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SCHULTZ, TERESA MCGLONE
A COGNITIVE-DEVELOPMENTAL STUDY OF CHILDREN'S CONCEPTS OF SELF-CONTROL.

THE OHIO STATE UNIVERSITY, PH.D., 1979
A COGNITIVE-DEVELOPMENTAL STUDY
OF
CHILDREN'S CONCEPTS OF SELF-CONTROL

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree of Doctor of Philosophy in the Graduate
School of The Ohio State University

By
Teresa McGlone Schultz, B.A., M.A.

* * * * *

The Ohio State University
1979

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# TABLE OF CONTENTS

ACKNOWLEDGMENTS ........................................... ii

VITA .................................................. iii

LIST OF TABLES ........................................... v

Chapter

I. INTRODUCTION .......... 1

II. LITERATURE REVIEW .... 5

III. METHOD .................. 47

IV. RESULTS .................. 62

V. DISCUSSION ............. 77

VI. SUMMARY ............... 101

APPENDIXES

A. Consent Form ............ 104

B. Stanford Preschool Internal-External Scale .... 105

C. Abbreviated Nowicki-Strickland Scale .... 107

REFERENCE NOTES .......... 109

REFERENCES ................. 110

iv


LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mean Complexity Score for Each Subconstruct.</td>
<td>63</td>
</tr>
<tr>
<td>2. Mean Repertoire Score for Each Subconstruct.</td>
<td>64</td>
</tr>
<tr>
<td>3. Categories Used Across All Vignettes.</td>
<td>66</td>
</tr>
<tr>
<td>4. Categories Used in Delay of Gratification Situations.</td>
<td>68</td>
</tr>
<tr>
<td>5. Categories Used in Persistence Situations.</td>
<td>69</td>
</tr>
<tr>
<td>6. Categories Used in Resistance to Temptation Situations.</td>
<td>70</td>
</tr>
<tr>
<td>7. Categories Used in Social Frustration Tolerance Situations.</td>
<td>72</td>
</tr>
<tr>
<td>8. Correlation Between Conceptual Measures and Locus of Control.</td>
<td>73</td>
</tr>
<tr>
<td>9. Mean Conceptual Scores of Subjects with Different Behavioral Responses.</td>
<td>74</td>
</tr>
<tr>
<td>10. Children's Examples of Self-Control Situations.</td>
<td>76</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

The acquisition of self-control is a critical aspect in the socialization of individuals in our society. It includes the ability to postpone immediate gratification in favor of future rewards and to tolerate such self-initiated frustration.

The theoretical importance of self-control has been widely recognized since the writings of Freud (1922). Indeed, the idea of voluntary postponement of immediate gratifications for the sake of distant, long-term gains is basic to many conceptualizations of complex human behavior. These formulations, which deal with such varied topics as the origins of "psychopathy" and antisocial behavior and "modernization" in societal and cultural adaptation patterns, emphasize, in part, the renunciation of immediate gratifications in favor of greater planning and the seeking of more substantial but deferred future gains (Mischel, 1974).

While the development of self-control has been considered by many theorists to be essential to successful socialization, the cognitive and motivational variables relevant to this ability were not systematically investigated until recently. Investigations working from a cognitive-developmental framework have focused on the role of private
speech in self-regulation, but they are few in number (Klein, 1963; Kohlberg, Yaeger and Hjertholm, 1968). Theorists with a behavioral orientation, particularly Mischel (1973; 1974; 1976) and Kanfer (1971; 1975; Kanfer and Karoly, 1972), have stimulated a significant number of studies with both children and adults in this area.

Mischel has proposed a theory which attempts to synthesize social learning and cognitive principles. His formulation of self-control distinguishes between two sets of variables. The first set includes the cognitive and learning processes through which novel forms of self-control are acquired. The second set of variables focuses on the motivational factors, such as incentive, value, and expectancy, that guide the individual's choice of potential behaviors among the array of acquired alternatives. Both kinds of variables must be considered in order to provide a complete theory of self-regulation which predicts the behavior of different individuals across various situations.

The present study is an exploratory investigation of some of the cognitive-developmental processes involved in the acquisition of the complex social behavior of self-control. More specifically, it looks at children's concepts of self-control and their concepts of the role of thinking in self-regulation. In his review of current research on cognitive behavior modification with children, Meichenbaum (1977) suggests that such a developmental interview study would be
most revealing and would have important implications for therapeutic interventions with children who have behavior problems. Bugental, Whalen and Henker (1977) provide support for this latter suggestion in both a literature review and an experimental study. They conclude that functional congruency between the perceived personal causality of the individual and the intervention strategy can optimize the effectiveness of interventions.

Speaking from a more general point of view, Brim (1976) calls attention to the deficit of research on "the origin and development of the young child's theories of self in relation to the world" (p.245). A review of the literature reveals that prior to the past decade, research on the development of children's thinking concentrated on the child's knowledge of the physical world and the non-social environment (Flavell, 1968; Wallach, 1963). Recent developmental research has begun to investigate social cognition (Shantz, 1975) and the child's expectancies of personal control in various situations (Nowicki and Strickland, 1973). Relatively little research has been done, however, on the child's verbalizable knowledge and awareness concerning inner processes and covert behaviors. An important exception is the interview study on children's knowledge about memory done by Flavell and his colleagues (Kreutzer, Leonard, and Flavell, 1975).
The research strategy of the developmental naturalist has the potential to add a new dimension to the literature on self-control. The past studies in this area have taken an antecedent-consequent approach to the problem and have failed to provide any more than a very general developmental description of the dependent variable. By differentiating self-control into some of its cognitive subskills and providing a gross ontogenetic profile for each subskill, the developmental descriptive approach will indicate directions for future research investigating causal-analytic relationships. This method will also generate information about how children think about the problems posed to them, so that inferences can be made about the qualitative pattern of the child's thinking about self-control. A better understanding of the cognitive processes underlying awareness of self-control in the child will contribute to a more complete explanation of the acquisition of this complex social behavior.

The present investigation will approach this area of children's knowledge of self-control by presenting children aged four to twelve with a variety of questions and mock-up problems dealing with self-regulation. The nature and development of certain aspects of concepts of self-control will be inferred from the children's answers, behavioral choices, and explanations of these answers and choices.
CHAPTER II

LITERATURE REVIEW

Self-control Theory

The first major theorist to attack the problem of self-control was Freud (1922). He proposed that the Reality Principle "demands and enforces the postponement of satisfaction, the renunciation of the manifold possibilities of it, and the temporary endurance of 'pain' on the long and circuitous road to pleasure" (p. 6). The development of the capacity to delay is seen as a transition from primary process to secondary process thinking. This transition is a continuing process which results in behavior which can be placed on a continuum from impulsivity to compulsive postponement. Thus, the capacity to delay gratification is postulated to increase with age.

In his extension and elaboration of psychoanalytic theory, Rapaport (1951, 1967) describes a conflict model of delay behavior. According to this model, impulses toward immediate gratification compete with the decision of the ego to delay reward and may overpower it. When tension increases and discharge is delayed because the need-satisfying object is absent, a hallucinatory image of the object may emerge and
provide a limited opportunity for discharge. Delay capacity becomes more developed as the ego begins to shift psychic energy away from the hallucinatory images of delayed rewards and towards reality testing and instrumental activity. Cognitive reality testing gradually takes the place of uncontrolled motor discharge in the attainment of needs.

Psychoanalytic theory suggests that self-control is an enduring and generalized dynamic of personality. While the idea of broad behavioral consistencies across situations has been rejected by psychodynamic theorists, the varied behavioral patterns are seen as serving the same underlying motivational dispositions.

In recent years, theory and research originating from a behavioral framework have made the overwhelming contribution to the understanding of self-control. Radical behaviorists, however, have not convincingly resolved the issue of self-control. Skinner (1953) proposes an explanation of self-control based on the principles of operant conditioning and asserts that people control their own behavior just as they control the behavior of anyone else. Behavior, whether it is one's own or that of another person, is controlled by manipulating the variables of which it is a function. Skinner goes on to nearly deny the existence of self-control by stating that in the analysis of the individual's self-controlling behavior, "eventually it must be accounted for with variables lying outside the individual himself" (p.228).
According to this perspective, self-control is an extremely situational behavior based on the individual's reinforcement history and the contingencies of the particular situation.

Cognitive social learning theorists such as Mischel (1976) contend that radical behaviorism has two basic deficits. First, it fails to acknowledge the manner in which the individual psychologically transforms the environment through the selective processing and constructing of information about events. Second, it views behavior as a one-way process with the environment influencing the person rather than seeing behavior as reflecting an interaction between the person and the environment with each component affecting the other.

In his theoretical framework of self-regulation, Kanfer (1975; Kanfer and Karoly, 1972) recognizes the importance of the situation-person interaction in the understanding of individual behavior. The influence of internal stimulation and self-generated reinforcing events depends on the magnitude, specificity, and complexity of the individual's available covert behaviors as they moderate and interact with the effects of external variables. A three-stage self-regulation process is proposed. The first stage consists of self-monitoring or self-observation which involves attending to one's own behavior. During the second stage self-evaluation occurs as the individual compares the information received from self-monitoring with internalized criteria for
that behavior. This discrimination response reveals any discrepancy between performance and standards. Finally, there is the motivational stage where self-reinforcement is given contingent on the divergence between behavior and performance standards. The entire sequence may proceed rapidly with minimal awareness. The effectiveness of the process is reduced to the degree that the covert behaviors during any of the three stages are carried out inefficiently.

Self-control is a special case of self-regulation within Kanfer's framework (1971). It is defined as a situation where the person initiates some behavior, in the absence of external coercion, that alters the probability of a more tempting but less desirable behavior. The occurrence of self-control is related to earlier training, reinforcement history, and present situation. While Kanfer recognizes that the process of maintaining one's behavior by self-reinforcement is much more complex than the operant conditioning of responses by the environment, he maintains that the behavioral analysis proposed by Skinner can cover both public and private events. Originally, covert behaviors are established by external contingencies and thus follow the same rules of acquisition, maintenance, and extinction as overt behaviors. Kanfer sees no need for postulating a "cognitive" theory with different mechanisms for covert than for overt behaviors.

This three-stage model of self-regulation is useful in that it provides a general framework within which one can
describe a specific instance of self-control. It fails to consider, however, the complexity of the cognitive mechanisms necessary for each of the three psychological processes. In particular, it neglects to explain how each process is affected by the cognitive developmental level of the individual. An extension of the model would imply that individuals at relatively early stages of development simply have less experience and training and thus are less efficient at each of the processes. The cognitive-developmental data to be presented later, however, suggests that the efficiency, specificity, and complexity of each process may be affected not only by learning but also by the individual's cognitive structures which cannot be explained by the parameters of associationistic learning.

Mischel (1973) has formulated a conceptualization of personality within a cognitive social learning framework. He proposes a shift away from traditional personality paradigms which postulate broad traits as the intrapsychic causes of behavioral consistencies toward a focus on the specific interactions between conditions and the cognitions and behaviors of the person. Utilizing constructs from the areas of cognition and social learning, this formulation proposes five kinds of person variables which are the products of cognitive development and learning experiences.

The first variable, construction competencies, is defined as the ability of the individual to generate diverse...
cognitions and behaviors in appropriate situations. This ability affects both the retrieval of information and the active organization of that information. When speaking of cognitive activities, Mischel is referring to the operations and transformations performed on incoming information rather than to a limited set of specific cognitions and responses which the person has. The nature of these cognitive processes has not been clearly delineated, but their range and quality vary considerably across individuals.

Encoding strategies and personal constructs comprise the second person variable. Each individual has units for encoding and categorizing input from the environment. These constructs affect the impact of stimuli on behavior.

Behavior-outcome and stimulus-outcome expectancies develop on the basis of past experience, instructions, and observation. Behavior in a particular situation is influenced by the expectancies that the person brings to it. These expectancies guide the selection of behaviors from among those which an individual is capable of constructing in any given situation. They do not necessarily reflect the objective contingencies of the situation.

The variable of subjective stimulus values refers to the effectiveness of a stimulus as a reinforcer. Various stimuli acquire the power to arouse positive or negative emotional states in the individual and to motivate behavior.
The final person variable presented by Mischel (1973) is labeled self-regulatory systems and plans.

These systems include: the rules that specify goals or performance standards in particular situations; the consequences of achieving or failing to achieve those criteria; self-instructions and cognitive stimulus transformations to achieve the self-control necessary for goal attainment; and organizing rules (plans) for the sequencing and termination of complex behavioral patterns in the absence of external hindrances (p. 275).

Mischel (1974) has taken his cognitive social learning synthesis and applied it more directly to self-control by proposing a two-stage process in the delay of gratification. First, the individual makes a choice to delay in order to obtain more preferred outcomes. Expectations concerning the probable consequences of each choice as well as the relative subjective value of each outcome influence this choice. Second, the delay is maintained to the extent that cognitive and overt activities are successful in reducing the aversiveness of the self-imposed frustration. The individual's self-regulatory systems play a major role during this stage. When the goals have been chosen, the individual attempts to make progress towards them without immediate external reinforcement. Covert symbolic activities such as self-monitoring of progress, self-instructions, and self-praise (Meichenbaum, 1977) mediate progress to the more preferred goal. Self-generated cognitive representations and transformations enable the individual to change a highly aversive, frustrating
situation into one which can be managed more easily (Mischel, Ebbesen, and Zeiss, 1972).

To summarize up to this point, both psychodynamic and behavioral theory postulate some kind of relation between thinking processes and the inhibition of an overt motor response directed toward immediate gratification (Singer, 1955). Mischel's cognitive social learning theory provides the most detailed and specific framework for understanding self-control and generating further hypotheses. Being a relatively recent reconceptualization of personality, however, this approach might benefit from the extension and elaboration of various components. The present paper attempts to explore further the proposed person variables related to cognitive processes by placing them within a developmental framework. The focus is on what Mischel has labeled self-regulatory systems and plans, but construction competencies and encoding strategies are also investigated. A brief review of cognitive-developmental theory follows so that it may be applied to the problem of self-control.

**Cognitive-Developmental Theory**

Cognitive-developmental theory (Ausubel and Sullivan, 1970; Kohlberg, 1969) assumes that development involves basic transformations of cognitive structures which cannot be explained as the direct result of either maturation or learning. Cognitive structures are defined as systems of internal relations which are the result of processes of interaction
between the individual and the environment. A cognitive structure is a schema of action, that is, it is an organized pattern of behavior. Piaget (1967) postulates that development occurs through the process of adaptation and organization. Adaptation involves the dual processes of assimilation and accommodation. Assimilation is the taking in of new information into present patterns of behavior. Accommodation is the change of existing schemas in order to adjust to the demands of the environment. Cognitive development tends toward a balance between these two processes; it moves towards a greater reciprocity between the action of the individual upon the environment and the action of the environment upon the individual.

