Mediational treatment of self-control in grade-school children: Comparing training methods and content

Randal Paul Quevillon
The University of Montana

Follow this and additional works at: https://scholarworks.umt.edu/etd
Let us know how access to this document benefits you.

Recommended Citation

This Thesis is brought to you for free and open access by the Graduate School at ScholarWorks at University of Montana. It has been accepted for inclusion in Graduate Student Theses, Dissertations, & Professional Papers by an authorized administrator of ScholarWorks at University of Montana. For more information, please contact scholarworks@mso.umt.edu.
MEDIATIONAL TREATMENT OF SELF-CONTROL IN
GRADE-SCHOOL CHILDREN: COMPARING
TRAINING METHODS AND CONTENT

By
Randal P. Quevillon
B.S., University of Wisconsin, Eau Claire, 1973

Presented in partial fulfillment of
the requirements for the degree of

Master of Arts
UNIVERSITY OF MONTANA
1976

Approved by:

Philip H. Borenstein
Chairman, Board of Examiners

John R. Stewart
Dean, Graduate School

June 3, 1977
ABSTRACT

Quevillon, Randal P., M. A., Spring, 1977 Psychology

Mediational Treatment of Self-Control in Grade-School Children: Comparing Training Methods and Content (112 pp.)

Director: Dr. Philip H. Bornstein

The purpose of the present investigation was to: (1) compare three methods of training mediated self-control strategies (Self-Instruction, SI, Mediation Essay Training, ME, and Simple Statement of Instructions, SS); (2) contrast two divergent types of training content (Distraction Strategies versus Contingency Emphasis); and (3) assess the effects of a procedural variation (i.e., half of the subjects received periods of play with toys) on the waiting times of children in a delay of gratification task.

Seventy-two children, selected by their relatively low scores on teachers' ratings of self-control, were randomly assigned to one of the twelve experimental conditions (3x2x2 factorial). Subjects were presented a delay of gratification task in which they could earn a previously high-rated (preferred) reward by remaining in an experimental room for an unspecified period until the experimenter's return (in fact, after a fifteen-minute waiting criterion). If subjects chose to cut short the delay period (by a pre-arranged signal), they received, instead, their second-rated (non-preferred) reward. Following the administration of instructions, subjects received mediation training with content appropriate to their group placement. As a partial check upon the usage of mediated self-control strategies, subjects were requested to overtly verbalize their thoughts during the experimental delay period.

Nearly 70 percent of all subjects waited to criterion and attained their preferred reward. Results indicated no significant differences between training methods, type of content, and the procedural variation (No Toy versus Toy groups). Two interactive trends (Training x Content, Training x No Toy/Toy) were obtained which approached significance. Implications of the present findings were discussed with regard to: (1) matching mediation training to self-control task, and (2) previous research indicating the superiority of either distraction or contingency content.
# TABLE OF CONTENTS

ABSTRACT ...................................................... ii

LIST OF FIGURES .............................................. iv

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

Chapter

I  INTRODUCTION .............................................. 1
   A Model of Mediation ....................................... 1
   Historical Overview ....................................... 3
   Current Mediational Research ............................... 5
   Applied Mediational Research .............................. 12
   Pilot Work ................................................ 37
   Purposes of This Research ................................ 39

II  METHOD ..................................................... 43
   Subjects .................................................. 43
   Experimenters ............................................ 44
   Dependent Variables and Design ......................... 44
   Apparatus ............................................... 46
   Procedure .............................................. 47

III RESULTS .................................................. 56
   Main Analyses ........................................... 56
   Secondary Analyses ...................................... 60

IV DISCUSSION ................................................ 65
   Content .................................................. 67
   Training ................................................ 70
   Limitations ............................................. 71

V SUMMARY .................................................... 76

APPENDIX A: TEACHER RATING SCALE ......................... 81
APPENDIX B: TRAINING STATEMENTS .......................... 85
APPENDIX C: SCORE SHEET AND CHECKLISTS .................. 92

REFERENCE NOTES ........................................... 100

REFERENCES ............................................... 102
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Training by Content Interaction (Means)</td>
<td>58</td>
</tr>
<tr>
<td>2.</td>
<td>Training by No Toy/Toy Interaction (Means)</td>
<td>59</td>
</tr>
<tr>
<td>3.</td>
<td>Pooled Frequencies for Ten Score Ranges</td>
<td>61</td>
</tr>
</tbody>
</table>
LIST OF TABLES

Table                   Page

1. ANOVA Summary Table - Raw Data          57
2. ANOVA Summary Table - Transformed Data   62
A Model of Mediation

Conceptually, the idea of mediation is a simple one. A mediating event (B) can be discerned if the probability of C in the sequence of events A → B → C, is different than the probability of C in the sequence A → C, where B is not present. That is, the presence of B between the other events influences, or mediates, the occurrence of C. While the mediating events may be observable, it is the covert events which are of interest here.

Conceptual definitions as formal descriptions of mediational processes are numerous and diverse (Kendler & Kendler, 1962; Reese, 1971). One particularly useful model has been developed by Goss (1961a) and will serve the purposes of the present discussion:

\[ S_{\text{initiating}} \rightarrow R_{\text{mediating}} \sim S_{\text{mediating}} \rightarrow R_{\text{terminating}} \]

Included within this model are covert mediating responses and the covert stimuli they produce. Mediators in this model must be observable or reasonably inferred as having temporally occurred between the initiating stimulus and
the terminating response. They must also (at least potentially) have an inhibitory or facilitative effect on some measure(s) of occurrence or strength of the terminating response (e.g., frequency or intensity). That is, a real or potential effect on the observable terminating response is required to assume mediation has occurred. In the Goss (1961a) model then, there must be a reason to assume that a mediator falls temporally between the observable initiating and terminating responses, and a measurable effect (or potential effect) made by its presence in the sequence.

Inspection of the model and its corollaries reveals that it is largely an extension of basic S-R principles to covert events. On this basis, it has been criticized (Mahoney, 1974) as being too simplistic to thoroughly explain covert phenomena. While more extensive models are available (cf. Mahoney, 1974; Reese, 1971), Goss' model was chosen because it provides a clear framework to tie together a number of topics in the area of mediational research. Consolidation and improvement of existing mediational models appears likely in the future, but variants of the S-R mediational model are still widely employed (e.g., Blackwood, 1970). Thus Goss' model provides a background from which to view research findings and a basis for understanding more specific conceptualizations.
Historical Overview

Classical associationism and the Structuralist and Functionalist traditions in psychology all dealt with psychological events related to mediation. It was J. B. Watson (1913, 1924), however, who specified the theoretical framework (similar to Goss' model, though largely confined to verbal mediation) by which these processes could be conceptualized. Watson's contemporaries refined and extended his proposals in the areas of language and symbolism (Dashiell, 1928), consciousness (Tolman, 1927), and conceptual thinking (Weiss, 1925). Attempting to explain covert mediational processes in terms of "implicit speech" involving small muscular responses (see Jacobson, 1932; Max, 1935, 1937), Watson (1913) allied behaviorism with the philosophical stance of materialistic monism. That is, mental processes were viewed in terms of physical events. In rejecting all but physical phenomena, he provided a productive structure for the study of covert mediation (Goss, 1961b). At the same time, however, Watson's stance set the stage for future philosophical objections by behaviorists which have been an obstacle to the application and clinical investigation of covert mediation (Mahoney, 1974).

Thus, basic research with verbal mediation was stimulated by early behaviorist models (Goss, 1961b), while behaviorists themselves developed an "aversion" to mentalistic
terms, covert phenomena, and inference. A non-mediational model became extremely popular in the 1950s and 1960s (see Skinner, 1953) and served to discourage behavioral researchers from employing mediational concepts in their work. Explanations of covert events which involved an inference to other levels of observation (as with "private" mediational events) were severely criticized (e.g., Skinner, 1950). In this way, the concepts of verbal and nonverbal mediation, dating back at least to John Locke (Goss, 1961b), were largely kept from receiving applied research attention. The viewpoint of many radical behaviorists has held these variables as unsuitable for study. Another influence, the approach to the study of memory founded by Ebbinghaus (i.e., the use of nonsense syllables) discouraged research on nonverbal mediators such as imagery (Paivio, 1971). Ebbinghaus' work provided an example for later experiments in which factors like meaning and imagery were controlled rather than investigated.

Recently, however, inhibitions in the applied clinical study of mediation appear to be evaporating. Mahoney (1974) has criticized the non-mediational model for its inability to handle data from several areas of research (e.g., vicarious learning processes, see Bandura, 1969). Homme (1965) has suggested that behavior modifiers should turn their analytic skills to covert phenomena. In addition, the recent influx of articles into applied journals (e.g., Bornstein &
Quevillon, 1976; MacPherson, Candee & Hohman, 1974; Meichenbaum, 1972; Robin, Armel & O'Leary, 1975; Sarason, 1973; and many others) as well as the publication of several new books in the area (Blackwood, 1972; Jacobs & Sachs, 1971; Mahoney, 1974; Meichenbaum, 1974) attest to the increased focus upon covert events and mediational processes. Cognitive approaches to the treatment of behavior problems have appeared in the form of the Mediation Essay (Blackwood, 1970), Self-Instruction Training (Meichenbaum & Goodman, 1971), Cognitive Restructuring (Lazarus, 1971), Covert Sensitization (Cautela, 1966), and Thought Stopping (Yamagami, 1972) among many others.

The basic study of mediation has been a part of the basic science of psychology for decades. The recent returning of behaviorist interest to the area has, however, resulted in a rapidly expanding subarea of study which has prospects for both the advance of knowledge and direct clinical application. The present discussion will briefly scan the broad area of mediation research, devoting more attention to the clinical subarea.

Current Mediational Research

For the most part, mediational research has been concentrated in the basic study of cognitive processes, employing tasks of little relevance to the behavior problems seen
by applied clinicians. Investigators have typically been
interested in intellectual and cognitive functions such as
concept learning, information transfer, and retention.
Studies have demonstrated the presence of mediation at
various ages (Reese, 1971), others have shown individual
differences and maturational changes in conceptual style
and tempo (Kagan, 1966), and still others have attempted to
facilitate mediated learning via imagery (Paivio, 1971) and
modeling (Bandura, 1971a). While the greatest portion of
this extensive literature appears to have few direct implica­
tions for applied clinical settings, aspects of the findings
and current trends in the area offer several significant
contributions to aid more applied clinical research with
mediation.

First, there appears to be a trend away from demonstra­
tion studies which simply show the existence of mediated
learning at various ages. Brown and Scott (1972), in experi­
ments with concept learning and transfer, have accumulated
evidence that mediational processes influence these cognitive
activities as early as three or four years of age. In fact,
in a reply to Brown and Scott, Cole and Medin (1973) state
that the presence of mediated learning has been so amply
demonstrated that current research attention should be di­
rected to more meaningful areas.

Among these areas is the parametric investigation of
maturational changes and individual differences in mediational processes. Individual differences in conceptual tempo have been studied by the use of the Matching Familiar Figures test (Kagan, 1966) which reliably separates "reflexive" and "impulsive" children. Mediational development has been investigated by tracing differences in a three-choice apparatus with random reinforcement schedules (Weir, 1964). Weir established norms to determine the more mature styles of responding, or response strategies. Adams (1972) combined the two approaches in comparing reflexive or impulsive classification to performance vis-à-vis the norms. Adams found that, at a given age, reflexive children showed significantly more mature guessing strategies than did those who fell in the impulsive category. Thus, these findings underline the importance of both maturational changes and individual differences in mediation.

