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GRATIFICATION PATTERNS AND THE PERCEPTION  
OF LOCUS OF CONTROL IN YOUNG CHILDREN  
BY BARBARA E.<sup>EPSTEIN</sup> ROSEN

A dissertation submitted to the  
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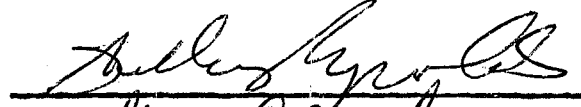
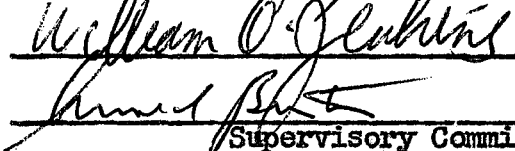
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## ABSTRACT

### Gratification Patterns and the Perception of Locus of Control in Young Children

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The present study is an attempt to analyze the development of patterns of behavior related to gratification in children between the ages of 8 and 11. Three response measures were administered to 146 children from a Nassau County, New York public school: a threefold choice questionnaire in which Ss indicated their preferences for immediate, delayed or risked reward, a children's locus of control scale and a probability guessing "card game" with fixed input probabilities.

It was found that the majority of younger children did not choose the immediate reward but did tend to choose it with the greater frequency than the older children. Younger children tend to perceive events as externally controlled and older children tended to perceive events as internally controlled. Children who preferred immediate gratification tended to perceive events as externally controlled while children who preferred delayed gratification tended to perceive events as internally controlled.

Risk taking behavior was found to be related to the perception of events as having an internal locus of control.

The frequency of "yes" responses was found to increase with

age and be related to preferences for delayed larger rewards and an external perception of the locus of control.

It was also found that older high IQ children almost always choose delayed gratification over immediate and risked gratification unlike their low IQ counterparts.

#### ACKNOWLEDGEMENTS

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## Chapter I

### INTRODUCTION

The ability of humans to delay gratification of needs has been viewed as a constitutional or characterological factor (Friedlander, 1960, and Freud, 1955), as a function of expectation (Mahrer, 1956, Mischel, 1958) and age (Washburne, 1929, Bailer, 1961, Melikian, 1959 and Mischel, 1962). In addition, this ability has been related to personality factors (Washburne, 1929, Mischel, 1961a, 1961b, Barnat and Johnson, 1955, Levine and Spivak, 1958, Graves, 1961 and Bailer, 1961)

The ability to postpone gratification is given special theoretical significance in psychoanalytic theory. Freud viewed the ability to postpone gratification as a reflection of an increasing competence to deal with the demands of reality. He described the developmental shift in the ability to delay rewards for more valued outcomes as a transition from functioning on the basis of the pleasure principle to functioning on the basis of the reality principle. "Under the influence of the ego's instincts of self preservation, the pleasure principle is replaced by the the reality principle. This latter principle does not abandon the intention of ultimately obtaining pleasures, but it nevertheless demands and carries into effect the postponement of satisfaction, and the temporary toleration of unpleasure as a step on the long indirect road to pleasure" (Freud, 1955, P.10).

Psychoanalytic theory offers explanations of several behavior disorders in terms of different kinds of early childhood experiences. For example, an impulse neurotic is described by Feni-

chel (1945, pp. 367-368) as unable to postpone an immediate reaction to the experience of a drive state. Impulse-neurotics therefore act before thinking and not being able to delay gratification, have not completely developed their reality principle. So-called depressives (while in a manic state) yield to impulses without adequate consideration of reality.

Friedlander (1960) stresses the importance of early libidinal development in the formation of a socially adaptive personality. Among delinquents, she observes that severe frustration of instinctive urges prevents proper identification with parents, thus impairing the development of the reality principle mode of functioning. Since the reality principle allows a normal child to satisfy urges in a way that is compatible with society, Friedlander characterizes delinquents as being dominated by the pleasure principle rather than by the reality principle.

As he develops a sense of reality, a maturing infant's growing intellectual capacities lead him beyond mere concern with indulgence or deprivation. The pleasure principle is gradually replaced by the reality principle. This process lends itself to interpretation as a learning process in which an infant becomes aware of possible changes in his environment and can anticipate future considerations. The reality principle, therefore refers to the ability to substitute a future for an immediate gratification.

According to Bailer (1961) in the early stages of development, there is no conception of the relationship between the outcome of events and one's own behavior. Consequently young children at first tend to attribute their experiences, both positive

and negative, to externally controlled factors such as fate, other people, and/or other external forces. But then as development proceeds, children begin to recognize their own role in influencing their experiences. They thus begin to perceive goal-directed behavior as being internally controlled.

In an earlier investigation, Bailer (1961) found that young children tend to conceptualize events as externally controlled while older children tend to conceptualize events as internally controlled. Moreover, those children who view events as consequence of their own behavior also possess the ability to delay gratification as measured in a situation in which they are allowed to choose between an immediate small reward and a future greater reward.

These formulations and investigations are predicated upon the proposition that the development of the reality principle is contingent upon the ability of the child to perceive that his own efforts can influence the course of events and on his ability to postpone gratification.

#### The Ability to Delay Gratification as a Function of Expectation

The ability to delay gratification had been viewed within the context of social learning theory (Rotter, 1954). Within this conceptual frame, behavior is seen as a joint function of the incentive value of the reward and the expectation of obtaining the reward in a given situation. In a situation where an individual chooses between an immediate reward and a larger but delayed reward his expressed preference is determined by his expectation that he will actually get the reward and the incen-

tive value that the reward possesses.

Within a basic expectancy model, Mahrer (1956) tested whether expectational differences predict reward choice differences. Using seven to nine year olds, he varied the number of times that a promised toy would be supplied. Different degrees of expectation were established by manipulating the reward schedule. Mahrer offered each group of Ss a choice of a small toy immediately, as a reward for participating in the experiment, or a more valued toy after a day's time. As predicted, Ss having the greatest expectancy for the agent of reward to supply the actual reward chose delayed reward significantly more often. When a different social agent offered the reward no significant differences were found between the expectancy groups.

Mischel (1958) emphasizes the role of the social agent in such reward choice situations. In a study using Trinidad negroes and East Indian children, Mischel hypothesized that perception of parental figures would generalize to other social agents in an immediate versus delayed reward choice situation. Trinidad Negroes have no parental figure in the home, and have had less opportunity to develop expectancies for the fulfillment of delayed reward. As predicted Trinidad Negroes consistently chose immediate reward. Using the same method, Mischel compared eight and nine year old Granada and Trinidad children and found that where a father is absent in the family, children consistently choose immediate reward. Both studies by Mischel support the hypothesis that reward preference is a function of learning.

#### The Ability to Delay Gratification as a Function Of Age

But Mischel found that the preference for immediate reward

among children whose fathers were absent does not hold true for children of ages 11 to 14. This finding is interpreted by Mischel to reflect the diminished effect of the family upon the development of expectations for reward in older children.

The evidence seems to indicate that there is a diminished tendency toward immediate reward choices with increasing age.

Washburne (1929) investigated the relationship between "those who chose now" and "those who chose later" and age with children of ages 4 to 17 and found that "now" choices diminished with increasing age. Using the Draw-a-Man-test, Melikian (1959) also found evidence of a positive relationship between age and delayed reward choices. More recently, Balier(1961) found a positive relationship between preference for delayed reward and age using normal and retarded children ages 6 to 14. Mischel (1962) also found a positive linear relationship between preferences for delayed reward and age. His instrument for measuring preferences for immediate versus larger delayed reward consisted of a series of choices. For example, S's were asked to indicate their preference for a small toy now or a larger toy in a week. Mischel (1962) especially noted an apparent "critical period" from 8 to 9 years of age when an increase in delay choices was found. If the critical age in the development of the ability to delay gratification occurs between 8 and 9 as Mischel suggests then at this age children should be expected to begin to function on the basis of the reality principle rather than the pleasure principle. This being the case, children at this age level should begin to show an internal perception of locus of control as defined by Bailer (1961) and an increase in larger

0

delayed reward preferences as measured in choice situations.

As defined by Freud (1942) the reality principle involves three behavioral aspects: (1) the ability to substitute future for immediate gratification, (2) foresight or the ability to anticipate future events and (3) the ability to control or inhibit pleasure seeking. If a child possesses the ability to postpone gratification for the sake of future gains and to perceive events as under his own control he may be said to have met Freud's criteria for the reality principle.

#### Risk Taking or Reality Testing

Brunswik (1939, 1943) points out that in every day life the probability of being rewarded for a correct response is less than 1.00. In the present study the dimension of "uncertainty of reward" is introduced as one of the determinants in a child's decision to delay gratification. That is, if a child possesses the ability to accept delayed gratification his choice will be affected by the degree of certainty of obtaining the future reward.

We already know that with increasing age children's willingness to choose a larger reward in the future which is certain over a smaller reward is a function of the difference in the size of the rewards.

It is to be expected that immature people will take unnecessary risks. They may be so focused on pleasure seeking that the most important aspect of a reward is its size. They may not understand the nature of uncertainty or risk so in effect they don't have the ability necessary to risk. They may not even think they are taking a risk. One would expect that with increasing age, maturity and understanding one will take risks under

specific conditions. Thus when conditions are considered favorable one will take a risk. Favorable conditions are minimum risk and high pay off.

Generally then, whether or not one will take a risk depends upon his judgment of the situation. Judgment as a general function of the ego is known as "reality testing" which involves the ability to anticipate the future in the imagination.

It is felt that risk taking behavior may be studied in probability guessing tasks wherein a child is forced to make a decision regarding the occurrence or non-occurrence of a stimulus. In this way, the certainty of the occurrence of the stimulus can be experimentally manipulated and concurrent changes in behavior may be observed. In effect, this involves the experimental manipulation of a reinforcement schedule.

