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A Self-Instructional Training Program for Impulsive Children

by

Brian C. McMillan

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled A Self-Instructional Training Program for Impulsive Children submitted by Brian C. McMillan in partial fulfilment of the requirements for the degree of Master of Education in Counselling Psychology.

E. E. Fox
Supervisor

Date July 9/1979

Dedication

This thesis is dedicated to my mother with fondest memories ... thank you.

Acknowledgement

I would like to thank the members of the committee, Dr. H. Janzen and Dr. J. Kirman for their insightful comments. Feelings of gratitude are conveyed to my chairman, Dr. E.E. Fox. Because of his foresight, patience, knowledge and sense of humor, this research project became an enjoyable experience. It was a pleasure to work with this scholar and humanist. Sincere feelings of appreciation are also extended to my friends who acted as pillars of support. Finally, to my best friend, my wife, who never faltered or doubted my capabilities during difficult times.

ABSTRACT

A self-instructional training program was introduced to three grade one impulsive children. Selection of subjects was based upon Kagan's (1966) Matching Familiar Figures test. The purpose of this study was threefold; firstly, to measure the efficacy of self-instructional training as an intervention strategy for impulsive children, secondly, to investigate the short term maintenance effects of self-instructional training and finally, to determine if treatment effects would generalize from a clinical setting to the classroom.

The research design used to test the hypotheses was a multiple baseline across three subjects. Baseline data was collected for all subjects during the first week. On the following weekend, one subject was randomly selected to receive treatment while the other subjects were placed in an expectancy control situation. This procedure was continued for the following two weekends until all subjects had been treated. The training of subjects consisted of two 50 minute periods separated by a 20 minute rest period, each Saturday and Sunday. The self-instructional program used was similar to that outlined by Meichenbaum and Goodman (1971).

The dependent variable selected to indicate treatment effects was on-task behavior. Observations were carried out during a morning or afternoon class, when structured lessons were in progress. The method of observation was established on a 10 sec. observe and 10 sec. record bases,

alternating daily for each subject. Subjects found to be on-task for the total 10 secs. received a plus (+) while those who were not, received a minus (-). Overall some 2700 individual observations were recorded.

The results of the study indicated that three grade one children were able to use their self-verbalizations to control their impulsive behaviors and increase their on-task behavior. Furthermore, treatment effects were not only maintained throughout the duration of the study, but generalized from the clinical setting to the classroom.

These findings were then discussed with respect to their heuristic value. More specifically, future research issues were discussed as well as some of the practical implications of the study.

Table of Contents

List of Figures

List of Tables

CHAPTER ONE

INTRODUCTION

While attempting to establish an appropriate yet dynamic introduction, I became troubled. How should I begin and what should I say? Eventually, I found myself embroiled in an internal conversation. The course of the conversation went somewhat as follows ...

> "OK, Brian, the first thing to do is to stay calm and cool. That's it, take a few deep breaths and let's get the wheels turning. Now let's see, where should I start? I know, why not begin with demonstrating how you use your language to help guide and regulate your behavior when writing an introduction to a thesis. Boy, that's a good idea! Writing a thesis introduction isn't all that difficult. In fact, it's relatively simple. All you have to do is to work carefully and slowly. Look how well I am doing. All that I have to write is what I am saying in my head. After all, carrying out an internal dialogue with oneself to facilitate a task assignment is a natural process. In fact, people often talk to themselves to help regulate and guide their behaviors."

The preceding "dialogue" demonstrates the applicability and utility of internal speech as a behavior controlling and guiding vehicle. Cognitive behaviorists such as Meichenbaum (1969) have taken advantage of this reported human ability to develop the intervention strategy of self-instructional training. Because of the recency of this promising technique, researchers have been busy seeking answers for numerous questions regarding the efficacy of

self-instructional training.

One question posed by researchers was, can individuals be trained to talk to themselves in a self-guiding fashion and spontaneously produce covert self-statements to assist in the regulation of behavior? Mahoney (1974) reported that the origins of self-instructional speech as a vehicle for performance regulation could be traced back thousands of years to the Eastern writings of the Bhagavad Gita and the Vedas. Its popularity grew slowly until the twentieth century when the Soviet psychologists, Luria (1959, 1961) and Vygotsky (1962), began to thoroughly investigate the role of covert speech in regulating motor behavior. Luria (1961) hypothesized that the child passed through three stages before reaching the internalized control of behavior. Initially, he explained that the child's performance was controlled by the verbal instructions of external agents, usually his parents or other adults. In time, as his language developed, he began to regulate his own behaviors through his overt self-talk. Finally, these verbalizations became covert and expanded their regulatory influences, assuming a self-governing role. This Soviet research acted as a catalyst resulting in a significant amount of experimental research being conducted to determine if this developmental progression of the Soviet psychologists might be employed as a therapeutic instrument for individuals to regulate their own behavior (Wine, 1971; Bem, 1967; O'Leary, 1968; Palkes, Stewart & Kahana, 1968; Hartig & Kanfer, 1973;

Meichenbaum, 1973a, 1974a,b; Meichenbaum & Cameron, 1974). Because of the limited available research, only the tip of the iceberg has been investigated with the results not overly conclusive. Some of these studies have met with varied levels of success while others (Madsen, Becker and Thomas, 1973; Robin, Armel and O'Leary, 1975; and Giebank, Stover & Fahl, 1968) have failed to support the efficacy of self-instructional training. According to Mahoney (1974), David Meichenbaum has been credited with engaging in the most extensive and clinically impressive work in the realm of self-instructional training. Meichenbaum (1977) offered this statement regarding the efficacy of this unproven therapy, "The techniques are not offered as "proven" procedures, but rather as descriptions of promising tools, which have resulted in quite encouraging initial results".[1] Subsequently, the goal for this researcher is to add empirical evidence to this unproven intervention strategy.

A second question posed by researchers investigating verbal self-instructional training focused upon the issue of treatment generalization and maintenance. Prior to and during the development of cognitive behavior modification, clinicians have been troubled by a lack of response maintenance after the termination of a treatment intervention strategy, as well as failing to demonstrate a transfer of training effects (Bornstein & Hamilton, 1975; Kazdin and Bootzin, 1972; O'Leary and Kent, 1973). The claim made by

the cognitive behaviorists and other researchers (Patterson & Cobb, 1971; Kazdin & Bootzin, 1972) was that the treatment programs employed by the behaviorists were situation specific. Therefore, they were influenced by the setting events, reinforcement probabilities and discriminative stimuli that operate in different settings. Several studies (Kuypers, Becher & O'Leary, 1968; Walker, Mattson & Buckley, 1971; Meichenbaum, Bowers and Ross, 1968) have indicated that generalization of treatment effects from treatment to non-treatment settings have unfortunately been a relatively uncommon event. The persistence of treatment effects over time after formal treatment has been withdrawn, has remained an issue for researchers. The literature (Walker, Mattson & Buckley, 1971; Walker & Buckley, 1968; and Kuypers, Becker & O'Leary, 1968) suggests that treatment effects were not automatically maintained once treatment procedures ceased. One cognitive behavior therapist (Meichenbaum, 1977) maintained that these two preceding obstacles could be hurdled with the advent of considering the individual's cognitions. He advocated that if self-instructions were employed with standard behavior therapy techniques, greater treatment efficacy, generalization, and maintenance would result. An associated and secondary by-product of a self-instructional training program was that it encouraged the development of self-control, which also served to facilitate the maintenance and generalization of treatment. Because the individual can control his behaviors through self-

verbalizations, the individual "inherits" a self-controlling mechanism (Luria, 1959, 1961). According to Kanfer & Karoly (1972), Mahoney (1974), Thorensen & Mahoney (1974), once the training program has terminated, the subject will likely be more capable of generalizing his verbal training across time, behaviors and settings. It would appear advantageous to this researcher for the individual himself to have the ability to control his behavior, as opposed to allowing external agents to have this capacity.

A more extensive rationale will be presented in the review of the literature chapter to substantiate and explain these previous statements. For the present time, this major question exists. Does a verbal self-instructional training program provide a solution to the generalization and maintenance dilemma? Hopefully this research project will shed some light on a rather clouded area.

In order to test the efficacy of such an intervention strategy, a treatment population had to be selected. Considerable care had to be taken to ensure that a suitable and worthy population was chosen. Kagan (1965, 1966) developed the term "conceptual tempo" to describe the two cognitive processes of reflection and impulsivity (R-I). A reflective child was one who responded slowly, carefully and with precision in tasks where response uncertainty was initially high and speed and accuracy were negatively related. Conversely, an impulsive child was one who responded rapidly, resulting in a greater number of errors being made. With

regard to the later group in particular, one has to only consult with elementary school teachers to determine its effect and implications for early childhood education. "Typically, these children react before thinking. Consequently, they are chronically fast and careless in tasks requiring precise analysis and accurate responding." Obviously a student becomes handicapped by being excessively impulsive in educational tasks involving reading, spelling, arithmetic, and writing. Acknowledging this as a problem, one could conjecture that it would be possible to train these children to control their impulsive behavior via covert self-verbalizations. If this was possible, the educational and social implications for these children would be significant. Some attempts have been made (Meichenbaum & Goodman, 1971; Bornstein & Quevillon, 1976) to employ a self-instructional treatment package for impulsive children but additional research is required to accurately measure its efficacy.