Another area receiving considerable current attention employs various strategies or interventions in an attempt to facilitate mediated learning. A number of studies have made use of instructional sets which encourage subjects to employ imagery (Paivio, 1971). For example, Yarmey and Bowen (1972) used imagery instructions to facilitate intentional and incidental learning in children. Their findings, with both normal and educable retarded populations, showed superior performance in children receiving the instructions as com-
pared with children in a no-instruction control group. Millar (1972) supported these findings using a shape recognition task with preschool children.

Within the extensive literature in this area are several studies comparing imagery instructions with other interventions. These are particularly interesting in their salience for clinical studies as they point to the need to match intervention with task. In one study by Gerst (1971), subjects were exposed to the manual language of the deaf (hand signals). Three intervention strategies were compared to a control group: summary labeling, in which key features of signals were encoded; imaginal coding, where visual retention was attempted; and verbal description, which involved a verbal itemization of the component features of signals. After the interventions (training), subjects were immediately assessed regarding their abilities to reproduce a modeled hand signal. Assessment was repeated after a fifteen-minute delay. Gerst found that imagery instructions produced the best immediate results, while summary labeling was superior to the other strategies after the delay. In another study (Mwanalushi, 1974), six- and nine-year-olds were tested on a pattern recognition task with computer-generated random shapes. Subjects receiving imagery instructions were significantly better at the task than those receiving either labeling or no instruction. Mwanalushi concluded that the results suggested that
problems involving spatial orientation are best handled via a nonverbal (imaginal) mode of mediation. Thus, the trend in this area of study has been toward matching a type or mode of intervention with the kinds of tasks for which it is most effective. That is, certain learning tasks have been most facilitated by instructional sets to use labeling and other tasks have been more responsive to imagery instructions. Progress in this area would seem to involve further delineation of the optimal intervention for each type of task.

While instructional sets have been frequently used as an intervention procedure, other studies have investigated more extensive methods such as modeling (Bandura, 1971b; Ridberg, Parke & Hetherington, 1971). Modeling has been employed in efforts to facilitate verbal and nonverbal mediation (see Zimmerman & Rosenthal, 1974 for a review) in several diverse populations. Rosenthal and Kellogg (1973) worked with retarded adults in nonverbal training via modeling. They exposed subjects to an adult model performing complex tasks in a conceptually consistent manner. Subjects receiving this training performed significantly better on the concept formation task than others receiving comparable verbal instructions. The modeling training had a much stronger effect than did the presence or absence of candy reinforcement contingent on performance.

Variations of the modeling procedure have been used with more verbally skilled populations as well (Bandura & Jeffrey,
1973; Denny, 1972). These often attempt to facilitate verbal mediation as well as nonverbal (e.g., Zimmerman, 1974). Zimmerman did this by including verbal statements (explanations) by the model as to the basis for her grouping strategies on a concept learning task. His results showed that model explanations significantly assisted concept acquisition in three-, four- and five-year-old subjects while incentives failed to effect performance.

The modeling area has produced positive findings which point to the possibility of matching interventions with subject characteristics as well as suggesting that both nonverbal and verbal mediation can be facilitated by this method. A possible weakness, however, lies in the frequently unspecified nature of the ties between the intervention and modification of mediational processes or style. The inferential step from instructing subjects to use imagery and their actual employment of this type of mediation involves a simple step (see Paivio, 1969); but the connection between modeling interventions and mediational changes is not as simple and is often not described (see Ridberg, Parke & Hetherington, 1971). The area of modeling does constitute a progression from simplistic techniques to a more involved, comprehensive procedure. As such, it illustrates a trend in mediation research away from simple statements toward training-type interventions.

The above review of current mediation research has ad-
mittedly been brief and selective. Most of the studies in the area have been concerned with intellectual tasks such as concept formation, retention, and so on. This focus would appear to be more relevant to applied efforts in education than to clinical behavior change. The next section, however, will illustrate that applied researchers interested in topics like disruptive behavior (Blackwood, 1970), self-control (Kanfer & Karoly, 1972) and schizophrenia (Meichenbaum & Cameron, 1973) have become increasingly interested in mediational processes. Thus, the trends in the basic study of mediation have relevance for its applied clinical study.

Mediational processes have been effectively demonstrated in most populations (Cole & Medin, 1973). Therefore, clinical researchers need not divert effort into demonstration; but instead modification strategies can thus be the focus of investigation. Secondly, the general finding that different tasks are more responsive to differing strategies for facilitating mediation (Gerst, 1971; Mwanalushi, 1974) ought to lead clinical researchers toward efforts to match interventions with types of problems. For example, it may be that one type of intervention works well in increasing resistance to temptation while another is more suited to the suppression of obsessional thoughts. If the differential treatment effectiveness that corresponds to different intellectual tasks is presumed to also apply to behavior problems, then the
development of problem-specific interventions and their comparative study becomes of crucial importance. Basic mediational research makes it seem unlikely that a single intervention will be found that is optimally effective with all of the clinical problems that are being investigated in a mediation framework. Comparative studies to determine which techniques work best with specific problems seems to be the appropriate direction for applied study.

Finally, the modeling literature provides the following points: the importance of specifying the conceptual relation between interventions and mediational changes; the need to match interventions with subject characteristics (e.g., nonverbally oriented procedures with subjects possessing few verbal skills); and the possibility of extensive, structured intervention techniques. Thus, the modeling research as well as the other areas of basic mediational research provide guidelines for investigators interested in the clinical application of mediation.

Applied Mediational Research

As we have seen, cognition has been a concern of psychologists for decades, and this focus has been shared by clinicians. However, recent clinical work with mediational concepts has differed greatly from earlier "dynamic" clinical theorizing in a way analogous to changes that have been
evidenced in the basic research on mediation. That is, currently working applied researchers have been much more concerned with operationalizing covert events than were their dynamically oriented predecessors. This is evidenced by the recent publication of several articles addressing methodological issues and measurement problems in dealing with covert events (e.g., Mahoney, 1970; Jeffrey, 1974). This increased emphasis on experimental rigor has facilitated systematic evaluation of mediational processes and has directed effort toward the accumulation of the firm data base that has been lacking in dynamic theories. Also, applied researchers have simulated current basic research in assigning an unambiguous role to covert mediators. For example, Rimm and Litvak (1969) considered subjects' covert verbalizations as stimuli and measured their effects on physiological responses. In this way, a clear interpretation of the contributions of covert mediators to obtained results have been possible. Current models of covert processes (the one presented at the beginning of this chapter, for example) carefully outline the simple inferential steps from observable phenomena; a striking contrast to the often extensive extrapolations of "dynamic" theories. Finally, many current applied workers have reflected basic investigators in viewing covert processes as behaviors which are potentially observable (at least indirectly) and manipulable rather than as "static
"substrata" (Mahoney, 1974). As discussed earlier, this modifiability has been supported in the basic research. It has also understandably been the major focus of clinicians working with applied problems. This focus has largely taken two overlapping directions: cognitive therapies directed toward behavior change via the modification of cognitive processes, and self-control training directed at change due to increased personal control and self-direction.

While self-control will be emphasized here, a brief review of some major cognitive therapies is in order. Many of these procedures, such as covert sensitization (Cautela, 1966, 1973), covert reinforcement (Cautela, 1970), coverant control (Homme, 1965), and thought stopping (Yamagami, 1972) apply conditioning principles to covert mediational events in order to affect changes in overt behavior. Thus, metaphors from the learning laboratory have been applied to mediational processes. Other cognitive therapies are further afield of learning principles, focusing upon mediators as "irrational" beliefs in Rational-Emotive-Therapy (Ellis, 1962, 1973) or as faulty reasoning in cognitive restructuring (Lazarus, 1971). Others emphasize the clients' locus of control or attributional processes (Levendusky & Pankratz, 1975; Skilbeck, 1974; Valins & Nisbett, 1971). Rimm and Masters (1974) review cognitive techniques and Mahoney (1974) surveys the area including an excellent discussion of the respective models and research evidence.
The second line of applied mediation research has dealt with self-control. The self-control area of behavioral research has expanded rapidly in recent years, as attested by the publication of several books on the topic (Goldfried & Merbaum, 1973; Mahoney & Thoresen, 1974; Thoresen & Mahoney, 1974). Many facets of the self-control process have been explored including self-monitoring (Kazdin, 1974; Romanczyk, 1974) and self-reinforcement (Bandura, 1971b; Glynn, 1970); but central to the present discussion are the studies of interventions geared toward fairly direct modification of general mediational styles (Blackwood, 1970; Meichenbaum & Goodman, 1971).

Perhaps the reason for the popularity of the self-control area lies in its clear ethical and practical implications for clinical practice. The goal of training individuals to control their own behavior and attain self-selected goals is central to behavior modification (Kazdin, 1975). Effective self-control patterns possess definite survival value (Thoresen & Mahoney, 1974). Self-control is central to the socialization process by which the young learn to become acceptable members of society (Scarr-Salapatek & Salapatek, 1973). On a pragmatic level, Kazdin (1975) points out that self-control interventions may transcend many of the limitations relating to monitoring and generalization in externally imposed programs and may even facilitate progress simply by
allowing the client some control over his/her own behavior. Most clinical problems are not readily accessible to the therapist and self-control interventions are directed toward changing problem behavior in its actual setting. Self-control training is a direct approach toward the change of covert phenomena and has been described as potentially more efficient and cheaper in terms of therapist time than traditional therapies (Cautela, 1969). Finally, training a client in self-control should increase his ability to deal with similar problems in new situations and this "success" should maintain the new skills trained. As Jeffrey (1974) points out, the enhanced generalization and maintenance from self-control (as opposed to externally controlled) interventions have largely not been demonstrated experimentally. They remain, however, encouraging potential benefits of this type of intervention strategy.

The above considerations illustrate real or potential advantages of a self-control approach. At the same time, they serve to underline the importance of studying intervention methods and active variables of self-control processes. These considerations and their importance apply equally well to the subarea of interest in the present discussion--namely interventions geared to the fairly direct modification of general mediational styles. Of these, self-instruction training (Meichenbaum, 1973) has received the most attention.
Self-instruction (SI) training developed from the theorizing of such authors as Vygotsky (1962) and Luria (1961, 1969) as well as the work of Kohlberg, Yaeger, and Hjertholm (1968). These theorists have posited an increasing interaction between verbal mediators and nonverbal behavior. Specifically, Luria (1961) has described a three-stage model for the development of control of behavior by private speech. Initially, the speech of others regulates a child's behavior, then a child's own overt speech gains control. Finally, the child's behavior is controlled by his covert speech. Luria's (1961) model, and similar conceptualizations, stimulated a considerable amount of laboratory research on the role of self-verbalizations in the control of nonverbal behavior. Several studies have demonstrated the influence of self-produced verbalizations on task performance (Bem, 1967; Birch, 1966; Lovaas, 1964; McGuigan, 1970; Meichenbaum & Goodman, 1969a, 1969b). For example, Meichenbaum and Goodman (1969a) used a finger-tapping task with kindergarten and first-grade children to assess the effects of three verbal statements ("faster," "slower," and "letter"). These instructions were compared for each subject in three conditions: Externally Administered (by the experimenter), Overt (verbalized aloud by the subject), and Covert (the subject "whispered" the word using only lip movements). An interactional effect was obtained in which the kindergarten
children's speed on the tapping task (number of taps) was most influenced by the instruction word in the Overt condition. First graders, on the other hand, were most influenced by their Covert self-verbalizations. While the interaction effect obtained by Meichenbaum and Goodman (1969a) has not been replicated, the functional significance of verbalizations has been demonstrated in all of the studies cited above.