Previous research in probability guessing by Stevenson and Weir (1959) has shown that younger children tend to choose a reinforcing stimulus significantly more often than older children. That is, younger children tend to maximize the probability of reinforcement where maximization is defined in terms of the frequency of choice of the reinforcing stimulus or the number of "yes" responses.

It has already been mentioned that the pleasure principle involves an inability to delay gratification and at times an inability to give up gratification. Thus, by maximizing reinforcement younger children are expressing an inability to relinquish gratification thereby functioning on the basis of the pleasure principle. Thus probability guessing behavior as used in the present study represents an attempt to investigate both foresight

and the ability to relinquish gratification which are two of the criterion Freud stated for functioning on the basis of the reality principle.

### Risk Taking and Internal-External Locus of Control

Risk-taking behavior was studied in relation to the internal-external locus of control construct (Liverant & Scodel, 1960, Lefcourt, 1965 and Lefcourt & Ladwig, 1965 a). This construct has been described by Rotter, Seeman and Liverant (1962) as distributing individuals according to the degree to which they accept personal responsibility for what happens to them.

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

Liverant and Scodel (1960) hypothesized that Ss low in externality would believe that they could exert a modicum of control in chance-determined situations while Ss high in externality would view such outcomes as occurring by chance. Ss were required to bet on the outcome of 30 trials of dice throwing. Ss selected amounts to bet and chose one of seven alternative bets with given objective probabilities. Internals tended to choose significantly more bets of intermediate probabilities and significantly fewer low probability bets than did high-external Ss. Internals were also found to wager more money on cautious than

risky bets. In terms of gratification patterns of behavior, internal prefer not to risk reward for larger quantities whereas externals prefer to risk reward for larger quantities significantly more frequently than internals.

#### Statement of Problem

The general formulation of the present study is as follows: in the early stages of development there is no conception of the relationship between the outcome of events and one's own behavior. Thus young children tend to view their experiences as externally controlled. In addition, young children do not possess the ability to postpone gratification and thus they function on the basis of the pleasure principle as opposed to the reality principle. Since younger children tend to perceive the course of events as controlled by external factors and thereby to be a function of chance rather than themselves, it is our thesis that they will be more willing to risk a reward for possible greater quantities.

The present study is an attempt to analyze the development of patterns of behavior related to gratification in children between the ages of 8 and 11. The main thesis of the study is that as the perception of the locus of control for behavior shifts from external to internal there are related changes in the ability to delay gratification. In particular the study is concerned with the relationship of age to three dimensions of gratification: delay in gratification, size of reward and willingness to take a risk.

The general hypotheses guiding the conduct of the study are: (a) with increasing age there should be an increasing inclination to choose larger delayed rewards. (b) with increasing age there

should be a shift in the perception of locus of control from external to internal. (c) children who prefer immediate gratification should perceive the course of events as determined by an external locus of control. (d) with increasing age there should be both a shift in the perception of locus of control and an increasing inclination to choose larger delayed and risked rewards. (e) children who tend to perceive events as having an external locus of control should be more likely to choose delayed larger risked rewards than children who perceive events as having an internal locus of control. (f) children who tend to choose immediate gratification will tend to make more "yes" responses irrespective of the probability input condition. (g) older children should tend to respond closer to the actual probability input condition than younger children. (h) children who perceive events as having an external locus of control should tend to make more "yes" responses than children who perceive events as having an internal locus of control.

## CHAPTER II

## METHOD

Subjects - 146 children from a public school in Nassau County ranging in age from 8 to 11 years served as subjects. The mean IQ for all Ss was 114.5. Two third, fourth and fifth grade classes were used. Judged from their father's occupations, the sample seemed to be primarily of upper-middle socio-economic background. Table 1 summarizes age and IQ data for the sample.

Procedure - There were three testing sessions, one week apart, for each subject. In the first session, the gratification choice measure (described below) was administered to the children within their classrooms. In the second session, the Locus of Control Scale for Children (Bailer, 1961) was administered to the children within their classrooms. In the third session, the probability guessing task was administered to the entire group.

Measure of Type of Gratification Patterns

Differences in types of gratification patterns i.e., immediate, delayed larger and risk was measured by a 14 item multiple choice questionnaire (see Appendix A) which was developed as follows. The items were the same as those employed by Mischel (1958) except that a third choice was added to each item in order to extend the instrument to include the dimension of risk.

The standardization procedure employed to determine the third component of the multiple choice items i.e. the dimension of delayed larger risk, was as follows. A pretest questionnaire con-

Table I

Means, Ranges and Standard Deviations of IQs and Age  
for all Six Classes

Class 3-H N = 26

	IQ	Age
Mean	114.4	8 yrs. 8 mos.
Range	32	1 yr.
Standard Dev.	7.7	4 mos.

Class 3-K N = 26

Mean	112	8 yrs. 5 mos.
Range	36	1 yr.
Standard Dev.	8.6	3 mos.

Class 4-G N = 28

Mean	120.2	9 yrs. 6 mos.
Range	42	9 mos.
Standard Dev.	12.4	3 mos.

Class 4-S N = 21

Mean	110.4	9 yrs 6 mos.
Range	33	9 mos.
Standard Dev.	9.2	3 mos.

Class 5-D N = 26

Mean	118.5	10 yrs. 8 mos.
Range	32	1 yr. 11 mos.
Standard Dev.	15.2	5 mos.

Class 5-J N = 19

Mean	111.5	10 yrs. 7 mos.
Range	38	1 yr. 7 mos.
Standard Dev.	11	4 mos.

sisting of 14 multiple choice items (see Appendix B) was administered to a standardization group of 50 third, fourth and fifth grade children from the same school as the test Ss. Each multiple choice item forced a choice among three alternatives to ascertain how much reward a child would have to expect in order to be willing to take a risk on a larger delayed reward. The minimum amount acceptable to at least 50% of the children in order for them to be willing to take a risk was the standard employed in selecting the third component of the gratification instrument.

The experimental procedure consisted of providing each child with an individual booklet containing the Type of Gratification Pattern questionnaire. They were then read the following instructions:

In front of each of you I have placed a booklet. Each page of the booklet contains a description of certain objects about which you will make a choice. I am going to show you the objects on each page and then I want you to make a choice about when you would like to receive the object. Now, suppose you could have your choice, which would rather have, a small bag of potato chips now (E displayed the potato chips in each choice), a larger bag of potato chips like this in a week or would you prefer to take this ticket (E displayed ticket) which will be good for a drawing to be held in a week for a much larger bag of potato chips like this. Remember if you take the ticket you are taking a chance for the very large bag of potato chips. Circle number one

if you want the small bag of potato chips now, circle two if you want to wait a week for the larger bag of potato chips or circle three if you want to take a chance for the much larger bag of potato chips. In each set of objects be sure to choose what you would actually like to have because in one of the choices I will really give you the thing you pick, although I won't tell you which one that is, until the very end. (The promise was of course kept.)

Each grade level was divided into three groups on the basis of their performance on the type of gratification pattern questionnaire: Group I: immediate reward; Group II: delayed larger reward; and Group III: delayed larger risked reward. In order for a child to be assigned to one of these three experimental groups he had to have chosen it as his most frequent category. In no case was a category chosen less than 5 times by any child assigned to that group.

#### Measure of Perception of Locus of Control

Perception of the locus of control (internal versus external) was measured by the use of the Locus of Control Scale for Children constructed by Bailer (1961) (see Appendix C)

Each child was asked to write "yes" or "no" as each item was read to him. His score was the total number of responses in the direction of internal control.

#### Probability Guessing Task

The materials consisted of 3 randomly mixed sets of 12 index cards on each of which was drawn a  $2\frac{1}{2}$  inch square in either

red or blue. One set contained 12 red squares (100%). The second set contained 8 red squares (66%) and the third set contained 4 red squares (33%).

Each group of children was given the following instructions: "We are going to play a guessing game today. I have with me a pack of cards (E holds up cards). Some of the cards have a red square on them and some have a blue square. I want you to guess which cards have a red square. I am going to draw a card from the top of the pack, if you think the card has a red square on it write "yes" next to number one in your booklet. If you think the card does not have a red square on it write "no" next to number one. I will tell you what number we are up to each time I draw a card." After each guess the card was shown to S so that he could see if he was right or wrong. The packs were pre-arranged so that the children in group A received packs containing 100% red cards. Group B received the packs containing 66% of the cards with red squares and group c received the packs containing 33% of the cards with red squares. Each child was given 80 guesses. A record was kept of the total number of correct guesses and the total number of "yes" responses for each child.

For the purpose of this task each type of gratification group (see above) was subdivided into three groups of equal number making a total of 27 experimental groups (e.g. Group IA; Group IB; Group IC etc.).

## CHAPTER III

## RESULTS

Since the third, fourth and fifth graders in the present study were primarily 8-9, 9-10 and 10-11 year olds respectively, grade and age level are used interchangeably in reporting the results.