Hence, the intention of this research study will be twofold. Firstly, develop a self-instructional training program for three impulsive grade one children. Secondly, assess not only the efficacy of this intervention strategy, but also its capacity as a generalizing and maintenance instrument.

In retrospect, this introduction presented three problems which require further investigation by the researcher. They were determining the efficacy of a self-

instructional training program, establishing an intervention strategy to enhance treatment generalization and maintenance across settings, and developing a treatment program to assist impulsive children in becoming more reflective. Before these issues can be tested, a review of the literature is imperative, if one is to clearly understand and implement a successful intervention strategy.

CHAPTER TWO

REVIEW OF THE LITERATURE

In this study the researcher developed and incorporated a self-instructional training program for three grade one impulsive children. The objectives of the research were to test the efficacy of this intervention strategy as well as its maintenance and generalization capabilities. Before this task could be fulfilled, a review of the literature was necessary if the researcher was to benefit from past research findings related to self-instructional training. This selected review of the literature will focus upon these three areas: self-instructional training, the variables (reflection-impulsivity) and finally pertinent studies and their application to a self-instructional training program.

Self-Instructional Training

Ways of Viewing Cognitions and Subsequent Intervention Strategies

The first premise established by the literature was that there were numerous cognitive behavior modification theories operating within clinical settings. Historically, in 1967 there were only three intervention treatments available for the cognitive behaviorist, according to Meichenbaum (1977). These strategies comprised a blend of Skinner's (1958) behavioral principles with the clients' cognitions. As time passed, researchers Wolpe (1969), Lazarus (1969) and Meichenbaum (1969) began to include

cognitive processes within their treatment procedures. This surge of interest acted as a catalyst in producing a conceptual shift towards emphasizing the role of cognitions. Meichenbaum (1976) proposed that there were currently seven theoretical approaches to cognitions. They included: irrational thinking styles, Beck (1970); irrational belief systems, Ellis (1962); problem solving ability, O'Zurilla & Goldfried (1971); cognitions as part of a response chain, Meichenbaum and Goodman (1971), cognitions as behaviors, Homme (1965), defense mechanisms, Shapiro (1965); and coping skills, Mahoney (1974). Although differences exist between these cognitive restructuring techniques, they were not necessarily isolated from one another. Often, the cognitive behaviorists' blended several of the available cognitive approaches to improve treatment efficacy (Ellis, 1962; Meichenbaum and Goodman, 1971; Lopatto & Williams, 1976; and Bornstein & Quevillion, 1976). In reviewing these various approaches to cognitions, it becomes evident that the treatment approach chosen by the therapist would depend upon his theoretical preference.

For this research study, studying cognitions as part of a response chain was deemed to be critical in attaining behavioral change. Meichenbaum and Goodman (1971) maintained that by using self-instructions as a forced mediation variable, it produced a separation between stimuli and responses causing the behavior sequence to be broken. Wherein, this mediation interrupted the response chain,

likely increasing the potential for the termination of the maladaptive behavior sequence at an earlier stage. If impulsive children were to be trained to become more reflective, it appeared that a self-instructional approach to cognitions would be practical and useful.

Cognitions and Behavior Change

If an individual is to engage in a self-instructional training program, a conceptual understanding of how cognitions bring about behavior change would be required to ensure treatment success. Meichenbaum (1977) provided a theoretical explanation of the psychological processes involved in cognitive behavioral changes. Essential to the behavior change process was the fact that the client had to engage in an intentional sequential process involving the interaction of inner speech, cognitive structures and the resultant outcome from the behavior. The process began with the client reorganizing his behaviors, and understanding the reactions that they evoked in his environment. This recognition led to a specific dialogue which differed from that engaged in prior to therapy. The individual had now commenced the cognitive restructuring process. Finally, this modified covert speech activated coping behaviors which led to new outcomes. The essence and stability of the behavior became dependent upon what the client said to himself following the emission of the new behavioral act and its' related consequences. The psychological behavior change process then reverted back to

its initial phase of internal speech where the cycle could begin again.

For the self-instructional therapist, the differences between cognitive therapies was not the behavioral change process itself, but rather which one of the three change processes was to be emphasized. With this intervention strategy, Meichenbaum (1969) stated that the key process in behavioral change was to alter the client's inner speech. As a result, this researcher would focus his attention upon the inner speech of the client during the behavioral change process.

Three Stages of Behavioral Change

In an effort to gain a clear understanding of the behavior change process, the researcher studied Meichenbaum's (1976) proposal, a three stage approach to behavior change. These phases were not constant but flexible, often interweaving to bring about behavior change. In the initial stage of self-observation, the client became the observer of his own behaviors. An important factor within this stage was the conceptualization process whereby according to Frank (1961), the client and therapist shared a conceptual treatment plan. The person began to understand his behavior from a given perspective during this course of treatment which served to facilitate the behavior change. Contrary to behavior therapy, Lazarus (1972) maintained that the conceptualization process exceeded behavior therapy approaches in that considerable emphasis was placed upon what transpired

prior to the implementation of therapy procedures. Through his internal dialogue or other cognitive processes, the client began to view his maladaptive behavior differently resulting in him feeling a sense of control. This perception of control according to Thornton & Jacobs (1971), helped to reduce the negative effects of stress for the client. The importance of the conceptualization process became obvious, and a necessary element for the researcher to incorporate within his treatment program. Furthermore, within the conceptualization process a translation process occurred for the client. With the assistance of the therapist, the client's initial feelings of helplessness and hopelessness took on a different perspective. The client developed a new explanation for the etiology and maintenance of his maladaptive behavior. Meichenbaum (1977) offered two important variables concerning the observational process. First, behavior outcome was determined by the degree to which conceptualization led to specific changes that could be transferred to real-life situations. Secondly, the translation process was influenced by the cognitive strategy employed by the therapist to prepare the client to explicitly accept the conceptualization which was accompanying treatment intervention.

The initial phase of the self-observation acted as a cue for the client to emanate different cognitions and behaviors, resulting in the client entering stage two. Here the individual learned to produce cognitions and

behaviors that interferred with the maladaptive behaviors. The content of his internal dialogue was dependent upon the conceptualization that emerged in therapy. For a change to occur, the client's verbalization had to initiate a new behavioral chain which was incompatible with his maladaptive behavior. Because the client was capable of coordinating his experiences around the new conceptualization, it allowed him to cope with the problem more effectively.

The final phase of cognitions concerning change involved the process whereby the client produced new behaviors and learned how to assess what to say to himself about the behavior outcome. The person's cognitions or self-verbalizations about the new behavior and their accompaning consequences would influence the generalization and maintenance of the behavior change process. Thus the efficacy of treatment became dependent upon the extent that the client changed both his behavior and internal dialogue.

In summarizing these three stages of behavioral change, it became evident to this researcher that these three processes (self-observation, incompatible thoughts and behaviors, cognitions concerning change), must be included within the self-instructional training program to ensure treatment success.

Factors to Consider in the Behavioral Change Process

Mahoney (1974) outlined four factors which the self-instructional therapist should be aware of when attempting to bring about behavioral changes from a cognitive

theoretical perspective. The therapist must examine the attentional factors of clients'. What the client was attending to may be both an internal or external process causing the maladaptive behaviors. Attentional relevance also included the rehlm of expectancy. An example of this would be the client who experiences progress after receiving only suggestions of therapeutic improvements as found by Kazdin (1973). Another problem area for cognitive therapists was that sometimes an individual's perceived cognitions were quite discrepant from the actual cognitions. Consequently, the job of the therapist was to identify those processes involving maladaptive cognitive contingencies and impart the true contingencies in a manner to establish cognitive restructuring. A third factor responsible for performance variance was response repetoire of the client. If deficiencies existed as a result of physiological restrictions, inadequate learning, poor attention or inappropriate response utilization a client's performance would be inadequate. A final factor to observe in cognitive therapies was the client's experiential feedback. Whether these consequences be observable incentives, vicarious learning or self-generated in origin, they have a definite influence on human behavior. These four cognitive factors presented by Mahoney (1974) provided valuable information for the self-instructional therapist attempting to achieve behavioral change. They, thus were implicit to the study.

Private Speech and Behavioral Change

Since the intervention strategy chosen for this research project was self-instructional training, a definite prerequisite was to investigate how internal speech brought about behavior change. This has proven to be a difficult task as researchers have been unable to derive empirical evidence for this functional role. Cognitive researchers have been forced to deduce from the literature clues to substantiate the functional value of speech. The first clue came from comparing Gagne's (1964) directive function of interpersonal instruction with McKinney's (1973) role of self-instructions. The comparison demonstrated that self-instructions operated in a similar fashion to interpersonal instructions. The second clue was found in Wine's (1970) study with anxiety. She concluded that it was not the arousal state itself which led to decreasing subject performance, but what the individual was saying to himself about arousal. Another hint for the presence of private speech in the change of behavior came from considering studies by Meichenbaum (1972) and Wine (1970). They found that when the subject restructured his cognitions about physiological effects by muscle tension, his newly produced cognitions resulted in his past feelings of helplessness being supplanted by feelings of control. Although these three research areas were diverse in nature, a reoccurring theme developed supporting the hypothesis that internal dialogue can bring about a change in behavior. One should be

cautioned that these findings are not conclusive, additional empirical verification is required.