The stages proposed by Piaget (1969) are particular groups of schemas which are in a relative state of equilibrium. At each stage there is a qualitative difference in the child's mode of thinking or solving a problem. With development, these stages consist of increasingly differentiated and integrated structures. The higher stages reintegrate the structures of the lower stages.

During the first stage, the individual constructs schemata and organizes reality through perceptions and movements in the absence of representation or language. Thus developmental change takes place by means of a sensorimotor coordination of actions. Following this stage is a transition period which involves the internalization of
actions through the semiotic function and the decentering of cognitive constructions. The second stage is that of concrete operations which are transformations of information from the environment by internalized actions which are grouped into coherent, reversible systems. The final stage, formal operations, is characterized by a shift from the purely concrete to hypothetico-deductive thinking. The individual is able to consider ideas in their own right and derive principles and ideas.

The cognitive-developmental theory of Piaget and others (Ausubel and Sullivan, 1970; Kohlberg, 1969) suggests some general trends in cognitive growth. There is a widening and increasing complexity of the cognitive field with greater ability to consider events which have no personal or immediate significance. Conceptualization becomes less stimulus-bound as there is a shift away from dependence on sensory-perceptual properties towards more inferential conceptual manipulations. Cognitive structures become increasingly differentiated and organized. Thought processes move from concrete to abstract modes with the development of the ability to manipulate verbal symbols and to employ abstract, classificatory schemata. Finally, development is characterized by a decline in egocentricity and subjectivity.

The foregoing assumptions can be applied more specifically to social development which is defined as "the restructuring of the (1) concept of self, (2) in its
relationship to concepts of other people, (3) conceived as being in a common social world with social standards" (Kohlberg, 1969, p. 349). Through social interactions, especially with peers, the child is gradually forced to become aware of others and coordinate thinking and action with theirs. This process of role-taking directs social development towards a reciprocity between the actions of the self and the actions of others toward the self. The child becomes more reflective and employs internalized social speech in order to adapt better to the social situation. Consequences are anticipated and alternatives are pretested.

Moral judgment is the area of social development which is covered most extensively by cognitive-developmental theory (Hoffman, 1970). In his study of morality, Piaget (1932) has focused on the respect for social rules and the concern for reciprocity and equality among people. He views moral development as an active process involving the development of certain cognitive capacities and new modes of social experience which leads to enhanced role-taking ability and a broadened perspective of authority. The child's moral orientation shifts developmentally from moral realism to autonomy, that is, from respect and submission to authority, to self-government and control. Piaget's research has found some interesting trends in moral development which will be discussed later.
Kohlberg (1964) has extended and modified Piaget's theory. Accepting the basic cognitive-developmental framework, he has constructed a more detailed, comprehensive, and logically consistent system. His framework consists of six stages at three levels of moral orientation. The first two stages are at the Premoral level where the control of conduct is external in the sense that the motive is to avoid punishment and obtain rewards. At the second level, Morality of Conventional Role-Conformity, the control of conduct is still external in that behavior is guided by the rules and expectations of others who have either personal significance or delegated authority. Judgment becomes more social and motivation becomes more internal as the child begins to take the role of significant others whose judgment is respected and to anticipate their praise and disapproval. The final level is that of Morality of Self-Accepted Moral Principles. Behavior is judged in terms of shared or shareable standards, rights, or duties. The control of conduct is internal in that standards have an internal source and behavior is a result of inner thought and judgment. Kohlberg maintains that progression from one stage to the next is largely a natural consequent of cognitive development. While Piaget stresses the importance of peer cooperation, Kohlberg views all social interaction as providing experience with a variety of conflicting values upon which the child's cognitive processes operate.
Private speech is another aspect of cognitive development which has implications for the understanding of self-control. Piaget (1926) viewed private speech as egocentric in that it reflects the young child's general inability to differentiate his or her own point of view from that of others. Occurring at the early stages of development, commands and speech to the self are no different from commanding and speaking to others. Piaget seemed to concentrate on the negative aspects of private speech by characterizing it as lacking both communicative intent and cognitive function (Kohlberg, Yaeger and Hjertholm, 1968). He assumed that this precommunicative orientation to social situations declines with age. This formulation has been extensively criticized by other theorists who have explored the positive functions of private speech.

Vygotsky (1962) proposes that private speech fails to communicate to others because it has a different function than social speech. The aim of private speech is cognitive self-guidance. During the early stages of development, self-guidance is vocalized because the young child cannot think or direct actions in a purely covert manner. With age, self-directing speech is internalized as verbal thought. Self-communication indicates communicative intent just as social communication does. At the stage when private speech is overt, however, it reflects a "parasocial" form of communication in the sense that self-directing speech is not clearly
differentiated from social speech. Since the self is a more understanding listener, self-guiding speech can be condensed and short-circuited. The developmental differentiation of private speech from social speech is reflected in the abbreviation and decreasing overtness of self-communication together with the increasing appropriateness of social speech. According to Vygotsky, there is a functional equivalence between the young child's private speech and characteristics of adult thought.

Another Russian scientist, Luria (1959, 1961) has also focused on the self-regulatory functions of speech and has proposed a specific developmental sequence by which speech becomes internalized and directive of one's behavior. Prior to the age of two years speech is insufficiently developed to serve as a regulator of the child's own actions. The speech of others, however, can initiate, direct and control the child's behavior but it cannot stop or restrain ongoing behavior. During the second stage, the child's own speech begins to assume a regulatory role. The child's overt speech has regulatory influence stemming from a motor component, that is, the direct, impelling, or initiating action of the speech itself helps initiate behavior but cannot inhibit it. Finally, the child's covert or inner speech takes on a self-governing role and the semantic content of the speech-for-self becomes dominant and directive. With the formation of internal speech,
the verbal analysis of the situation begins to play an important role in the establishment of new connections; the child orients himself to the given signals with the help of rules he has already formulated for himself; this abstracting and generalizing function of speech mediates the stimuli acting upon the child and turns the process of elaboration of temporary connections into the complex "highest self-regulating-system" (Luria, 1961, p. 96)

Thus, Luria postulates that the development of the self-directive functions of speech involves two interlocking dimensions: first, a growing internalization; and second, an increased capacity to discriminate alternatives and to precede action.

Working within the Vygotsky-Luria framework, Kohlberg and his colleagues (Kohlberg, Yaeger and Hjertholm, 1968) have formulated a more detailed hierarchy of private speech: Initially presocial and self-stimulating, language is characterized by word play and repetition. At the second level private speech is outward directed; it consists of remarks addressed to nonhuman objects and statements describing one's own activity. Private speech becomes inward directed at the third level as evidenced by questions answered by the self and self-guiding comments. The fourth level involves external manifestations of inner speech such as inaudible muttering. Finally, at the fifth level, self communication is silent inner speech or thought.

The preceding discussion of cognitive-developmental theory has covered several different kinds of cognitive
activities which may have implications for understanding the development of self-control. A good summary of the trends predicted by the theorizing in these various areas is presented by Aronfreed (1968) in his discussion of the development of verbal representational control over behavior. At the first level of development behavior is tied directly to the control of concrete stimuli. Gradually behavior is controlled by verbal mediators which tend to be representations of concrete stimulus events. Finally behavior is controlled by more symbolic and abstract verbal representations.

An integration of cognitive-developmental theory into the cognitive social learning framework will follow the discussion of relevant research.

Research

Some of the earliest research in the area of verbal self-control was designed to test Luria's hypothesis (1961) that there is a developmental sequence through which private speech becomes increasingly internalized and directive of one's behavior. In his own study, Luria (1961) found that most children under four years of age could not respond correctly when required to squeeze a rubber bulb twice at the onset of a particular signal. They could respond correctly, however, when instructed to say "Toot, toot" at the onset of each signal. In a subsequent study by Bem (1967), preschool subjects were instructed to press a lever the number of times
corresponding to the number of lights displayed and then covered. Initially only 28% of the three-year-olds responded correctly. A training program was instituted whereby the three-year-olds were taught to respond correctly with external feedback from the experimenter. This program was followed by a fading procedure which successfully shifted control of the subjects' behavior to their own self-instruction. The author interprets her data as indicating that the absence of self-control is a learning deficit rather than a developmental deficiency. This interpretation may be accurate, but it does not mean that the level of development of cognitive capacity is a less important factor. Indeed, since some of the three-year-olds and 94% of the four-year-olds responded correctly without any training, one might postulate that the remaining three-year-olds had developed the necessary cognitive abilities but had not yet had sufficient experience with the environment to spontaneously employ the effective strategy.

Miller, Shelton and Flavell (1970) also used preschoolers in their test of Luria's hypothesis. In their investigation, subjects were instructed to either squeeze or not squeeze a rubber bulb at the onset of a particular signal. Contrary to Bem's results, they found that verbal self-instructions did not facilitate motor responding at any age. The conclusion is made that verbal responding in this particular experimental situation was just an additional task for
the child rather than a useful verbal mediator. The apparent discrepancy between these findings and those of Bem may be explained by important training differences. The procedure used by Bem was much more complex than simply instructing the child to make a certain statement. In one sense, the procedure followed Luria's sequence by establishing external stimulus control prior to attempting to teach self-control. The gradual fading of external cues was another significant aspect of Bem's training program.

The developmental control of the motor response of tapping by the verbal operants "faster" and "slower" was investigated by Meichenbaum and Goodman (1969) in an experiment with kindergarten and first grade children. The effectiveness of these verbal operants was examined under three different conditions: (1) the experimenter verbalized the instructions; (2) the subject said the words aloud; (3) the subject whispered using only lip movements. When the instructions were verbalized overtly, the kindergarten children's performance did not differ significantly from that of the first graders. In the situation where verbalizations were relatively covert, however, first grade children's self-instructions were more effective than when overt while kindergarten children's self-instructions had little control over motor behavior. These findings support Luria's contention that with age speech-for-self becomes internalized and guiding.
In a naturalistic developmental study, Klein (1963) investigated the utilization of private speech by 3- to 7-year-old children engaged in puzzle and drawing tasks. There was no significant age difference in the frequency of children using private speech. As age increased, however, overall audible comprehensible speech declined while task-relevant comprehensible speech increased. More task-relevant speech was also related to successful completion of the puzzle. Thus, private speech did not decline with age and the child's declining egocentrism. Rather, it became more covert and facilitated task-oriented behavior.

The study of self-control in children has been explored mainly in paradigms involving delay of gratification, resistance to temptation, or a combination of both. Mischel and Metzner (1962) did one of the early studies in this area. Children from 5 to 12 years of age were asked whether they preferred a small piece of candy immediately or a larger piece at a later time. The preference for delay increased with age and intelligence, and decreased with longer time intervals. The major change in preference occurred at 3.5 to 9 years. These results are consistent with cognitive developmental theory which postulates that older children have a greater capacity to think abstractly, to verbally mediate impulsive behavior, and to anticipate the future.

More recent research (LeSure, 1977) with fourth and fifth graders has found a positive relationship between
intelligence and preference to work for a delayed reward. This relationship existed for both groups which experienced success and those which failed.

In another investigation (Nisan and Koriat, 1977) involving the choice between an immediate small reward and a delayed larger reward, kindergarten children were asked to guess the response of a smart or stupid child as well as to choose for themselves. Interestingly, children attributed more delay to the smart child than they displayed themselves. They did not display more delay than they attributed to the stupid child. The behavior of these children suggests that even at the initial point of choosing to delay, the first stage of Mischel's (1974) model of delay behavior, there is a conflict between the impulse for immediate gratification and standards of performance. Knowledge of the advantages of delay does not appear to be a sufficient condition to insure delay behavior. It is also possible that these children had not really internalized the standards of performance which they were advocating; they may have been simply parroting what they had heard their parents and other adults say.

A number of studies have looked at the effect of different kinds of cognitive activities on delay behavior. Mischel and his associates (Mischel, Ebbesen and Zeiss, 1972) studied the effectiveness of different cognitive events on increasing the delay behavior of preschool children in a
situation where they received a larger food reward for waiting. The results revealed that in general children waited longer for a reward when they thought about other things than when they attended directly to the rewards. While "thinking fun things" facilitated delay behavior, "thinking sad thoughts" decreased delay time. These findings suggest that delay of gratification may be enhanced by distracting oneself from the rewards but will be hindered if the conditions of the delay interval are too aversive. Investigations employing somewhat different methods support this conclusion. In one such study (Corfield, Al-Issa and Johnson, 1976), 8-to 11-year-olds worked on a puzzle during the delay period. In the condition where the puzzle contained words irrelevant to the reward, the subjects waited longer than when the puzzle's content was relevant to the reward.

Moore, Clyburn and Underwood (1976) evoked positive, negative, or neutral moods in preschool children prior to asking them to choose between two rewards. Positive mood subjects were more likely to choose the more desirable, delayed reward, while negative mood subjects more frequently chose the immediate reward.

In an experiment involving elementary school children, Fry (1975) found that children in a positive affect condition resisted temptation longer than those in a negative affect condition.
Another interesting technique explored by Mischel and his associates is the cognitive transformation of rewards. In one such study (Mischel and Baker, 1975), preschool children were asked to think about either the consummatory qualities of the relevant rewards or their nonconsummatory qualities and associations. For example, if the reward was a marshmallow, one group of children was asked to think about eating the marshmallow and how it would taste, while the other group was told to think about how the marshmallow resembled a pillow or a cloud. The consummatory ideation significantly hindered delay while focusing on nonconsummatory qualities facilitated delay even more than comparable ideation about irrelevant rewards. Another investigation (Moore, Mischel and Zeiss, 1976) showed that when children were taught to cognitively transform real rewards, which were present, into pictures they waited longer than when they turned pictures into real rewards. The child's cognitive representation of the stimulus appears to be a more important determiner of delay behavior than the actual presence of the reward.

The above research suggests that effective self-control may depend on transforming the difficult into the easy and the aversive into the pleasant. The spontaneous behavior of children during delay intervals supports this interpretation (Mischel, Ebbesen, and Zeiss, 1972). Children stopped themselves from reaching for the termination signal with
distractions such as singing, praying, pounding the floor, and even sleeping. These distractions were especially evident when the distress of waiting appeared acute.

Miller and Karniol (1976) propose that Mischel and his colleagues have found that attending to the reward increases frustration and decreases delay time because they have examined situations where delay is self-imposed. When Freud postulated the existence of an hallucinatory image, he was concerned with situations in which delay was externally imposed. In order to test their hypothesis, Miller and Karniol observed second and third graders under conditions of self-imposed delay and externally imposed delay. The evidence supported their contention. In the self-imposed delay situation where the reward was physically present, children attended less to reward-relevant cues and involved themselves more in reward-irrelevant activity.