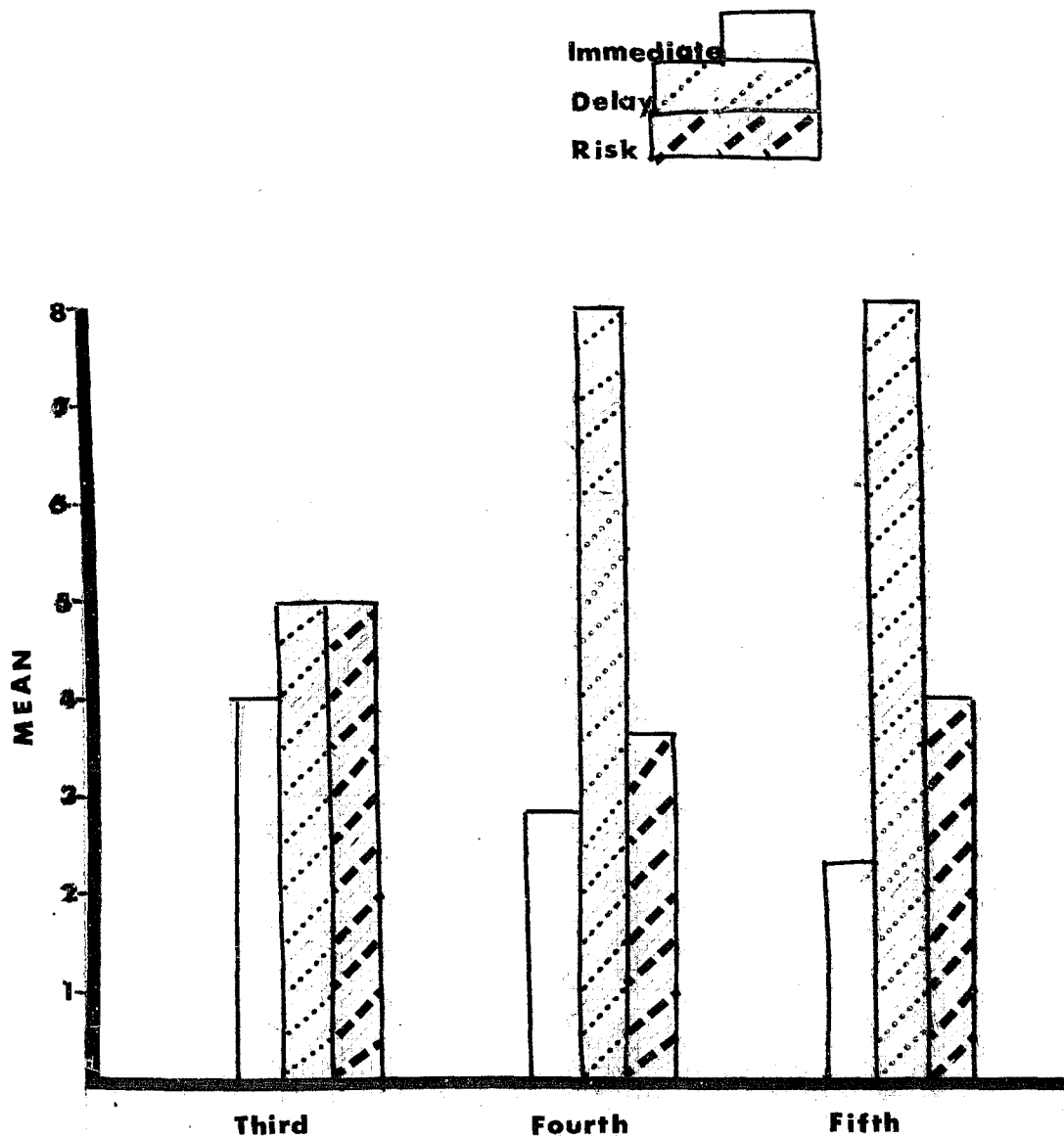
Age and Type of Gratification Pattern

For the sake of statistical analysis the two classes at each grade level were combined. T-tests showed that there were no significant differences between the two classes at each grade level with respect to the means for immediate, delayed larger and risked choices (see Appendix D).

Hypothesis A With increasing age there should be an increasing inclination to choose larger delayed rewards.

To test this hypothesis, the percentage of children at each grade level who chose immediate, delayed larger and delayed larger risked reward was computed and can be found in Table 2. The percentage of third graders who fell into the group of those who most frequently chose the immediate reward was 27%. Although this percentage was higher, in the expected direction, than the percentage of fourth and fifth graders who fell into this category, it was not significantly higher, and contrary to Mischel's (1962) findings, the majority of third graders did not tend to choose the immediate reward with the greatest frequency.

Figure I presents the mean scores for the immediate, delayed and larger and risked reward measure at each grade level. Again the third graders show the highest mean frequency of immediate reward choices but this is not significantly different from the



**Figure 1 Mean Score for each Grade Level on the Immediate, Delayed Larger and Risked Reward Measure\***

\*  
Based on table in Appendix E

TABLE 2

Percentage of Children in Immediate  
Delayed Larger, or Risked Reward  
Groups for each Grade Level\*

	Immediate	Delayed	Risked
Third	37% (19)**	37% (19)	27% (14)
Fourth	31% (15)	41% (20)	29% (14)
Fifth	33% (15)	38% (17)	29% (13)

\*  $\chi^2 = .54$   $p > .05$

\*\* Numbers in parentheses are N's

other grade levels.

An additional chi square analysis was performed to determine whether there were any differences between the extreme older and younger Ss within each grade level as to the number of Ss classified as preferring immediate, delayed larger and delayed larger risked rewards (see Table 3). Ss were classified as older and younger according to whether they fell above or below the mean age for each grade level. No significant increase in the number of Ss classified as delayed larger was found with increasing age ( $\chi^2 = 14.79$   $p > .05$ )

Although some of these results, might be interpreted as tending to lend some support to the hypothesis, the differences are significant and therefore the hypothesis was not confirmed.

#### Age and Perception of Locus of Control

Hypothesis B: With increasing age there should be a shift in the perception of locus of control from external to internal.

The percentage of children classified as "internals" and "externals" at each grade level is found in Table 4. Ss were classified as internals if they had a score of 16 on the Locus of Control scale. As expected, third graders showed the highest percentage of external responders (69.12%) and the fifth graders showed the highest percentage of internal responders (77.7%).

A chi-square analysis performed on the older and younger Ss at each grade level with respect to to the differences in the number of Ss classified as internals or externals was found to be significant at the .001 level (see Table 5).

Inspection of Table 5 shows that the number of Ss classified as internals for the older third graders approximates the

TABLE 3  
 Oldest and Youngest Subjects  
 at each Grade Level  
 and Type of Gratification Pattern\*

	Immediate	Delayed	Risked
Grade 3			
Oldest	5	9	11
Youngest	14	10	3
Grade 4			
Oldest	7	13	9
Youngest	8	7	5
Grade 5			
Oldest	5	1111	8
Youngest	10	6	15

\*  $\chi^2 = 14.79$   $p > .05$

TABLE 4

Percentage of Children Classified  
as Internals and Externals  
For each Grade Level\*

	Internal	External
Third	30.8% (16)**	69.2% (36)
Fourth	59.1% (29)	40.9% (20 )
Fifth	77.7% (35)	22.3% (10)

\*  $\chi^2 = 22.50$   $p < .001$

\*\* Numbers in parentheses are N's

TABLE 5

Number of Oldest and Youngest Subjects  
at each Grade Level and  
Perception of the Locus of Control\*

	Internals	Externals
Grade 3		
Youngest	5	23
Oldest	11	15
Grade 4		
Youngest	13	7
Oldest	15	14
Grade 5		
Youngest	15	6
Oldest	20	14

\*  $\chi^2 = 49.13$   $p < .001$

number of younger fourth graders. Similarly the number of older fourth graders classified as internals approximates the number of younger fifth graders. Thus older third graders tend to respond like younger fourth graders, while older fourth graders tend to respond like younger fifth graders on the Locus of Control scale. The results reported in Tables 4 and 5 reveal a significant relationship between age and the perception of locus of control. Hypothesis B is thus confirmed.

Perception of Locus of Control and Type of Gratification Pattern

Hypothesis C Children who prefer immediate gratification should perceive the course of events as determined by an external locus of control.

A chi-square analysis of type of gratification pattern versus perception of locus of control is found in Table 6.

An analysis of these results shows that of the 21 children classified as immediates only 2 were internals. Furthermore it can be seen that except for the category of delayed larger in the third grade the majority of children choosing delayed larger rewards were internals. A separate chi-square analysis of type of gratification pattern versus perception of locus of control for each grade level is contained in Table 7.

Age, Perception of Locus of Control and Type of Gratification Pattern

Hypothesis D With increasing age there should be both a shift in the perception of locus of control and an increasing inclination to choose larger delayed and risked rewards.

To test this hypothesis a triple analysis of variance was

TABLE 6

Type of Gratification Pattern  
and Perception of Locus of Control\*

	Internals	Externals
Immediate	2	21
Delayed	49	34
Risked	29	11

\*  $\chi^2 = 25.99$   $p < .01$

\*\* Based upon Table 7

TABLE 7

Type of Gratification Pattern  
and Perception of Locus of Control\*

Third Graders

	Internals	Externals
Immediate	0	13
Delayed	6	15
Risked	10	88
* $\chi^2 = 10.21$ $p < .05$		

Fourth Graders

	Internals	Externals
Immediate	2	5
Delayed	18	12
Risked	9	3
* $\chi^2 = 2.925$ $p > .05$		

Fifth Graders

	Internals	Externals
Immediate	0	3
Delayed	25	7
Risked	10	0
* $\chi^2 = 13.46$ $p < .01$		

performed using age, type of gratification pattern and perception of locus of control as the variables (see Table 8).

To purify the age effect the youngest third graders (below the mean age for the third grade); the average fourth graders (at the mean fourth grade age); and the oldest fifth graders (above the mean fifth grade age) were selected.

The perception of locus of control main effect was found to be significant ( $F= 264, p < .001$ ). This confirms the hypothesis that younger children perceive the locus of control to be external while older children perceive the locus of control to be internal.

