. Goldstein and Kass (1961) matched retarded and non-retarded children on mental age and found that retarded children perform as well as non-retarded children on tasks that measure gross features of incidental learning. Subsequent investigations (Hetherington & Banta, 1962; Singer, 1964) have been supportive of the Goldstein and Kass findings: retarded children do not exhibit an incidental learning deficit when compared to non-retarded children of comparable mental age.

Baumcister (1963) essentially replicated the Hetherington and Banta study, but matched subjects on the basis of chronological age (CA). He found that non-retarded subjects were superior in their performance on immediate intentional and incidental learning tasks. Another study with subjects of equivalent CA was conducted by Logan, Prehm & Drew (1968). These authors found no support for an STM deficit in retarded individuals in either intentional or incidental learning. Inconclusive results are not surprising with such a limited base of empirical data. Far more research is required before clear trends may be expected.

A potentially important variable that has received very limited attention in this area is socioeconomic status. The potency of socioeconomic status on learning patterns has long been of interest in various dimensions of intentional learning, yet has remained virtually unexplored in terms of incidental learning. A single study by Wilson (1969) examined the effects of socioeconomic status on intentional and incidental learning by retarded and non-retarded subjects. The author concluded that no significant positive relationship existed between social class status and intentional learning. Wilson's investigation remains the single source of information concerning the influence of socioeconomic status on incidental learning. Further investigation is essential to clarify this area, particularly in the context of MA and CA variables.

The purpose of the present investigation was to conduct two related experiments, the first examining the intentional and incidental learning capabilities of retarded and non-retarded children of equivalent chronological age and the second examining the influence

of socioeconomic status on the intentional and incidental learning capabilities of retarded and non-retarded children with comparable mental ages.

## EXPERIMENT I METHOD

### Subjects

Subjects for experiment I consisted of fifteen mentally retarded children (I.Q.'s 55 to 83) and fifteen non-retarded children (I.Q.'s 92-109). Subjects were selected using stratified random sampling (Drew, 1980) from the population of students with CAs of 85 to 108 months who were attending public schools in the Salt Lake City School District. Retarded subjects were enrolled in self-contained special education classes and non-retarded subjects were enrolled in second and third grade regular classes at the time of investigation. Table I provides a summary of CA, MA, and I.Q. characteristics of subjects in experiment I.

		Experiment I			
Group	N	Statistic	CA (Mo.)	MA (Mo.)	IQ
Non-retarded	15	range	86-108	84-108	92-109
		mean	95	95	101
Retarded	15	range	85-106	46-77	55-83
		mean	95	62	71

### Materials

Materials consisted of ten colored pictures of common animals. These pictures were photocopied line drawings taken from the Peabody Language Development Kit (Primary 1). Pictures were individually presented on a white sheet of paper 21.59 x 27.94 centimeters in size. Each figure was monochromatically tinted utilizing one of the following colors: green, red, blue, yellow, or black. Each color was used for two drawings, resulting in ten pictures of animals and five colors.

### Procedures

Essentially replicating procedures by Baumeister (1963) and Wilson (1969), the subjects in each group were administered a test of immediate intentional learning and a test of immediate incidental learning. Prior to the presentation of the figures the subjects were informed that they would be asked to recall the names of each animal presented. The subjects were tested on their ability to identify each animal during the testing situation by having the subject verbalize the animal's name as it was being presented. Figures were exposed to the subject for a period of five seconds with an interval of three seconds between each drawing. The subjects were asked to name as many of the ten animals as possible in a free-recall situation after the presentation of all the pictures had been completed. The experimenter recorded the number of correct responses for each subject. The incidental learning test was conducted immediately following the intentional test. This test involved the subjects recalling the color of each animal previously presented during the intentional learning task. No mention of color recall had been made

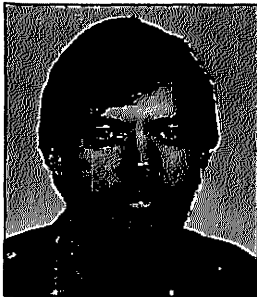
prior to this time. All subjects had been initially screened for color identification skill and color blindness prior to the investigation.

## RESULTS AND DISCUSSION

Data were analyzed using an independent test (Bruning & Kintz, 1968) with mean correct responses as the dependent variable. Table 2 summarizes mean correct responses for both intentional and incidental learning tests by subject classification. Results indicate no significant differences between retarded and non-retarded subjects on intentional learning ( $t=1.58$ ,  $df=28$ ,  $p>.05$ ). On the incidental test however, non-retarded subjects made significantly more correct responses than the CA equivalent retarded groups ( $t=2.54$ ,  $df=28$ ,  $p<.05$ ).