Language and Self-instructional Training

When exploring the literature on self-instructions a primary element to establish is that language as speech represents a form of cognition (Meichenbaum, 1976), just as is imagery a form of cognition. A second area requiring clarification is, what is the relationship between language, thought and speech? According to Vygotsky (1962), speaking and thinking developed as two separate or parallel processes which became interrelated when a word or element of the speaking system became associated with an element of the thinking system. The interrelationship of these two processes was said to yeild a third process, language. Another explanation was provided by Furth (1966) who stated that thinking can occur without language, but that language can greatly enhance thinking and in turn influence behavior. Regardless of the interpretation, both theorists maintained that a relationship existed between the three processes which has the ability to influence behavior.

The Soviets, Luria (1959), Vygotsky (1962) stated that there were two processes (overt and covert) which allowed man to employ language. The overt process was the external verbalization of language, while covert speech was considered to be overt speech that had gone "underground". The literature forwards an essential assumption regarding covert speech. Studies by Bem (1967), Meichenbaum and Goodman

(1971), Hartig & Kanfer (1973) and Masters and Santrock (1976), maintained that private speech could be taught to children after the age of four. An important study by Kurtz, Neisworth, Goeke & Hanson (1976) attempted to provide an explanation for this process. Their explanation was based on the fact that subject's who received reinforcement for making statements when no discriminative stimuli were present, carried out the target behavior. Therefore, they hypothesized that only covert statements produced by the student acted as self-managed cues in the treatment setting. Assuming that covert speech can be taught, the researcher can now examine the roles of private speech in self-instructional training.

The Role of Covert (Private) Speech

According to Mahoney (1974) and Meichenbaum (1977), internal dialogue served two roles which were essential to the theory of self-instructional training. The first role was that private speech influenced the clients' behaviors. Initial support for the ability of internal speech to control behavior was a result of research carried out by the Soviet psychologists Luria (1951, 1961), and Vygotsky (1962). Luria (1959, 1961) described a three-stage process by which the child eventually became able to use verbalizations to control nonverbal behaviors. During the first stage, the child 0-2 years of age had his behavior influenced by his environment and past experiences. From the ages of 2 to 4, the child entered the second stage. Vygotsky (1962) used

the term functional reorganization to describe this period when the child's overt language began to control his motor behavior. Through the period from 4 to 6 years, the child progressed to the final stage. This period was distinguished from stage two, by Luria (1959), as the directive role of speech incorporating the semantic aspect of speech, and this aspect became dominant. Covert speech was the highest form of intellectual speech that the child developed. Further evidence for the role of speech in controlling behavior was offered by Kanfer & Karoly (1972), who suggested that an intentional statement (saying) might be viewed as a verbal operant for the execution of the intended behavior (doing).

The second role attributed to internal dialogue according to Meichenbaum (1977) and Mahoney (1974) was that it altered a client's cognitive structure. Meichenbaum (1977) explained that what the person said to himself about experienced behaviors would determine whether he accepted the results as evidence which could then alter his beliefs or cognitive structure. The individual's statement provided an explanation of how the internal dialogue could be influenced and adjusted to fit the person's cognitive structure. Sokolov (1972) reiterated the importance of the individual's system of beliefs as they gave rise to a particular set of self-statements which became part of a meaning system. For him, when altering behaviors, in addition to considering the person's internal dialogue, it was also necessary to establish how the inner speech fit within the

cognitive structure.

In summary, this section on language explained for the self-instructional therapist two critical factors in the development of a treatment program. First, that a relationship exists between language, thought, and speech which is capable of influencing behavior. Secondly, that covert speech can alter the behavior of a client as well as his cognitive structure.

Versatility of Self-instructional Training

The scope of problems where self-instructional training has been employed are exceptional upon considering its relatively brief existance. Some of the problem areas where this intervention strategy has been utilized can be gleaned from Table #1.

The clinical history of this versatile therapeutic tool, hardly makes it necessary to elaborate upon its implications for clinicians and educators. These numerous studies not only attest to the versatility of self-instructional training but also attest to the efficacy of self-instructional training.

This was not to suggest that all self-instructional studies have been successful as some studies have not been successful (Madsen, Becker and Thomas, 1973; Robin, Armel, and O'Leary, 1975; Giebank, Stover and Fahl, 1968). What cautions did the literature offer to prevent failure to produce positive results?

Table 1

A Selected Overview of Some of the Treatment Areas Where Self-instructional training has been used

Treatment Area	Researchers and/or Clinicians
creativity	Meichenbaum (1975b)
anxiety relief	Wolpe & Lazarus (1966)
geriatrics	Meichenbaum (1974b)
impulsivity	Meichenbaum & Goodman (1971)
schizophrenics	Meyers, Mercators & Sirota (1976) Meichenbaum (1969)
aggressive behavior	Camp, Blom, Herbert & Van Doorwick (1976)
resistance to temptation	Hartig & Kanfer (1973)
behavior problems	Strober & Bellack (1975) Bornstein & Quevillon (1976) Harris & McReynolds (1977)
hyperactivity	Palkes, Stewart, Kahana (1968) Douglas (1975)
test anxiety	Meichenbaum (1972)
speech anxiety	Meichenbaum, Gilmour, Fedoraricius (1971)
educational television	Meichenbaum & Turk (1972)
control of pain	Scott & Barber (1977)

Meichenbaum (1977) attributed failure of self-instructional programs to several factors. Firstly, if the self-instructions were too general or not sufficiently individualized they would very likely be ineffective.

Secondly, the self-instructions must be sensitive to situational conditions, such as contingencies of rewards and punishment in order to strengthen the appropriate behaviors. Finally, Meichenbaum & Cameron (1972) maintained that having clients merely rehearse self-instructions, would not lead to consistent behavior changes. They believed that there had to be opportunities for the application of the self-instructions with tasks other than just the criterion events. For this researcher, these three concerns had to be carefully surveyed while developing this self-instructional training program.

Treatment Variables in Self-instructional Training

An integral part of the self-instructional training package was covert modeling. Both Meichenbaum (1977) and Bandura (1969) believed that the explicit modeling of cognitive mediating responses facilitated the learning process because the model could first demonstrate coping skills to overcome the maladaptive behaviors and secondly this modeling assisted in the restructuring of maladaptive behaviors. Important to the modeling process according to Meichenbaum & Goodman (1971) was the opportunity for subjects to practice their self-instructions. Similarly, Bender (1976) found that when self-instructions were used in addition to peer modeling, these self-instructions contributed more to the control of impulsive behavior than just the modeled verbalized instruction. In addition, Meichenbaum & Cameron (1972) stressed the inclusion of a skills training program, so that

client's feelings of distress could be changed into feelings of control. When comparing coping and mastering models, Meichenbaum (1971) found that with impulsive kids, exposure to coping models produced significantly greater improvement than observation of a mastery model. He also advocated that the model be more process rather than content oriented. As a result of this review of the literature on cognitive modeling, the researcher has learned that allowing subjects to practice self-verbalization from a process oriented model which including coping skills, will likely facilitate treatment outcome.

A second factor to consider was the self-verbalization process. Behavior change was hypothesized by Meichenbaum (1977) and Masters & Santrock (1976) to be attributed to the fact that the self-verbalizations acted as mediators both covertly and overtly. The question of whether these verbalizations should be taught overtly or covertly initially has been investigated by Toner and Smith (1977). They believed that overt verbalizations should proceed covert processes because they suit the nature of the child, as well as overt speech being more appropos to external supervision during training. Support for this sequence would be provided by Luria (1959) who viewed this process to be a developmental phenomenon. Furthermore, Meichenbaum & Goodman (1971) believed that by encouraging subjects to initially verbalize overtly and then covertly, produced contingencies of reinforcement for their subjects. Because of these findings,

the researcher has decided to train subjects to practise their self-instructions overtly before developing covert responses.

Finally, the literature contains reference to two problems that exist with self-instructional programs. One of the stumbling blocks, according to Meichenbaum (1977) was to get individuals, especially children to use self-instructions. Several solutions were presented for overcoming this obstacle. With children, Meichenbaum (1977) had them use self-verbalizations while they played or developed games to encourage self-talk. Some researchers, i.e. Bornstein & Quevillon (1976) included reinforcers (i.e. "M & M's", Smarties, etc.) to encourage the individual to use self-verbalization. A second obstacle suggested by Meyers, Mercatoris and Sirota (1976) were that subjects needed cues to help them remember to use self-instructions. They suggested that "prompts" could be used to bring about recall to use self-instruction. Similarly, a study by Palkes, Stewart and Kahana (1968) made up pictures and signs to facilitate children in remembering to engage in self-instructions. The previous solutions were important to this researcher's self-instructional program, as he incorporated within the training program, games and pictorial prompts to prevent the self-instructions from lapsing into non-use.