It was also found that the age by locus of control and the locus of control by gratification pattern interaction effects were significant ( $F= 5.9, p < .005$ ;  $F=23.4, p < .001$  respectively). This adds further support to the evidence of a relationship between age and the perception of locus of control and the perception of locus of control and type of gratification pattern. Specifically, it means that with an increase in age, children show a shift in the perception of locus of control from external to internal and that this shift is accompanied by an increasing inclination to choose delayed larger rewards.

No significant interaction effect was found to obtain between age and type of gratification pattern ( $F= .03, p > .003$ ). This is in agreement with our previous finding (see section age by type of gratification Pattern.)

#### Perception of Locus of Control and Risk Taking Behavior

Hypothesis E Children who tend to perceive events as having

TABLE 8

Analysis of Variance of Age  
(Oldest, Middle and Youngest) by Type

of Gratification Pattern by Perception of Locus of Control

<u>Source</u>	<u>SS</u>	<u>DF</u>	<u>MS</u>	<u>F</u>	<u>P</u>
Total	3453.5	89			
Age					
(Oldest					
Middle	0	2	0	0	
Youngest)					
Locus of Control					
(Internal	2270.0	1	22.70	264	.001
and External)					
Gratification					
Pattern					
(Immediate,					
Delayed, and	0	2	0	0.00	
Risked					
Age X Locus of					
Control	102.9	2	51.4	5.9	.005
Locus of Control					
X Gratification	402.5	2	201.2	23.4	.001
Pattern					
Gratification					
Pattern X Age	.1	4	.03	.003	

an external locus of control should be more likely to choose delayed larger risked rewards than children who perceive events as having an internal locus of control.

Table 7 shows that on every grade level the majority of children preferring risked rewards were internals. Only 11 out of 29 children classified as risk takers were also classified as externals. Hypothesis E is thus not confirmed but on the contrary it appears that risk taking is more closely associated with the perception of events as having an internal locus of control.

#### Age, Type of Gratification Pattern and Probability Guessing Behavior

Hypothesis F Children who tend to choose immediate gratification will tend to make more "yes" responses irrespective of the probability input. On the basis of hypothesis A these children should also be the younger children.

Table 9 shows the mean number and percentage of "yes" responses for each type of gratification pattern and probability input condition. It does not appear from these results that children who tend to choose immediate gratification make more "yes" responses. In fact, the children who prefer delayed larger rewards make the most "yes" responses under the 66% and the 100% input conditions.

Table 10 shows the mean number of "yes" responses for the first and last ten trials of probability guesses for each type of gratification pattern. Again, it does not appear from these results that children who tend to choose immediate gratification make more "yes" responses. When the results are viewed in this way, risk takers tend to make more "yes" responses for the

TABLE 9

Mean Number of Yes Responses  
by Type of Gratification Pattern

	<u>33%<sup>1</sup></u>	<u>66%<sup>2</sup></u>	<u>100%<sup>3</sup></u>
Immediate	35.2 (44%)	48.4 (60%)	68.1 (85%)
Delayed	35.7 (44%)	54.4 (69%)	73.1 (91%)
Risk	34.2 (42%)	50.3 (63%)	70.2 (89%)

1.  $F = .1$

2.  $F = 4.3$        $p < .01$

3.  $F = 5.7$

TABLE 10

Mean Number of Yes Responses for the First and Last Ten Trials by Type of Gratification Pattern for Each Input Condition

	33%			66%			100%		
	Immed.	Delay	Risk	Immed.	Delay	Risk	Immed.	Delay	Risk
First									
ten trials	4.4	4.3	4.4	6.0	6.2	6.4	6.0	6.8	7.2
Last									
ten trials	4.4	4.1	4.0	5.7	6.2	5.9	9.0	9.1	9.9

first ten trials under all three input conditions. By the last ten trials of probability guesses, immediates, delayers and risk takers regulate their "yes" response level closer to the actual inputs under the 33% and the 100% conditions. Under the 66% input condition, delayers tend to respond closer to the actual input than immediates or risk takers while under the 100% input condition, risk takers respond closest to the actual input.

Table 11 shows the mean number and percentage of "yes" responses for children at each grade level under the three probability input conditions. These results seem to indicate that contrary to expectation, the frequency of "yes" responses seems to increase with age.

An analysis of variance using age and type of gratification patterns as the variables was performed separately for each probability input condition (33%, 66%, and 100%). Under the 33% input condition only the age main effect was significant. The main effect for type of gratification pattern was not significant. (see Appendix I) Under the 66% and the 100% input conditions, both the age and type of gratification pattern main effects were significant (see Appendix J and K)

Since the frequency of "yes" responses was found to increase with age and to be related to preferences for delayed larger rewards when just the overall "yes" response level is considered at each actual input condition and to delayed larger risked rewards when the first ten trials of probability guesses are considered, Hypothesis F was not confirmed.

Hypothesis G Having had no previous information regarding actual probability input conditions all children should begin

TABLE 11

Mean number of Yes Responses by Grade

	<u>33%<sup>1</sup></u>	<u>66%<sup>2</sup></u>	<u>100%<sup>3</sup></u>
Third	35.2 (45%)	61.6 (76%)	62.4 (74%)
Fourth	37.6 (45%)	41.6 (58%)	71.2 (89%)
Fifth	42.2 (50%)	56.8 (70%)	74.4 (92%)

1. F = 6.1

2. F = 54.7      p &lt; .001

3. F = 9.9

responding "yes" during the first ten trials close to 50% of the time. Older children should then tend to respond closer to the actual probability input conditions than younger children.

Table 12 presents the mean number of "yes" responses by grade level for the first ten and the last ten trials of probability guessing under all three of the actual input conditions. It can be seen that under the 33% input condition the children on all grade levels responded "yes" during the first ten trials approximately 50% of the time. During the last ten trials under the 33% input condition third and fourth graders lowered their "yes" response level closer to the actual input condition while fifth graders show an increase in the number of "yes" guesses from the first ten to the last ten trials.

Under the 66% input condition third graders show an unusually high "yes" response level of 8.7 for the first ten trials and then decrease their "yes" response level closer to the actual 66% input condition during the last ten trials. Fourth graders respond "yes" approximately 50% of the time during the first ten trials and show a slight increase in their "yes" response level closer to the actual 66% input condition by the last ten trials. Fifth graders respond "yes" at the actual input level of 66% during the first ten trials and then increase their level to 7.5 during the last ten trials.

Under the 100% input condition all three grades show a "yes" response level above 50% of the time for the first ten trials and fourth and fifth graders show a higher "yes" response level than third graders which is closer to the actual 100% input condition during the last ten trials.

TABLE 12

Mean Number of Yes Responses  
for First Ten and Last Ten Trials  
by Grade Level for each Input Condition

	33%			66%			100%		
Grade	3	4	5	3	4	5	3	4	5
First Ten Trials	4.8	5.5	5.2	8.7	5.2	6.6	6.9	6.1	6.8
Last Ten Trials	4.2	3.9	5.6	5.9	5.6	7.5	8.5	9.6	9.9

Under all three input conditions older children show somewhat more "yes" responses from the first ten to the last ten trials and only under the 100% input condition do older children respond closer to the actual probability input. Further, all grades show an increase in the number of "yes" responses as the actual probability input increases.

#### Perception of Locus of Control and Probability Guessing Behavior

Hypothesis H Children who perceive events as having an external locus of control should tend to make more "yes" responses than children who perceive events as having an internal locus of control.

Table 13 shows the mean number and percentage of "yes" responses for each of the three probability input conditions for children rated as externals and children rated as internals.

It can be seen that for each of the three input conditions the children rated as externals showed a significantly higher frequency of "yes" responses.

An analysis of variance of age by perception of locus of control of "yes" responses was performed separately for each probability input (see Appendix L, M and N). The main effects for the perception of locus of control and age were significant for all three probability input conditions. Hypothesis H is confirmed by these results.

Table 14 presents the mean number of "yes" responses for the first and last ten trials of probability guesses for the perception of locus of control. During the first ten trials externals make more "yes" responses than internals under all three input

TABLE 13

Mean Number of Yes Responses for Perception  
of Locus of Control

	<u>33%<sup>1</sup></u>	<u>66%<sup>2</sup></u>	<u>100%<sup>3</sup></u>
Internal	40.9 (50%)	50.4 (63%)	70 (87%)
External	44.5 (55%)	52.4 (65%)	73.9 (91%)

1. F = 5.5

2. F = 1.4

3. F = 4.1

p < .01

TABLE 14

Mean Number of Yes Responses for First and Last Ten Trials  
by Perception of Locus of Control for each Input Condition

	<u>33%</u>		<u>66%</u>		<u>100%</u>	
	<u>Internals</u>	<u>Externals</u>	<u>Internals</u>	<u>Externals</u>	<u>Internals</u>	<u>Externals</u>
First						
Ten						
Trials	5.0	5.2	6.2	6.8	6.5	6.7
Last						
Ten						
Trials	4.6	4.8	6.4	6.5	9.9	9.1

conditions. During the last ten trials the only significant difference in the "yes" response level was under the 100% input condition where internals make more "yes" responses than externals and responded closer to the actual probability input.

Intelligence, Type of Gratification Pattern and Perception of Locus of Control

Since it might be assumed that the ability to delay gratification and to recognize an internal locus of control are both attributes of a more mature mode of functioning it might be expected that these attributes will be more likely to be present in children of higher intelligence.

Table 15 shows the mean scores on the locus of control scale for the fifteen highest and the fifteen lowest IQ Ss in each grade. In Table 15 it can be seen that the differences in the scores on the locus of control scale between high and low IQ Ss are small and not significant and are in the wrong direction.