The incidental learning data in this experiment thus indicate a performance difference favoring non-retarded subjects when compared with retarded subjects of equivalent CA. These data support Baumeister's contention that non-retarded children learn more incidentally than retarded children on a task involving on presentation and immediate recall. Results of the present investigation and the earlier Baumeister experiment are, however, at variance with the findings of Logan et. al. study. Concerns relating to the authors' characterization of backward recall as a test of incidental learning may preclude the utilization of conclusions regarding incidental learning capabilities of retarded children. Hardman & Drew (1975) suggested that: "The intuitive leap from their results to the fact that backward recall is a test of incidental learning is a questionable premise. It is possible that paired associates are learned as a chain. The ability to give the response term when it was previously a stimulus term may be more a function of identifying the missing part of the chain rather than the missing part referred to as incidental...The authors' suggestion that backward recall may be incidental learning does not seem firmly based in logic" (p.5).

The data in the present study indicated no significant differences between retarded and non-retarded groups on an immediate test of intentional learning with a CA control. These results are not supportive of the Baumeister study that revealed a significant superiority in non-retarded children on tasks of intentional learning.



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## EXPERIMENT II

### Method

#### Subjects

The design of experiment II involves two independent variables (socioeconomic status and subject classification). This design compared mentally retarded and non-retarded children with equivalent MAs (subject classification variable), and middle and low socioeconomic status groups in a 2 x 2 configuration. Thus four groups of fifteen subjects each were constituted: lower SES mentally retarded, middle SES mentally retarded, lower SES non-retarded and middle SES non-retarded.

Subject classification specifications involved an IQ range of 61 to 83 for the mentally retarded children and 90 to 120 for the non-retarded children with the MA range for both classifications being 84 to 108 months. Within these specifications the two initial subject pools were formed using stratified-random sampling procedures. All children within these subject pools were then assessed in terms of SES using the Revised Warner Index of Social Status (Chinn, 1967). The low and middle SES groups were then constituted for each subject classification. Group matching procedures (Drew, 1980) were used to maintain equivalence on control variables while formulating low and middle SES conditions. As with subjects in Experiment I, the mentally retarded children in this experiment were enrolled in self-contained special education classes and the non-retarded children in second and third grade classrooms. Table 3 summarizes subject characteristics.

Table 2 Experiment I  
Mean Correct Responses by Groups on Intentional and Incidental Learning Tests

Group	Intentional Learning	Incidental Learning
Non-retarded	5.80	6.87
Retarded	4.86	4.86

Table 3 Experiment II  
CA, MA and IQ Characteristics of Subjects

Group	N	Statistic	CA (Mo.)	MA (Mo.)	IQ
• Non-retarded					
Low SES	15	range	85-106	84-107	90-120
		mean	94	94	101
Middle SES	15	range	92-103	84-107	92-109
		mean	96	94	101
Retarded					
Low SES	15	range	108-159	85-108	62-83
		mean	133	94	75
Middle SES	15	range	116-166	85-108	61-83
		mean	137	98	74

#### Materials and Procedure

The learning materials and operational components for this experiment were identical to those employed in Experiment I. The format was an immediate test of intentional and incidental learning in a free recall situation.

## Results and Discussion

Data were analyzed using 2 x 2 (Intelligence Classification x SES Classification) analysis of variance with mean correct responses serving as the dependent variable. Table 4 summarizes group performance for both intentional and incidental learning. Results of the analysis of variance on intentional learning data indicated that there were no significant differences between retarded and non-retarded subjects of equivalent MA ( $F = .006$ ,  $df = 1/56$ ,  $p < .05$ ). Differences between SES groups were also not significant on intentional ( $F = .70$ ,  $df = 1/56$ ,  $p < .05$ ) or incidental tests ( $F = 1.46$ ,  $df = 1/56$ ,  $p < .05$ ). No interactions were evident between main effects variables in either analysis.

The results in this experiment sustain the conclusions drawn by earlier investigations (Goldstein & Kass, 1961; Hetherington & Banta, 1962; Singer, 1964) indicating that retarded children do not exhibit incidental learning deficits when compared to non-retarded children of comparable mental age. However, as was previously discussed in Experiment I, the conclusions must be analyzed in terms of the task requirement. Future research must attend to task specificity and complexity. As the task becomes more complex retarded children appear to be superior in the number of responses given, but are significantly inferior in their accuracy (Goldstein & Kass, 1961). Singer (1964) has also suggested that retarded individuals exhibit a significant incidental learning deficit as the tasks increase in difficulty level. Additionally, data from the present investigation confirm results of the study by Wilson (1969), indicating that no significant relationship exists between socioeconomic status and intentional or incidental learning. Future research must also attend to a potential long-term incidental learning deficit in retarded populations. The present investigation has chosen only to focus upon an immediate recall situation. Additionally, further research should examine the effects of reward and the nature of incidental learning stimulus materials in conjunction with social status.

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Table 4  
Experiment II  
Mean Correct Responses by Groups on Intentional and Incidental Learning Tests

Group	Intentional Learning	Incidental Learning
Non-retarded		
Low SES	5.60	6.33
Middle SES	6.80	7.73
Retarded		
Low SES	6.27	6.73
Middle SES	6.00	6.73

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