In summarizing this section on self-instructional training, specific salient points were forwarded from the literature which were facilitative in the understanding and

development of behavior change. Similarly, the researcher realized that additional threads of research were required to weave a stronger theoretical fabric for self-instructional training. The following section will concentrate on the treatment population for this research project.

Conceptual Tempo (Reflection and Impulsivity)

Many children have difficulty controlling their behavior. For some, this problem is severe, resulting in them being handicapped, educationally, socially and personally. One segment of the population which has difficulty controlling their behaviors is impulsive children.

Definition

Considerable confusion often arises when attempting to determine a definition of impulsivity, as many individuals have difficulty distinguishing this construct from the construct of hyperactivity. As Papolin & Olds (1975) have clearly pointed out, hyperactivity is a child syndrome which included a complex of behavioral characteristics such as impulsivity, restlessness, an inability to concentrate, a high activity level and emotional ability. Subsequently, impulsivity is one determining characteristic of the hyperactive behavioral syndrome. Kagan (1965) stated that impulsivity and reflectivity refer to a conceptual tempo. Conceptual tempo was defined by Kagan (1965, 1966) as a person's relative disposition to respond quickly (impulsive) or slowly (reflective) in a situation of high response uncertainty, in which several response alternatives are generated

simultaneously. This tendency to be impulsive (I) or reflective (R) may partly be an innate personality characteristic or a function of the environment. Possible evidence for this later statement was a result of research by Kagan (1966), who found that children from lower social classes were more impulsive. Regardless of the nature/nurture dilemma, for those children who's school failure is attributed to being impulsive, special training techniques can be employed (Kagan & Kogan, 1970; Stewart & Olds, 1973). In lieu of the fact that conceptual tempo is a cognitive process, it would appear advantageous to employ a cognitive intervention treatment. One of the more popular treatments has been a self-instructional training program (Meichenbaum & Goodman, 1971).

Factors Related to Impulsivity

Before investigation the efficacy of this intervention strategy, care should be taken to investigate pertinent factors and their relationship to impulsivity. In a literature review by Messer (1976), inconsistent data were found suggesting that a sex difference was present. Using the Matching Familiar Figures Test as a measure of reflection-impulsivity, Ward (1968), Kagan (1965c), found that children demonstrated no difference in responses but that girls did have fewer errors than boys. Harrison & Nodelman (1972) reported 4 1/2 year old girls to be more reflective than boys on both response time and errors. Studies by Lewis, Rausch, Goldberg & Dodd (1968), Zucker & Stricker (1968),

Adams (1972) suggested that there were no sex differences. Researchers have also investigated the possibility of whether there was an age factor present. There were not any inconsistent findings here. Wright (1971), Messer (1976) and Toner, Holstein & Hetherington (1977) reported that with age children became more reflective, but as Kagan (1966) stated, the positions of the children on the reflection-impulsive dimension remain quite stable over time. Another factor, I.Q. was moderately related to impulsivity when the I.Q. fell within the normal range according to Messer (1976), Toner, Holstein & Hetherington (1977), Kagan, Rosman, Day, Albert & Phillips (1964). After correlating 24 studies involving I.Q. and conceptual tempo, Messer (1976) found that the relationship was higher for errors and slightly higher for girls than for boys. Kagan, Rossman, Day, Albert & Phillips (1964) believed that the response latency was positively correlated with non-verbal measures of intelligence. Research has been conducted regarding personality characteristics and social behavior. With respect to the variable anxiety, Messer (1970) stated reflectives were more anxious about making errors while conditions stressing individual competence, resulted in the impulsives experiencing greater anxiety. Considering their ability to sustain attention over a period of time, Zelniker, Jeffrey, Ault & Parsons (1972) established that reflectives were superior. With regard to behavioral control, Messer (1976) reported that the ability of pre-school impulsives to inhibit their

actions was considerably less than reflectives. One can easily discern from this literature, that children who demonstrate impulsive behaviors experience greater problems than their reflective counterparts.

Children who have been classified as impulsive have in general experienced educational problems. In a study by Kagan (1965b), students who were identified as being impulsive in grade one, tended to have the highest reading error scores. Kagan (1965b) summarized the relation between conceptual tempo and reading as being dependent upon the amount of reading uncertainty in the reading materials. Increasing impulsive children's level of reflectivity resulted in improved reading comprehension for grade two students according to Egeland (1974). Surveying the academic success of impulsive students, Messer (1970b) tested 65 grade one students for conceptual tempo. Seven children were found to have failed a grade, 2 years later. Of these seven, 5 were impulsive, and one was reflective. Two years later the same seven children though comparable in verbal intelligence to those children who had not failed, were still significantly more impulsive. Just as in a study by Finch, Pezzuti, Montgomery and Kemp (1974), they demonstrated that impulsives were found to be two grades below reflectives in a group of 12 year olds, emotionally disturbed children in spite of their comparability on achievement tests. Gupta (1970) found reflectives to have generally higher grades than impulsive students. According

to Keogh & Doulon (1972), children who manifested serious learning and behavior disorders were more impulsive when compared to children with less serious learning handicaps. Wright (1971) identified these school subjects as handicaps for the excessively impulsive student; reading, arithmetic, spelling and most subjects involving academic learning. On the other hand, the reflective student was not as adept in these activities: dancing or expressive movement, dramatics, story-telling, and creative art. This review of the literature strongly suggested that impulsive students tend to experience greater difficulty in school.

Before attempting to implement a self-instructional package, researchers had wisely chosen to determine the nature of the problem. The literature reported three areas of deficiency. Bem (1967) discovered in her research that subjects were unable to control their motor behavior appropriately, despite the fact that they had the necessary responses available. She hypothesized that the subjects did have available responses that could serve as mediators of their subsequent motor-behavior; but that these responses did not function as control variables. Therefore, this lack of self-control was due to a comprehension deficiency. This comprehension deficiency implied that the child did not comprehend the nature of the problem and task. Consequently, he/she was unsure of which mediators to use.

In studying subjects from the Kagan (1966) research,

Meichenbaum (1971) found that impulsive children used their private speech (covert) in a less mature and less instructional manner than reflectives. Sixty-four percent of the private speech of impulsive children consisted of immature self-stimulating content (i.e. animal noises, repeating words, singing). In addition, he reported that the calibre of self-stimulating private speech did not decrease in specific goal-oriented tasks. Similarly, Meichenbaum & Goodman (1969) researched the ability of impulsive children to use verbal control on motor-controlled tasks. They reported that under covert self-instructions impulsive children demonstrated significant less verbal control of inhibitory motor behaviors as well as a greater number of errors. These studies supported research conducted by Reese (1962), who believed that impulsive children experience a mediational deficiency. This implied that the mediators the impulsive child used did not guide his/her ongoing behavior.

Another reported area of deficiency for impulsive children was termed by Flavell, Beach, Chomsky (1968) to be a production deficiency. They maintained that the child had the response repetoire, but just could not spontaneously and appropriately use them. Additional evidence to support this assumption was reported by Kagan & Kogan (1970), and Meichenbaum & Goodman (1975). The three problem areas identified from the literature for impulsive children were (1) a comprehension deficiency, (2) a mediational deficiency,

and finally, a production deficiency.

Self Instructional Training and Impulsivity

The task for cognitive behaviorists was to establish an intervention strategy to overcome these deficiencies. Meichenbaum & Goodman (1971) believed that impulsive children would benefit from a training procedure where they would learn to talk to themselves in a directive self-regulatory fashion. Subsequently, Meichenbaum & Goodman (1971) developed a self-instructional training program to train impulsive children to talk to themselves as a means of developing greater self-control in an attempt to control their impulsiveness. Dykman, Ackerman, Clements & Peters (1971) agreed with Meichenbaum & Goodman's (1971) rationale. They proposed that impulsive children required training in internalized "linguification". These researchers presumed that by training the child to talk to himself, he would gain greater control of his impulsive behaviors. The goal of the self-instructional training program was twofold: first to teach the children to recognize and classify their impulsive behaviors and the cues that activate them at different intensity levels, and secondly to have them spontaneously produce cognitive and behavioral coping responses to improve their self-control. Employing this rationale, self-instructional programs have had some success with reducing levels of impulsive behaviors in children (Meichenbaum & Goodman, 1969; Meichenbaum & Goodman, 1971; Douglas, 1975; Bornstein & Quevillon, 1976;

and Bugental, Whalen & Henker, 1977). Although the evidence is encouraging, it is still not sufficient to guarantee the efficacy of self-instructional training. It is the intention of this researcher, to contribute to the presently available bank of knowledge.

Pertinent Studies and Application of Self-instructional Training

This portion of literature review will focus upon pertinent research and their relevance for four critical components of the research project. They include research design and subjects, salient factors in self-instructional training, self-verbalization and maintenance and generalization of treatment.