Table 16 shows the mean number of choices made by high and low IQ Ss in each type of gratification category. There is a distinctively different pattern of means in each of the three grade levels. High IQ third graders made significantly more immediate gratification choices and made significantly less risk choices than low IQ third graders. High IQ fourth graders made significantly less risk choices than low IQ fourth graders. There were no differences in the choice patterns of fifth graders.

Table 17 shows the number of high and low IQ children in each type of gratification pattern category for the youngest, average and eldest age Ss. The differences in Table 17 are significant and in the expected directions. In the youngest group

TABLE 15

Mean Scores on Locus of Control Scales for Fifteen Highest  
and Fifteen Lowest IQ Subjects by Grade

	<u>High IQ</u>	<u>Low IQ</u>
Third	13.7	13.8
Fourth	16	16.9
Fifth	18	19

TABLE 16

Type of Gratification Patterns for Fifteen Lowest  
and Fifteen Highest IQ Subjects by Grade\*

	High IQ	Low IQ	t	p
<b>Third</b>				
Immediate	4.4	3.0	3.6	.001**
Delayed	4.6	5.9	-2.1	
Risk	5.1	6.5	-4.0	.001**
<b>Fourth</b>				
Immediate	2.0	3.0	-1.6	
Delayed	9.9	5.7	6.0	.001**
Risk	2.2	5.3	-2.6	.05**
<b>Fifth</b>				
Immediate	1.9	1.9	0	
Delayed	8.2	8.2	0	
Risk	4.8	4.9	1	

\* Numbers in Table represent mean number of choices in each category

\*\* significant at .001 level

TABLE 17

Number of High and Low IQ Children in each Type of  
Category for Youngest Average and Oldest Age Subjects\*

	Youngest		Average		Oldest	
	High	Low	High	Low	High	Low
Immediate	6	1	0	3	0	2
Delayed	7	6	7	0	11	7
Risked	2	4	1	6	1	3
Mean IQ	121.9	105.2	130.7	102.5	129.9	105.5

\*  $\chi^2 = 45.78$   $p < .001$

the higher IQ children choose more immediate rewards while in the average age and eldest groups the high IQ children almost always choose delayed gratification over immediate and risked gratification, unlike their low IQ counterparts.

CHAPTER IV  
DISCUSSION AND CONCLUSIONS

Age and Type of Gratification Pattern

In accordance with Mischel (1962) it was expected that younger children would prefer immediate gratification over larger delayed gratification. However, the majority of the younger children in the present study did not choose significantly more immediate, than larger delayed rewards. Younger children did tend to choose more immediate rewards than the older children but this difference was not statistically significant. This difference in results might be a function of the difference in the type of gratification pattern measure that was used. The Mischel (1962) study was concerned with the relationship between age and immediate versus larger delayed rewards while the present study was concerned with the relationship of age to three dimensions of gratification: delay, size and willingness to take a risk. Thus the present study confronted S with a three-fold choice situation which may have caused him to show more variation in his response pattern whereas the Mischel (1962) choice measure confronted S with a two-fold choice situation.

The Mischel (1962) choice measure was scored for the total number of immediate and delay choices and then correlated with the age of S. The present choice measure was scored for the total number of immediate, delay and risk choices and then an analysis of variance was performed using age and type of gratification pattern as the main effects. If age and type of gratification patterns are significantly correlated as Mischel (1962) found then an analysis of variance should have revealed significant age main effect which

was not found in the present study (see Appendix 3). Even when delay and risk choices are considered together in the present study (see Table 1) as both of these components contain the element of delay, the results are not in agreement with those of Mischel (1962).

Another possible explanation for the discrepancy in results between those of the present study and Mischel's might be the difference in socio-economic status between the two samples used in the studies. Mischel's (1962) sample was composed of children from lower-middle socio-economic background while the children in the present study were primarily from an upper-middle socio-economic background. It is also possible that regional differences in the samples may account for these discrepancies. Mischel's Ss were from California while the Ss in the present study were from New York.

#### Critical Age

Mischel (1962) noted an apparent "critical age" from 8 to 9 at which an increase in the frequency of delayed reward choices occurred. In the present study 8 and 9 year-olds were third and fourth graders respectively. While fourth graders did show more delayed reward choices than third graders, this difference was not statistically significant. Likewise, third graders showed more immediate choices than fourth graders but this difference was not significant (see Figure 1). But it is worth noting that when Ss were divided into older and younger children at each grade level, there was quite an impressive difference between the number of older third graders classified as immediates ( $N=5$ ) and the number of third graders classified as immediates ( $n=14$ ). The older third graders were closer to 9 years of age than eight.

This difference between older and younger third graders did not hold true for Ss classified as delayers (older=9, younger=10). Since the risk gratification choice does contain the element of delay it is worth mentioning that out of the 25 oldest third graders, 11 were classified as risk takers while only 3 out of 27 younger third graders were classified as risk takers. (see Table 3).

When older third graders and younger fourth graders were compared, the older third graders appear to respond similarly to younger fourth graders with respect to immediate versus delayed larger rewards, however, they differ on risked gratification preferences. Specifically, older third graders tend to prefer risked reward more than younger fourth graders (see Table 3). Thus the results of the present study suggest the beginnings of a shift in preference from immediate to delayed larger reward from the third to the fourth grade levels (8 to 9) but no clear cut transition in reward preferences was noted.

When Ss are viewed in terms of internals and externals there appears to be quite a marked shift from external to internal with increasing age in agreement with Bailer (1961). In particular, significantly more third graders were classified as externals than fourth or fifth graders (see Table 4). These results suggest a clear cut transition from an external to internal perception of the locus of control between 8 to 9 years of age. Furthermore, Ss classified as externals show significantly more immediate reward choices than Ss classified as internals and internals show significantly more delayed reward choices than externals (see Table 6).

One of the main theses of the present study is that as the perception of the locus of control of behavior shifts from external to internal there will be related changes in gratification patterns. Thus far it has been shown that an internal perception of locus of control is accompanied by a preference for delayed reward as opposed to immediate reward. In view of the fact that a definite critical age for the development of delayed gratification preferences has not been found but immediate reward preferences are characteristic of externals and delayed reward preferences are characteristic of internals, the ability to delay gratification would appear to be more a function of the perception of the locus of control than the age of the child. However, since age was found to be significantly related to the perception of locus of control and the perception of the locus of control is significantly related to gratification patterns it would appear that while age may not be a strong factor in the development of the ability to delay gratification it does seem to have some effect on type of gratification patterns.

Apparently the shift from an external perception of the locus of control to an internal perception of the locus of control can be expected to occur around age 9. This shift in the perception of the locus of control appears to be a prerequisite for the development of the ability to postpone gratification.

The pleasure principle mode of functioning appears to be related to an external perception of the locus of control and an inability to delay gratification. A transition from the pleasure to the reality mode of function apparently requires a shift in

perception of locus of control from external to internal and an expressed preference for delayed larger reward over immediate reward. This shift of locus of control around the age of 9 has been suggested by the findings in the present study as the time at which the shift from the pleasure to the reality principle mode of function takes place. In order for this shift in the perception of locus of control to take place the child must first perceive that an internal locus of control is a possibility.

While the results do show that the majority of the older children were significantly more internally oriented than the third graders, paradoxically it was the third graders who more frequently made the risk choices. On third grade level the number of Ss classified as internal risk takers was approximately the same as the number classified as external risk takers (see Table 7). This was not the case at the fourth and fifth grade level where risk taking appeared to be related to an internal orientation. Thus it appears that at the third grade level the risk taking behavior is independent of the perception of the locus of control. These results would tend to lend some support to the notion of a critical age with respect to a change in risk taking behavior patterns. Specifically, at about the fourth grade level the willingness to take a risk seems to become related to an internal perception of locus of control. Moreover, as internals get older their gratification

preferences go on to shift from risk taking to the choice of delayed larger rewards. This shift was evidenced by the sharp increase that can be noted in the number of internals who prefer delayed larger rewards as one moves from the third to the fourth and fifth grade levels. Table 7 reveals that the preferred type of gratification pattern choice at the fourth and fifth grade level is the delayed larger and at the third grade level the delayed larger is the least preferred choice. These data argue for the possibility that age 9 is the transitional age for the development of the willingness or ability to delay gratification as Mischel (1962) suggests.

It appears that for older children the willingness to take a risk and delay gratification is related to an internal perception of the locus of control and that in younger children it is not. In view of the fact that the perception of the locus of control was found to function differentially for younger and older children in relation to type of gratification patterns then age seems to be a factor in the development of changes in gratification patterns.

One possible determinant of choices among the younger Ss might be that since younger less mature children are so focused on pleasure seeking that they attend to the most conspicuous aspect of the reward i.e. its size or immediacy. For some of these children the risked or delayed rewards because of their size offered the most attractive choice for

others the immediate reward choice seemed the most attractive. Older children, on the other hand, seem to prefer a reward that is certain to one that is uncertain and to prefer a larger reward to a smaller reward.

#### Reality Principle Mode of Function as a Learning Process

It was predicted that younger children would express more "wishful thinking", hoping that a red square would appear in the probability guessing situation, than older children. In effect, younger children were expected to respond with more "yes" guesses than older children under the 33% and the 66% input conditions but not under the 100% condition. This type of behavior would reflect the tendency of younger children to respond more on the basis of the pleasure than of the reality principle. It was also hypothesized that after the initial block of 10 guesses that the action of the reality principle would be manifested by the tendency of the "yes" response level to move closer to the actual input levels. This expectation was based on the findings of previous research in probability guessing behavior (Stevenson and Weir, 1955). Such behavior would indicate that learning had taken place. The closer the children's "yes" response level was to the actual input, the more it would represent a function of learning and the more realistic their behavior would be. Thus older children were expected to respond closer to the actual probability input conditions, than younger children. However, under the 100%

input condition, older children would have to show more "yes" responses than younger children. In this way, the reality principle as a mode of function is viewed as tied to the learning process.