These demonstrations prompted Meichenbaum and his associates (Meichenbaum, 1973; Meichenbaum & Cameron, 1974; Meichenbaum & Goodman, 1971) to develop a training package directed toward providing effective self-instructions or modifying subject's self-statements. While no assumptions were made that the mediational control of overt behavior necessarily takes the form of self-instructions (Meichenbaum & Cameron, 1974), it was felt that the SI training could affect behavior change via the facilitation of effective mediation. Meichenbaum's training package, as originally reported (Meichenbaum & Goodman, 1971), was directed toward "impulsive" children and developing in them effective covert mediators to guide their performance on several intellectual tasks (e.g., reproducing designs taken from the Stanford-Binet intelligence test). A central aspect of the package was the verbal fading procedure which proceeded as follows: (1) the experimenter modeled the task while "self-instructing" aloud,
(2) the subject performed the task while the experimenter instructed aloud, (3) the subject performed the task talking aloud to himself while the experimenter whispered the same statements, (4) the subject performed the task while whispering to himself (lip movements), and (5) the subject performed the task self-instructing covertly (without lip movements). The content of the self-instruction statements included: (a) questions about the nature of the task, (b) answers to the questions in the form of cognitive rehearsal and planning, (c) self-instructions in the form of self-guidance through the behaviors required in the task, and (d) self-reinforcement. An example of an error in performances was included as well as self-guiding statements regarding how to respond to the error. In addition to the components outlined above, several supplementary procedures have recently been described (Meichenbaum & Cameron, 1974). One of these is the use of imagery manipulations—image eliciting words included in self-guiding statements (e.g., "I will not go faster than a slow turtle."). Another possible addition involves the subject verbally directing another person to perform a task without using gestures or visual modeling (e.g., the subject may be sitting on his hands while attempting to instruct). A third procedure makes use of an older child as a "teaching assistant" to model appropriate self-instructions. The result of the expanding and flexible SI
training package has been its rather inconsistent application in clinical practice and in research. That is, the omnibus package has frequently been simplified; at times reduced to subjects merely being instructed to use self-instructions (with no fading component employed).

With this broad definition of what constitutes SI training, a large number of applications have been attempted. In adult populations, investigators have used self-instructions in efforts to modify speech anxiety (Meichenbaum, Gilmore & Fedoravicus, 1971), test anxiety (Meichenbaum, 1972), task performance in schizophrenics (Meichenbaum & Cameron, 1973), and other problems. The efficacy of self-verbalizations in reducing stress in surgical patients has been explored in adults (Langer, Janis & Wolfer, 1975) and in children (Burstein & Meichenbaum, Note 1). Geibink, Stover and Fahl (1968) examined the role of self-instructions in increasing adaptive responses to frustration among emotionally disturbed boys. A number of investigators have made use of intellectual or educational tasks in training children having classroom-related difficulties to modify their mediating statements. Palkes and her associates (Palkes, Stewart & Kahana, 1968; Palkes, Stewart & Freedman, 1972) used SI training to modify the performance of hyperactive children on the Porteus Maze Test. Meichenbaum and Goodman (1971) taught impulsive children to modify their response styles on a number of stan-
standardized tasks (e.g., WISC-coding) via effective self-instructions. Bornstein and Quevillon (1976) used a variant of the SI training package to modify on-task behavior in overactive preschool boys. Robin, Armel and O'Leary (1975) compared SI training with a direct training package (minus self-statements and the fading component) in children with writing deficiencies. They found that SI training added a small but significant increment over the writing improvement that results from direct training.

Robin et al. (1975) have voiced criticism of several of the above applications of the omnibus SI package with children having classroom problems. They point out that in most of the studies (e.g., Meichenbaum & Goodman, 1971) self-instruction groups have been compared to attention-placebo and no-treatment controls. This type of design precludes the separate examination of the components of the SI package (e.g., self-instruction, verbal modeling, fading, etc.). Robin et al. cite a study by Higa (Note 2) who, in an extension of Meichenbaum and Goodman (1971), failed to obtain a significant performance effect of SI training over direct training. More comparative studies to isolate active treatment components are sorely needed. In addition, Bornstein and Quevillon (1976) cite evidence that certain classes of behavior such as on-task behavior (Bornstein & Quevillon, 1976) and task approach (Palkes, Stewart and Freedman,
1972) have been more amenable to change via SI training than
have other targets such as letter copying (Robin et al.,
1975) or performance related to task ability (Palkes et al.,
1972). Behaviors accompanied by stable ability factors like
spatial-representation, discrimination, and numerical reason­
ing may be less responsive to SI training than behaviors less
influenced by these kinds of factors. Certainly, the evi­
dence in support of this contention is fragmentary and further
research is needed to match SI training to the classes of
target behaviors with which it is most effective.

Other studies, using simplified SI training interventions,
have begun to tie types of self-instructional statements to
self-control gains in specific situations. A series of studies
by O'Leary and his associates (Israel & O'Leary, 1973;
Monahan & O'Leary, 1971; O'Leary, 1968) found that the appro­
priate use of overt self-statements such as "I can press" and
"I cannot press" (the token reinforcement dispenser) was nega­
tively correlated with rule-breaking (dispensing reinforcement
during a "wrong" SD). Children were taught to key press for
marble tokens in the presence of triangular stimuli but not
during the presentation of slides of a circle. Every key
press was reinforced, but children using correct self-
instructions "broke the rule" less by pressing during the
inappropriate time. In a tolerance of noxious stimulation
situation, Kanfer, Karoly, and Newman (1975) pre-trained
dark "phobic" children in overt self-instructions to use during two darkened test trials. They found that self-guiding or competence-related instructions (e.g., "I can take care of myself in the dark") were generally more effective (in terms of subjects' duration of dark tolerance and low illumination intensity) than either stimulus-related instructions (e.g., "The dark is a fun place to be") or a nursery rhyme repeated aloud. A third self-control situation, that of resistance to temptation, was investigated by Hartig and Kanfer (1973). Their subjects (275 kindergarten and first-grade children) were blindfolded, escorted into a room, and seated with their backs to a table on which there were several attractive toys. The blindfold was removed and subjects were told not to look at the toys behind them. After the experimental manipulations which divided the subjects into groups, the experimenter left the room repeating instructions not to look at the toys. The dependent measure was the latency in seconds until the individual subject turned to regard the toys (with a ceiling time of ten minutes). The manipulations consisted of different sets of statements which the children were asked to verbalize aloud. The content of the statements varied for the five groups as follows: (1) verbalization positive (e.g., "If I do not look . . . I will be a good boy [girl]"), (2) verbalization negative—involving the negative conse-
quences of transgression, (3) verbalization instruction ("I must not turn around and look at the toy" which was included in groups 1 and 2 as well), (4) verbalization control ("Hickory dickory dock . . ."), and (5) no verbalization control where the child was not given any instructions to verbalize aloud to himself. In general, groups 1, 2, and 3 were significantly more resistant to temptation than were groups 4 and 5. There were no differences among the first three groups (task-relevant verbalizations). Among younger subjects (aged 40-65 months) who verbalized as instructed, groups 1 to 4 were not different but all were superior to group 5. No sex differences were obtained but younger children had significantly shorter latencies than older children (aged 66-88 months). The authors suggest that task-relevant verbalizations were effective in prolonging "the tolerance of resistance to temptation" in the children studied (Hartig & Kanfer, 1973, p. 265) and that for younger children the effects of task-relevant self-instructions and reciting a nursery rhyme were not different. The lack of differences between groups 1, 2, and 3 may have been due to implicit consequences (both positive and negative) being consistently associated with task-relevant statements. Hartig and Kanfer cite anecdotal support for this explanation from spontaneous verbalization recorded from subjects in their first three groups (e.g., a group 2 subject added "but if I look straight
ahead, I will be a very very good and big girl" to the original instruction). There were also spontaneous references in their postexperimental interview to a preference by older children for covert verbalization of self-instructions. Unfortunately, several problems in the Hartig and Kanfer (1973) study limit the generalizations that can be made from the findings. The data collected sufficiently deviated from the normal distribution (due to the large number of children in some groups who reached the ten-minute ceiling in latency to the turn). This resulted in the division of latency times into categories and a myriad of subsequent nonparametric analyses making the results section difficult to follow. More importantly, the abbreviated SI training resulted in only about half of the subjects in the first four (verbalization) groups complying with the request to overtly self-instruct. Post-hoc analyses based on a verbalizer/nonverbalizer division lose credence as a result of subject self-selection. Also, the lack of any group receiving another type of training precludes any comparison of treatments for temptation situations as they relate to self-control. The study, therefore, has little impact for matching self-control training packages to self-control problems. Finally, the authors cite the results obtained with their verbalization control (the nursery rhyme) as contradicting the effectiveness of distraction as a controlling response for improving resistance to temptation. Not only was this not the case with "young" verbali-
zers, but there may have been aspects of using a pre-set rhyme which detracted from its utility as an effective self-instruction. Kanfer has further investigated tolerance of noxious stimulations as another paradigm for the study of self-control (Kanfer & Goldfoot, 1966) and his use of the expression "tolerance of resistance to temptation" (Hartig & Kanfer, 1973) suggests that he regards the two situations as highly similar (further reasoning for this will be outlined below). If evidence from the tolerance of noxious stimulation research is seen as salient to the temptation situation, distraction as an effective controlling response has received some support (Barber, Note 3; Kanfer & Seidner, 1973). Several investigators, however, have found that the subjects' control or perceived control was an important element in the efficacy of controlling responses to noxious stimulation (Averill, 1973; Corah & Boffa, 1970; Geer, Davison & Gatchel, 1970). This appears to be true not only with distracting responses to noxious stimulation (Kanfer & Seidner, 1973), but with verbal controlling responses in the resistance to temptation paradigm (Kanfer & Zich, 1974) as well. Thus, the external control of prescribing a set nursery rhyme may have impeded the effectiveness of the distraction control. A similar control in the Kanfer et al. (1975) study with children's fear of the dark was likewise ineffective. A better distraction control group may involve increased
subject control through self-selected distractors as opposed to those imposed by the experimenter.

In sum, SI training has shown considerable promise for the effective treatment of a wide variety of self-control and behavioral problems. There remains, however, considerable need for further study and refinement in several areas. The component analysis of the omnibus package, explication of the target behaviors most amenable to SI treatments, comparison with other general packages for self-control training, and the investigation of possible contributing factors (such as distraction) stand clearly in need of further investigation.