Design and Subjects

One of the first decisions for a researcher to make is the selection of appropriate research design. The popular research design of ANOVA (used by Meichenbaum & Goodman, 1971) was quickly ruled out because as Messer (1976) stated it did not fit the trait variables of reflection impulsivity. Craighead, Mahoney & Kazdin (1976) held that in cognitive behavior research inferences are made, therefore "talk of cognitive processes must be defined in terms of the operations used to measure them and that all cognitive behaviors must be anchored to publically observable data".[2] As a result, Craighead, Mahoney & Kazdin (1976) and Hersen & Barlow (1977) have suggested a multiple baseline across subjects as an appropriate design

to measure treatment effects. The number of baselines to include for this research project would be three, due to Wolf & Risley's (1971) statement that a set of three or four baselines was convincing evidence of behavior change. The "anchor" (dependent variable) chosen to measure the efficacy of a self-instructional training for this project was on-task behavior. Studies by Bornstein & Quevillon (1976), Meyers, Mercatoris & Sirota (1976), Wright (1971), Kagan, Rossman, Day, Albert & Phillips (1964), have confirmed that on-task behavior was an appropriate dependent measure to represent change in conceptual tempo. Another important decision for the researcher was the selection of subjects. The choice of six year olds as subjects was based upon Luria's (1959, 1961), Vygotsky's (1962) research which stated that 4 to 6 year olds were capable of both producing and learning covert speech (e.g. Bem, 1967). Thus, these previous studies have allowed the experimenter to determine a workable research design.

Relevant Factors in Self-instructional Training

Several studies have outlined specific factors to enhance self-instructional training. One variable found to improve treatment success was the incorporation of collaboration with the child (Meichenbaum, 1977). The purpose of this construct was twofold. Firstly, to attempt to define and diagnose the subjects problem and secondly, through collaboration develop an individualized program to meet the child's specific needs. Mahoney & Thoresen (1974)

supported an individually tailored program, as they felt it took into account linguistic variability and individual differences. Although other studies of self-instructional training (Bornstein & Quevillon, 1976; Meyers, Mercatoris & Sirota, 1976; Harris & McReynolds, 1977; Novaco, 1976) did not stress this factor, this researcher planned to include collaboration in the treatment package. Another important variable to be included within training was subject attribution. Bugental, Whalen and Henker (1977) reported that subjects who believed in intrinsic causality were more effective at self-regulatory behavior. Consequently, a goal for the researcher during collaboration would be to have the subjects understand that they were in control and capable of changing their impulsive behaviors. Both the collaboration and attribution factors were deemed as necessary components for self-instructional training.

Self-verbalization

A major component of the self-instructional training program was the self-verbalizations. Considerable research has been carried out, suggesting what pertinent considerations must be made when employing self-verbalizations. To begin with, numerous studies by Harris & McReynolds (1977), Masters and Santrock (1976), Karoly & Dirks (1977) emphasized the importance of having the self-verbalizations contingent upon the occurrence of the target behavior. An interesting study by Karoly and Dirks (1977) showed that subjects who followed a say-do behavior as opposed to

a do-say behavior developed a higher level of correspondence behavior. Masters and Santrock (1976) maintained that a crucial factor of the self-verbalization, was affect, because it provided the motivating force for determining behavior change. For Patterson and Mischel (1976), the specific content of the self-instructions was a salient factor. Furthermore, research by Hartig & Kanfer (1973), Kurtz, Neisworth, Goeke & Hanson (1976) indicated that verbalizations which were task relevant facilitated treatment, while irrelevant verbalizations were not as effective. Another important consideration was presented by Wine (1971) and Goldfried (1970) who emphasized that self-verbalizations needed to be practised as this not only enhanced self-control but as Weissburn and Lamb (1977) suggested, allowed for greater self-instructional experience. After reviewing these studies involving self-verbalizations, this experimenter incorporated these findings in designing the self-instructional treatment program.

Maintenance and Generalization of Treatment Effects

An objective of this research project was to obtain maintenance and generalization of behaviors across settings using self-instructional training. Support for the importance of cognitions came from Lang (1968), who hypthesized that "the absence of programs for shaping cognitive sets and attitudes may contribute to the not infrequent failure of transfer of treatment effects".[3] The likelihood

of achieving these goals were minimal, according to Wahler (1969); Kuypers, Becker, O'Leary (1968); Walker, Mattson, & Buckley (1971). The problems confronting treatment generalization and maintenance appeared to be that they were not natural consequences of treatment, thus suggesting that special factors should be incorporated into the treatment program. One such factor advocated by Kanfer (1970), Mahoney (1974) and Mahoney & Thoresen (1974) was to teach self-reinforcement strategies to facilitate post treatment effects, as they compensated for the withdrawal of overt reinforcement. Other studies (Meichenbaum, 1973; Douglas, 1975; Meichenbaum and Goodman, 1971) have stressed the importance of training the subjects appropriate self-verbalizations and coping skills. Meichenbaum (1973) hypothesized that these self-instructions emphasized words which were abstract representations of stimulus events. The researchers, Weissberg and Lamb (1977) attributed their treatment generalization to coping skills they included within treatment. The subjects attributions and reasons for change, according to Kopel and Arkowitz (1975) played an instrumental role in the maintenance of behavior change. A related variable, according to Meichenbaum (1977) was for the client to understand the procedures and requirements of the treatment package. Another ingredient added to facilitate treatment generalization was employed by Bornstein & Quevillon (1976). They had subjects role play (pretend) that they were performing school work for the

teacher within the treatment setting. In an effort to maximize treatment maintenance and generalization across settings, the researcher "built-in" these reported findings into his self-instructional training program. Although self-instructional training studies by Kurtz, Neisworth, Goeke and Hanson (1976), Bornstein & Quevillon (1976), Weissberg and Lamb (1977), Meuers, Mercatoris, Sirota (1976) have reported relative success in attaining generalization across settings and short-term maintenance, this limited amount of evidence is inconclusive. Additional research is required to validate its effectiveness in attaining treatment generalization and maintenance.

Upon reviewing the literature there remain three major questions to which this research project is addressed:

(1) Can a group of grade one impulsive children be taught to use language in a self-guiding manner to control impulsive behaviors?

(2) Is self-instructional training an effective intervention strategy for reducing impulsivity in grade one children?

(3) Will behavioral change, obtained in a treatment setting be maintained and generalizable to a non-treatment setting when employing a self-instructional intervention strategy?

The Hypotheses

More formally the hypotheses are:

(1) A grade one impulsive child can be taught to use

his language to control impulsive behaviors.

(2) Self-instructional training is an effective intervention strategy for reducing impulsivity (as measured by on-task behavior) in grade one children.

(3) A self-instructional training program will produce short-term treatment maintenance effects for impulsive children.

(4) A self-instructional training program can produce treatment generalization across settings for impulsive children.

The following chapter will explain the experimental design and procedures used to test these hypotheses.

CHAPTER THREE

DESIGN AND PROCEDURE

In this chapter the reader will find an explanation of the pertinent variables of the research design and a description of the procedures. The following topics will be discussed: subjects, general procedure, dependent variable, observation and recording procedures, reliability of observations, expectancy control, instrumentation, and the self-instructional training program.

Description of Subjects

Three subjects were selected from a grade one class of fourteen students who attended an elementary school in the Edmonton Public School System. Criterion for selection of subjects was determined by their performance on Kagan's (1966) Matching Familiar Figures Test (M.F.F.). The following is a brief description of the three subjects.

Subject #1 Deanna, was a 6 year old white girl from a middle class family. It was her second year in grade one. Anecdotal reports indicated that she was a restless child who found it difficult to control her physical behaviors. An example of this was her tendency to get up out of her desk suddenly. Deanna's teacher described her to be a day-dreamer. Deanna's level of school achievement was rated as below average.

Subject #2 Nate was a six year old black male living with an upper middle class family who have adopted him. He was

described by his teacher to be a "moody" child performing at a below average level of achievement. Major problems included stubborness, inconsistent motivation levels, inattentativeness and weak work habits (i.e. rushed through his work which resulted in careless errors).

Subject #3 Tamara was a six year old white girl from a middle class family. Her teacher reported that she had few friends, inconsistent work habits, and problems with following instructions. Tamara also reportedly demonstrated mood changes and attention seeking behavior. Her level of school achievement was average.

General Procedure

One week prior to initiating the research project, the experimenter administered the Matching Familiar Figures test to a grade one class to determine subjects for treatment. Five children were identified as being impulsive according to the M.F.F. test. The parents of these children were contacted in order to gain their permission and co-operation. From these five parents, three agreed to have their children participate. During the weekend of testing, both parents and children visited the University of Alberta Clinical Services Centre. The purpose of the meeting was to orient parents and children to the facilities in an effort to avoid possible anxiety produced from engaging in a new experience. Attention should be directed to the fact that neither parties were provided with information regarding the exact nature of the study.

The experimental design chosen for this research project was a multiple baseline study across three subjects. In order to implement this program, the following steps were taken. During the first week, the experimenter visited the subjects' classroom where baseline data was collected from the first five days of school for all three subjects. On the first weekend of treatment which included both Saturday and Sunday, the three subjects attended the university clinic where they individually received a two hour, session each day. Because of the age of the subjects, the training session was divided into two 50 minute periods separated by a twenty minute rest. One of the three subjects was randomly chosen to receive treatment (self-instructional training) during both sessions of the weekend. The other two subjects were exposed to the same stimulus materials. In this expectancy control condition the experimenter modeled the appropriate responses and also assisted the subject in performing the various tasks.