The results did not show there to be any clear differences in the number of "yes" responses among different age levels for the first ten trials. In the 33% input condition all of the groups responded "yes" approximately 50% of the time during the first ten trials of the probability guessing task. This finding is in agreement with Stevenson and Weir (1955) and would be expected on the basis of the fact that Ss in the present study had no previous knowledge about the actual probability input conditions but did not confirm the hypothesis that younger children would show more "yes" responses than older children. In the 66% input condition all of the groups responded with considerably higher levels of "yes" responses, 66% for the fourth and fifth graders and 87% for the third graders.

These two sets of findings are difficult to reconcile in view of the fact that the findings at the 33% condition confirm the Stevenson and Weir data while the findings at the 66% level tend to confirm the present hypothesis. But perhaps the excessively large number of "yes" responses found among the third graders may be an artifact due to the possibility that these children may have received some feedback from an-

other class regarding the nature of the task.

Reference to Table 11 reveals that older children show a higher "yes" response level than younger children for the entire 80 Trials (with the exception of the third graders under the 66% condition). These differences result from an increasing tendency on the part of the older children to make "yes" responses as a result of the schedules of reinforcement.

When the frequency of "yes" guesses are viewed in terms of the perception of locus of control it seems that externals show a significantly higher frequency of total "yes" responses for the first ten trials and the last ten trials of probability guessing are considered, there appears to be very little differences in the "yes" response level for internals and externals.

Under the 33% input condition both externals and internals respond "yes" close to 50% of the time for the first ten and the last ten trials. Under the 66% input condition externals show a significantly higher level of "yes" responses for the first ten trials but then both groups respond close to the actual input by the last ten trials. The most appreciable difference in the "yes" response level was noted under the 100% input condition where the internals responded closer to the actual probability input than externals.

It should be noted that both the externals and the internals responded closer to the actual probability input condition on the last ten trials than they did on the first ten trials.

Thus both groups showed that some learning had taken place between the first and last ten trials of probability guessing. Since the internals and externals did not show differential amounts of learning under the 33% and the 66% input conditions the relationship between the perception of the locus of control and probability guessing remains somewhat in question.

It was also expected that children classified as immediates would make more "yes" responses than children classified as delayers had an overall "yes" response level that was higher than that of children classified as immediates and risk takers.

When the first and last ten trials of "yes" guesses are compared the results appear somewhat different. Under the 33% and the 66% input conditions there were no notable differences in the behavior of immediates, delayers and risk takers. However, under the 100% input condition, the risk takers show the highest "yes" response level for both the first and the last ten trials.

Recall that for the purposes of the present study the reality principle as a mode of function has been defined as a willingness to delay gratification and as an internals perception of the locus of control. In addition, realistic behavior has been defined in terms of the level of "yes" responses. The further away from the actual probability level the "yes" response level was found to be the more unrealistic the behavior was considered.

Our probability guessing results appear to be consistent with these definitions since the "yes" response level for older children was found to be closer to the actual input conditions than the younger children. Delayers as a group did not respond closer to the actual input conditions than immediates or risk takers and internals did not show a "yes" response level that was closer to the actual probability inputs than externals except under the 100% condition.

It would appear then, that the "yes" response level in general is related to the age of Ss and with the probability input condition but not to his type of gratification pattern.

#### Intelligence and Type of Gratification Pattern

The finding that IQ does not generally affect children's choice behavior with respect to the type of gratification pattern when high and low IQ children are considered at each grade level, is somewhat misleading because an IQ is computed by dividing the MA by the CA, thus the brightest children will also be the youngest children (the smaller the denominator the larger the resulting IQ).

Therefore, in order to assess the relationship of IQ to the type of gratification pattern, it is necessary to compare a given IQ level (high and low) at given ages (youngest, average and oldest). When this analysis was done, the findings suggested that there was an increase in the willingness to delay gratification as a function of both IQ and age.

In view of these results it appears that part of a definition of intelligence should include an increasing willingness or ability to delay gratification or to be able to function from the standpoint of the reality as opposed to the pleasure principle.

#### Some Methodological Suggestions

It is quite possible that individuals prefer to delay gratification with respect to some rewards or values but not with respect to others. Previous work on the generality-specificity of immediate and delayed larger reward preference patterns (Mischel, 1961) suggests considerable variability in choices across different modes of reinforcement (for example, oral, or food rewards as opposed to material or monetary rewards). Possibly then the results might have been sharpened had only one type of reinforcement been offered.

Perhaps some of the results were attenuated by the variance in age levels among the groups, therefore, a more homogeneous group of children at each age level might have provided a clearer picture of the relationship between age and the other variables, particularly the type of gratification variable.

In retrospect it appears to be the case that the expectation with regard to the risked reward choice did not materialize, for instead of the risked reward choice providing an

indicator of the capacity to forgo present pleasure for future gain it seemed to be more related to wishful thinking and unrealistic expectations.

As to the probability guessing task, instead of a random schedule of reinforcement, a planned schedule of reinforcement may have been better. This may have diminished the variance and controlled for the accidental possibility of the first three or four cards being red or at least not in line with the actual probability input condition.

## CHAPTER V

## Summary

The present study is an attempt to analyze the development of patterns of behavior related to gratification in children between the ages of 8 and 11. The main thesis of the study is that as the perception of the locus of control for behavior shifts from an external to an internal locus of control there are related changes in the ability to delay gratification. Three response measures were used: a threefold choice questionnaire in which Ss indicated their preferences for immediate, delayed or risked reward, a children's locus of control scale and a probability guessing "card game" with predetermined input probabilities of 33%, 66% and 100% respectively. Previous research has suggested a transition from immediate to delayed reward preferences at about the fourth grade level.

The background literature has shown first, that there is a high positive relationship between age and internal control of reinforcement and second, that Ss who perceive events as internally controlled choose delayed gratification over immediate gratification.

The following hypotheses were tested.

(a) With increasing age there should be an increasing inclination to choose larger delayed rewards.

(b) With increasing age there should be a shift in the perception of locus of control from external to internal.

(c) Children who prefer immediate gratification should perceive the course of events as determined by an external locus of control.

(d) With increasing age there should be both a shift in the perception of locus of control and an increasing inclination to choose larger delayed and risked rewards.

(e) Children who tend to perceive events as having an external locus of control should be more likely to choose delayed larger risked rewards than children who perceive events as having an internal locus of control.

(f) Children who tend to choose immediate gratification will tend to make more "yes" responses irrespective of the probability input condition.

(g) Older children should tend to respond closer to the actual probability input condition than younger children.

(h) Children who perceive events as having an external locus of control should tend to make more "yes" responses than children who perceive events as having an internal locus of control.

All three response measures were administered to 146 children from the third, fourth and fifth grades in a Nassau County, New York public school. All Ss received 14 immediate, delayed and risked reward choice items and the locus of control scale. The Ss at each grade level were then divided into three groups on the basis of immediate, delay and risk responses. Group A at each grade level received 100% reinforcement in the probability guessing situation, group B received 66% reinforcement and group C receiv-

ed 33% reinforcement.

Contrary to previous findings, it was found that the majority of third graders did not tend to choose the immediate reward with the greatest frequency. In agreement with previous research, there was a positive relationship between age and internal perception of the locus of control and children who prefer immediate gratification tend to perceive events as determined by an external locus of control.

In addition, it was found that with an increase in age, children show a shift in the perception of the locus of control from external to internal and this shift is accompanied by an increasing inclination to choose delayed larger rewards.

Risk taking was found to be related to the perception of events as having an internal locus of control.

Moreover, the frequency of "yes" responses was found to increase with age and to be related to preferences for delayed larger rewards and an external perception of the locus of control when both the overall "yes" response level and the first ten trials of probability guessing were considered. Further, all grades show an increase in the number of "yes" responses as the actual probability input increases and older children respond closer to the actual input condition for only 100% reinforcement.

When IQ is considered in relation to type of gratification pattern, the results show that older high IQ children almost al-

ways choose delayed gratification over immediate and risked gratification, unlike their low IQ counterparts.

A number of methodological suggestions for future research were made.

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**APPENDICES**

## APPENDIX A

## Type of Gratification Measure

1. Which one of the following choices would you rather have?
  - A) a small notebook now
  - B) a larger notebook in a week
  - C) a ticket for a drawing to be held in 1 week for a much larger notebook
2. Which one of the following choices would you rather have?
  - A) 10¢ now
  - B) 20¢ in 1 week
  - C) a ticket for a drawing to be held in 1 week for 40¢
3. Which one of the following choices would you rather have?
  - A) a small toy now
  - B) a larger toy in 1 week
  - C) a ticket for a drawing to be held in 1 week for a much larger toy
4. Which one of the following choices would you rather have?
  - A) a small bag of salted peanuts now
  - B) a large can of mixed nuts in 1 week
  - C) a ticket for a drawing to be held in 1 week for an extremely large can of mixed nuts.
5. Which one of the following choices would you rather have?
  - A) 25¢ now
  - B) 50¢ in 1 week

## APPENDIX A (cont.)

- C) a ticket for a drawing to be held in 1 week for \$1.00
6. Which one of the following choices would you rather have?
- A) a candy bar now
  - B) a larger candy bar in 1 week
  - C) a ticket for a drawing to be held in 1 week for 10 large candy bars
7. Which one of the following choices would you rather have?
- A) 50¢ now
  - B) \$1.00 in 2 weeks
  - C) a ticket for a drawing to be held in 2 weeks for \$2.00
8. Which one of the following choices would you rather have?
- A) a bag of pretzels now
  - B) a larger bag of pretzels in 1 week
  - C) a ticket for a drawing to be held in 1 week for 10 large bags of pretzels
9. Which one of the following choices would you rather have?
- A) 25¢ now
  - B) 50¢ in 2 weeks
  - C) a ticket for a drawing to be held in 2 weeks for \$4.00
10. Which one of the following choices would you rather have?
- A) a box of cookies now
  - B) a larger box of cookies in 1 week
  - C) a ticket for a drawing to be held in 1 week for 10 boxes of cookies
11. Which one of the following choices would you rather have?