To provide further direction for the above lines of study, a refinement of mediational models and self-control models with covert mediation components might have considerable utility. From the Goss (1961a) mediation model described earlier in this chapter and a self-control conceptualization by Skinner (1953), several elaborations have appeared (Kanfer, 1970, 1971; Kanfer & Karoly, 1972). An especially useful model, in terms of its simplicity and its somewhat restricted definitions of the role of mediation in self-control was provided by Blackwood (1972). Blackwood regards speech as verbal chaining which produces discriminative stimuli and conditioned reinforcers. These overt or covert verbal "connections" mediate behavior by altering the prob-
ability of the omitted response. Thus, self-statements provide the mediational component of self-control. Blackwood emphasizes "descriptions of ultimate consequences" (both positive and negative) as powerful mediators. He states, for example, that "the strongest verbal self-punishment may be a description of the ultimate punishing consequences of a behavior" (Blackwood, 1972, p. 22). In this way, self-produced warnings and self-promises are essential elements of Blackwood's view of mediated self-control. A child's production of self-warnings when tempted by an environmental situation would lead to his resisting the temptation to misbehave. The child would, in response to his mediating statements, emit a discriminated avoidance response instead of misbehaving. Blackwood's diagram of this sequence, with the notation changed slightly to provide generality, is reproduced below as a framework for several self-control situations:
The upper half of the diagram illustrates a failure in self-control (as in the temptation situation) where misbehavior (e.g., talking in the classroom) is followed by positive short-range consequences (e.g., social interaction) and a negative long-range result (e.g., bad grades, detention). In the lower half of the diagram, mediated appropriate behavior leads to negative short-range but positive long-range consequences. In the resistance to temptation paradigm used by Hartig and Kanfer (1973), the appropriate response (not turning around to look at toys) was followed by negative short-term consequences (e.g., "curiosity," not knowing which toys were on the table) and positive long-term consequences (perhaps generally the avoidance of punishment for transgression and praise, etc.). Similar substitution shows that the operational definitions of several self-control tasks, such as rule-breaking (Monahan & O'Leary, 1971) and tolerance of noxious stimulation (Kanfer & Seidner, 1973) fit the diagram equally well. In all, subjects' self-control is a matter of tolerating stimuli of varying aversiveness in order to obtain a delayed positive consequence. The results obtained with the different paradigms can thus be regarded as stemming from parametric variations of a common self-control theme. Viewed in this way, the findings of these and similar paradigms (delay of gratification is discussed below) may eventually lead to a broad understanding
of mediational factors in self-control.

In addition to his model of mediated self-control, Blackwood has developed a method for training effective mediation (Blackwood, 1970). As a result of pilot work consisting of interviews with teacher-selected self-controlled and misbehaving eight- and ninth-grade students, Blackwood concluded that the major differentiating factor between the two groups was the inability of the misbehaving students to verbalize the consequences of disruptive and acceptable behaviors. That is, the misbehaving children were (in Blackwood's opinion) lacking in accurate and detailed mediating statements of the "ultimate consequences" of their behavior. To remedy this deficit, he developed mediation essay (ME) training. This procedure made use of printed essays administered to subjects following their emission of misbehavior. The essays consisted of four questions and their answers (corresponding to subjects' reading levels, the target behaviors, and environmental contingencies), and took the following form: (1) "What did I do wrong?" followed by a sentence describing the misbehavior, (2) "What things happen I don't like when . . . (I emit the target behavior)?" followed by a description of the aversive consequences, (3) "What should I do?" followed by a brief but concrete description of appropriate behavior, and (4) "What pleasant things will happen when . . . (I emit the appropriate behavior)?" followed by a concrete description
of the reinforcing consequences of the appropriate behavior. The training consisted of having subjects read and copy the appropriate essay following an instance of misbehavior. Blackwood (1970) described possible further training consisting of paraphrasing the essay and writing it from memory in the subjects' own words. In published reports using this procedure, however, these latter training techniques have almost never been employed (Blackwood, 1970; MacPherson, Candee & Hohman, 1974). The obvious potential in ME training for confounding between the effects of modified mediational statements and effects of external consequation (the copying tasks contingent on misbehavior) has been examined by employing a control condition where subjects proceed through the same training tasks (i.e., reading and copying) with a punishment essay of similar length, writing style, and reading level (but having irrelevant content--e.g., the working of a steam engine). Blackwood (1970) found that ME training significantly reduced disruptive behavior below the level obtained with the punishment essay control. This finding was supported by a more thorough study by MacPherson et al. (1974) on lunchroom misbehavior with 221 elementary school children aged six to thirteen years. This study compared three groups: (1) a behavior modification group receiving the application and withdrawal of positive reinforcement, time-out, etc., (2) a behavior modification plus ME training group, and (3)
a behavior modification plus punishment essay group. The latter two groups received similar external consequences as group 1 in addition to the reading and copying of essays following misbehavior. Essays were essentially the same as described above. MacPherson and her associates found that lunchroom misbehaviors occurred significantly less often (were almost eliminated) in the behavior modification plus ME training group despite the fact that ME training involved only the copying of the essay. While the aversiveness of the ME training did not appear to be the decisive factor, MacPherson et al. unfortunately did not attempt to measure changes in mediational style. Thus, no isolation of the active components of ME training was possible. In addition, the punishment essay group seemed to effectively control for the external consequences of training, but no other mediation training procedure was provided for comparison. While the two preliminary reports of ME training effects are encouraging, research is needed to determine its effectiveness in modifying mediational styles in several self-control situations. An initial question might involve the effects of ME training without the concurrent use of a behavior modification program (as both studies combined the two).

While Blackwood's (1972) model has been useful in tying together several self-control situations in inspiring an innovative mediational training procedure, the more circum-
scribed model formulated by Mischel (1974) for the delay of gratification deserves attention as well. Confining his theorizing to the self-control task of imposing delays of reward on oneself for the sake of future consequences, Mischel posits a two-step mediational process. The first step is the choice of delay based on the subject's expectations of immediate and delayed outcomes (cf. Blackwood, 1970, "ultimate consequences"). Second, given the choice to delay gratification, is a self-distraction process to reduce the aversiveness of the delay. As Amsel (1958, 1962) points out, frustration (the self-imposed lack of immediate reward) involves an actively aversive event. Thus, Mischel maintains that the subject needs to "tune out" on the goal objects to reduce the aversiveness. As operationalized for experimental investigation with children, the delay of gratification task has been defined by the following procedure (Mischel & Ebbesen, 1970): (a) the subject is escorted to the experimental room and taught a signal (a bell) with which he can summon the experimenter, (b) the subject is given a choice between two edible reinforcers and told that he can have the non-preferred reward immediately or upon summoning the experimenter (with the bell), but that if he waits till the experimenter returns on his own, he can have the preferred reward, and (c) leaving the subject in the delay (waiting) situation. Both the general definition
of delay of gratification (Mischel, 1974) and its operational
definition (Mischel & Ebbesen, 1970) fit easily into the
self-control diagram (Blackwood, 1970) reproduced above.
Thus, delay of gratification can be viewed as another form
of the self-control task associated with tolerance of noxious
stimulation, rule-following, and resistance of temptation.

In terms of support for the two-step mediational model,
evidence has come from studies using the procedure outlined
above with preschool children (Mischel & Ebbesen, 1970;
found that subjects were able to wait longer if they could
not attend to the rewards than if either the preferred re­
ward or the non-preferred, or both rewards were facing them.
The second group of experiments (Mischel et al., 1972) was
especially salient here in that self-instructional manipula­
tions (e.g., instructions for the subjects to "think fun
things" and examples of things to use as distractors) were
investigated. In experiment I, fifty preschool children were
divided into five groups, three of which received the three-
step procedure above and the remaining two received the
"bell game" instruction to summon the experimenter but no
waiting contingency. Individual differences in group treat­
ment were as follows: (1) received the waiting contingency
instructions and were left to wait with a toy available as
an external distractor, (2) received the waiting contingency
and an instructional set to "think fun things" as an internal distractor (plus suggestions to think of singing songs or playing with toys as examples), (3) received the waiting contingency instructions alone, (4) received the overt distraction (toy) without a waiting contingency, and (5) received the internal distraction instructions without a waiting contingency. Children in the contingent waiting condition who received the "think fun" distraction instructions (group 2) were able to wait significantly longer than in the contingent waiting-toy distraction condition (group 1). Both of these groups were strikingly superior to the other groups in waiting time (no subjects in groups 3, 4, or 5 were able to reach the fifteen-minute ceiling for waiting time while roughly half of group 1 and 2 subjects reached criterion). Thus, the waiting contingency was seen as essential for long periods of voluntary waiting (as operationalized) and distractors (especially mediational or cognitive ones) drastically prolonged the waiting period tolerated. In Experiment II, all subjects received the "bell game" instruction and the waiting contingency. One group replicated the "think fun" condition (Experiment I, group 2), while the remaining two groups received "think sad" or "think of the reward" sets of instructions respectively. The "think fun" group (six subjects) was able to tolerate significantly longer waiting periods than either of the other two groups
(ten subjects each). Experiment III replicated groups 2 and 3 from Experiment I with one addition: the preferred and non-preferred rewards were removed from subjects' visual attention. In Experiment I, the rewards were in an opaque cake-tin on a table in front of the subject; in Experiment III the rewards and cake-tins were placed under the table, out of the subjects' visual field. Experiment III also replicated the "think rewards" condition (from Experiment II) but with rewards also removed from visual attention. Mean delay (waiting) times of "think fun" and "no ideation" groups did not differ, but both were significantly greater than the "think rewards" group mean. This was interpreted as supporting a view that thinking of rewards enhanced the aversiveness of the self-imposed delay. The results of the study were supportive to the two-step theory of Mischel (1974). The lack of a check on the mediational manipulation, however, seriously limits the conclusions that can be drawn regarding the mediational changes resulting from the instructional sets (i.e., "think fun," "think rewards," etc.). In addition, Mischel and Moore (1973) suggest that how children "think about rewards" makes a difference in delay times. More research is needed to explicate the role of mediational statements regarding contingencies in the delay of gratification. Finally, Mischel et al. (1972) used only one type of manipulation to modify mediational processes in their subjects
(instructional sets). Questions regarding the effects of different training methods are therefore unanswerable in their design. Further investigation of Mischel's model are obviously required, but the delay situation provides an intriguing situation in the study of mediated self-control.

Pilot Work

In order to explore the delay of gratification task with slightly older children and investigate the feasibility of employing other training procedures to modify mediational styles in this self-control situation, pilot work was conducted with seven children (with ages corresponding to first-and second-grade placement) at a local ungraded elementary school. The use of a room was obtained, and two pilot sessions (one week apart) were conducted. Four subjects rated a group of seven edible rewards and two (carmels and cherry candies) were chosen for use. The author was interested in the following questions: (a) what percentage of subjects would wait for fifteen minutes (ceiling) on the delay task?, (b) could variants of SI training and ME training be equated in terms of training time with a simple statement (SS) procedure similar to the instructional sets of Mischel et al. (1972)?, (c) would multiple trials on the task be sufficiently independent to allow an ABAB design (Baer, Wolf & Risley, 1968) to be used?, and (d) would subjects respond to instruc-
tions to "think out loud" to provide a check on mediational manipulations?

To obtain information regarding these questions, the seven subjects (five running once and two receiving two trials a week apart) went through the delay of gratification task and received one of six mediational treatments. All subjects received the "bell game" and waiting contingency instructions essentially the same as those used by Mischel et al. (1972), and were also asked to remain seated throughout the trial and to "think out loud" (only four subjects) when the experimenter left the room. Two training content statements (similar to those in appendix B) provided the two types of training content (distraction or contingency emphasis). Three training methods were used: (1) SI consisting of modeling and fading to overt self-instructions (from Meichenbaum & Goodman, 1971), (2) ME consisting of the experimenter reading, the subject reading, and the subject copying the typed training content "essay," and (3) SS or simple statement training involving two repetitions by the experimenter of the training statements. As the two types of content (distraction and contingencies) were used separately for each training method, six conditions resulted (SID, SIC, MED, MEC, SSD, and SSC). The first two subjects run were in the SSD condition, with the other five being randomly placed in the remaining five conditions. Subjects who were repeated
received different training in their second trial than they did in their first. The dependent measure was waiting time in seconds. The obtained results were as follows: (1) three of the four subjects instructed to do so verbalized aloud, (2) all six mediational training packages were administered in twelve to fifteen minutes, (3) five of the seven subjects (on first run) attained the waiting ceiling of fifteen minutes, and (4) neither repeated subject "reversed" or altered waiting time from the first trial—they also stated that they "did the same things to help wait" as they had in the first trial. Thus, the present study seemed feasible, but only in a group design with a statistical test for assumption violation required before data analysis. A manipulation check seemed possible as did the equating of training time for the mediation interventions.