Other factors also are significantly related to the delay behavior of children. In an investigation involving children from two age groups, Crooks (1977) varied the magnitude of the difference between the immediate and delayed rewards. The results showed that children in both age groups were more likely to wait for the delayed reward if the magnitude was great enough. Another recent article (Lewittes and Israel, 1978) reports that kindergarten children who expected their delay behavior to produce consequences for other children delayed longer than those who
did not. Knowing the consequent others or thinking that they would be informed did not make a difference. A complex interaction of variables including subjective stimulus values and behavior-outcome expectancies thus influence delay behavior.

In a series of studies using a talking "Clown Box" as the tempting distraction, Mischel and Patterson have looked more directly at resistance to temptation rather than delay of gratification. The clown box tempts the preschool child to play with it while the child is working on a task in order to be rewarded with time playing with some fun toys. The findings (Patterson and Mischel, 1976) revealed that temptation-inhibiting self-instructions significantly improved performance while task-facilitating self-instructions did not. Reward-oriented self-instructions also facilitated delay behavior (Mischel and Patterson, 1976). Hartig and Kanfer (1973) had similar results with children aged three to seven years who were admonished not to play with some attractive toys. Those groups in which the children verbalized either positive consequences for nontransgression, negative consequences for transgression, or instructions not to transgress all showed better control than the groups in which the children either repeated a rhyme or did not verbalize at all.

The opportunity to rehearse self-instructions prior to being placed in a tempting situation does not seem to
improve resistance to temptation (Patterson and Mischel, 1975). These findings suggest that the actions called for in the plan are already available to the young child. The strategies spontaneously generated by the children give further support to this conclusion. The most frequent tactic was an attempt to eliminate or counter the clown by saying "don't talk to me" or "stop that." Another strategy was to remind oneself of the reward for task completion. Some children devalued the clown by making statements such as "that's no fun." Evidence of devaluation has been presented in other investigations which utilized the forbidden toy paradigm (Aronson and Carlsmith, 1963; Ebbesen, Bowers and Phillips, 1975). In the interpretation of their findings, Ebbesen and his colleagues conclude that derogation of the forbidden toy is an attempt by the child to cope with a frustrating temptation period rather than the result of dissonance reduction. Following a brief review of the literature, Bandura and Walters (1973) conclude:

Both devaluation of not readily attainable or forbidden goals and activities and high evaluation of unpleasant means to a goal that is highly desired appear to be learned ways of maintaining self-control.

Thus, children as young as preschool age display the ability to generate strategies for facilitating self-control in situations where there are relatively strong pressures to give in to impulses.
The significance of verbal self-instruction for self-control and overall adaptive behavior becomes strikingly apparent when one looks at those individuals who fail to use this cognitive strategy. In his review of the literature, Meichenbaum (1975) concludes that there are two groups of people who display this deficit: adult schizophrenics and impulsive children. Investigating the behavior of young aggressive boys, Camp (1975) found that their verbal development was adequate but they fail to use their ability to think through plans for problems unless specifically instructed to do so. While performing a task, these boys talk to themselves a lot, but their verbalizations tend to be immature, self-stimulatory, and irrelevant to the task. When instructed to verbalize overtly before responding, these impulsive boys readily achieve response inhibition. Whispering self-instructions was inconsistent in achieving response inhibition. These results suggest impulsivity may be related to delayed progress through Luria's hierarchy. While these impulsive boys could be taught to direct their own behavior through overt verbalizations, they may not yet have the cognitive capacity to guide themselves with covert speech.

In a related area of research, Spivack and Shure (1974; Spivack, Platt, and Shure, 1976) have explored the development of interpersonal cognitive problem-solving skills by presenting children of different ages with interpersonal
problem situations. In general, they have found that both the capacity to generate alternate solutions and the ability to articulate the step-by-step means to carry out the solutions are significant mediators related to behavioral adjustment independent of verbal productivity. The high alternative thinker was better able to conceptualize solutions beyond those limited to direct force. The correlation between social-cognitive skills and intelligence was only low to moderate, suggesting that additional factors also contribute to the development of interpersonal cognitive ability.

The literature on child development reveals that self-control has been correlated with a number of other variables including future-time perspective, locus of control, and moral judgment. While the research in these three areas has not always been consistent, it suggests some interesting relationships between self-control and particular cognitive orientations.

In one of his earlier studies on delay of gratification, Mischel (Mischel and Metzner, 1962) found that time perspective was slightly but insignificantly longer for the group of children who chose to delay. It was more variable for the group who chose immediate gratification, however, suggesting the absence of a well-developed concept of the future. Farnham-Diggory (1966) compared psychotic, brain-damaged, and normal children aged 7 and 16 years in her interview
study of self, future and time. One of her measures was a delay of gratification task involving a choice between a small piece of candy immediately or a large piece next week. Both non-normal groups displayed a flattening out of time perspective and more immature images of the future than the normal group, with the psychotic group more severely impaired. Only the psychotic group chose the immediate reward significantly more often than the normal group. These results are inconclusive but suggest the possibility of a relationship between severely impaired future time perspective and lack of self-control.

In an experiment with 10- to 12-year-old boys, Klineberg (1968) utilized three different measures of future time perspective: (1) length of time perspective; (2) everyday concern with future events; and, (3) sense of reality of future events. His measures of delay included a hypothetical story and the typical behavior measure of choosing between two pieces of candy. The results indicated no difference in length of future time perspective between the boys who chose immediate gratification and those who chose to delay. Consistent delayers, however, displayed greater everyday preoccupation with the future and more consistent ordering of future events.

In summary, children who tend to delay gratification give evidence of a more coherent, consistent concept of the future and show greater interest in it. This conclusion
suggests that level of conceptual maturity may be related to self-control. This proposed relationship receives additional support in a cross-cultural study of delay of gratification and abstract ability in 8- to 11-year-old boys (Granzberg, 1976). Self-control was measured by a choice between one candy bar now or two next week. Abstraction ability was measured by analyzing the causal attributions in subjects' responses to projective pictures. Delay of gratification correlated significantly with frequency of abstraction.

Locus of control is a construct defined as an individual's generalized expectancies about events occurring as a consequence of his or her own action (internal control) or as a consequence of external forces (external control). In his pioneering monograph on this topic, Rotter (1966) presents a series of investigations in which it was found that adults who exhibit internal control, the belief that they have control over their own destiny, tend to be alert to feedback which provides useful information for future behavior, take steps to improve conditions in their environment, place greater value on skill, and are resistive to subtle influence attempts. These findings suggest that expectancies of personal control are related to the individual's style of coping with the environment. A greater sense of internal control appears to be correlated with more effective strategies for influencing one's own behavior and
the environment.

Reviewing a decade of research with both children and adults, Lefcourt (1976) reaches the same conclusion. He presents evidence which supports the proposed relationship between locus of control and various kinds of cognitive activity including attention, deliberation, and utilization of information. Internals tend to be more perceptive, inquisitive, and ready to learn. Lefcourt suggests that some people lack the cognitive processes necessary to examine and evaluate their choices and decisions. Failing to see the available choices, these individuals yield easily to external pressures.

Research of locus of control in children has found increasing internality with age but no significant sex differences (Beebe, 1971; Milgram, 1971). Internality also appears to be related to a positive self-concept (Beebe, 1971; Moyal, 1977) and the tendency to choose more adaptive responses in conflict situations (Moyal, 1977).

McClure (1976) found that the ability to generate alternative problem solutions was correlated with an internal locus of control. Training that enhanced interpersonal problem solving increased the belief in internal control.

Several studies have examined the relationship between locus of control in children and their self-control behavior in specific situations. Employing children in grades one through eight, Bialer (1961) verbally administered a locus
of control scale and asked subjects to choose between an immediate reward or a more preferred delayed reward. With increasing age, subjects tended towards a sense of internal control and choice of the delayed reward. While both chronological age and mental age were significant independent predictors, mental age exhibited a stronger relationship to behavior. Locus of control and delay of gratification were also related to each other independently of their relationship to mental age and chronological age. Bialer interprets this evidence as reflecting an underlying personality factor of conceptual maturity.

Subsequent research has confirmed the relationship between locus of control and delay of gratification. Interviewing second and third graders, Walls and Smith (1970) found that internals were more likely to wait for seven cents than receive an immediate five cents, while the reverse was true for externals. Internals also displayed a more accurate judgment of time. Strickland (1972) reported similar findings for white children but not for black children. In the case of black children, the race of the experimenter was more important than locus of control for predicting decisions to delay. This latter study indicates the importance of controlling for the variable of race in any investigation of delay of gratification.

Differentiating between expectancies for control of positive events (I+) and expectancies for control of
negative events (I-), Mischel, Zeiss and Zeiss (1974) explored the relationship between locus of control and persistence in preschool children. They found that I+ but not I- was related to persistence in three different situations in which instrumental activity would lead to a positive outcome. I- but not I+ was related to persistence in the situations where persistence averted the occurrence of a negative outcome. These results point to the usefulness of distinguishing between expectancies in varying contexts rather than viewing locus of control as a transsituational personality trait.

Gordon, Jones and Short (1977) investigated the relationship between expectancies of control and persistence on a task with no reward or explicit standard of performance. In general, third and sixth graders with a perceived internal locus of control persisted longer than those who attributed causality to external control. The failure to find consistent differences across all groups is probably due to the very broad measure of locus of control (Nowicki and Strickland, 1973) which was utilized.

Employing a more situation-specific measure, the Academic Achievement Accountability Questionnaire, Gagne (1975) found that internals persisted longer at learning digit spans than did externals.

These locus of control studies support the general conclusion of a congruency between causal schemata and
behavior in situations where self-control is the most adaptive response. In a study directly assessing this issue, Bugental, Whalen, and Henker (1977) compared different intervention techniques with hyperactive boys who had either high or low perceived personal causality with respect to academic experiences. One group of boys received training in self-guiding techniques while the other group experienced systematic extrinsic reinforcement. The self-control intervention produced greater error reduction on a task for children with high perceived personal causality while the social reinforcement intervention was more effective for children with low perceived personal causality.

A previous investigation (Gagne, 1975) reports similar results with respect to self-instructions. Goal-setting statements increased the persistence of internals in learning digit spans but not externals. The data suggests a link between cognitive variables such as attributions and expectancies, and the effectiveness of self-instruction in guiding behavior.

Moral development is another area of research which directly relates to the issue of self-control. Mischel (1976) summarizes the relationship between these two variables in the following statement:
Moral judgment concerns the evaluation of good-bad (right-wrong) and of what one "ought to do," moral conduct and self-regulation concern the processes and behaviors relevant to the achievement of the good and the avoidance of the bad and thus of realizing (or falling short of) one's moral ideals (pp. 84-85).

The cognitive developmental theorists define a moral act as behavior resulting from prior judgment of that act as right or wrong (Hoffman, 1970). Their research is aimed at studying the higher mental processes and cognitive structures which underlie such moral judgments. Piaget's and Kohlberg's frameworks, which were discussed earlier, are both based on extensive interviewing of children.

Piaget (1928) has discovered some interesting trends in the development of moral judgment. Initially, children judge consequences without considering intention. The seriousness of a lie is judged solely in terms of its deviation from the truth. It is not until approximately the age of nine years that children begin to judge behavior by the underlying motives. In studying children's concepts of justice, Piaget found a trend from a categorical, unconditional view that all wrongdoing must be punished to a view that punishment should be reciprocal, contingent on the misdeed, and accompanied by explanations. Piaget (1932) also investigated children's understanding of rules and proposed three stages in the development of this concept. The very young child is oblivious of rules. The preschool child regards rules as being
permanent and having an inviolable authority of their own. At about ten or eleven, the child begins to see rules as being developed by humans to regulate behavior and thus subject to change based on mutual agreement. In summary, Piaget's research indicates that children move from very rigid, narrow, concrete moral judgments to more flexible, complex, inferential, and abstract judgments of behavior.

More recent investigations have explored the relationship between moral judgment and behavior. Overt behavior is frequently assessed in situations requiring self-control such as resistance to temptation. The empirical evidence relating moral judgment and behavior, however, is quite inconsistent and inconclusive (Hoffman, 1970). Nelson, Grinder, and Challas (1968) found that level of moral judgment assessed within Kohlberg's framework did not relate to resistance to temptation in seventh graders while IQ did. On the other hand, Harris, Mussen, and Rutherford (1976) report that maturity of moral judgment was significantly correlated with resistance to temptation even with intelligence partialed out. In his reviews of the literature, Kohlberg (1964; 1969) concludes that there is substantial evidence relating moral judgment to factors such as intelligence, anticipation of future events, control over fantasy, and self-esteem. Based on a study of the relationship between conscience and attentional processes (Grim, Kohlberg, and White, 1968), he also suggests that delay of
gratification is related to a general high level of competence reflected by higher intelligence, more mature cognitive development, and a greater capacity for sustained attention. As a result of the same study, the authors propose that experimental honesty may indicate an ability to stay with a boring task and resist distracting possibilities such as cheating which are more interesting. Resistance to temptation may therefore be determined by the interaction of moral judgment maturity and attentional-volitional capacities.

Summarizing his argument that the developmental level of moral judgment is a significant factor in understanding behavior, Kohlberg (1969) concludes,

> While moral judgment maturity is only one of many predictors of action in moral conflict situations, it can be a quite powerful and meaningful predictor of action where it gives rise to distinctive ways of defining concrete situational rights and duties in socially ambiguous situations. The causal role of moral judgment appears to be due to its contribution to a "cognitive" definition of the situation rather than because strong attitudinal or affective expressions of moral values activate behavior (p. 397).

In his review of the literature on moral development, Hoffman (1970) concludes that both behavior generality and dynamic consistency increase with age. The moral behavior of the young child is mainly a matter of learning specific acts in order to gain reward and avoid punishment. At the age of four or five years, cognitive mediation becomes possible and
generalization of behavior begins to reflect conceptual similarities rather than simply common stimulus events. As moral principles become internalized, there may be a pull towards consistency between principles and overt behavior. Behavior will also be influenced, however, by other characteristics of the individual in interaction with situational factors. With age, cognitive factors appear to become a more significant factor in determining behavior in both moral conflict situations and those eliciting self-control. These two kinds of situations overlap to considerable extent.

In summary, the research on self-control in children reports that from the age of three children can be taught to use overt verbal statements, covert verbal statements, and a variety of cognitive representations in order to facilitate delay of gratification, resistance to temptation, and persistence on a task. Spontaneous techniques for controlling one's own behavior also appear at a young age. Verbal self-instructions become more frequent and increasingly covert with increasing age. The tendency to exhibit self-control and expectations of personal control also increase with age. Cognitive developmental research suggests that conceptual maturity is a significant underlying factor in these developmental trends. Concern with the future, locus of control and moral judgment demonstrate varying degrees of relationship with self-control behavior.
Integration of Two Theoretical Approaches

The implications of cognitive-developmental theory and research for the five cognitive social learning person variables proposed by Mischel (1973) will be briefly discussed here. The individual's ability to construct or generate particular cognitions and behaviors increases with age. The constructions of both behaviors and cognitions become more social and more self-aware. The encoding strategies of an individual become less egocentric, less stimulus bound, and more inferential with age. Personal constructs move from a global, vague and undifferentiated form towards increasing differentiation, specificity and hierarchial organization. Expectancies are increasingly based on inferences about others rather than strictly overt behavior. The stimuli which have subjective value for an individual become more social, delayed and secondary. Self-regulatory systems display increasing complexity and internalization. Planfulness increases as the individual develops a better understanding of the interrelationship of the factors influencing his or her own behavior.