## APPENDIX A (cont.)

- A) 50¢ now
- B) \$1.00 in 2 weeks
- C) a ticket for a drawing to be held in 3 weeks for \$5.00

12. Which one of the following choices would you rather have?

- A) a bag of potato chips now
- B) a larger bag of potato chips in 1 week
- C) a ticket for a drawing to be held in 1 week for  
10 larger bags of potato chips

13. Which one of the following choices would you rather have?

- A) 50¢ now
- B) \$2.00 in 3 weeks
- C) a ticket for a drawing to be held in 3 weeks for  
Ten dollars

14. Which one of the following choices would you rather have?

- A) a game today
- B) two games in 1 week
- C) a ticket for a drawing to be held in 1 week for  
4 games

## APPENDIX B

## Item Pool for Measure of Type of Gratification Pattern

1. Suppose you could have 10¢ now or wait for some money, how much money would you have to get to wait 1 week instead of getting the 10¢ now?

--20¢                      --30¢                      --40¢

2. Suppose you could have 10¢ now or wait 2 weeks for some money, how much money would you have to get to wait 2 weeks instead of taking the 10¢ now?

--20¢                      --30¢                      --40¢

3. Suppose you could have 10¢ now or wait 3 weeks for some money, how much money would you have to get to wait 3 weeks instead of taking the 10¢ now?

--20¢                      --30¢                      --40¢

4. Now, suppose you were offered a ticket which would be placed in a drawing to be held in 1 week, how much money would the ticket have to be worth for you to take a chance and wait 1 week for the drawing instead of taking 10¢ now?

--20¢                      --40¢                      --80¢

5. Now, suppose you were offered a ticket which would be placed in a drawing to be held in 2 weeks, how much money would the ticket have to be worth for you to take a chance and wait 2 weeks for the drawing instead of taking 10¢ now?

--20¢                      --40¢                      --80¢

6. Now, suppose you were offered a ticket which would be placed in a drawing to be held in 3 weeks, how much money would the ticket have to be worth for you to take a chance and wait 3 weeks for the drawing instead of taking 10¢ now?

--20¢                      --40¢                      --50¢

7. Suppose you could have 25¢ now or wait 1 week for some money, how much money would you have to get to wait 1 week instead of taking the 25¢ now?

--50¢                      --60¢                      --70¢

8. Suppose you could have 25¢ now or wait 2 weeks for some money, how much money would you have to get to wait 2 weeks instead of taking the 25¢ now?

--50¢                      --60¢                      --70¢

9. Suppose you could have 25¢ now or wait 3 weeks for some money, how much money would you have to get to wait 3 weeks instead of taking the 25¢ now?

--50¢                      --60¢                      --70¢

10. Now, suppose you were offered a ticket which would be placed in a drawing to be held in 1 week, how much money would the ticket have to be worth for you to take a chance and wait 1 week for the drawing instead of taking the 25¢ now?

--50¢                      --75¢                      --\$1.00

11. Now, suppose you were offered a ticket which would be placed in a drawing to be held in 2 weeks, how much money would the ticket have to be worth for you to take a chance and wait 2 weeks for the drawing instead of taking the 25¢ now?

--50¢                      --75¢                      --\$1.00

12. Now, suppose you were offered a ticket which would be placed in a drawing to be held in 3 weeks, how much money would the ticket have to be worth for you to take a chance and wait 3 weeks for the drawing instead of taking the 25¢ now?

--50¢

--75¢

--\$1.00

## APPENDIX C

## Children's Locus of Control Scale

1. When somebody gets mad at you, do you usually feel there is nothing you can do about it?
2. Do you really believe a kid can be whatever he wants to be?
3. When people are mean to you, could it be because you did something to make them mean?
4. Do you usually make up your mind about something without asking someone first?
5. Can you do anything about what is going to happen tomorrow?
6. When people are good to you, is it usually because you did something to make them be good?
7. Can you ever make other people do things you want them to do?
8. Do you ever think that kids your age can change things that are happening in the world?
9. If another child was going to hit you, could you do anything about it?
10. Can a child your age ever have his own way?
11. Is it hard for you to know why some people do certain things?

12. When someone is nice to you, is it because you did the right things?

13. Can you ever help any to think about what you will be when you grow up?

14. Can you ever try to be friends with another kid even if he doesn't want to?

15. When someone gets mad at you, can you usually do something to make him your friend again?

16. Can kids your age ever have anything to say about where they are going to live?

17. When you get in an argument, is it sometimes your fault?

18. When nice things happen to you, is it only good luck?

19. Do you often feel you get punished when you don't deserve to?

20. Do you believe a kid can usually be whatever he wants to be when he grows up?

22. When bad things happen to you, is it usually someone else's fault?

23. Can you ever know for sure why some people do certain things?



## Appendix E

Number of Children, Mean, Range and Standard  
Deviation of Scores for each of Six Classes  
on the Immediate, Delay and Risk Choice Measure

## Class 3-H N=26

	Immediate	Delay	Risk
Mean Score	3.6	4.9	5.6
Range	13	9	13
Standard Deviation	3.3	2.3	3.5
Number	10	8	8

## Class 3-K (N=26)

Mean Score	4.4	5.1	4.4
Range	10	13	13
Standard Deviation	3.2	4	4.1
Number	9	11	6

## Class 4-G (N=28)

Mean Score	1.9	8.7	3.3
Range	5	11	11
Standard Deviation	1.8	4.4	3.3
Number	7	14	7

## Appendix E (cont.)

	Immediate	Delay	Risk
Class 4-S (N=21)			
Mean Score	3.7	5.8	4.4
Range	8	13	10
Standard Deviation	3.2	4.4	3.4
Number	8	6	7
Class 5-D (N=26)			
Mean Score	2.7	8.0	3.2
Range	6	8.0	6
Standard Deviation	1.8	2.3	2.2
Number	9	11	6
Class 5-J (N=19)			
Mean Score	1.7	6.6	5.5
Range	7	14	14
Standard Deviation	3.1	4.7	5.1
Number	6	6	7

## Appendix F

Mean, Range and Standard Deviation of Scores for each  
of Six Classes on the Locus of Control Measure

## Class 3-H (N=26)

	<u>Internal</u>	<u>External</u>
Mean Score	14.6	8.4
Range	9	10
Standard Deviation	3	4
Number	7	19

## Class 3-K (N=26)

Mean Score	14.5	8.7
Range	10	10
Standard Deviation	2.9	4.3
Number	9	17

## Class 4-G (N=28)

Mean Score	15.5	7.6
Range	7	8
Standard Deviation	3.3	1.4
Number	14	14

## Appendix F (cont.)

## Class 4-S (N=21)

	<u>Internal</u>	<u>External</u>
Mean Score	16	6.9
Range	11	11
Standard Deviation	1.4	3.3
Number	14	7

## Class 5-D (N=26)

Mean Score	17.3	5.6
Range	7	7
Standard Deviation	4.1	2
Number	20	6

## Class 5-J (N=19)

Mean Score	17.8	5.1
Range	10	11
Standard Deviation	1.4	3.2
Number	15	4

## Appendix G

Analysis of Variance of Age by Perception  
of Locus of Control

Source	SS	DF	MS	F
Total	7254	291		
Age	2	2	1	
Locus of Control	4692	1	4692	957
Age x Locus of Control	1140	2	570	116*
Within Groups	1420	286	4.9	

\* Significant at .001 level

Appendix H

Means, Ranges and Standard Deviations for Correct and Yes Guesses

for each of Eight Blocks of Ten Trials

Grade 3

Blocks	33%								66%								100%							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
Yes	4.8	4.4	4.5	4.3	4.3	4.4	4.2	4.2	8.7	9.5	9.9	9.2	6.7	6.1	6.0	5.9	6.9	7.3	7.7	7.8	7.8	8.1	8.4	8.5
Cor.	5.8	5.7	5.4	5.5	5.1	5.9	5.9	5.9	5.4	6.1	6.8	6.5	5.6	6.4	5.5	5.9	6.9	7.3	7.7	7.8	7.8	8.1	8.4	8.5
Yes	3.0	4.0	5.4	5.5	5.5	5.5	5.5	5.5	6.4	4.5	4.4	7.5	5.5	5.5	6.6	6.6	4.4	5.5	5.5	5.5	4.4	4.4	4.4	4.4

Grade 4

Yes	5.5	5.2	4.9	4.5	4.5	4.6	4.5	3.9	5.2	5.1	4.7	4.9	5.4	5.6	5.6	5.6	6.1	8.5	9.3	9.6	9.4	9.4	9.6	9.6
Cor	5.7	5.4	5.3	5.4	5.5	5.0	4.9	5.6	6.5	6.3	5.9	6.2	6.3	6.4	6.6	6.6	6.1	8.5	9.3	9.6	9.4	9.6	9.6	9.6
Yes	5	6	5	4	4	4	5	5	4	5	4	4	5	5	4	4	7	5	7	7	6	5	5	5