Purposes of This Research

Earlier in this chapter, similarities were drawn between delay of gratification, tolerance of noxious stimulation, rule-following, and resistance to temptation situations as operationally defined by investigators. The point has not been that these self-control tasks are identical, but that they can be viewed as variations on a common self-control theme. As such, findings from each of the paradigms may be applied with varying degrees of salience to any of
the situations—in the present study, the delay of gratification. Findings from these paradigms would seem to have potential for meaningful contributions to a thorough analysis of the factors and parameters of the self-control task diagrammed earlier. Several issues must be investigated, however, before this potential is realized. For example, the questions of when and if attentional factors (distractions) play an active role in mediated self-control are open and are interesting issues given their neglect in some self-control models (e.g., Blackwood, 1970). These two questions would have considerable importance in determining content of interventions and matching content with problem parameters. Parameters such as the reinforcer value of short-range consequences of misbehavior, long-range consequences of desired behavior, definiteness of consequences, aversiveness of present situation etc. need to be explored to provide clues as to when distraction content can enhance self-control.

Other issues, such as which training methods are most effective in which situations, have also been raised by the grouping of the studies using variants of the self-control task of interest here. Most of the studies reviewed have either failed to tie specific components of interventions to changes in mediation (i.e., Meichenbaum & Goodman, 1971), failed to provide a check on mediational changes (i.e., Mischel et al., 1972), or failed to compare results of more
than one training method (i.e., Hartig & Kanfer, 1973; Mischel et al., 1972). The matching of interventions with problems requires comparisons be made across treatment methods and problem parameters. In addition, possible interactions between training techniques and training content can only be explored via comparative studies.

The purpose of the present investigation, then, was to begin this matching process. Specifically, the study was designed to address the delay of gratification paradigm in an attempt to compare two types of content (distractions and contingency emphasis) across three methods of training (SI, ME, and SS or simple statements). In the content area, theories have been contradictory (Blackwood, 1972; Mischel, 1974) and research findings have led to opposing conclusions (Hartig & Kanfer, 1973; Mischel et al., 1972). In regards to training methods, the verbal fading of SI training and the visually presented essay and copying task of ME training have never been empirically compared. It is also a matter of speculation what these training components add to an instructional statement of training content. Whether or not these training techniques would add to the SS approach similar to that used by Mischel et al. (1972) was a focus of the present study. Interactions between content and training, as they would possibly lead toward a matching between content and training method, were also of interest. Despite
the exploratory nature of the present investigation, it was hoped that at least tentative conclusions regarding the above issues could be reached for the delay of gratification task with the population studied. The present investigation was viewed as a beginning step in the exploration of parameters needed if an adequate model of mediated self-control is to be reached. It was hoped that the results obtained would eventually lead in the direction of effective treatments for specific self-control problems.
Subjects

The subjects were seventy-two children (forty-two males, thirty females) from grades one through three of regular classrooms in Missoula, Montana. They came from the classrooms of teachers from three public and two parochial schools who volunteered to aid in the research project. Subjects were selected via a Teacher Rating Scale (see appendix A) estimating self-control. Teachers were asked to rate their students on several items logically related to self-control, with students falling in the lowest third (lowest rated self-control) being considered eligible for the present study. Parents of the children thus selected were contacted by phone to obtain permission for participation and parental permission was obtained for all seventy-two children who served as subjects. The initial thirty-six subjects were blocked according to grade and randomly assigned to one of the six conditions (see below) such that two subjects from each grade level occupied each group. Subsequently, the process was repeated to provide a replication under slightly different conditions (see below).
Experimenters

Two University of Montana undergraduates (one female, one male) served as experimenters. Experimenters received eight hours of training (in the two-week period prior to the running of the study) in administering the various training packages used and with all experimental variations. The training also stressed that the experimenters employ a playful and friendly manner with the children being run in the experimental task. The pre-training of experimenters was accomplished at Sussex School using volunteer subjects of roughly the same age range as the current subject population. Due to scheduling problems, however, the author (male) was forced to serve as a third experimenter. The author, who had run the pilot study and had conducted the training of the other experimenters, was sufficiently versed in all aspects of administering the training packages.

Dependent Variables and Design

The primary variable under study was waiting time (in seconds) defined as the time between the experimenter's leaving the subject alone (and activating a stopwatch) and the end of the waiting period. The waiting period could end either by the subject ringing a bell to summon the experimenter, or the experimenter's self-initiated return following fifteen minutes. An attempt by the subject to open the reinforcement display case (activating a buzzer)
was also considered an end of the waiting period. In addition, the experimenter made a rating (+ or -, see score sheet in appendix D) of whether or not the child overtly made use of a mediational statement(s). This was defined as warranting a (+) when the subject overtly verbalized any statement relating to the waiting contingency (e.g., "If I wait, I'll get the ______"), any statement involving distraction content (e.g., singing songs aloud, etc.), or any self-direction to aid the wait (e.g., "I will wait"). Tape recordings made of the subjects' verbal behavior provided a reliability check in that an independent judge also rated the tapes and the two ratings were compared. In addition, pre-training of experimenters was intended to produce high reliability in that pre-training had proceeded until ten consecutive subjects received identical ratings from both experimenters (see Johnson & Bolstad, 1973).

The design of the present investigation was a 3x2x2 factorial. The three factors were: 1) type of mediation training (Self Instruction, Mediation Essay, and Simple Statement), training content (distraction content, contingency emphasis), and the added contextual condition (No Toy versus Toy) in which half of the subjects had pre-training and post-experiment play sessions available to them. Thus, the subjects (randomized according to sex and blocked on grade level) were assigned to the six cells arising
from the training/content combinations; then the 3x2 experiment was replicated with the addition of the play sessions (intended to shorten mean delay times). The result was a twelve cell factorial with six subjects per cell.

Apparatus

Materials used in the present study included four hinged partitions into one of which was built a door. These partitions were designed for constructing a small, consistent, experimental "room" in various locations within school facilities. In the experimental "room" were located a small table and chairs for the subject and experimenter. On the table was the reinforcer display case (a housing consisting of a wood base and back and a hinged plexiglass cover) for visually presenting the reinforcers (five varieties were used: cherry candy, lemon drops, carmels, pretzels, and chocolate kisses). The reinforcer display case had, in its back, an electric buzzer activated by lifting the plexiglass cover. Also on the table was a Lux Minute-Minder timer and bell (the bell served as the signal to summon the experimenter and was rung manually by subjects). Other materials included paper towels upon which reinforcers were placed, and an experimenter-carried stopwatch. Outside the room were a cassette tape recorder and tapes for recording subject verbalizations.

In addition to the above materials, subjects within
the toy conditions (see below) were provided with an array of toys for a pre-training play session (as well as a post-experiment session if desired). The toys were of the type available at most department stores and they included: a miniature plastic bulldozer, western "action" figures and accessories, dolls, construction toys, plastic army figures, and several age-levels of jigsaw puzzles. The toys were kept in a large, cardboard box.

Procedure

All subjects were individually escorted from their classrooms to the experimental "room" by an experimenter. The subject was seated across from the experimenter and a brief conversation followed to orient the subject and attempt to make him/her feel comfortable. Half of the subjects then proceeded directly to the "bell game" while the rest were first given a brief period to play with available toys (see below). In the bell game, the experimenter demonstrated how to ring the bell and had the child attempt to follow his model. When the subject was successful, the experimenter introduced the "game" per se (similar to Mischel et al., 1972). The experimenter repeatedly stepped out of the room, closing the door behind him. He returned immediately every time the bell was rung. Thus, the child's signal repeatedly brought the experimenter back into the room and the subject was told that the procedure would work "every time you want
me to come back to the room.

Following the "bell game", the experimenter produced the five kinds of reinforcers and set them out for the child's visual inspection. The subject was asked to place the kind of reinforcer they liked "the best" on their right, the second best next, and so on. If the child did not comply with this request, the experimenter pointed to two of the reinforcers and asked the subject to choose between them. The preferred reward was placed on the right of the non-preferred reinforcer. The experimenter then pointed to another two reinforcers and the process continued in this pair-wise manner until all five reinforcers were rank-ordered. The experimenter then checked the ranking by making sure the subject preferred each reinforcer to the one next to it on the subject's left. When he was satisfied with the ranking, the experimenter then removed the three lowest-ranked reinforcers and proceeded to explain the waiting contingency.

The experimenter again asked the subject which of the two remaining reinforcers was preferred and placed both objects in the reinforcer display case. He placed the display case directly in front of the child and gave the following instructions:

I will have to leave the room soon, and if you wait until I come back by myself you can have this one (pointing to the preferred reward) to eat. You know, if you don't want
to wait you can ring the bell and I'll come back like I did before. You can ring the bell anytime and I'll come right back, but if you ring the bell, you can't have this one (preferred reinforcer). You will have this one (pointing to the non-preferred reinforcer) to eat if you ring the bell and bring me back. So if you wait for me to come back on my own you can have the _____, but you can ring the bell and have the _____.

Then the experimenter asked the child: (1) to repeat which he would receive if he called the experimenter back, (2) how this was done, and (3) which he would receive if he awaited the experimenter's returning by himself. If the child passed the three comprehension questions the experimenter consulted a hidden portion of the subject list which informed him for the first time of the training condition to which the subject had been randomly assigned. While, of necessity, the subject list informed the experimenter which children were in the No Toy and Toy conditions (see below), he was not previously aware of the specific group to which the child had been assigned. He then told the subject, "I will have to leave soon, but while I'm gone I have some things you can think about." The subject was then given the mediational treatment corresponding to his group membership. The six groups are discussed below.
Self-instruction training with distraction content (SID).

Subjects in this group received training involving a set of (vocabulary controlled) statements emphasizing things they could think of to distract themselves during the waiting period. The difficulty of these statements was designed to correspond with the grade level of the subject (see appendix B for the three grade levels of Distraction Content). The construction of the instructional sets employed graded word lists available elsewhere (Botel, 1962; Fry, 1972; Karlin, 1975). The method of training consisted of the cognitive modeling and verbal fading components of Self-Instruction training as previously described (Meichenbaum & Goodman, 1971). In this method, the experimenter initially modeled the set of statements (twice); then asked the subject to recite them aloud along with him. When the child was able to do so without error, the experimenter repeated the content again, this time at a whisper while the subject repeated them aloud. Finally, the experimenter faded out his participation completely by first repeating the training content (along with the subject) using only lip movements; then by having the subject overtly reciting the statements alone. When the subject was able to proceed through the distraction statements by himself, the experimenter gave the closing instructions. The experimenter attempted to keep training time to around fifteen minutes. In the closing instructions, the experimenter stated that he had to leave, that he would be back,
and that the subject could bring him back (if he or she wanted) at any time via the bell. In addition, the experimenter stated that he wanted the subject to "think out loud" while he was outside the room and that it was all right to do so in this situation. Then the experimenter repeated that he wanted the subject to think aloud and left, activating a stopwatch to time the waiting interval.