Training materials used throughout the study consisted of exercises from the subjects' mathematics, phonetic and reading books, as well as materials from the Mental Abilities Test (K-1), Porteuse Maze, Wechsler Preschool and Primary Scale of Intelligence (W.P.P.S.I.) and several practice assignments similar to those on the M.F.F. test. During the second week, baseline data was collected for the two nontreatment subjects while treatment data was collected on the treated child. On the second weekend,

one of the remaining subjects was randomly chosen to receive the treatment package while the other child continued in the expectancy control condition, as outlined in the first weekend. Observational data was collected for the two treatment subjects as well as the subject who was still functioning on baseline. The remaining nontreatment subject received treatment on the third weekend. Subsequently, for the remaining three weeks, treatment data was collected for all subjects.

Dependent Variable

The dependent variable was on-task behavior. The operational definition for on-task behavior was that when asked to participate in a work period, the student would perform the prescribed and accepted classroom activity. To add validity to this definition, the classroom teacher was asked to outline what the appropriate and expected classroom behaviors were. This course of action helped to take into account individual classroom teacher expectations. Subsequently, the child was to be attentive and silent during teacher instructions. Similarly, when working on a task, the child was to work independently and if assistance was required, raise his/her hand. Therefore, off-task behavior included carrying out any behaviors which were not consistent with the task set forth (e.g. moving about the room, gazing out the windows, fighting, speaking out, or playing with toys, pencils, etc.).

Observation and Recording Procedures

Behaviors were recorded as either off-task or on-task by the observer. Data was collected for a period of six weeks. In all, over 2700 individual behaviors were recorded. Throughout the study on-task and off-task behavior notes were collected during either morning or afternoon periods each day. This helped to take into account subjects' performance variation as a factor of the time of day. Data was collected only when formal instructions and assignments were being carried out, to provide for a clearer indication of the presence or absence of appropriate behavior. Also, in an effort to extinguish academic preferences, data was collected across most school subjects and activities (e.g. printing, reading, phonics, arithmetic, story-time, show and tell, etc.). Consequently, the periods of data collection were not constant, but for each observation period (morning or afternoon), a minimum of thirty observations were made at the appropriate times.

The recording of on-task behavior was measured as a 10 second "observe" and a 10 second "record". If the child was on-task it was coded as a plus (+), but if the subject was off-task, it was scored as a minus (-). In order to receive a (+) the child had to be on-task for the entire 10 seconds of observation. Each day, the order of subject observation was randomly changed. Throughout the observation period, the observer would watch the first subject for 10 seconds and then take 10 seconds to code his behavior

before moving on to the second subject on the list. This pattern of recording was repeated until termination of activity.

The observer sat off to the side of the classroom, attempting to avoid all forms of physical or verbal contact with the children whenever possible.

Reliability of Observations

Because of the nature of the researcher's financial position, observers could not be obtained. As a result, the experimenter was to be the observer. In order to establish reliability and rule out experimenter-observer bias, portions of the classroom activities were video-taped and scored by the observer so that they could later be rated by two neutral observers. In this way, inter-rater reliability scores could be obtained. Following completion of data collection, two senior graduate students from the faculty of educational psychology were trained on how to observe and categorize off-task or on-task behavior. Both observers were naive as to the nature of the study and the reason for their observation. The observers rated video-recordings of all three subjects across a variety of activities from various days throughout the study.

Subject rating was recorded simultaneously by both observers who were informed as to which child to score by the experimenter. The reason for this, was to allow for the experimenter's previous ratings to be matched with the observers. Therefore, the three records (experimenter and

observer I and observer II) could be compared interval by interval for each subject and a measure of agreement obtained. Agreement was calculated by taking the number of observer agreements divided by the total number of agreements plus disagreements. Agreement constituted all observers recording the same behavior during the same 10 sec. observation interval. Disagreement was scored when one observer recorded a behavior code that the other had not. An inter-rater reliability of .90 was established and may statistically be regarded as satisfactory.

Expectancy Control

Attempts were made by the experimenter to control for any nonspecific treatment affects (e.g. attention from experimenter, interaction with stimulus materials, etc.). All three subjects were given 100 minute training sessions with the experimenter on the same day that the self-instructional training program was to be administered. Because of the nature of the experimental design, a multiple baseline across subjects, the treatment "package" was sequentially administered. While the randomly selected subject was receiving self-instructional training, the remaining two subjects were instructed to work on similar training materials. During this expectancy control situation, the subject worked independently after receiving the necessary instructions from the experimenter as to how to carry out the assigned tasks. If the child experienced difficulty, the

experimenter modelled the appropriate response and explained how the answer was determined.

Instrumentation

The instrument used to determine conceptual tempo (reflection-impulsivity) was Kagan's (1966) Matching Familiar Figures Test. Operationally this construct has been defined as a composite of two dimensions, latency to first response and accuracy of choice or total errors. In this test the child was asked to select from six variants one picture which was identical to the standard. (See Figure 1).

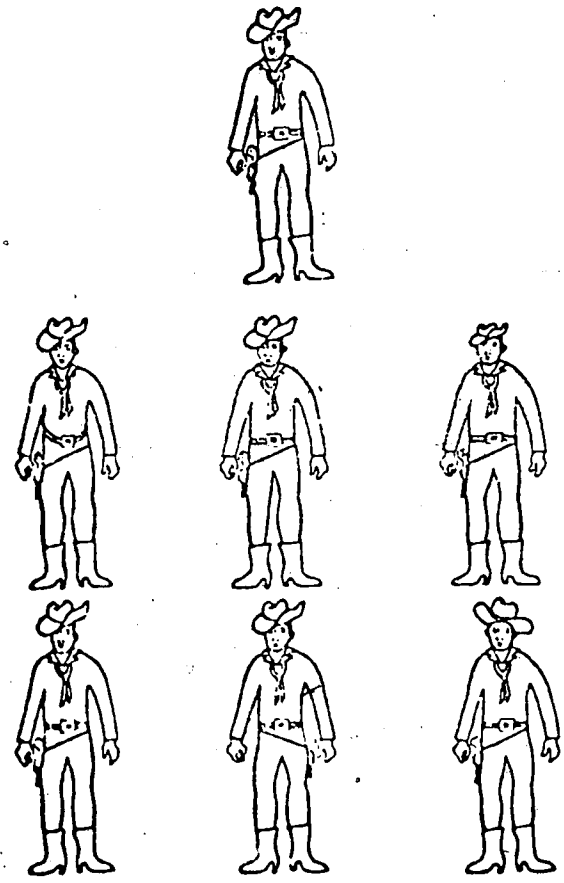

Figure 1: A Sample Item From Kagan's (1966) Matching Familiar Figures Test

The following instructions were given to the subject, "I am going to show you a picture of something you know and then some pictures that look like it. You will have to tell me the number of the picture on this bottom page (point) that is just like the picture on this top page (point)" (Kagan, 1966). Scoring the test consisted of the experimenter recording latency to first response to the half-second, and then totalling the number of errors for each item and the order in which the errors were made. Classification of subjects was achieved by employing a double split median for latency and errors. Subsequently, subjects whose scores fell below the sample median for errors and above the sample median for latency, were referred to as reflective (slow-accurate), while those whose scores fell above the sample median for errors and below the sample median for latency were considered to be impulsive (fast-inaccurate). Those subjects whose scores fell within the remaining two quadrants, using the two dimensional criteria, were considered as fast-accurate and slow-inaccurate. All fourteen children were administered the M.F.F. on the same day.

Reliability and Validity

Reported reliability and validity scores for the M.F.F. test have been inconsistent. The author Kagan (1966) stated that the M.F.F. response times correlated .44 and .34 with reponse times of two forms of a design recall test, which the author considered to be a measure of reflection. In Messer's (1976) review of the literature, he reported the

following test retest reliability scores for (1) response time .58, .58, .73 and .96, and corresponding errors .39, .34, .43 and .80. Block, Block and Harrington (1974) reported an internal consistency reliability coefficient for response time of .89, but a reliability of .62 for errors. A study by Yando and Kagan (1970) to determine the convergent validity produced median correlations of .73 for response time and .68 for errors across 10 different Matching Familiar Figures Test.

Problem

Because individual scores on the M.F.F. cannot be scaled but are merely blocked, problems arise. Depending upon the sample tested, a child may be reflective on one test while on a second test, he might be considered impulsive. In an effort to alleviate this problem, the experimenter obtained a set of norms recently developed by Salkind (1978), which permitted a comparison of research subject scores, to standardized median scores for children of identical ages. This strengthened the validity and reliability of test results.

Treatment: Self-instructional Training Program

For the initial training day (Saturday), the primary goal was to introduce and train the subject how to use self-instructions to regulate behavior. The training was introduced to the subject as follows:

Experimenter: "Do you remember the test that you took

where you had to pick one picture from six that matched the one at the top?"

Child: "Yes!"

Experimenter: "How do you think you did on that test?"

(If the child was not sure of question, experimenter prompted child by asking, did you make many mistakes or have difficulty doing the test?)

Child: "Well, not very good, because I made a lot of mistakes."

Experimenter: Why do you think that you made the mistakes?"

Child: "Oh, I don't know. I guess that I just picked one of the pictures quickly and was not careful."