Looking more specifically at Mischel's two-stage model of delay behavior, one would expect the decision to delay for the sake of more preferred outcomes to increase with age as a greater interest in the future and a sense of continuity develops. The child gradually becomes more reflective and begins to anticipate consequences and pretest alternatives.
The effectiveness of maintaining delay should improve as the individual develops a greater number and more complex overt and cognitive self-distractions to reduce the aversiveness of the self-imposed delay. These self-distractions become increasingly internalized.

The assertion that the tendency to exhibit self-control increases with age has been substantially verified in the literature. However, the hypothesis that the children's conceptualizations of strategies for initiating and maintaining self-control change with age has scarcely been studied. This investigation attempts to explore this area by presenting children with short vignettes in which the central character has the choice between a tempting but less desirable behavior and a more desirable behavior resulting in self-initiated frustration and delayed gratification. While the presentation of stories may seem to be more abstract and require higher level thinking than presenting films, past research in the area of social cognition has reported that young children's understanding of films did not differ significantly from their understanding of similar stories (Berndt and Berndt, 1976). This method also permits the researcher to ask each child to pretend to be the central character in order to optimize the quality of the concepts shown by the child since other studies have revealed a strong tendency for children to become aware of their own subjective states before they become aware of the subjective states of
others (Keasey, 1977; Selman and Byrne, 1973). The procedure employed here is probably not as effective in eliciting children's ideas as placing them in the actual situations would be, but it does facilitate the utilization of diverse situations very close to those the child encounters in everyday living.

Another important issue to acknowledge is that children exhibit self-control long before awareness of self-control can be considered a significant factor and before they are able to verbalize their knowledge about the involved processes. The assumption of the present study, however, is that language increasingly enhances thinking and thus influences behavior. While one behavioral measure of self-control is utilized, the focus is on children's reported self-control and their conceptualizations of such situations rather than their actual behavior. Once the development of these concepts is clearly delineated, then their relationship to overt behavior can be studied; but the development of an awareness of self-control and the conceptualization of such behavior is interesting in its own right. A general, developmental description of the quantitative and qualitative changes in the cognitive processes underlying the child's awareness of self-control will contribute to a better understanding of the child's theories of self in relation to the social world.
The paucity of previous theoretical and empirical research impedes the formulation of hypotheses. If children's concepts of self-control are embedded within a cognitive-developmental framework, however, then some general trends can be predicted. It was expected that performance would range from preoperational to a level transitional between concrete and formal operations in Piaget's system. The following hypotheses were tested:

1. Elementary school-aged children's concepts of self-control become increasingly complex with age.
2. Elementary school-aged children's concepts of self-control become increasingly differentiated and display a wider variety of ideas with age.
4. Elementary school-aged children's concepts of self-control display increasing abstractness with age.
5. Elementary school-aged children's concepts of self-control increasingly involve taking the perspective of the other.

A measure of locus of control was administered in order to explore the relationship between expectancy for internal control and concepts of self-control. The following hypothesis is proposed:
7. Conceptual level (as reflected by the complexity and repertoire scores) displays a moderate positive correlation with locus of control. It is predicted that this relationship becomes stronger with age throughout elementary school.

A behavioral measure of delay of gratification was employed as a warm-up to more abstract questioning. The following hypothesis was tested:

8. The choice to delay gratification becomes more frequent with age.

This behavioral measure also helped provide exploratory evidence concerning the relationship between conceptual level and behavior. While it is not a part of the main analysis, it was expected that overt behavior shows a moderate but increasingly significant positive relationship to underlying conceptual processes.

While no hypotheses specifically related to stages were proposed, a developmental sequence of conceptual levels concerning self-control are derived, based on a post-hoc analysis of the data.
Subjects

The subjects were 90 primarily middle and upper-middle class children from public schools in San Luis Obispo, California. Fifteen girls and 15 boys were selected at each of three grade levels: kindergarten, third and sixth. The average age of the kindergarten group was five years two months (range = 4-9 to 5-8); that for the third grade was 8 years 4 months (range = 7-10 to 8-10); and the average for the sixth grade was 11 years 6 months (range = 11-0 to 12-0).

Intelligence test scores were not available to the experimenter. Statements by teachers, however, suggested that a good cross-section of intellectual ability was represented by the subjects in each class.

Written, informed consent was obtained from a parent or guardian of each child. A copy of the consent form appears in Appendix A. Approximately 50 percent of the consent forms were returned, with a slightly higher return rate in the kindergarten group.
Procedure

Each child was interviewed individually by the experimenter. The interviewing was done in a quiet place, with subject and experimenter sitting at a table, and a tape recorder in front of the subject. The session was recorded and subsequently transcribed.

Oral consent was obtained from each child. After establishing rapport with the subject, the experimenter gave the following explanation: "I am trying to find out what children of different ages think in different situations. When I talk to children, I ask them what they would think and do in a variety of situations. There are no 'right' or 'wrong' answers since different people think differently in various situations."

The behavioral measure of delay of gratification was always administered prior to the vignettes and followed by the Self-control Ability item in order to provide a warm-up and to prevent contamination from the other measures. The vignettes were presented in a random order which varied across subjects. The locus of control measure was administered either at the beginning or the end of the interview with the sequence being comparable across age and sex. The entire interview was usually about 20 minutes long.

Measures

In addition to the locus of control measure, the behavioral measure and the questions about perceived self-control.
vignettes involving four different types of self-control were presented, namely, delay of gratification, persistence, resistance to temptation, and social frustration tolerance. These four types of self-control were selected on the basis of past research, clinical experience, and relevancy to children of a particular age range. They are not mutually exclusive and overlap to a considerable degree. Each type of self-control was the major focus in three vignettes.

The subject was asked to pretend to be the central character of each story. A clinical interview format was adopted in which standardized questions are followed up with interview probes solely to clarify the meaning of the child's response. All subjects, including those who reported they would not display self-control, were asked the follow-up questions on why and how they could help themselves control their own behavior.

Prior to the primary investigation, a pilot study of 14 subjects between 4 and 12 years of age was run in order to insure that the vignettes and follow-up questions were relevant and understandable for children in all three age groups. The specific details of four vignettes were varied according to the age group. The details appearing below in parentheses are those which are presented to the two older groups.

**Behavioral measure**

Each subject was presented with the following choice: "In order to thank you for helping me out, I'm going to give
you a choice between getting one cookie today or three cookies next week. Which would you like?" A cookie was placed on the table while the subject made the choice. (This measure was used as a dependent rather than an independent variable due to the limited nature of the measure and the results of a pilot study which suggested it would be difficult to find kindergartners who delayed and sixth graders who sought immediate gratification.)

Self-control ability

As a warm-up technique, each subject was asked the following questions: "Sometimes people have a difficult time doing what they know they should do. Do you ever have a hard time getting yourself to do what you know you should do? Are there ever times you just don't feel like doing what you are supposed to do? If yes, when are these times?"

Delay of gratification

The following three vignettes are presented to each subject.

(1) "You have helped your parents clean the house and they offer to pay you for it. They give you a choice between getting one quarter now or two quarters next week. Which do you choose? Why might you want to wait for two quarters? How do you make yourself wait until next week?"

(2) "You are at school and you have a lot of work to do in the classroom. The teacher gives you a choice between
going out to play and doing the work later, or doing the work now and playing later. Which do you choose? Why might you want to work first and play later? How do you make yourself work now and play later?"

(3) "You want your dad to play with you very much. When you ask him, he says he is busy right now. Your dad gives you a choice between having him play with you right now for ten minutes or tomorrow afternoon for 30 minutes. Which do you choose? Why might you want to wait until tomorrow? How do you make yourself wait until tomorrow?

Persistence

The following three vignettes were presented to each subject.

(1) "You are working on a project (some arithmetic problems) in school. You reach the last part (problem) and it is very hard. Right now the teacher is busy and cannot help you. Do you keep trying to figure out how to do it? Why might you want to keep trying? How do you make yourself keep trying?"

(2) "You are at home putting together a puzzle that has a really neat picture on it. It has lots of small pieces and is taking a very long time to put together. Do you keep trying to put the puzzle together? Why might you want to keep trying? How do you make yourself keep trying to put the puzzle together?"
(3) "You are getting ready to go outside so you have to put your shoes on. You find one shoe but seem to have lost the other. Nobody is around who can help you find it. Do you keep looking for your other shoe or give up? Why might you want to keep looking? How do you make yourself keep looking?"

Resistance to temptation

The following three vignettes were presented to each subject.

(1) "You and your mom are in the kitchen where she is baking cookies for a special party. She says that it looks like she may not have enough cookies for the party. The doorbell rings and your mom leaves the kitchen. The cookies look and smell very good. You want to eat one very much. Do you take a cookie while your mom is out of the kitchen? Why might you not want to take a cookie? What do you do to stop yourself from taking a cookie?"

(2) "Your teacher has to go to the classroom next door to get a new cover for the hamster cage. She asks you to watch the cage while she is gone to make sure that the hamsters don't get out. While the teacher is gone, all of the other kids in your class go out to the playground to play your favorite game. They sound like they are having a lot of fun. They keep calling for you to come outside and play. Do you leave the hamsters before your teacher comes back so
that you can play? Why might you want to stay with the hamsters? What do you do to make yourself stay in the classroom and watch the hamsters?"

(3) "You are walking down the street and the person in front of you drops a quarter (dollar) but does not know it. You pick it up and think about what you could buy with it. Do you return the quarter (dollar) or keep it for yourself? Why might you want to return the quarter (dollar)? How do you make yourself return it to the person who dropped it?"

Social frustration tolerance

The following three vignettes were presented. Authority figures were absent from these scenes in order to minimize the tendency to turn to an adult in frustrating social situations.

(1) "You are at school. A kid in your class comes running up to you and hits you hard for no reason. You don't see the teacher anywhere. What do you do? Why might you not want to hit the kid back? How do you stop yourself from hitting the other kid?"

(2) "You are playing with a friend. The friend gets mad and breaks one of your favorite toys (things). What do you do? Why might you not want to do something bad to your friend? How do you stop yourself from doing something bad to your friend?"
(3) "You are at the park with some other kids. There is only one swing so everyone decides to take turns. When it is your turn, the kid before you will not get off. What do you do? Why might you not want to do something bad to the other kid? How do you stop yourself from doing something bad to the other kid?"

Locus of control

The Stanford Preschool Internal-External Scale (Mischel, Zeiss and Zeiss, 1974) was administered to the kindergarten subjects. Test-retest correlations for this scale are generally significant for children who are at least four years old when first tested. This scale consists of 14 forced-choice questions which elicit expectancies about locus of control for positive and negative events. A child's score is the total number of questions answered with the internal alternative. Appendix B contains a copy of this scale.

The subjects in the third and sixth grades were administered the abbreviated version of the Nowicki-Strickland Locus of Control Scale (Nowicki and Strickland, 1973). This scale was chosen because it yields a general as opposed to academic measure of locus of control and is not related significantly to social desirability. The mean test-retest reliability for administrations six weeks apart is approximately .65. The abbreviated scale consists of 18
questions which are answered "yes" or "no." The total number of questions answered in the internal direction is a subject's score. See Appendix C for a copy of the Nowicki-Strickland scale.

Coding System

For coding, responses were divided into items, each item consisting of one discrete bit of information. Each item was coded in one of 16 categories. The categories represent different strategies for initiating and maintaining self-control. These categories were derived from the results of a pilot study and are presented below.

1) **Self-instructions.** The subject gives himself or herself simple instructions as to the desirable behavior to exhibit, without stating any reasons or explanations. (Examples: "I say to myself, 'Don't ask now, ask later'" and "Tell yourself, 'Calm down.'")

2) **Appeal to an authority figure.** An authority figure such as a teacher or a parent is asked to help by altering or remedying the situation in some way. Appeals for aid from an unspecified or ambiguous person are also coded here. (Examples: "I ask my mom if I could have a cookie," "Call the teacher," and "I ask for help.")

3) **Appeal to a peer.** The subject asks or expresses the expectation that a peer or sibling will take care of the situation. (Examples: "I ask the other kids 'Can you save me a game?'" and "When he didn't get off, the other kids would probably beat him up."
4) **Talk with a peer.** The frustrating act of a peer is coped with by asking or commanding that a behavior be changed, or by talking the situation over together. This category includes only non-threatening statements. (Examples: "I'd tell him to stop it" and "Ask him why he did it and talk it over with him.")

5) **Positive consequences.** The focus is on the long-term rewards of positive consequences for oneself of the more desirable behavior. (Examples: "Just think of the picture and how it will look" and "Cause then I'd get to play more.")

6) **Negative consequences.** The focus is on the possible punishment or other negative consequences for oneself of the less desirable behavior. (Examples: "Tell myself not to because I'll get in trouble too" and "Think if I go outside barefoot I might get cut or stung by a bee.")

7) **Rules.** Behavior is guided by the rules and expectations of others who have either personal significance or delegated authority. This category includes all general rules. (Examples: "The teacher tells me to do it" and "Just think that it's best to get the work done.")

8) **Devalue the temptation.** The attractiveness of the less desirable behavior is minimized or depreciated. (Examples: "I know there's nothing I can buy with a quarter" and "I don't want to play.")
9) **Enhance the attractiveness of the frustrating situation.** The aversiveness of self-imposed frustration is reduced by focusing on the positive aspects of the desirable behavior (other than long-term reward) or by convincing oneself that is what one prefers to do. (Examples: "I like hamsters so I want to stay" and "Half the fun is waiting."")

10) **Eliminate the temptation.** The tempting alternative is eliminated by turning away, leaving the situation, or forgetting about it. (Examples: "I go out of the room" and "I just don't think about it.")

11) **Self-distraction.** The tempting alternative is countered by distracting oneself with other activities. (Examples: "I go next door and play with my cousins" and "I go play on something else.")

12) **Displacement of frustration.** Anger or frustration is released through more socially acceptable channels. (Examples: "I hit a pillow" and "I stomp my feet."")

13) **Role-taking.** The subject takes the point of view of the other and thinks about how a specific behavior will affect that person. This category includes focusing on the positive or negative consequences for the other person. (Examples: "Tell yourself that they might really need it" and "I think about how I would feel if I lost a dollar.")

14) **Avoidance of anxiety.** An attempt is made to avoid uncomfortable feelings such as anxiety, worry and guilt. (Examples: "Later you can play and not worry about it" and
"If you kept it you'd probably have a guilt and feel badly that you didn't return it.")