**Mediation essay training with distraction content (MED).** Subjects in this group received training involving the same set of distraction content statements used in the previous group (the three grade levels of Distraction Content are reproduced in appendix B). The content of training was thus identical except that the (SID) group received verbal training while the (MED) group were presented the content statements in a printed "essay" format. More specifically, each subject in the (MED) condition received the vocabulary controlled (graded) essay (see appendix B) along with paper and a pencil. Subjects were told to copy the essay and were told that this copying task (similar to the ME training of Blackwood, 1970) would aid them in learning the content of the essay, thereby helping them during the waiting period. Subjects worked at the copying task for fifteen minutes and turned in their copies to the experimenter. The experimenter then gave the closing instructions (described for the SID group) which were identical to those given to all groups.
Simple statement of distraction content (SSD). Subjects in this group received training content identical to that in the above two distraction groups except that the SSD statements were modified (first person changed to second, etc.) to obtain an instructional form (see appendix B - Modified Distraction Content for SSD Group). The experimenter presented the instructional set three times verbally, asking the subject to repeat the content from memory after each presentation. Prompts (e.g., "anything else?") were also given and the experimenter checked off portions of key content on the appropriate prepared checklist (see appendix C for the three graded lists of distraction content). When the child cited all key portions of content, general discussion followed to approximate the fifteen minutes allotted for training. Finally, the standard closing instructions were given.

Self-instruction training with contingency content (SIC). Subjects in this group received training involving a set of vocabulary controlled statements emphasizing the waiting contingency and the consequences of their actions (see appendix B - Contingency Content). These statements were also designed to correspond with subjects' grade level and were used in a similar manner as the distraction content statements. The training method received by the subjects in this group involved the cognitive modeling and fading components used in self-instruction training (Meichenbaum &
Goodman, 1971) and proceeded in the same sequence as the (SID) group. Closing instructions were the same as for all groups and an effort was made by the experimenters to provide about fifteen minutes of training.

**Mediation essay training with contingency content (MEC).** Subjects in this group received a printed essay of the statements identical to those in the previous group (appendix B - Contingency Content). Training methods were identical to those in the mediation essay with distraction content (MED) group while the content of the essays differed. Closing instructions were the same as for all groups.

**Simple statement of contingency content (SSC).** Subjects in this group received three verbally-presented repetitions of the content statements administered identical to those in the simple statement of distraction content (SSD) group. Instructional statements here, however, involved the contingency content sets (see appendix B - Modified Contingency Content for SSC Group) essentially identical to the content of the previous two groups (SIC, MEC). As with all groups, an effort was made to equate training time and identical closing instructions were used. (See Checklists, Appendix C.)

**No Toy versus Toy conditions.** As cited above, half of the subjects were allowed a brief play period with provided toys as part of their introduction to the experimental
situation. Subjects in this condition differed from (No Toy) subjects in that, following the introductory conversation, they were presented with a box of toys (not present during the running of "No Toy" subjects) and told that they could play with whatever they chose for five minutes while the experimenter left the room. The experimenter also suggested that the child sample several toys and see if he could come up with a "favorite" for later play. The experimenter then left and, upon his return, he helped gather up the toys in the box informing the subject that a longer play period would be available "after we get through with our work." The second (elective) play session took place directly before the subject was returned to his/her classroom.

To summarize, the sequence through which subjects were individually run proceeded as follows: (a) introduction to the experimental situation including the play session for (Toy) condition subjects, (b) the "bell game," (c) reinforcer ratings for the five kinds available, (d) the waiting contingency involving the two top-rated rewards, and (e) mediational training corresponding to group members. Following these steps, the experimenter left the room, recording training time. The subject was left to wait while the experimenter rated the presence (+) or absence (-) of overt mediational statements. Finally, the experimenter recorded time, in seconds, that the child waited after either he ended the period by returning on his own (fifteen-minute ceiling) or
the subject rang the bell to end the delay. When the experimenter returned, he asked the subject which reward he preferred and which he "earned" by his waiting behavior. The experimenter then returned the toy box to the subjects in the (Toy) condition who elected a second play period. Finally, each subject was thanked, complimented for good behavior, and returned to his/her classroom.
CHAPTER III

RESULTS

Main Analyses

The main analyses were conducted within the 3x2x2 factorial design. The levels of the three factors were as follows: (A) Training (SI, ME, and SS); (B) Content (Distraction and Contingency); and (C) No Toy versus Toy. Mean waiting times (in seconds) for the main factors were: (A) SI = 648.125, ME = 709.208, SS = .801.542; (B) D = 720.139, C = 719.111; (C) No Toy = 770.583, Toy = 668.667.

The twelve groups that resulted from combinations of the factors at their various levels (n = 6, per cell) were assessed for homogeneity of variance via Cochran's C (Winer, 1962). The analysis of group variances was nonsignificant \[ C (12, 5) = .180, p > .05 \]. A 3x2x2 ANOVA was then performed on the raw data (seconds of waiting time), the results of which have been summarized in table 1. No significant differences were obtained for any of the main factors or interactions (smallest \( p > .05 \)), though two \( F \)-ratios (AB and AC) approached significance (\( p \)'s < .10). The AB (Training x Content) interaction is presented graphically in figure 1 and the AC (Training x No Toy/Toy)
TABLE 1

SUMMARY TABLE FOR THE 3x2x2 ANOVA RAW DATA

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (Training)</td>
<td>286346.0</td>
<td>2</td>
<td>143173.0</td>
<td>1.665</td>
</tr>
<tr>
<td>B (Content)</td>
<td>19.0</td>
<td>1</td>
<td>19.0</td>
<td>.0002</td>
</tr>
<tr>
<td>AB</td>
<td>414944.0</td>
<td>2</td>
<td>207472.0</td>
<td>2.412+</td>
</tr>
<tr>
<td>C (No Toy/Toy)</td>
<td>186966.0</td>
<td>1</td>
<td>186966.0</td>
<td>2.174</td>
</tr>
<tr>
<td>AC</td>
<td>457406.0</td>
<td>2</td>
<td>228703.0</td>
<td>2.659+</td>
</tr>
<tr>
<td>BC</td>
<td>14365.1</td>
<td>1</td>
<td>14365.1</td>
<td>.167</td>
</tr>
<tr>
<td>ABC</td>
<td>74410.3</td>
<td>2</td>
<td>37250.2</td>
<td>.433</td>
</tr>
<tr>
<td>Error</td>
<td>5160140.0</td>
<td>60</td>
<td>86002.3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>6594600.0</td>
<td>71</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p ≤ .05

*+p ≤ .10

interaction is depicted in figure 2.

It was clear from an inspection of the raw data on waiting time that a high percentage of subjects reached the fifteen-minute ceiling. This fact, and the relatively small number of subjects contained within each cell (n = 6), severely limited the power of the 3x2x2 ANOVA. Within individual groups, the percentage of subjects attaining the ceiling time (900 seconds) ranged from 33 percent (SID, Toy and SIC, Toy) to 100 percent (SSD, No Toy). More specifically, the modal
FIGURE 1

TRAINING BY CONTENT INTERACTION

MEAN WAITING TIME IN SECONDS

D-DISTRACTION
C-CONTINGENCY

TRAINING
FIGURE 2

TRAINING BY NO TOY/TOY INTERACTION

MEAN WAITING TIME IN SECONDS

NO TOY

TOY

TRAINING
ceiling percentage across all groups was 83 percent and the overall mean was just under 70 percent (see figure 3 for a visual presentation of the number of subjects within various ranges of scores).

While neither sample size nor the proportion of subjects reaching ceiling could be altered, a number of transformations of the raw data [e.g., reciprocal, log (base 10), square root, ARC SIN of proportions, etc.] were performed in an attempt to alter distribution parameters. Only one of these transformations, ARC SIN of proportions, led to even slight improvements in homogeneity \( C(12, 5) = .155 \ p > .05 \). The results of the 3x2x2 ANOVA performed on the transformed data have been included (see table 2). Both analyses led to highly similar conclusions, though, in the case of the transformed data, the AB interaction failed to even approach significance. In short, the one unmistakably clear finding was the high percentage of subjects from all groups who reached the ceiling level in waiting time.

Secondary Analyses

Prior to the major analyses described above, an unequal-n, One-way ANOVA was performed on the data collected by each of the three experimenters to assess possible differences associated with experimenter. The mean waiting times obtained by the subjects run by each experimenter were as follows: \( E_1 = 738.607 \ (n = 28); E_2 = 697.208 \ (n = 24); E_3 = 720.050 \ (n = 20). \)
FIGURE 3

POOLED FREQUENCIES FOR TEN SCORE RANGES
TABLE 2
SUMMARY TABLE FOR THE 3x2x2 ANOVA TRANSFORMED DATA: ARC SIN OF PROPORTIONS

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (Training)</td>
<td>1.25594</td>
<td>2</td>
<td>.62797</td>
<td>1.983</td>
</tr>
<tr>
<td>B (Content)</td>
<td>.04725</td>
<td>1</td>
<td>.04725</td>
<td>.149</td>
</tr>
<tr>
<td>AB</td>
<td>1.18062</td>
<td>2</td>
<td>.59031</td>
<td>1.864</td>
</tr>
<tr>
<td>C (No Toy/Toy)</td>
<td>.78196</td>
<td>1</td>
<td>.78196</td>
<td>2.469</td>
</tr>
<tr>
<td>AC</td>
<td>1.56042</td>
<td>2</td>
<td>.78021</td>
<td>2.463+</td>
</tr>
<tr>
<td>BC</td>
<td>.01720</td>
<td>1</td>
<td>.01720</td>
<td>.054</td>
</tr>
<tr>
<td>ABC</td>
<td>.17002</td>
<td>2</td>
<td>.08501</td>
<td>.268</td>
</tr>
<tr>
<td>Error</td>
<td>19.00430</td>
<td>60</td>
<td>.31674</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>24.01780</td>
<td>71</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .05
+p < .10

ANOVA results indicated no significant differences between the three groups [F (2, 68) < 1].

Subsequent to the main analyses, a One-way ANOVA was also performed on the three grade levels used in the present investigation. The three grade levels were equally represented in each of the twelve cells of the design and the mean scores were as follows: First grade = 643.5 (n = 24), Second grade = 707.125 (n = 24), and Third grade = 808.25 (n = 24). Despite
the seemingly consistent pattern in means, no significant between-group differences were found in the ANOVA \([ F (2, 69) = 1.825, p > .10]\).

Possible sex differences between the 42 males and 30 females who constituted the present sample were assessed via a \( t \) test. The means for the two groups were nearly identical (\( M = 727.12 \) for males, \( M = 709.133 \) for females) and the resultant \( t \) \([(df = 70), t < 1] \) indicated no significant difference between groups in waiting time.

Regarding the (+ or -) ratings made of content-relevant subject verbalizations, the following analyses were conducted. Reliability was assessed for all subjects by comparing experimenter ratings to those of an independent rater who reviewed the audiotapes made during the waiting periods. An agreement was tallied when the experimenter and the tape rater concurred in their assessment of a given child's verbalizations. The reliability coefficient was calculated by dividing the number of agreements by the number of agreements plus the number of disagreements. No attempt was made to differentiate between experimenters. The obtained reliability coefficient was .972 (70 agreements, 2 disagreements). The subsequent analysis was based solely on experimenter ratings. The means for '+' category subjects, or verbalizers (\( n = 38, M = 821.395 \)) and '-' category or nonverbalizers (\( n = 34, M = 606.765 \)) were compared \([ t (70) < 1] \). Thus, no significant differences were obtained between subjects who verbalized relevant content and
those who did not. In sum, no significant between-group differences were indicated by analyses performed on the variables of: experimenter, grade-level, sex, or verbalization.