Note: (The goal here was to have the child realize why he had made the numerous errors. Often, the experimenter and child spent additional time to discuss this issue.)

Experimenter: "Well, I know a trick that will help you do better work and not make as many mistakes. Would you like to learn my new trick?"

Child: "O.K."

Experimenter: "We call the trick "Peter Parrot". Do you know why we call it "Peter Parrot"? (If child is having difficulty the experimenter asked child, what does a parrot do?)

Child (usual response): "It can talk".

Experimenter: "That's right, and if you talk to yourself like a parrot, it will help you. Let me show you."

This introduction sequence was then followed by the self-instructional training procedure as suggested by Meichenbaum & Goodman (1971). The following six steps were

implemented.

Step (1): The experimenter provided the child with the necessary verbal instructions to cope with the problem or task. This was accomplished by providing some cognitive modeling in the form of overt speech.

Cognitive Modeling

To facilitate the child's acquisition of the performance relevant skills included within the cognitive modeling process, the child was instructed that these were "Peter Parrot's" rules for carrying out the trick. They included:

(A) Ask myself what I am to do.

(B) Repeat what I am supposed to do.

(C) Explain how I am going to do the problem by talking to myself.

(D) Praise myself for doing the problem.

(E) Ask myself how I can do it better next time.

Step (2): The child performed the task while the experimenter instructed the child overtly. (The experimenter states, "Now I'll tell you how to do it, while you carry out the task"):

Step (3): The child then repeated the experimenter's instructions overtly.

Step (4): The child performed the task himself using his own set of self-instructions to guide his behavior.

Step (5): The subject performed the task whispering the

self-guidance instructions softly.

Step (6): The child performed the task with covert self-instructions. Here, the child was asked to just move his lips.

The preceding dialogue and step consideration is an illustration of the cognitive modeling employed by the experimenter. The tasks chosen for demonstration purposes were question items similar to those used on the M.F.F. test. The purpose of this was twofold. First, the experimenter wanted the subject to be familiar with the task, and secondly by using the "Peter Parrot" trick, the child would have personal evidence that when he used this strategy it worked. Questions which resulted in errors before, could now be completed, resulting in the child becoming motivated.

Experimenter: "O.K., what is it that I have to do? You want me to pick the picture of the one airplane, from these six airplanes, that looks just like the one at the top. I will have to go slowly and carefully. Now, I will begin by looking at one portion of the plane from the top and comparing it to the six on the bottom. Hey, that's a great way to do this. I'll start by counting the engines. The plane at the top has four, so let's see how many engines the bottom plane has. This plane has four engines so it might be this one, but this plane has only three engines so it can't be this one. Boy, this is not hard to do. Now the other four planes have four engines. Whoops, I made a

mistake! This last plane doesn't have four engines. Making a mistake is all right because I can go back and correct it. Remember, if I go slowly and look at each plane carefully, I won't make any mistakes."

Through the process of elimination this procedure is continued until the child finds the plane that matches the one at the top. At this time these summary self-instructions would be stated to complete the cognitive modeling.). "There, I did it! I found the plane that looked just like the one at the top. I did a good job. I wonder what I could do next time to help me do better. Oh, I know. The next time I'll cross out the pictures that aren't the same as the airplane at the top. This will help me to remember which planes are different."

The progression from one step in the training package to the next was determined when the subject had successfully completed the required procedure. When necessary, the experimenter returned to step one if a child was continuing to make errors. As soon as the subject had successfully completed the training sequence for the designed task, the entire process was repeated with the assigning of a new task. Each successive task increased in its rate of difficulty as the training session progressed. Subsequently, on both days of training, the child continued to practice his or her self-verbalizations across numerous tasks. Periodically, the child was asked to repeat "Peter Parrot's" rules from memory as this was essential to the training program.

During the Sunday training program, if the child had successfully acquired the self-instructional training package, several games were played to help the child improve his/her "Peter Parrot" skills. One game was called robot, which involved the experimenter giving the child a set of instructions, (e.g. "Please go and close the door.") Being a robot, the child repeated back the instruction and proceeded to carry out the task. A second game played was called "Copy Cat". In this game the child's job was to repeat exactly what the experimenter said to her. Both of these games were implemented, in order to help the child improve his/her listening skills as well as provide an opportunity to practice her cognitive rehearsal skills (self-verbalizations.) An additional variation from Saturday's treatment package, was that the child and instructor engaged in role playing. The subject was informed that we were going to play school and that I was the teacher and he/she would be the student. What ensued was that the child was provided with some school work and informed to carry out the "Peter Parrot" trick. Meanwhile, the teacher (experimenter) pretended to be busy walking around the room, talking to imaginery students and marking work. If the subject worked diligently throughout the role playing exercise, he/she received verbal praise from the experimenter. The purpose of the role playing was to facilitate possible treatment generalization across settings and maintenance. Attention should be drawn to the fact that, self-instructional

training was provided only during the randomly selected training periods. Once the training period had terminated, the subjects were not encouraged or asked about the treatment package upon subsequent visitations.

In conclusion, the researcher has presented an overview of the critical variables involved within research design and its procedures. The overall objective of this chapter was to ensure the understanding of this study and provide the necessary information for its replication.

The succeeding chapter will explain the results and conclusions obtained from these experimental procedures.

CHAPTER IV

FINDINGS AND CONCLUSIONS

It will be recalled that the intention of this research study was to test the efficacy, generalization and maintenance capabilities of a self-instructional training program with three grade one impulsive children. In so doing, four hypotheses emerged from chapter two which required verification. In this chapter the experimenter will present his findings and conclusions. In order to test the hypotheses concerned, the researcher utilized a multiple baseline across three subjects for six weeks, collecting over 2700 individual observations. Since mental events such as self-instructions are unobservable events, the experimenter incorporated observable physical events (the depend variable) to acknowledge their presence. The dependent variable selected to demonstrate treatment effects was on-task behavior. An increase in on-task behavior would represent a decrease in level of impulsivity as well as positive treatment effects. Because of the nature of the design, interpretation of data was obtained by visual analysis. In addition, percentage scores as well as percentage mean scores of on-task behavior for both baseline and treatment segments of the graph were used to supplement this visual analysis.

Hypothesis #1

Grade one impulsive children can be taught to use

their language to control impulsive behaviors.

Findings

It can be noted that through visual comparison of the baseline and treatment data in Figure 2, that all three subjects (Tamara, Nate and Deanna) improved their on-task behavior immediately upon the introduction of the intervention strategy. Because the intervention strategy required subjects to employ their language to carry out the treatment program, it can be inferred that they were able to use language to reduce their impulsive behavior.

Conclusion

Visual analysis of the data confirms Hypothesis 1, therefore it may be concluded that grade one children can, via language, control impulsivity.

Hypothesis #2

Self-instructional training is an effective intervention strategy for reducing impulsivity as measured by on-task behavior in grade one children.

Findings

Visual observation of the baseline and treatment scores in figure 2 demonstrated that with the immediate implementation of the self-instructional training program, on-task behavior scores increased substantially. Mean baseline scores of 59%, 51.38% and 52.54% for Tamara, Nate and Deanna increased after treatment to 83.47%, 74% and 81.13% (see Table 2). This represents a mean difference from baseline to treatment of 24.47%, 22.60%, and 28.60%