15) Focus on problem-solving. The focus is one a problem-solving strategy of some sort. (Examples: "First you look for the corner pieces and then for the pieces that go along the edge" and "Think back to where you put it and go back to all the places where you've been.")

16) Other. All items which are not appropriate for any other code but are reasonable strategies are placed in this category. (Items which are irrelevant or meaningless are not scored.)

The reliability of the scoring categories used in the data analysis was assessed by having two judges independently code 18 of the 90 protocols. Three protocols were chosen randomly from each grade sex subgroup. Reliability is reported as the percentage of items scored identically by the two judges. Interjudge agreement for frequency of predicted self-control was 100%. Interrater reliability for complexity was 97.5% and that for repertoire was 98.3%. Agreement on scoring categories across all subconstructs was 94.5%. Cases in which there was disagreement were resolved easily by discussion.

The coding system provided for more specific hypotheses as follows:

1. Sixth grade children have significantly higher complexity scores than third grade children who have
significantly higher scores than kindergarten children.

2. Sixth grade children have significantly higher repertoire scores than third grade children who score higher than kindergarten children.

3. Younger children appeal to an authority figure more often than older children.

4. Older children use the following strategies more frequently than younger children: "rules," "devalue the temptation," "enhance the attractiveness of the frustrating situation," "eliminate the temptation," and "self-distraction."

5. Older children use the role-taking strategy more often than younger children.

6. Older children more frequently mention the strategies which involve "avoidance of anxiety" and "displacement of frustration."

No hypotheses are proposed concerning the other strategies. It was expected that children in all three age groups demonstrate the ability to articulate the following strategies: "self-instructions," "appeal to a peer," "talk with a peer," "positive consequences," and "negative consequences."

**Analysis of the Data**

A frequency of predicted self-control score was derived for each subject. This score consisted of the number of times that the subject chose the more controlled response across the 12 vignettes. Preliminary analysis revealed no sex differences, so males and females were combined in the analysis of variance. The Scheffe test was used to interpret significant
The scoring categories were used to determine two kinds of scores for each subject. The complexity score is the number of techniques or strategies mentioned by a subject in response to one particular situation requiring self-control. These complexity scores were averaged across the three situations for each subconstruct of self-control in order to obtain one score for each subconstruct. The scores were averaged across all 12 vignettes in order to obtain one overall complexity score. The repertoire score is the total number of different techniques used by a subject at least once. A repertoire score was determined for each subconstruct as well as across all situations. Initially, these scores were analyzed as dependent variables in a two-way analysis of variance. No sex differences or interaction effects were found so the data was combined and a one-way analysis of variance was computed to assess age differences for each subconstruct. Significant results in an analysis of variance were further explored through post-hoc comparisons according to the Scheffé test. A Pearson product moment correlation was computed for total complexity score and total repertoire score. A correlation also was computed for each conceptual score (complexity and repertoire) and the frequency of predicted delay.

A two-way analysis of variance was performed for frequency scores in each category where the data met the
necessary assumptions. No significant sex or interaction effects were revealed so the data was combined and a one-way analysis of variance was performed for each strategy of self-control. A Kruskal-Wallis one-way analysis of variance for large samples (Siegel, 1956) was used where data seriously deviated from normality and homogeneity of variance. The above analysis also was used to look at the strategies utilized in response to the situations relevant to each subconstruct.

Pearson product moment correlations were computed for the dependent variables relevant to Hypothesis Seven.

A $\chi^2$ was performed to assess the relationship between age and choice to delay gratification (as indicated by the behavioral measure). Age and sex differences in frequency of predicted delay were compared using a two-way analysis of variance.

Due to the nature of the results, it was possible to analyze the relationship between overt behavior and conceptual processes in the case of kindergarten children and third grade boys. T-tests were utilized for this purpose.
CHAPTER IV

RESULTS

An analysis of variance showed a significant age effect for predicted self-control (the number of times the more controlled response was chosen across the 12 vignettes), $F(2,87)=3.94$, $p<.05$. The mean scores for kindergarten, third grade and sixth grades were 9.40, 10.57, and 9.97, respectively. Post-hoc comparisons revealed that the difference between the kindergarten and third grade groups was significant at the .05 level while the sixth grade did not differ significantly from the other two groups.

Table 1 presents the means and $F$ ratios for complexity scores across all subconstructs. Age differences were significant beyond the .001 level for each subconstruct. Post-hoc comparisons between specific age groups consistently found significant differences with the one exception that third graders did not differ from sixth graders on the subconstruct of persistence.

Age differences on repertoire score followed a similar pattern as those for complexity score. Table 2 shows that $F$ ratios were significant for age effects across all subconstructs while post-hoc comparisons found no difference between third graders and sixth graders for persistence.
Table 1
Mean Complexity Score for Each Subconstruct

<table>
<thead>
<tr>
<th>Subconstruct</th>
<th>Grade</th>
<th>K</th>
<th>3</th>
<th>6</th>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delay of Gratification</td>
<td></td>
<td>1.04</td>
<td>1.47</td>
<td>1.86</td>
<td>F(2, 87)=30.67</td>
</tr>
<tr>
<td>Persistence</td>
<td></td>
<td>.86</td>
<td>1.41^b</td>
<td>1.47^b</td>
<td>F(2, 87)=27.96</td>
</tr>
<tr>
<td>Resistance to Temptation</td>
<td></td>
<td>1.00</td>
<td>1.46</td>
<td>1.97</td>
<td>F(2, 87)=26.23</td>
</tr>
<tr>
<td>Social Frustration Tolerance</td>
<td></td>
<td>1.20</td>
<td>1.67</td>
<td>2.08</td>
<td>F(2, 87)=27.68</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1.04</td>
<td>1.50</td>
<td>1.94</td>
<td>F(2, 87)=55.87</td>
</tr>
</tbody>
</table>

^a F ratios are all significant at the .001 level.

^b Numbers sharing this superscript are not significantly different from each other. Post-hoc comparisons according to the Scheffé test revealed significant differences at the .01 level for all other means in the same row.
Table 2
Mean Repertoire Score for Each Subconstruct

<table>
<thead>
<tr>
<th>Subconstruct</th>
<th>Grade</th>
<th>Statistic^a</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>K</td>
<td>3</td>
</tr>
<tr>
<td>Delay in Gratification</td>
<td>2.07</td>
<td>2.93</td>
</tr>
<tr>
<td>Persistence</td>
<td>1.73</td>
<td>3.07(^b)</td>
</tr>
<tr>
<td>Resistance to Temptation</td>
<td>2.57</td>
<td>3.47</td>
</tr>
<tr>
<td>Social Frustration Tolerance</td>
<td>1.97</td>
<td>3.43</td>
</tr>
<tr>
<td>Total</td>
<td>5.83</td>
<td>8.53</td>
</tr>
</tbody>
</table>

\(^a\) F ratios are all significant at the .001 level.

\(^b\) Numbers sharing this superscript are not significantly different from each other. Post-hoc comparisons according to the Scheffé test revealed significant differences at the .01 level for all other means in the same row.
The correlation between total complexity score and total repertoire score was highly significant, \( r = .81, p < .001 \). The correlation between predicted self-control and complexity was lower but still significant, \( r = .36, p < .05 \). The correlation between predicted self-control and repertoire was not significant, \( r = .21, p > .05 \).

A one-way analysis of variance was performed for each category in order to assess age differences in the frequency of utilizing each strategy of self-control. The means for each age group and the F ratios are displayed in Table 3. Significant age differences were found for ten of the 16 categories. Sixth graders used appeal to an authority figure significantly less than third graders who mentioned this strategy less often than kindergartners. For the categories of appeal to a peer and avoidance of anxiety, sixth graders had higher scores than kindergarten children. The third grade mean fell in between the two age groups for each of these strategies, but did not differ from either of them. Both third graders and sixth graders had significantly higher scores than kindergartners for the following categories: positive consequences, negative consequences, eliminate the temptation and self-distraction. Sixth graders employed the following strategies significantly more often than the other two age groups: rules, devalue the temptation, and role-taking. No age differences were found for self-instructions, talk with a peer, enhance the attractiveness
<table>
<thead>
<tr>
<th>Category</th>
<th>K</th>
<th>3</th>
<th>6</th>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-instructions</td>
<td>.53</td>
<td>.57</td>
<td>.60</td>
<td>N.S.</td>
</tr>
<tr>
<td>Appeal to an authority figure</td>
<td>3.27&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.93&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.93&lt;sup&gt;c&lt;/sup&gt;</td>
<td>F(2,87)=26.37 ***</td>
</tr>
<tr>
<td>Appeal to a peer</td>
<td>.10&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.23&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>.50&lt;sup&gt;b&lt;/sup&gt;</td>
<td>H(2)=8.21 *</td>
</tr>
<tr>
<td>Talk with a peer</td>
<td>.83</td>
<td>1.30</td>
<td>1.50</td>
<td>N.S.</td>
</tr>
<tr>
<td>Positive consequences</td>
<td>2.93&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.00&lt;sup&gt;b&lt;/sup&gt;</td>
<td>4.83&lt;sup&gt;b&lt;/sup&gt;</td>
<td>F(2,87)=12.73 ***</td>
</tr>
<tr>
<td>Negative consequences</td>
<td>1.67&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.37&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3.87&lt;sup&gt;b&lt;/sup&gt;</td>
<td>F(2,87)=14.05 ***</td>
</tr>
<tr>
<td>Rules</td>
<td>.87&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.30&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.17&lt;sup&gt;b&lt;/sup&gt;</td>
<td>F(2,87)=9.90 ***</td>
</tr>
<tr>
<td>Devalue the temptation</td>
<td>.43&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.57&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.50&lt;sup&gt;b&lt;/sup&gt;</td>
<td>F(2,87)=9.77 ***</td>
</tr>
<tr>
<td>Enhance the attractiveness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of the frustrating situation</td>
<td>.47</td>
<td>.40</td>
<td>.57</td>
<td>N.S.</td>
</tr>
<tr>
<td>Eliminate the temptation</td>
<td>.30&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.13&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.60&lt;sup&gt;b&lt;/sup&gt;</td>
<td>F(2,87)=9.21 ***</td>
</tr>
<tr>
<td>Self-distraction</td>
<td>.40&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.03&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.27&lt;sup&gt;b&lt;/sup&gt;</td>
<td>F(2,87)=8.46 ***</td>
</tr>
<tr>
<td>Displacement of frustration</td>
<td>.03</td>
<td>.07</td>
<td>.30</td>
<td>N.S.</td>
</tr>
<tr>
<td>Role-taking</td>
<td>.47&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.70&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.83&lt;sup&gt;b&lt;/sup&gt;</td>
<td>F(2,87)=24.94 ***</td>
</tr>
<tr>
<td>Avoidance of anxiety</td>
<td>.03&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.20&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>.47&lt;sup&gt;b&lt;/sup&gt;</td>
<td>H(2)=12.83 **</td>
</tr>
<tr>
<td>Focus on problem-solving</td>
<td>.27</td>
<td>.27</td>
<td>.23</td>
<td>N.S.</td>
</tr>
<tr>
<td>Other</td>
<td>.07</td>
<td>.33</td>
<td>.33</td>
<td>N.S.</td>
</tr>
</tbody>
</table>

Note. The results of post-hoc comparisons according to the Scheffe test are indicated by superscripts. Those means sharing the same superscript do not differ significantly. * p<.05. ** p<.01. *** p<.001.
of the frustrating situation, displacement of frustration, and focus on problem-solving.

The frequency of using various strategies in delay of gratification situation is shown in Table 4. All three age groups focused most often on positive consequences. Both older age groups mentioned negative consequences more than the youngest group. Sixth graders used the technique of self-distraction more frequently than kindergartners. The remaining strategies were utilized relatively rarely.

Table 5 presents the mean frequency of categories employed in persistence situations at different ages. Again, all three groups used positive consequences most frequently, but third and sixth grade children utilized this technique significantly more often than kindergarten children. Sixth graders also mentioned negative consequences more than kindergartners.

Categories utilized in resistance to temptation situations are displayed in Table 6. Sixth graders referred to the strategies of rules and role-taking most often and significantly more often then either kindergarten or third grade children. All three groups placed a heavy emphasis on negative consequences. Kindergarten children appealed to an authority figure more frequently than the older two groups. Sixth graders suggested the devalue the temptation strategy significantly more often that the younger two groups. The oldest group also mentioned positive consequences and avoidance of anxiety more than the kindergarten group.
Table 4

Categories Used in Delay of Gratification Situations

<table>
<thead>
<tr>
<th>Category</th>
<th>Mean Frequency</th>
<th></th>
<th></th>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>K</td>
<td>3</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Self-instructions</td>
<td>.03</td>
<td>.03</td>
<td>.03</td>
<td></td>
</tr>
<tr>
<td>Appeal to an authority figure</td>
<td>.07</td>
<td>.03</td>
<td>.00</td>
<td></td>
</tr>
<tr>
<td>Appeal to a peer</td>
<td>.00</td>
<td>.10</td>
<td>.00</td>
<td></td>
</tr>
<tr>
<td>Talk with a peer</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td></td>
</tr>
<tr>
<td>Positive consequences</td>
<td>1.87</td>
<td>2.10</td>
<td>2.40</td>
<td>N.S.</td>
</tr>
<tr>
<td>Negative consequences</td>
<td>.17</td>
<td>.60</td>
<td>.73</td>
<td>H(2)=7.59 *</td>
</tr>
<tr>
<td>Rules</td>
<td>.13</td>
<td>.03</td>
<td>.17</td>
<td>N.S.</td>
</tr>
<tr>
<td>Devalue the temptation</td>
<td>.17</td>
<td>.17</td>
<td>.33</td>
<td>N.S.</td>
</tr>
<tr>
<td>Enhance the attractiveness of the frustrating situation</td>
<td>.17</td>
<td>.13</td>
<td>.27</td>
<td>N.S.</td>
</tr>
<tr>
<td>Eliminate the temptation</td>
<td>.07</td>
<td>.20</td>
<td>.37</td>
<td>N.S.</td>
</tr>
<tr>
<td>Self-distraction</td>
<td>.20</td>
<td>.53</td>
<td>.83</td>
<td>H(2)=16.43 ***</td>
</tr>
<tr>
<td>Displacement of frustration</td>
<td>.00</td>
<td>.00</td>
<td>.03</td>
<td></td>
</tr>
<tr>
<td>Role-taking</td>
<td>.27</td>
<td>.17</td>
<td>.27</td>
<td>N.S.</td>
</tr>
<tr>
<td>Avoidance of anxiety</td>
<td>.00</td>
<td>.00</td>
<td>.03</td>
<td></td>
</tr>
<tr>
<td>Focus on problem-solving</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>.00</td>
<td>.07</td>
<td>.03</td>
<td></td>
</tr>
</tbody>
</table>