As was discussed above, an effort was made to equate training times across the various conditions. To assess the extent to which this was accomplished, means were calculated in seconds (SI, M=921; ME, M=900; SS, M=878) and a One-way ANOVA was run [F (3,23) < 1]. Thus, training times across conditions did not differ to a significant degree.
CHAPTER IV

DISCUSSION

The results of the present investigation indicate that grade school children may employ either distraction or contingency strategies to mediate self-control operations in a delay of gratification task. Furthermore, training techniques of varying structure appear to yield similar results with regard to the elicitation of mediating processes. The present study obtained no differences between groups regarding sex of subject, grade level, or verbalization of content-relevant statements. It is interesting to note, however, that several subjects spontaneously stated that they preferred the covert rather than overt mode of mediation. This lends some support to previous research (Hartig & Kanfer, 1973; Meichenbaum & Goodman, 1969a) which has suggested that grade school subjects prefer to self-instruct in a covert manner.

As illustrated in figure 1, Training and Content may have had an interactive effect, whereby Self-Instruction training tended to work best with contingency content while distraction content was more effective with other training methods. The Contingency Content consisted of more concrete, task-oriented statements in contrast to the open-ended self-suggestions
which characterized Distraction Content. This finding thus suggests an interesting possible confluence with prior Self-Instruction research, the bulk of which has involved similar highly specific task-related, self-guiding statements (cf. Meichenbaum, 1973; Meichenbaum & Goodman, 1971; Robin, et al., 1975). It should be stressed, however, that the Training x Content interaction was merely a trend, and one that "washed out" in analysis of the transformed data. Thus, the above speculations await future research before they can be articulated in any form approaching confidence.

The second obtained trend, that of the Training x No Toy/Toy interaction, was stronger statistically but warrants extreme interpretive caution on additional grounds. The Toy condition was included with the intention of more closely approximating prior research using the delay of gratification analogue (Mischel, et al., 1972). The prediction was that this condition would serve to lower the proportion of subjects waiting to criterion. However, No Toy subjects were run in the first half of the experiment followed by Toy subjects. This design flaw threatens internal validity in allowing for possible alternative explanations of effects vis à vis maturation, concurrent events, etc. (Campbell & Stanley, 1966). These alternatives remain possible despite the fact that the entire investigation was carried out in a continuous four-week period and that public and parochial schools were adequately sampled for both conditions. Thus, while experi-
mental manipulations seem to be the most plausible cause for the obtained trend, the design problem and lack of firm significance render interpretive efforts highly tenuous.

The obtained Training x Content interactive trend suggests that the Toy condition may have generally had the intended effect of lowering mean waiting times, though the reverse would appear to be true in Mediation Essay training groups. As punishment serves as a component within the mediation essay paradigm (e.g., MacPherson, et al., 1974), it may be related to peripheral forms of "temptation" (i.e., not directed specifically at waiting/reward contingency) than the other training modes (whose effects may be focused solely upon the contingency). That is, ME training's added aversive component may provide for a more generalized effect on peripheral situational factors which impede self-control efforts. Conversely, ME training may be seen as involving an aversive component which mildly disrupts subsequent self-control efforts under more favorable circumstances (i.e., the Toy condition). While the above ideas have possible implications for matching training techniques with self-control situations, research evidence must accrue before meaningful formulations can replace speculation.

Content

The present findings indicated no differences between the two types of Content employed: Distraction and Contin-
gency Emphasis. As was mentioned before, two prominent models of mediated self-control differ in the emphasis they placed upon contextual factors. One model stresses distraction strategies (see Mischel, 1974) and the other implicates contingency statements (see Blackwood, 1972). Both positions have, in the past, been able to marshal evidence in support of their own contentions. Thus, from time to time distraction content has been shown superior to contingency instructions (Mischel, et al., 1972) while contingency content has likewise been demonstrated superior to distraction (Hartig & Kanfer, 1973; Kanfer, et al., 1975). However, the seemingly conflicting studies obtaining positive results with distraction (e.g., Kanfer & Goldfoot, 1966) and contingency content (e.g., Blackwood, 1970) have not employed alternative-content groups of equal power (as attempted in the present investigation).

The present results provide some support for the findings from both areas, and further suggest that a broader conceptualization (employing both types of content) would best conform to the available data base. It is possible that the two content types differ situationally in the effectiveness. In addition, it may indeed be that a wide variety of types of content are efficacious or that content tends to be relatively unimportant or idiosyncratic. These alternatives have yet to be systematically explored.

Still another possible alternative comes from basic
mediational research. In paired-associates learning, a variety of elaborative (mediational) strategies are employed by children by the time they reach age five as part of their normal development (Kendler, 1963). By the third grade, children generally employ spontaneous rehearsal strategies when faced with short-term memory tasks (Frank & Rabinovitch, 1974). Certain mediational strategies in coping with learning and memory tasks thus appear to be developmental phenomena. It is fairly plausible, then, to hypothesize a variety of mediational strategies appearing at differing ages as a means of coping with delay of gratification or other self-control type tasks.

Some preliminary support for this contention was obtained via qualitative data collected in the course of the study. Through experimenter observations during verbalization ratings and subsequent review of the tapes by the author, a "content cross-over" phenomenon was observed in (at least) nine subjects. This phenomena involved the subjects' utilization of content related to the untrained condition (e.g., a subject in a distraction group making contingency self-statements). In fact, two subjects (one from each content condition) made apparently sole use of content related to that trained in the other group. It can be argued that subjects in the distraction conditions also had some prior instruction in contingency content (via the Waiting Contingency explanation). The reverse, however, was not true and the frequency of con-
tent cross-over in both directions suggests the possibility that developmental processes or prior learning experiences made the present content types (particularly distraction strategies) especially easy for the children to learn.

The present findings and the current state of research and theorizing in the area of mediational content suggest a number of intriguing areas for future attention. It is clear, however, that all one can state with confidence is that more research needs to be done; both in the area of providing conceptual formulations which accommodate all (or at least most) of the available findings and in the thorough investigation of a number of avenues in which there is a paucity of research. Systematic explorations of developmental aspects of mediated self-control and "matching" studies regarding content types and self-control situations are just two of the available avenues.

Training

The failure to obtain reliable differences between the three types of training was quite unexpected. In fact, it was hypothesized that the varying structure and logically-deduced areas of emphasis (e.g., Self-Instruction makes use of a verbal fading process, Mediation Essay emphasizes information transfer via practice and the visual aid, etc.) would facilitate achieving differences between groups. Indeed, one of the main goals of the present investigation centered
around the explorations of what Self-Instruction and/or Mediation Essay training would add to Simple Statement training. In the present study, however, the above training methods appeared to add nothing--Simple Statement training did equally as well with respect to subjects' waiting times. Furthermore, Simple Statement training was the least "expensive" treatment in terms of trainer's effort expenditure, making this finding potentially important to the cost/efficiency side of the "matching" process. That is, if the present results are generalizable to self-control delay of gratification tasks, then a Simple Statement training procedure would appear to warrant preference over the more structured modes. Future research should be directed at testing this procedure with in vivo self-control problems. In addition, since Self-Instruction training has been criticized as being cost/benefit expensive for certain situations (e.g., Robin, et al., 1975), simplified training procedures require investigative attention as more efficient alternatives.

Limitations

The current study was exploratory in nature and serves to point out a number of potentially fruitful research areas. However, a number of design limitations resulted in interpretive difficulties and plausible alternative explanations. First, the present investigation was intended to test training
and content variations against the baseline (of approximately
50 percent of the subjects attaining the 15 minute waiting
criterion) obtained in previous research using a treatment
similar to the present SSD-Toy group (e.g., Mischel, et al.,
1972). No-training controls were thus omitted from the de­
sign. Differences were expected between training/content
groups and measures were undertaken to allow for the assess­
ment of those differences (i.e., [1] subjects were selected
on the basis of low teacher-ratings with regard to self-
control; [2] only the top two of five possible rewards were
used to ensure a general proximity between preferred and
non-preferred rewards).

In spite of the above, nearly 70 percent of all subjects
waited to criterion. Other differences between the present
study and those from which the expected base rate was ob­
tained may account for this finding. First, the present sub­
jects were slightly older (primary grades versus preschool)
than children run in prior studies (e.g., Mischel & Ebbeson,
1970). While grade level was not a source of significant
differences within the present investigation, the between-
study age differences may have been an important factor.
Second, the content checklist currently employed in the
Simple Statement training groups may have made training suf­
iciently more extensive (in ensuring each child grasped each
major point of content), thus promoting greater delay of
gratification in the Simple Statement groups. Finally,
spontaneous comments by children during their waiting periods suggested that return to their classes presented, for some, an aversive external contingency. That is, removal from class may have served as an escape paradigm, overriding, in part, any experimental manipulations. For example, one subject "changed his mind" vis à vis his preferred choice within a few seconds of the onset of the waiting period. A brief set of excerpts taken from his audiotape follows:

No, I guess I really want the cherry [non-preferred choice] after all. So if I ring the bell I get the cherry [candy] . . . I'll get the cherry but I'll have to go back to Mrs. room . . . If I wait [pause] maybe I can ring the bell just before [experimenter's name] comes back.

The above subject (SIC-No Toy) waited 511 seconds despite the fact that he reversed his choice within approximately 20 seconds of the beginning of the waiting period. In addition, several spontaneous comments (e.g., "Do I have to go back now?" "Can we do something else?") were made both during the waiting period and in the closing period of the subjects' contact. Thus, this external contingency seemed to intrude on the experimental manipulations with some children. While this has not been discussed in prior reports, it seems fairly likely that most preschool environments would not impose an equivalent aversive consequence. Regardless of causative factors, the lack of no-training controls and the consistent excelling of expected baserates poses problems in interpreta-
tion with regard to the present results.

The second design limitation relates to the general lack (despite ratings of verbalizations) of a method with which to unequivocally tie covert mediational events to performance at the waiting task (cf. Jeffrey, 1974). Overt verbalizations were not significantly related to longer waiting times (compare Robin, et al., 1975). This, combined with the problems above, allows for the presence of plausible rival hypotheses which cannot be eliminated. For example, Bem (Note 4) has recently suggested that performance on a delay of gratification analogue (similar to the one currently employed) may largely be a function of compliance. The crucial point is that variations in delay behavior may not be due to mediational processes at all. This is loosely supported by a series of experiments by Blumenthal and Reiss (1974) using a different sort of delay situation (e.g., the choice of 5 cents now or 15 cents in two days). Employing no mediational suggestions or training, Blumenthal and Reiss found 70 to 85 percent of all subjects consistently chose the delayed alternative. It should be emphasized, however, that the Blumenthal and Reiss (1974) research employed a different (choice) type of delay of gratification analogue. Thus, the obtained differences between expected baserates and presently obtained rates of subjects' reaching criterion continues to require further research exploration.