Grade 5

Yes	5.2	6.4	4.9	5.4	5.6	5.3	5.4	5.6	6.6	6.7	7.0	7.4	7.2	7.3	7.3	7.5	6.8	8.9	9.9	9.9	9.8	9.9	9.9	9.9
Cor	5.1	6.4	4.7	5.4	6.1	6.2	6.4	6.3	6.6	6.6	7.0	7.3	7.1	7.4	7.2	7.5	6.8	8.9	9.9	9.9	9.8	9.9	9.9	9.9
Yes	3	6	5	6	6	6	5	5	4	5	3	4	5	4	5	5	5	5	1	1	1	1	1	1

## APPENDIX I

Analysis of Variance of Age by  
Type of Gratification Patterns for 33% Yes Responses

Source	SS	DF	MS	F
Total	33.07	71		
Age	5.3	2	2.65	6.1*
Type of Gratification Patterns	.1	2	.05	.1
Age x Type of Gratification Pattern	0	4	0	0
Within Groups	27.67	63	.43	

\* Significant at the .01 level

## APPENDIX J

Analysis of Variance of Age by Type of  
Gratification Pattern for 66% Yes Responses

Source	SS	DF	MS	F
Total	175.90	71		
Age	90.87	2	45.43	54.7*
Type of gratification patterns	7.17	2	3.58	4.3*
Age x gratification patterns	25.43	4	6.35	7.6*
Within Groups	52.43	63	.83	

\*  
significant at .01

## APPENDIX K

Analysis of Variance of Age by Type of  
 Gratification Patterns  
 for 100% Yes Responses

Total	104.65	71		
Age	19.31	2	9.65	9.9*
Type of Gratification Patterns	10.01	2	5.00	5.7*
Age x Gratification Patterns	4.09	4	2.02	2.1
Within Groups	61.24	63	.97	

\* significant at .01 level

## APPENDIX L

Analysis of Variance of Age by Perception  
of Locus of Control for 33% Yes Responses

Source	SS	DF	MS	F
Total	5304	71		
Age	502.5	2	251.25	4.18*
Locus of Control	333	1	333	5.5 *
Age x Locus of Control	404.5	20	202.25	3.15*
Within Groups	4164	66	60	

\* Significant at .025

## APPENDIX M

Analysis of Variance of Age by Perception  
of Locus of Control for 66% Yes Responses

Source	SS	DF	MS	F
Total	10,090.2	71		
Age	1,101.8	2	550.9	4.7*
Locus of Control	270.2	1	270.2	1.4
Age x Locus of Control	990.0	2	495.0	4.2*
Within Groups	7,728.2	66	117	

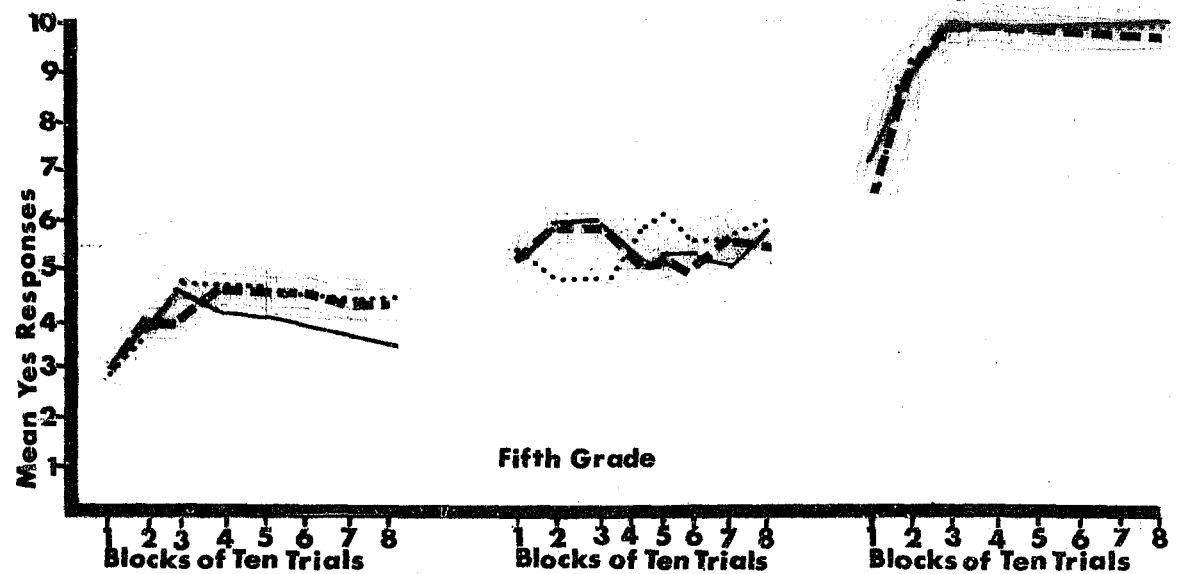
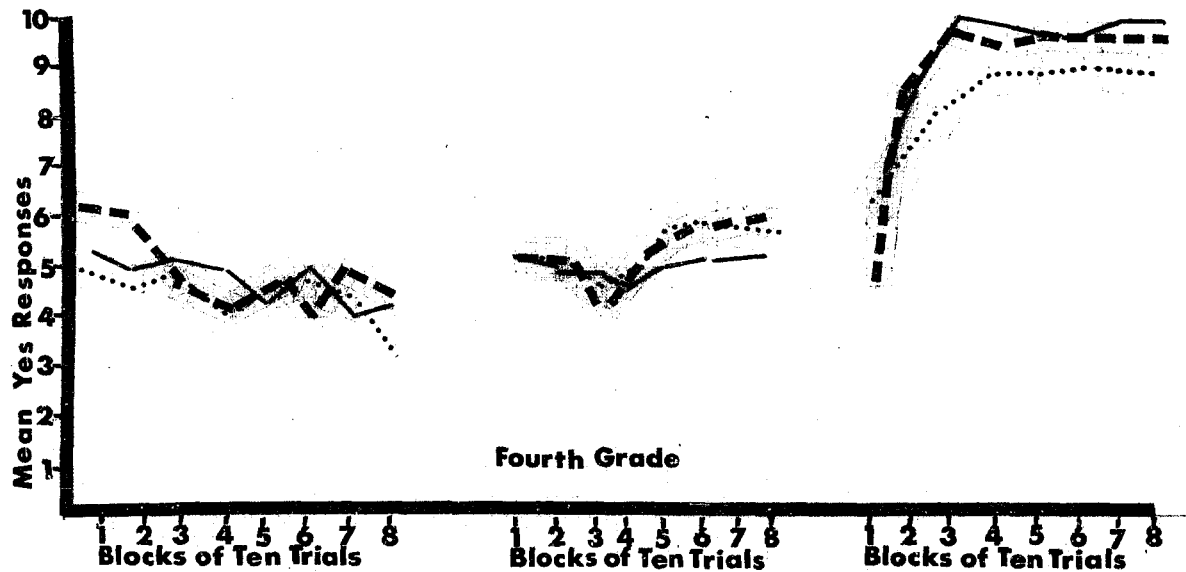
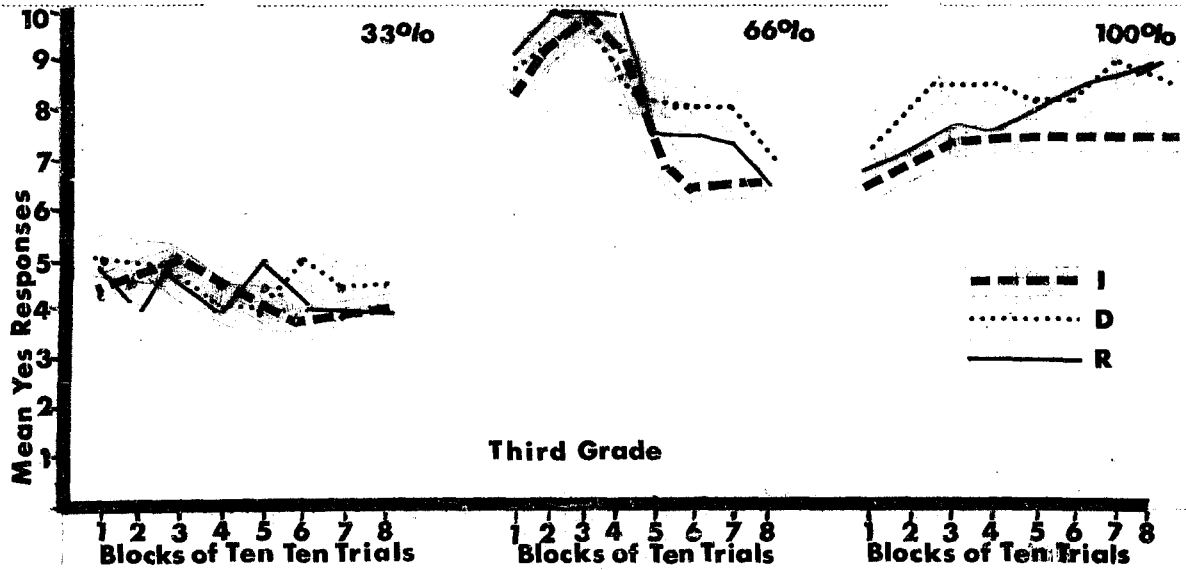
\* Significant at .025

## APPENDIX N

Analysis of Variance of Age by Perception of  
Locus of Control for 100% Correct Responses

Source	SS	DF	MS	F
Total	4056	79		
Age	133	2	66.5	1.3
Locus of Control	180	1	180	4.1*
Age x Locus of Control	563	2	281.5	6.5*
Within Groups	3180	74	42.9	

\* Significant at .005



Appendix Mean number of yes responses at each block of ten trials for all grade levels for immediate, delay and risk choices

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