Note. Numbers in the same row sharing the same superscript are not significantly different. * p<.05. *** p<.001.
Table 5

Categories Used in Persistence Situations

<table>
<thead>
<tr>
<th>Category</th>
<th>Mean Frequency</th>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>K</td>
<td>3</td>
</tr>
<tr>
<td>Self-instructions</td>
<td>.07</td>
<td>.27</td>
</tr>
<tr>
<td>Appeal to an authority figure</td>
<td>.53</td>
<td>.27</td>
</tr>
<tr>
<td>Appeal to a peer</td>
<td>.07</td>
<td>.13</td>
</tr>
<tr>
<td>Talk with a peer</td>
<td>.00</td>
<td>.03</td>
</tr>
<tr>
<td>Positive consequences</td>
<td>1.03&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.67&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Negative consequences</td>
<td>.37&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.87&lt;sup&gt;ab&lt;/sup&gt;</td>
</tr>
<tr>
<td>Rules</td>
<td>.13</td>
<td>.17</td>
</tr>
<tr>
<td>Devalue the temptation</td>
<td>.03</td>
<td>.07</td>
</tr>
<tr>
<td>Enhance the attractiveness of the frustrating situation</td>
<td>.13</td>
<td>.17</td>
</tr>
<tr>
<td>Eliminate the temptation</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>Self-distraction</td>
<td>.00</td>
<td>.03</td>
</tr>
<tr>
<td>Displacement of frustration</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>Role-taking</td>
<td>.00</td>
<td>.03</td>
</tr>
<tr>
<td>Avoidance of anxiety</td>
<td>.00</td>
<td>.03</td>
</tr>
<tr>
<td>Focus on problem-solving</td>
<td>.20</td>
<td>.27</td>
</tr>
<tr>
<td>Other</td>
<td>.00</td>
<td>.07</td>
</tr>
</tbody>
</table>

Note. Numbers in the same row sharing the same superscript are not significantly different. ** $p<.01$. *** $p<.001$. 
### Table 6

**Categories Used in Resistance to Temptation Situations**

<table>
<thead>
<tr>
<th>Category</th>
<th>Mean Frequency</th>
<th></th>
<th></th>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>K 3 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-instructions</td>
<td>.17 .03 .10</td>
<td></td>
<td></td>
<td>N.S.</td>
</tr>
<tr>
<td>Appeal to an authority figure</td>
<td>.60&lt;sup&gt;a&lt;/sup&gt; .27&lt;sup&gt;b&lt;/sup&gt; .10&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td></td>
<td>H(2)=13.85 ***</td>
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<tr>
<td>Appeal to a peer</td>
<td>.00 .00 .00</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Talk with a peer</td>
<td>.17 .07 .17</td>
<td></td>
<td></td>
<td>N.S.</td>
</tr>
<tr>
<td>Positive consequences</td>
<td>.00&lt;sup&gt;a&lt;/sup&gt; .13&lt;sup&gt;ab&lt;/sup&gt; .30&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td></td>
<td>H(2)=9.14 *</td>
</tr>
<tr>
<td>Negative consequences</td>
<td>1.10 1.40 1.00</td>
<td></td>
<td></td>
<td>N.S.</td>
</tr>
<tr>
<td>Rules</td>
<td>.43&lt;sup&gt;a&lt;/sup&gt; .87&lt;sup&gt;a&lt;/sup&gt; 1.40&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td></td>
<td>F(2,87)=12.23 ***</td>
</tr>
<tr>
<td>Devalue the temptation</td>
<td>.17&lt;sup&gt;a&lt;/sup&gt; .10&lt;sup&gt;a&lt;/sup&gt; .50&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td></td>
<td>H(2)=12.60 **</td>
</tr>
<tr>
<td>Enhance the attractiveness of the frustrating situation</td>
<td>.17 .10 .17</td>
<td></td>
<td></td>
<td>N.S.</td>
</tr>
<tr>
<td>Eliminate the temptation</td>
<td>.13 .50 .40</td>
<td></td>
<td></td>
<td>N.S.</td>
</tr>
<tr>
<td>Self-distraction</td>
<td>.07 .23 .13</td>
<td></td>
<td></td>
<td>N.S.</td>
</tr>
<tr>
<td>Displacement of frustration</td>
<td>.00 .00 .00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Role-taking</td>
<td>.20&lt;sup&gt;a&lt;/sup&gt; .53&lt;sup&gt;a&lt;/sup&gt; 1.23&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td></td>
<td>H(2)=32.25 ***</td>
</tr>
<tr>
<td>Avoidance of anxiety</td>
<td>.00&lt;sup&gt;a&lt;/sup&gt; .13&lt;sup&gt;ab&lt;/sup&gt; .27&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td></td>
<td>H(2)=8.00 *</td>
</tr>
<tr>
<td>Focus on problem-solving</td>
<td>.03 .00 .00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>.00 .00 .00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note.** Numbers in the same row sharing the same superscript are not significantly different. * p<.05. ** p<.01. *** p<.001.
The mean frequencies of categories used in social frustration tolerance situations at different ages are presented in Table 7. Sixth graders utilized four strategies more frequently than the other two age groups: appeal to a peer, negative consequences, devalue the temptation, and role-taking. On the other hand, sixth grade children used the appeal to an authority figure technique less often than kindergarten or third grade children. Sixth graders also referred to talk with a peer more than kindergartners. Third graders mentioned eliminate the temptation more than the youngest group.

Table 8 displays the correlations between locus of control and each of the two conceptual measures. The correlation between these dependent variables is statistically significant only in the case of the sixth grade group.

A chi square revealed no significant age differences for the behavioral measure. The number of subjects in kindergarten, third grade and sixth grade who chose to delay was 16, 20, and 17, respectively. Another chi square indicated no sex differences. However, within the third grade group, females delayed gratification significantly more often than males, $x^2(1)=5.4$, $p<.05$.

Mean conceptual scores of subjects with different responses to the behavioral measure are presented Table 9. The variability of the cell size made it difficult to
Table 7
Categories Used in Social Frustration Tolerance Situations

<table>
<thead>
<tr>
<th>Category</th>
<th>K</th>
<th>3</th>
<th>6</th>
<th>Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-instructions</td>
<td>.27</td>
<td>.23</td>
<td>.20</td>
<td>N.S.</td>
</tr>
<tr>
<td>Appeal to an authority figure</td>
<td>1.97&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.40&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.67&lt;sup&gt;b&lt;/sup&gt;</td>
<td>F(2, 87)=12.74***</td>
</tr>
<tr>
<td>Appeal to a peer</td>
<td>.03&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.10&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.43&lt;sup&gt;b&lt;/sup&gt;</td>
<td>H(2)=17.12***</td>
</tr>
<tr>
<td>Talk with a peer</td>
<td>.67&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.20&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>1.30&lt;sup&gt;b&lt;/sup&gt;</td>
<td>F(2, 87)=3.79*</td>
</tr>
<tr>
<td>Positive consequences</td>
<td>.00</td>
<td>.00</td>
<td>.03</td>
<td>—</td>
</tr>
<tr>
<td>Negative consequences</td>
<td>.07&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.50&lt;sup&gt;a&lt;/sup&gt;</td>
<td>1.23&lt;sup&gt;b&lt;/sup&gt;</td>
<td>H(2)=27.29***</td>
</tr>
<tr>
<td>Rules</td>
<td>.10</td>
<td>.17</td>
<td>.30</td>
<td>N.S.</td>
</tr>
<tr>
<td>Devalue the temptation</td>
<td>.07&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.20&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.57&lt;sup&gt;b&lt;/sup&gt;</td>
<td>H(2)=18.83***</td>
</tr>
<tr>
<td>Enhance the attractiveness</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
<td>—</td>
</tr>
<tr>
<td>Eliminate the temptation</td>
<td>.07</td>
<td>.43&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>.67&lt;sup&gt;b&lt;/sup&gt;</td>
<td>H(2)=6.09*</td>
</tr>
<tr>
<td>Self-distraction</td>
<td>.13</td>
<td>.20</td>
<td>.30</td>
<td>N.S.</td>
</tr>
<tr>
<td>Displacement of frustration</td>
<td>.00</td>
<td>.07</td>
<td>.20</td>
<td>N.S.</td>
</tr>
<tr>
<td>Role-taking</td>
<td>.00&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.00&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.30&lt;sup&gt;b&lt;/sup&gt;</td>
<td>H(2)=14.68***</td>
</tr>
<tr>
<td>Avoidance of anxiety</td>
<td>.00</td>
<td>.03</td>
<td>.00</td>
<td>—</td>
</tr>
<tr>
<td>Focus on problem-solving</td>
<td>.03</td>
<td>.00</td>
<td>.00</td>
<td>—</td>
</tr>
<tr>
<td>Other</td>
<td>.07</td>
<td>.20</td>
<td>.27</td>
<td>N.S.</td>
</tr>
</tbody>
</table>

Note. Numbers in the same row sharing the same superscript are not significantly different. * p<.05. *** p<.001.
Table 8
Correlation Between Conceptual Measures And Locus of Control

<table>
<thead>
<tr>
<th>Grade</th>
<th>Pearson's $r$</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Complexity Score</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kindergarten</td>
<td>-.17</td>
<td>$p &gt; .05$</td>
</tr>
<tr>
<td>Third grade</td>
<td>.10</td>
<td>$p &gt; .05$</td>
</tr>
<tr>
<td>Sixth grade</td>
<td>.71</td>
<td>$p &lt; .001$</td>
</tr>
</tbody>
</table>

| **Repertoire Score** |               |                       |
| Kindergarten        | -.12          | $p > .05$             |
| Third grade         | .16           | $p > .05$             |
| Sixth grade         | .47           | $p < .01$             |
Table 9
Mean Conceptual Scores of Subjects With Different Behavioral Responses

<table>
<thead>
<tr>
<th>Group</th>
<th>Grade</th>
<th>Complexity Scores</th>
<th>Repertoire Scores</th>
<th>Locus of Control Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>K</td>
<td>3</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Delay</td>
<td>1.03 (8)</td>
<td>1.53 (13)</td>
<td>1.69 (7)</td>
</tr>
<tr>
<td></td>
<td>No delay</td>
<td>.98 (7)</td>
<td>1.50 (2)</td>
<td>1.98 (8)</td>
</tr>
<tr>
<td>Boys</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Delay</td>
<td>1.14 (8)</td>
<td>1.63 (8)</td>
<td>1.92 (10)</td>
</tr>
<tr>
<td></td>
<td>No delay</td>
<td>1.01 (7)</td>
<td>1.30 (7)</td>
<td>1.67 (5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Delay</td>
<td>5.50 (8)</td>
<td>8.85 (13)</td>
<td>9.71 (7)</td>
</tr>
<tr>
<td></td>
<td>No delay</td>
<td>5.71 (7)</td>
<td>9.00 (2)</td>
<td>10.00 (8)</td>
</tr>
<tr>
<td>Boys</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Delay</td>
<td>6.13 (8)</td>
<td>8.75 (8)</td>
<td>9.90 (10)</td>
</tr>
<tr>
<td></td>
<td>No delay</td>
<td>6.00 (7)</td>
<td>7.57 (7)</td>
<td>9.60 (5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Delay</td>
<td>5.50 (8)</td>
<td>10.85 (13)</td>
<td>12.43 (7)</td>
</tr>
<tr>
<td></td>
<td>No delay</td>
<td>6.14 (7)</td>
<td>10.00 (2)</td>
<td>13.50 (8)</td>
</tr>
<tr>
<td>Boys</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Delay</td>
<td>5.88 (8)</td>
<td>13.00 (8)</td>
<td>14.42 (10)</td>
</tr>
<tr>
<td></td>
<td>No delay</td>
<td>5.86 (7)</td>
<td>9.57 (7)</td>
<td>10.20 (5)</td>
</tr>
</tbody>
</table>

Note. Numbers in parentheses indicate the number of subjects in each cell.

\( ^{ab} \) Means sharing the same superscript differ significantly at the .05 level.
statistically evaluate the differences between those who chose to delay and those who chose the immediate reward. The only significant difference was found in the case of third grade boys. Those who chose to delay had significantly higher complexity scores, t(13) = 2.01, p < 0.05, and higher locus of control scores t(13) = 2.35, p < 0.05 than those who chose the immediate reward. The difference for the repertoire score approached significance, t(13) = 1.59, p < 0.10.

Finally, children's own examples of situations requiring self-control are displayed in Table 10. These responses which were part of the self-control ability questions were categorized on a post-hoc basis and are presented simply as exploratory data to stimulate future hypotheses. One-third of the subjects proposed examples which involved doing household chores. Other types of parental instructions were suggested by 12 subjects. Thirteen subjects focused on either schoolwork or homework. Over half of the kindergarten group gave no examples.
Table 10

Children's Examples of Self-Control

<table>
<thead>
<tr>
<th>Type of Situation</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>K</td>
</tr>
<tr>
<td>Household chores</td>
<td>4</td>
</tr>
<tr>
<td>Parental instructions</td>
<td>6</td>
</tr>
<tr>
<td>Schoolwork</td>
<td>1</td>
</tr>
<tr>
<td>Homework</td>
<td>0</td>
</tr>
<tr>
<td>Personal care</td>
<td>1</td>
</tr>
<tr>
<td>Peer pressure</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
</tr>
<tr>
<td>None&lt;sup&gt;a&lt;/sup&gt;</td>
<td>16</td>
</tr>
</tbody>
</table>

<sup>a</sup>Subjects placed in this category insisted they never had difficulty getting themselves to do what they were supposed to do.
CHAPTER V

DISCUSSION

The failure to find a consistent developmental trend in the number of times the more controlled response was predicted across the 12 vignettes is difficult to explain. One would have expected that increased awareness of strategies for enhancing self-control would be accompanied by increased expectancies of exhibiting self-control. The absence of this relationship might be explained by Mischel's (1974) two-stage model of delay of gratification. In the first stage, the individual makes a choice to delay in order to obtain a more preferred outcome. This choice is influenced by expectations concerning the probable consequences. The results of this study show that children at all ages tend to focus on positive consequences in delay of gratification situations. While older children display a greater awareness of strategies for enhancing self-control, these strategies are not employed until the second stage of Mischel's model, that is, the stage during which delay is maintained through cognitive and overt activities. Thus, knowledge of strategies for maintaining delay may not be related to the initial choice concerning whether or not to delay.
The first two hypotheses receive strong support from the data. Children's concepts of self-control become increasingly complex and display a wider variety of ideas with age. These results are consistent with Kreutzer, et al.'s (1975) study of children's verbalizable knowledge concerning memory. The older child can report more different kinds of strategies for coping with both memory problems and self-control situations. These age differences reflect a general trend in development towards a widening and increasing complexity of the cognitive field. Throughout the elementary school years cognitive structures become increasingly differentiated and organized.