The present investigation failed to obtain significant
differences between groups with regard to main variables of training, content, and No Toy/Toy variations. Secondary variables such as sex, grade level and verbalization similarly did not lead to significant differential effects. However, these results do suggest numerous areas for future research in training methods, training content, and their effects upon mediated self-control. Furthermore, obtained trends suggest several possible considerations in the facilitation of the "match" between training, content, and self-control task. Thus, the present research has added to the rapidly expanding findings and formulations in the area of mediated self-control, hopefully serving to speed the progression to an adequate understanding of this important and intriguing field of study.
CHAPTER V

SUMMARY

In recent years, workers in the area of behavioral self-control have begun to devote considerable research attention to the study of mediational processes which affect self-regulatory behavior in several tasks (Mahoney, 1974; Thoresen & Mahoney, 1974). A significant portion of the research effort has been directed at the facilitation of self-control efforts through the modification of mediational style. Training packages, such as Self-Instruction Training (Meichenbaum & Goodman, 1971) and Mediation Essay Training (Blackwood, 1970), have been designed to alter the style and the content of mediation, thereby providing improved self-regulatory skills.

Successful applications of these mediation training packages to a number of self-control tasks have been encouraging (e.g., Bornstein & Quevillon, 1976; MacPherson, et al., 1974), but more research is needed before confident conclusions can be reached as to their utility. First, a paucity of research comparing the effects of various training packages on performance at specific self-control tasks severely limit the ability to match training method to self-control
problem. Secondly, there is contradictory evidence regarding the most efficacious type of mediational content to be employed in training. Using seemingly similar self-control analogue tasks, investigators have variously found distraction strategies to be superior to contingency-type content (e.g., Mischel, et al., 1972), while others have obtained better results with contingency emphasis compared to prescribed distraction content (e.g., Hartig & Kanfer, 1973). Clearly, more research is needed before mediated self-control training becomes an adequately understood procedure of demonstrated clinical efficacy.

In an effort to forward this process, the present investigation was conducted to: (1) compare three training methods (Self-Instruction, Mediation Essay training, and Simple Statement of instructions); (2) assess the differential effects of two divergent types of training content (Distraction versus Contingency Emphasis); and (3) compare the effects of the presence or absence of periods for play with toys (No Toy versus Toy conditions) on the waiting times of children in a delay of gratification task.

Seventy-two children, selected by their relatively low self-control ratings by their teachers, were blocked on grade level (first through third) and assigned to one of twelve experimental groups. These groups resulted from the 3x2x2 factorial design employing the factors described above. Subjects were individually presented instructions from the
delay of gratification task (modified from Mischel & Ebbesen, 1970) in which they could earn a preferred reward by waiting an unspecified period in the experimental room (in fact, however, a fifteen-minute ceiling was placed on waiting times). If subjects chose to signal for the experimenter's return (thereby ending the delay period), they received instead their second-rated (non-preferred) reward. Following the administration of instructions, subjects received training with content appropriate to their group placement. Subjects in the "Toy" conditions were also allowed pre- and post-experiment play periods. Overt verbalization of the subjects' thoughts was requested as a partial check on the use of mediational strategies.

Nearly 70 percent of all subjects waited to criterion, with no significant differences obtained regarding training, content, No Toy/Toy or several secondary variables. Training x Content and Training x No Toy/Toy interactions approached significance, though their interpretation was tenuous.

The present results did, however, support divergent lines of research with mediational content (e.g., Hartig & Kanfer, 1973; Mischel, et al., 1972) and indicated that both distraction and contingency content need to be included in conceptual formulations of mediated self-control. In addition, the current findings indicated that neither of the more structured training methods was able to add anything of clear effect to Simple Statement training in promoting delay of gratification
(as presently defined). This suggests that the latter, comparatively efficient, procedure may be preferable with this type of self-control task.

The present investigation was exploratory in nature and limited by several factors (such as the difficulty to directly tying mediational phenomena to performance). However, the present findings have added to the existing information regarding mediated self-control, and hopefully they have contributed to the understanding of this area such that the effective match between specific mediational training procedures and self-control tasks is closer to realization.
APPENDIX A

TEACHER RATING SCALE
Teacher Rating Scale

Name of Student ____________________________

Please rate the above student on the scales provided below each item. Make one and only one X per item corresponding to your best estimate of his/her behavior in the situation described. For example:

\[ \begin{array}{c|c|c|c|c|c}
0 & 1 & 2 & 3 & 4 \\
\hline
\end{array} \]

- Please mark on the number nearest to your estimate and mark each item.

1. Rate the degree to which the student is distractible—has trouble attending to tasks or is easily diverted by external events:

\[ \begin{array}{c|c|c|c|c|c}
0 & 1 & 2 & 3 & 4 \\
\hline
\end{array} \]

Almost never distracted \\
not extremely distractible

2. Rate the amount of care taken in making difficult decisions (or impulsiveness in decision-making) in situations like test questions:

\[ \begin{array}{c|c|c|c|c|c}
0 & 1 & 2 & 3 & 4 \\
\hline
\end{array} \]

Impulsive many errors or hasty choices \\
not very careful and reflective
3. Rate the degree to which the child typically approaches problems in a systematic manner:

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Often confused</td>
<td>Average</td>
<td>Orderly in approach</td>
<td></td>
<td></td>
</tr>
<tr>
<td>disorganized</td>
<td></td>
<td>stepwise</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Rate the amount of patience or ability to wait quietly for upcoming events:

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very impatient</td>
<td>Average</td>
<td>Can occupy self well in waiting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>needs to be actively engaged</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. Rate the amount of restraint the student has when tempted to misbehave, such as when the teacher leaves the room and/or a classmate suggests inappropriate behavior.

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easily tempted to misbehave</td>
<td>Average</td>
<td>Very resistant to temptation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Rate the child's knowledge of the effects of his/her behavior (how well can he/she describe the consequences of his/her actions):

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seems only vaguely aware</td>
<td>Average</td>
<td>Very knowl-edgeable of effects of acts</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Please check the anchoring words (below the scales) to ensure that your ratings correctly reflect your estimates. These words indicate the direction of the numerical scale (e.g., 0-impulsive, 4-reflective) and will ensure that your rating was in the correct direction. Thank you.
APPENDIX B

TRAINING STATEMENTS
Distraction Content

First Grade

To help me wait, I will think of fun things. I will sing songs to myself. I will think of my toys and playing with them. I will name colors and all the friends I can think of. I will think of a store and all the things I see there.

Second Grade

To help me wait, I will think of fun things. I will sing songs to myself or play games with myself. I will think of playing with my toys. I will name things like colors, friends, or animals. I will think of going to a store and name the things I see there. I will think of filling up a big basket with things I like and see how many things I can put in it.

Third Grade

To help me wait, I will think of fun things. I will sing songs to myself or tell myself a story that I make up as I go or remember that I heard before. I will name things--colors, my friends, animals, the things in my room--to see
how many I can think of. I will play games with myself like seeing how many words I can think of that start with the letter S. I will think of going on a trip and imagine all the places I see.
Modified Distraction Content for SSD Group.

**First Grade**

To help you wait, you can think of fun things. You can sing songs to yourself. You can think of your toys and playing with them. You can name colors and all the friends you can think of. You can think of a store and all the things you see there.

**Second Grade**

To help you wait, you can think of fun things. You can sing songs to yourself or play games with yourself. You can think of playing with your toys. You can name things like colors, friends, or animals. You can think of going to a store and name the things you see there. You can think of filling up a big basket with things you like and see how many things you can put in it.

**Third Grade**

To help you wait, you can think of fun things. You can sing songs to yourself or tell yourself a story that you make up as you go or remember that you heard before. You can name things--colors, your friends, animals, the things in your room--to see how many you can think of. You can play games with yourself like seeing how many words you can think of that start with the letter S. You can think of going on a trip and imagine all the places you see.
Contingency Content

First Grade

I want to wait so I can get the ________. I want the _______ so I will wait for ____________ to come back. I will get the ________ for ringing the bell and I do not like that as good. So I will wait and get the ________ that I want. It is not bad to wait.

Second Grade

I want to wait so I can get the ________. I will wait for ________ to come back on his/her own so I can get it because I like ________ most. I can ring the bell and have the ________ now but I want the ________. So I will wait a little to get it because I cannot get it now. It will not be hard for me to wait here a little.

Third Grade

I want to wait so I can get the ________. I will wait for ________ to come back on his/her own so I can get it. I like ________ best and if I ring the bell, I have to get the ________. So I can get the ________ now by ringing the bell to bring ________ back, or I can wait for him/her to come back and get the ________. Waiting will not be very hard. I can wait and it will not hurt me. ________ will be back.
Modified Contingency Content for SSC Group

First Grade

You want to wait so you can get the __________. You want the _________ so you can wait for me to come back. You will get the _________ for ringing the bell and you do not like that as good. So you can wait and get the _________ that you want. It is not bad to wait.

Second Grade

You want to wait so you can get the __________. You want to wait for __________ to come back on his/her own so you can get it because you like _________ most. You can ring the bell and have the _________ now but you want the __________. So you will wait a little to get it because you cannot get it now. It will not be hard for you to wait here a little.

Third Grade

You want to wait so you can get the __________. You want to wait for __________ to come back on his/her own so you can get it. You like _________ best and if you ring the bell, you have to get the _________ best. So you can get the _________ now by ringing the bell to bring _________ back, or you can wait for him/her to come back and get the
Waiting will not be very hard. You can wait and it will not hurt you. ______ will be back.
APPENDIX C

SCORE SHEET AND CHECKLISTS
SCORE SHEET

NAME: __________________________

SEX: M F  

GRADE: K 1 2 3

TRAINING TIME: _______________

VERBALIZATIONS: + -

TIME WAITING: _____________

NAME: __________________________

SEX: M F  

GRADE: K 1 2 3

TRAINING TIME: _______________

VERBALIZATIONS: + -

TIME WAITING: _____________
**SIMPLE STATEMENT CHECKLIST:**

**GRADE 1**

**DISTRACTION**

<table>
<thead>
<tr>
<th>Item</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fun Things</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sing Songs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Think-Toys</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name Colors, Friends</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Store</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**SIMPLE STATEMENT CHECKLIST:**

**GRADE 2**

**DISTRACTION**

<table>
<thead>
<tr>
<th>Activity</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fun Things</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sing Songs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Think-Toys</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name Colors, Friends</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Store</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basket</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SIMPLE STATEMENT CHECKLIST:

GRADE 3

DISTRACTION

Fun Things

Sing Songs

Story

Name Colors, Friends

Name Animals, Room objects

Play Games

Trip
### SIMPLE STATEMENT CHECKLIST:

**GRADE 1**

**CONTINGENCIES**

<table>
<thead>
<tr>
<th>Statement</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wait to get . . .</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Want . . .</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Get . . . if ring</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don't like . . . as good</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not bad to wait</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SIMPLE STATEMENT CHECKLIST:
GRADE 2
CONTINGENCIES

Wait to get . . .  
Want . . .  
Get . . . if ring  
Don't like . . . as good  
Not bad to wait  
Wait and get what you want most  
<table>
<thead>
<tr>
<th>Statement</th>
<th>Yes</th>
<th>No</th>
<th>Neutral</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wait to get</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Want</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Get if ring</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Like best</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can ring or wait</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not bad to wait</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not hurt to wait</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
REFERENCE NOTES
REFERENCE NOTES


4. Bem, D. Personal communication following a colloquium given at the University of Montana, Spring 1976.
REFERENCES


Bandura, A. Social learning theory. New York: General Learning Press, 1971. (a)


Goss, A. E. Verbal mediating responses and concept formation. Psychological Review, 1961, 68, 248-274. (a)


Watson, J. B. Psychology as a behaviorist views it. Psychological Review, 1913, 20, 158-177.


Weiss, A. P. A theoretical basis of human behavior. Columbus, Ohio: Adams, 1925.