The hypothesis that children's strategies of self-control become increasingly internalized with age also received strong support. The highly significant and consistent decline with age in the use of an authority figure parallels Piaget's (1932) findings concerning moral development. The child's focus gradually moves from respect and submission to authority to self-government and control. These findings also are congruent with past research on metamemory which found that kindergarten children displayed an "apparent readiness to use other people as storage and retrieval devices" (Kreutzer et al., 1975, p. 51). Rather than employing representational skills, the young child tends to respond to problem-solving situations by using a well-learned pattern of social help-seeking.
As cognitive activity shifts from the preoperational stage to that of concrete operations, the child depends less on others and more on inferential, conceptual manipulations. The hypothesis of increasing planfulness and abstractness with age was confirmed by the findings for all proposed strategies except enhance the attractiveness of the frustrating situation. While the means for the other categories consistently fell in the predicted direction for the three age groups and the overall age effect was significant, the differences between two specific age groups was not always statistically significant. In those cases where the kindergarten and third grade groups do not differ significantly, the findings may reflect the position of the third grade as a transition period during which newly acquired cognitive skills are not yet fully utilized. The failures to find a difference between the third and sixth grade groups may indicate that those strategies are relatively well-developed early during the stage of concrete operations and their use does not increase significantly during this stage. The failure to find age differences with respect to enhance the attractiveness of the frustrating situation is difficult to explain.

The finding that sixth graders focus on the rules relevant to a situation significantly more often than the lower two grades is consistent with Kohlberg's (1963) research concerning
moral development. He found that while most seven-year-old children's moral judgments were at the preconventional level, ten-year-olds tended to respond at both the preconventional and conventional levels. By the age of 13 years, a larger percentage of moral judgments were at the conventional than at the preconventional level. The conventional level is characterized by a concern for mutual interpersonal expectations and conformity. Decisions about behavior are based on a desire to maintain rules which support stereotypical good behavior. An awareness of shared feelings and agreements takes primacy over individual interests (Kohlberg, 1976). The trend for third graders to refer to rules more often than kindergartners indicates that the third grade children are beginning to develop an awareness of shared experiences.

Sixth graders also used the strategy of devaluing the temptation more frequently than the other two age groups. Studies (Ebbesen et al., 1975) based on the forbidden toy paradigm have found this method to be effective in helping children cope with a frustrating temptation period. Research also shows, however, that children as young as 4 years old utilize this technique (Aronson and Carlsmith, 1963). This latter finding suggests that there may be a wide gap between the age at which children begin to use a particular self-control strategy and the age when they can verbalize how they use that strategy.
Both third grade and sixth grade children employed the strategies of eliminate the temptation and self-distraction more often than kindergarten children. Investigations (Corfield et al., 1976; Mischel et al., 1972) of children's delay behavior have shown that distracting oneself from the rewards is an effective technique for enhancing the delay of gratification and resistance to temptation.

A recent study by Mischel, Mischel and Hood (Note 1) has placed children from 2 years 8 months to 9 years 1 month in a delay of gratification situation and asked them if they wanted the reward in view or covered. Significantly more older children chose to cover rather than expose the reward. A subsequent investigation (Mischel, Mischel and Hood, Note 2) employed preschoolers, third graders and sixth graders. These subjects were asked what they would say to themselves to help them wait. Most preschoolers could not answer this question. The results indicated a similar distribution of delay strategies for the third and sixth grade groups. The most frequent strategy was to focus on the task-contingency, that is, the reward for delaying gratification. The other utilized strategies in order of decreasing frequency were distract oneself, think about the rewards in a non-tempting way (devalue the temptation), and focusing on the consummatory properties of the rewards. These results confirm the findings of the present study with respect to increasing abstractness with age. The third and sixth graders recognize that mental
strategies which transform difficult situations into easier, less frustrating ones enhance self-control.

The finding that sixth graders employ role-taking more often than the younger groups is congruent with their more frequent focus on rules. These sixth graders are most likely at Kohlberg's stage three of moral development, that is, the stage of mutual expectations and interpersonal conformity. The social perspective of the individual in this stage is that of relating "points of view through the concrete Golden Rule, putting yourself in the other guy's shoes" (Kohlberg, 1976, p. 34). Based on his own research, Selman (1976; Selman and Byrne, 1974) proposes that "mutual role taking" occurs during the stage from 10 to 12 years. The child discovers that both self and other can consider each other's viewpoint mutually and simultaneously. The child also can take a third person perspective and view the interaction from the outside. Within Selman's framework of social role-taking stages, the 5-year-old has an "egocentric viewpoint" and fails to differentiate between the social perspective of self and other. The eight-year-old is just entering the stage of "self-reflective role taking." This child recognizes that each individual is aware of the other's perspective but cannot abstract these reflections to the level of "simultaneous mutuality."

The hypothesis that children's concepts of self-control display increasing awareness of negative affect with age
received only partial support from the data. No age differences were found for displacement of frustration, but the means fell in the predicted direction with the sixth grade group showing a strong tendency to use this strategy more often than the younger two groups. The age effect was significant for avoidance of anxiety. Sixth graders utilized this strategy significantly more often than kindergartners.

The low incidence of awareness of both these strategies (displacement of frustration and avoidance of anxiety) across all age groups is consistent with cognitive-developmental theory. The ability to take one's own thought as an object and reason about it in an abstract manner does not appear until the stage of formal operations (Elkind, 1968). At approximately the age of 12 years, individuals become more aware of their own thoughts and begin to reflect upon what they know. Since most of the children in the current sample probably had not yet attained formal operational thought, they could not verbalize the nature of more complex cognitive processes. The awareness of possible negative affect resulting from a hypothetical situation appears to be a relatively advanced thought process.

As predicted, no age differences were found for self-instructions and talk with a peer. In the case of the latter category, however, observation of the data reveals that older children were more likely to talk it over and ask for the other person's perspective, while the younger children tended
simply to tell the other person what they were thinking or feeling.

Contrary to expectations, a significant age effect was found for appeal to a peer. Sixth graders mentioned this technique more frequently than kindergartners. This finding may parallel the decline in appeal to an authority figure. Conflicts are solved less often by subordination to adult demands and more often by receiving aid from peers. This trend occurs in the context of the overall increasing influence of the peer group as a socializing agent during the middle childhood years (Campbell, 1964).

Both third and sixth graders referred to positive and negative consequences more often than the other categories; and they used these strategies significantly more frequently than the kindergartners did. This result is consistent with Mischel el al.'s (Note 2) finding that the most frequent strategy suggested by both third and sixth graders was to focus on the contingencies of the task. Their findings also indicated, however, that few preschoolers could verbalize delay strategies. The present investigation has shown that many kindergarten children display a verbalizable awareness of the task contingencies, that is, consequences of delay behavior. Thus, it appears that the later preschool and early kindergarten months may be a significant period in the development of the ability to verbalize the contingencies of a self-control situation.
The literature indicates that neither attending directly to the rewards (Mischel et al., 1972) nor knowledge of the advantages of delay (Nisan and Koriat, 1977) enhances delay behavior in voluntary delay of gratification situations. Recent studies (Miller and Karniol, 1976; Patterson and Mischel, 1976) have shown, however, that focusing on the reward does aid delay behavior when delay is externally imposed. Thus, the effectiveness of this strategy appears to depend on certain characteristics of the situation. The increase with age in focusing on the consequences may reflect a greater interest in the future and a more well-developed ability to anticipate consequences and pretest alternatives.

The hypothesis that locus of control is correlated with conceptual level received partial support from the data. The correlation was significant only for the sixth grade group. Cognitive-developmental theory would predict a stronger relationship with age as a result of increasingly integrated and organized cognitive structures (Piaget, 1969). This finding is consistent with recent research (McClure, 1975) which has shown that the ability to generate alternative problem solutions is correlated with a belief in inner control over circumstances.

The failure to find an age difference with respect to overt delay behavior is probably due to the inadequacy of the behavioral measure. Mischel (1978) points out that "the
individual who has the capacity to delay may be unwilling to
do so when the delayed outcome seems...trivial or irrelevant" (p. 55).

The measure in the present investigation was chosen based on the results of a pilot study and past research (Bialer, 1961; Mischel and Metzner, 1962) which indicated that older children would delay more often than younger children when given a choice between an immediate, smaller sweet reward and a delayed, larger sweet reward. All these studies employed subjects up to 12 years of age. In the late 1970's, however, a sweet food reward may no longer be attractive to many children. The spontaneous comments of subjects while making their choice provided evidence that the current emphasis on "health foods" and staying thin influenced their choices. Indeed, for many children, choice of the immediate, smaller reward may have reflected greater self-control than choosing the delayed, larger reward.

Another potentially confounding factor is the level of trust experienced by each subject. Some children may question whether the experimenter will return with the rewards. Mischel, Mischel, and Hood (Note 1) have shown that the factor of trust may have a significant impact on the kind of self-control strategy chosen in a delay situation. It is likely that this factor also influences the initial choice concerning whether to delay or not.
The inadequacy of the behavioral measure raises questions about the usefulness of discussing the relationship between that measure and the conceptual measures, but it will be considered here briefly. The data indicated a difference between those who chose the immediate reward and those who chose to delay only in the case of third grade boys. The boys who chose to delay had significantly higher complexity and locus of control scores. The difference between the two groups for repertoire score only approached significance. One might speculate that this group of delayers had the ability to delay as indicated by their complexity scores and the expectation that the delayed outcome would materialize as indicated by their locus of control scores. Further theorizing on this relationship must await the utilization of a more meaningful behavioral measure.

The nature of the data made it difficult to derive developmental stages in the conceptualization of each subconstruct. An attempt is made here, however, to describe general trends in coping with each type of self-control situation.

In delay of gratification situations, kindergartners placed a heavy emphasis on positive consequences. They mention the use of other strategies relatively infrequently. Third graders stress positive consequences but also focus on negative consequences and display an insignificant trend
towards more frequent use of self-distraction. Sixth graders respond to delay situations in a similar way as the third graders but use effective strategies such as self-distraction even more frequently and significantly more often than the kindergarten children. The frequency of eliminate the temptation shows a statistically insignificant increase across the three age groups. Thus, kindergartners tend to verbalize one, relatively ineffective strategy for coping with self-imposed delay situations. With age, they gradually acquire the ability to verbalize more effective techniques such as self-distraction and eliminate the temptation.

Persistence problem situations elicited the smallest variety of strategies. All three groups focused heavily on positive consequences with the third and sixth graders using this strategy more frequently than the kindergartners. The data also showed a trend for increasing awareness of negative consequences with the sixth graders significantly more aware than the kindergarten group. An insignificant trend indicated more appeal to an authority figure by the youngest group. It appears that cognitive development during the elementary school years has little impact on the child's awareness of strategies for enhancing persistence behavior.

Resistance to temptation and social frustration tolerance situations are different from the previously discussed kinds of self-control situations in that there are definite socially accepted "right" and "wrong" responses to these situations.
A larger number of age differences were found in response to these situations which involve conflict between "good" and "bad" behaviors. This result may indicate that children receive more instruction in how to cope with this kind of social conflict situation.

Kindergarten children frequently suggested thinking of negative consequences and appealing to an authority figure as ways to aid resistance to temptation. Other strategies were rarely mentioned. Third graders also focused on negative consequences but suggested appeal to an authority figure significantly less often than the youngest group. Insignificant but strong trends were found for the increasing use of positive consequences, rules, eliminate the temptation, and role-taking. Sixth graders employ the strategies of rules and role-taking most frequently. They also tend to focus on negative consequences, devalue the temptation, positive consequences and avoidance of anxiety. In summary, all age groups think of negative consequences. The kindergartners also display a reliance on adults. By the third grade, the reliance on adults has declined as new strategies are being acquired gradually. At the end of the concrete operational period, children have consolidated conceptualizations of effective strategies for resisting undesirable temptations.

In social frustration situations, kindergartners most frequently respond in one of two ways: appeal to an authority figure or talk with a peer. Third graders also utilize these
strategies and are beginning to develop an awareness of other techniques including focus on negative consequences, eliminate the temptation, and devalue the temptation. By sixth grade, there is a significant decline in appeal to an authority figure. The strategies of appeal to a peer, talk with a peer, negative consequences, devalue the temptation, eliminate the temptation, and role-taking all are used relatively frequently. The data thus indicate that not until sometime between third and sixth grade do children become less dependent on authority figures to resolve social conflict. This decline in dependence is correlated with an increasing awareness of a variety of strategies for enhancing frustration tolerance.

The subjects' own examples of self-control situations did not reveal much useful data. The large majority of subjects tended to suggest situations which involved meeting the expectations of some authority figure. These results may be due at least partially to methodological factors. More in-depth questioning or a more ecological approach might yield additional information.

To summarize up to this point, children as young as kindergarten age can verbalize a number of strategies for enhancing self-control but they overwhelmingly tend to stress appeal to an authority figure, positive consequences and negative consequences. Talk with a peer and rules also are relatively frequent strategies mentioned by this group. Third
grade children focus on both positive and negative consequences significantly more often than kindergartners, while suggesting appeal to an authority figure less often. This middle group also displayed a significant increase in using eliminate the temptation and self-distraction strategies. By sixth grade, children utilize all the strategies present in third grade with a continuing though insignificant increase in their frequency. Sixth graders also verbalize awareness of the strategies of rules, devalue the temptation, and role-taking more often than the other two groups. Appeal to a peer and avoidance of anxiety are more frequent for the sixth grade than for the kindergarten. These overall results confirm Mischel's (1978) findings of a "distinct linear progression in children's understanding of what is involved in delaying their immediate desires" (p. 55). As their thought processes mature, children become more aware of ways to transform difficult situations into easier, less frustrating ones. These transformations include both overt behavioral strategies and covert mental strategies.

The results of the present investigation also parallel the same general pattern of Kreutzer et al.'s (1975) findings concerning metamemory. They conclude that while kindergarten and first grade children display some knowledge about memory, third and fifth grade children appear "to know the same things better and a number of things in addition" (p. 52). This very general congruency raises the question of the relationship
between various "metas." While some researchers (Gleitman, Gleitman, and Shipley, 1972) have proposed that the various "metas" are functionally related and develop somewhat synchronously, others (Flavell, 1977) suggest that such functional interrelationships do not exist and would be very difficult to verify even if they did. More research is needed to determine if and how this question can be answered.

The self-control strategies discussed here are part of what Mischel (1976) has labeled "self-regulatory systems." These systems have four components: expected consequences, rules that specify performance standards, mental strategies required to achieve self-control, and plans for complex patterns of behavior. The present findings indicate that children in the preoperational stage are very much aware of how consequences influence their behavior. The verbalizable awareness of strategies for maintaining self-control, however, becomes increasingly complex and abstract throughout the stage of concrete operations. The pattern of development parallels that which Piaget (1932) has delineated for moral development. The child moves from rigid, narrow, and concrete moral judgments towards more flexible, complex, inferential, and abstract judgments of behavior.

Flavell and Wellman (1977) suggest that knowledge about thought processes, "'metacognition,'" may:

 develop through something analogous to Piaget's reflective abstraction process...the child abstracts and
permanently incorporates into his cognitive structure generalizations or regularities concerning properties of his own actions vis-a-vis the environment, as contrasted with knowledge about the environment itself that derives from physical abstraction (pp. 29–30).

Knowledge about self-control, memory, and other thought processes develops through generalizations about people and their interactions with the environment. Thus, reflective abstraction may be an important process involved in their acquisition.

This study has focused on cognition rather than behavior. The clarification of the relation of thought to action is an important issue, but a structural-developmental analysis is valuable for its own sake. This approach may not predict specific actions, but it does provide a description of "the general form of thinking most likely to underlie a wide range of an individual's judgments in a particular issue domain or across several domains" (Selman, 1976, p. 316). While there is not a perfect correlation between cognitive structure and behavior, a cognitive-developmental analysis of reasoning is one essential component of a comprehensive theory of social behavior. It might be argued that each component must be clearly delineated in order to understand the complex interaction of the various contributing factors.

Research in the area of metamemory has investigated the relationship between cognition and behavior. A relatively
early study (Flavell, Beach and Chinsky, 1966) showed that of children observed to verbalize stimulus names as a mnemonic strategy, 25% appeared to lack the ability to report that they had. More recent research (Wellman, Drozdal, Flavell, Salatas, and Ritter, 1975) has demonstrated that children who verbalized a particular type of memory knowledge were more likely to employ a related strategy than those who did not. The pattern of results suggested that the relationship between metamemory and behavior becomes stronger with age.

Research on the relationship between cognition and self-control has been far from conclusive. The literature reviewed earlier found conflicting evidence with respect to the relation of moral judgment to overt behavior. Weinstein (1969) suggests that one important component in the development of interpersonal competence is the acquisition of a repertoire of tactics to use with and on others. This component can be extended to include tactics to regulate and direct one's own behavior. The results of an extensive research program reviewed by Spivack, Platt and Shure (1976) provide evidence of the importance of a repertoire of social strategies. In their investigation of the relationship between cognition and social behavior the focus was on "interpersonal cognitive problem-solving skills" and behavioral adjustment assessed by rating scales completed by teachers. Cognitive skills are evaluated through responses to interpersonal conflict situations which are quite similar to the
type of self-control situation labeled "social frustration tolerance" in the present study. The findings showed that different cognitive skills were significant mediators of behavioral adjustment at different ages.

In the case of kindergarten and preschool children, the ability to generate alternative solutions to social conflict situations was related to social adjustment. Relatively maladjusted children were aware of the consequences but not aware of alternative behaviors. During middle childhood alternative solution thinking continued to be important while means-end thinking, the ability to articulate the step-by-step means to carry out a solution, also was related significantly to adjustment. Again, consequential thinking did not show a clear, consistent relation to behavioral adjustment. Consequences begin to take on significance as mediators of social adjustment during adolescence.

The present investigation found a relationship between cognitive skills and behavior only in the case of third grade boys. The above results suggest, however, that a different behavioral measure would have indicated a significant relationship for the other subgroups. The heavy emphasis on consequences by subjects in this study also may have obscured the relationship of the other strategies to self-control behavior.

The issue of competence versus performance is an important one in the area of social-cognitive development.
Weinstein (1969) proposes that there are a variety of factors which may inhibit or augment the utilization of a repertoire of interpersonal strategies. These parameters include personality factors such as rigidity, self-esteem, and locus of control. Mischel and Mischel (1976) also suggest that performance depends on motivational variables and incentive conditions, especially behavior-outcome expectancies. The individual's expectancies influence the choice of behavior from among the repertoire which has been acquired. Research (McClure, 1975) has also shown, however, that training that focused on enhancing the ability to generate alternative problem solutions also increased the belief in internal control over circumstances. This finding of a reciprocal relationship between social-cognitive skills and behavior-outcome expectancies has important implications for behavior change problems.

Clinical application of cognitive-developmental analyses is a relatively new area of research. Selman (1976) proposes that "from a cognitive-developmental perspective, both education and psychotherapy seek the optimal rate of development of children through social-cognitive and cognitive stages" (p. 308). In recent years, intervention programs focusing on social-cognitive skills have been developed for all ages and a variety of clinical populations (Spivack, Platt, and Shure, 1976). These programs tend to take
a highly structured, sequenced approach to teaching interpersonal cognitive problem-solving skills. Initial evaluations of the programs indicate significant effectiveness in both enhancing social-cognitive skills and improving behavioral adjustment. These programs place emphasis on cognitive skills in social conflict situations. Situations involving conflict within oneself, such as the delay of gratification and persistence situations presented in the current study, are not addressed directly. One notable exception is the "Think Aloud" program developed by Camp and Bash (1975) for aggressive children. This program is aimed at developing an inner dialogue that will help the child problem-solve in situations involving both impersonal and interpersonal tasks.

Mischel and his colleagues (Mischel and Baker, 1975; Mischel, Ebbesen, and Zeiss, 1972; Mischel and Patterson, 1976; Moore, Mischel, and Zeiss, 1976) have shown that even preschoolers can be taught to use cognitive strategies which aid delay of gratification and resistance to temptation in experimental situations. The application of these kinds of strategies is one direction for future research.

The findings of the present investigation suggest a general developmental sequence in the verbalizable awareness of self-control strategies. One might speculate that an intervention program aimed at enhancing such strategies would be most effective if it followed the same general sequence.
Presenting two case studies, Selman (1976) demonstrates how a cognitive-developmental analysis can be quite valuable in clinical diagnosis and treatment. Children's social-emotional deficits can be conceptualized at least partially in terms of delayed development in one or more areas of social cognition. Depending upon the diagnosis, the intervention strategy may be to augment cognitive-social skills, resolve the interfering emotional components, or some combination of both.

Currently, little data is available relating social-cognitive skills to particular clinical types (Spivack, Platt and Shure, 1976). More research is necessary to explore the relationship of underlying cognitive structures to various child clinical diagnoses. Directions for the innovation of new therapeutic approaches would follow.

The development of knowledge concerning self-control is a very new field of research with many unexplored areas for future investigations. The present study has provided a general outline of the development of verbalizable knowledge of strategies for enhancing self-control. Future research must replicate these results and the self-control strategies explored in this investigation could be analyzed further. For example, the category of positive consequences is quite broad. Perhaps there is a developmental trend in the particular kind of positive consequences which children are aware of. The relation of this knowledge to behavior also remains to be clarified.
Different measurement techniques need to be employed in order to determine the optimal way to tap children's thought processes. Open-ended questions often are difficult for young children. Another measurement condition may reveal greater knowledge at earlier ages, since children appear to use a variety of strategies before they display the ability to verbalize about them.

The antecedents of developing an awareness of various self-control strategies remain to be investigated. Potentially significant factors include childrearing practices, peer relations, social class, and cultural background. This investigation used middle and upper-middle class subjects. It is quite possible that lower class children will display a different developmental sequence in their concepts of self-control based on different social experiences.

Later developments in the awareness of self-control also need to be explored. Strategies such as avoidance of anxiety and displacement of frustration seem to be just coming into awareness during sixth grade. The onset of adolescence and the stage of formal operations may enhance the awareness of these strategies and perhaps bring about the awareness of additional strategies unknown to younger individuals.

In conclusion, the acquisition of verbalizable knowledge of various self-control strategies appears to follow a general developmental sequence during middle childhood. Children depend less on adult authority figures as they develop
an awareness of effective strategies for regulating their own behavior. Initially the focus is on overt behavioral strategies, but increasing awareness of internal cognitive strategies gradually develops. By the end of elementary school, most children display a knowledge of both overt tactics and covert processes which may enhance self-control.
CHAPTER VI

SUMMARY

This developmental interview study explored some of the cognitive processes involved in the acquisition of the complex behavior of self-control. More specifically, it investigated the development of verbalizable knowledge of particular strategies for directing and regulating one's own behavior.

Working within a cognitive-developmental framework, the following hypotheses were tested:

1. Children's concepts of self-control become more complex with age.

2. Children's concepts of self-control display a wider variety of ideas with age.

3. Children's concepts of self-control become increasingly internalized with age.

4. Children's concepts of self-control display increasing abstractness with age.

5. Children's concepts of self-control increasingly involve taking the role of the other.

6. Children's concepts of self-control display increasing awareness of negative affect with age.
7. Conceptual level displays a moderate positive correlation with locus of control.

8. The choice to delay gratification becomes more frequent with age.

Thirty subjects at each of three grade levels (kindergarten, third and sixth) were interviewed individually by the experimenter. The interview procedure began with a behavioral measure of delay of gratification and questions concerning self-control ability. Subsequently, each subject was asked to respond to open-ended questions relating to vignettes representing four different types of self-control: delay of gratification, persistence, resistance to temptation, and social frustration tolerance. The responses to these vignettes were coded in categories derived from the results of a pilot study. A locus of control measure also was administered to each subject.

The first two hypotheses received strong support from the data. Children's concepts of self-control became increasingly complex and displayed a wider variety of ideas with age. Their concepts also became increasingly internalized as indicated by the decrease in appeal to an authority figure.

The hypothesized increase in abstractness was confirmed for all of the strategies except enhance the attractiveness of the frustrating situation. Both third and sixth graders demonstrated an awareness of the strategies of eliminate the temptation and self-distraction.
significantly more often than kindergartners. The sixth grade children mentioned rules and devalue the temptation more frequently than the younger two groups.

Role-taking increased with age as indicated by the sixth graders using this strategy more than either kindergartners or third graders. The hypothesized increase of negative affect was supported for avoidance of anxiety but not for displacement of frustration. However, there was a trend in the predicted direction for this latter strategy. A nonpredicted significant difference was the increased focus on positive and negative consequences by third and sixth graders as compared to kindergartners.

Locus of control was related to the other conceptual measures only for the sixth grade group. The choice to delay gratification did not increase with age.

These results were discussed in the context of cognitive-developmental theory and research. The relative effectiveness of the various strategies based on research in the area of delay of gratification also was explored. Implications for therapeutic interventions were suggested and directions for future research were proposed.
APPENDIX A - CONSENT FORM

Dear Parent or Guardian,

I am a graduate student at The Ohio State University working under the direction of my advisor, Dr. Charles Wenar. Currently I am interviewing children of different ages to learn more about what they think in different situations. Each child is interviewed individually for approximately 15 minutes. The interview consists of questions about what children think in social situations where they have a choice between two alternatives. It is tape recorded and subsequently transcribed. The children's names will not appear on any of their responses in order to insure confidentiality. Each child will also be given a cookie for his or her participation. (This cookie will not contain any sugar, white flour, or preservatives.)

If you are willing to consent to your child's participation in this study, please sign the form below and send it in to school with your child. Even if you sign this form, your child will be free to choose not to participate.

If you have any questions, please feel free to call me at the number given below.

Thanks so much for your time and consideration.

Terry Schultz, M.A.
543-5188

I consent to have my son/daughter________________________ participate in an interview study concerning children's ideas about particular social situations.

The nature and general purpose of the procedures have been explained to me. This study is to be performed by Terry Schultz, who is a graduate student at The Ohio State University.

I understand that any further inquiries I make concerning this procedure will be answered. I understand that my child's identity will not be revealed in any publication, document, recording, or in any other way which related to this research. Finally, I understand that I am free to withdraw my consent and discontinue my child's participation at any time.

Signed__________________________________________________
(Parent or guardian)

Date____________________________________________________

104
APPENDIX B

Stanford Preschool Internal-External Scale

1. When you are happy, are you happy
   I+ a. because you did something fun, or
   b. because somebody was nice to you?

2. When somebody tells you that you are good, is that
   I+ a. because you really have been good, or
   b. because he is a nice person?

3. Do you think I brought you to this room
   I+ a. because you have been good today, or
   b. because I'm a nice person?

4. When your mother gives you a cookie, is that
   I+ a. because you need a cookie, or
   b. because she has too many cookies?

5. When somebody brings you a present, is that
   I+ a. because you are a good girl (boy), or
   b. because they like to give people presents?

6. When you draw a whole picture without breaking your crayon, is that
   I+ a. because you were very careful, or
   b. because it was a good crayon?

7. If you had a shiny new penny and lost it, would that be
   I- a. because you dropped it, or
   b. because there was a hole in your pocket?

8. When you are sad and unhappy, are you sad and unhappy
   I- a. because you did something sad, or
   b. because somebody wasn't very nice to you?

9. When you play a game and lose, do you lose
   I- a. because you didn't play well, or
   b. because the game was hard?

10. When somebody stops playing with you, is that
    I- a. because he doesn't like the way you play, or
    b. because he is tired?
11. When you get a hole in your pants, is that
   I- a. because you tore them, or
   b. because they wore out?

12. If you had a pet turtle and he ran away, do you think
    that would be
   I- a. because you did something to make him leave, or
   b. because there was a hole in his cage?

13. When you are drawing a picture and your crayon breaks,
    is that
   I- a. because you pushed too hard, or
   b. because it was a bad crayon?

14. When you can't find one of your toys, is that
   I- a. because you lost it, or
   b. because somebody took it?

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Note. I+ indicates the internal response for a positive item.

I- indicates the internal response for a negative item.
APPENDIX C

Abbreviated Nowicki-Strickland Scale

1. Do you believe that most problems will solve themselves if you just don't fool with them? (No)

2. Do you feel that most of the time it doesn't pay to try hard because things never turn out right anyway? (No)

3. Do you feel that most of the time parents listen to what their children have to say? (Yes)

4. Do you believe that wishing can make good things happen? (No)

5. Do you feel that it's nearly impossible to change your parent's mind about anything? (No)

6. Do you feel that when you do something wrong there's very little you can do to make it right? (No)

7. Do you believe that most kids are just born good at sports? (No)

8. Are most of the other kids your age stronger than you are? (No)

9. Do you feel that one of the best ways to handle most problems is just not to think about them? (No)

10. Do you feel that when a kid your age decides to hit you, there's little you can do to stop him or her? (No)

11. Have you felt that when people were mean to you it was usually for no reason at all? (No)

12. Do you believe that when bad things are going to happen they just are going to happen no matter what you try to do to stop them? (No)

13. Most of the time do you find it useless to try to get your own way at home? (No)
14. Do you feel that when somebody your age wants to be your enemy there's little you can do to change matters? (No)

15. Do you usually feel that you have little to say about what you get to eat at home? (No)

16. Do you feel that when someone doesn't like you there's little you can do about it? (No)

17. Do you usually feel that it's almost useless to try in school because most other children are just plain smarter than you are? (No)

18. Are you the kind of person who believes that planning ahead makes things turn out better? (Yes)

19. Most of the time, do you feel that you have little to say about what your family decides to do? (No)

Note. The answer in parentheses following each item is the internal response.
REFERENCE NOTES


REFERENCES


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