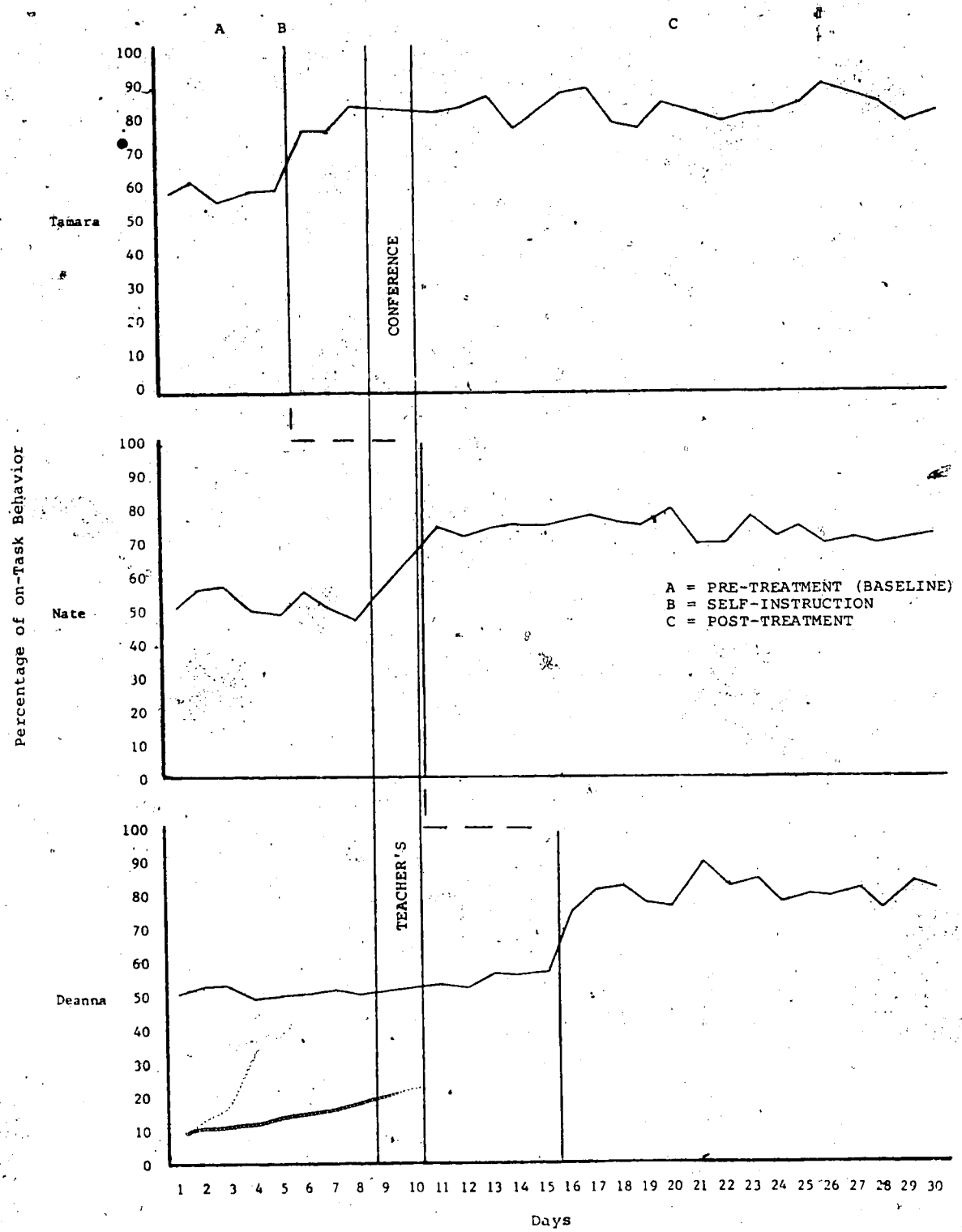

Figure 2

Daily Percentage of on-task Behavior for Tamara, Nate and Deanna Across Experimental Conditions

respectively. In summary, the mean percentage increase of on-task behavior for Tamara, Nate and Deanna were 41.47%, 43.98% and 54.43%.

Table 2

Summary of Data from Multiple Baseline Observations

	Tamara	Nate	Deanna	Subjects
Mean	59%	51.38%	52.54%	
Highest % Score	62%	56%	58%	Baseline
Lowest % score	56%	46%	48%	Data
Mean	83.47%	74%	81.13%	
Highest % score	91.%	81%	90%	Treatment
Lowest % score	77%	70%	76%	Data
Mean differences between Baseline & Treatment	24.47	22.6%	28.60%	
Mean % increase of on-task behavior	41.47%	43.93%	54.43%	

Conclusion

On the basis of this analysis, Hypothesis number 2 may be accepted. It can be said that a self-instructional program can lead to reduced impulsivity (i.e. increased on-task behavior) in children.

Hypothesis #3

A self-instructional training program will produce short-term treatment maintenance effects for impulsive children.

Findings

Visual analysis of post-treatment data for all three

subjects indicated that treatment effects were maintained for a period of: five school weeks for Tamara, four school weeks for Nate, and three school weeks for Deanne (Figure 2). The consistency of treatment maintenance becomes clearly evident upon inspecting the minimal amount of amplitude between each subject's lowest treatment score with their mean treatment score. The difference in scores were 6.47% for Tamara, 4% for Nate, and 5.13% for Deanna (Table 2).

Conclusion

On the basis of this analysis, Hypothesis 3 may be accepted. Short-term maintenance has been demonstrated to be fairly constant for up to five weeks.

Hypothesis #4

A self-instructional training program can produce treatment generalization across settings for impulsive children.

Findings

It was noted that after a self-instructional training program was administered within the clinical setting (Figure 2, letter B) that the mean on-task behavior increased in the classroom for all three impulsive subjects by 41.47% (Tamara), 43.98% (Nate) and 54.43% (Deanna). Therefore, it can be inferred that treatment generalized from the clinical setting to the classroom for the three subjects.

Conclusion

On the basis of this analysis, Hypothesis 4 may now be accepted. Therefore, it may be concluded that clinical to classroom generalization of treatment is possible.

Conclusions

In summary, the above findings suggest that the following conclusions can be inferred:

1. Impulsive grade one children can be taught to use their language to control their impulsive behaviors.

2. A self-instructional training program is an effective intervention strategy for reducing impulsivity in grade one children.

3. Self-instructional training can produce short-term maintenance effects for impulsive grade one children.

4. Self-instructional training can produce treatment generalization across settings for impulsive grade one children.

CHAPTER V

DISCUSSIONS AND IMPLICATIONS

The major objective of this study was to test the efficacy of a self-instructional training program and to determine the generalization and maintenance potential of such a program. More specifically, the researcher was attempting to establish if grade one impulsive children were capable of utilizing their language and a self-instructional training program to reduce their impulsive behavior tendencies and increase their on-task behavior. Furthermore, once introducing this intervention strategy within a clinical setting, determine if training would be maintained and generalize to their classroom setting. In this chapter references will be made regarding the following:

1. procedures taken to enhance the validity and reliability of the study,
2. hypothetical explanations for these findings,
3. implications for future research,
4. the practical implications of the study.

Procedures to Enhance the Reliability and Validity of Study

The selection of a multiple baseline across three subjects was favourable because subjects' behaviors could be constantly monitored. Hence, any changes in behavior could be pin-pointed, increasing the likelihood of explaining these changes. In addition, the successive

application of self-instructional training in comparison to the baseline scores (on-task behavior), to the treatment scores (on-task behavior), uneqivocally demonstrated causation. Subsequently, it would appear from these findings that the impulsive child was able to control his overt (on-task behavior) via self-instructions. This non-statistical research design facilitated the recognition and assurance of treatment effects.

A second step taken by the researcher to augment the study centered upon data collection and observation. Because of limited finances, the researcher assumed the dual role of experimenter and recorder. Although this has not been an unusual practice in previous research (Hersen Barlow, 1976), this researcher took specific steps to enhance objectivity (Lipinski & Nelson, 1974). Following Craighead, Mahoney and Kazdin (1976) suggestion, video-taped segments of subjects classroom behavior were taken in order that two trained observers could also score data and interrater reliabilities be determined. To increase the reliability of the coding of observations, only two categories of behavior were scored reducing the possibility of interrater error. In an effort to prevent observer bias for the trained observers during scoring of video taped data, the experimenter took four precautionary procedures. These were: observers were not informed of expected results, not provided with evaluative feedback during scoring, not aware that they were performing reliability observations

with each other, as well as with the experimenter, and finally, not aware of whether they were recording baseline or treatment segments from the study. An additional procedure taken by the experimenter to enhance reliability and validity of the study was to concern himself with the problem of "demand characteristic". When subjects are aware of the research hypothesis expectations (Hersen & Barlow, 1976), they will cooperate in an effort to please the experimenter. For this reason, the subjects were not informed or aware of the dependent variable, upon which scoring was based. O'Leary & Kent (1973) presented evidence that observers who compute reliability within a group may drift toward defining of the behavioral code due to idiosyncratic group concensus. Consequently, within group reliability scores can become inaccurate. To reduce the possibility of observer drift, reliability scores were calculated between the two trained observers and the experimenter. Because the experimenter was compelled to record the research data, it was necessary to concentrate upon preventive procedures to eliminate; experimenter-recorder bias, observer bias, demand characteristic, and observer drift.

The literature made reference to a possible problem with respect to the Matching Familiar Figures test not being a reliable discriminating instrument for determining impulsivity (Messer, 1976). To enhance the external validity (i.e. that the subjects selected for this study

were truly representative of impulsive children) their latency and error scores were compared to a set of M.F.F. norms (Salkind, 1978). (See Table 3) The Table clearly indicates that the treatment subjects errors scores were considerably higher than the expected median error scores, contrary to their latency scores which were considerably lower. The credibility of subject test scores can be accepted, as these results followed the assumptions underlying the criterion for determining impulsive children. That is, their scores fell above the norm median for errors and below norm median for latency. Consequently, the researcher felt confident that the sample used in this research were representative of the impulsive population.

Table 3

Comparison of Conceptual Tempo Scores on M.F.F. Test For Treatment Subjects with Established Norms for 6 year old Children (Saklind, 1978)

	Median Latency (in seconds) (For Boys & Girls)	Median for Errors
Norms	8.21	17.52
Subjects Scores:		
1) Tamara	5.25	24
2) Nate	6.71	23
3) Deanna	3.79	31

Hypothetical Explanations for Findings

What hypothetical explanations can be provided to explain these findings? The ability of these three, grade one children to learn how to use their language to control impulsive behaviors may be attributed to several factors. Firstly, as Meichenbaum & Goodman (1971), Vygotsky (1962), Bem (1967), Douglas (1975), Weissburn & Lamb (1977) and others have suggested, the rehearsal of appropriate self-verbalizations greatly enhances the individuals ability to influence his/her behavior. Secondly, Vygotsky (1962), Bem (1967), Meichenbaum and Goodman (1971) and Bornstein & Quevillon (1976) outlined the importance of subjects engaging in a fading procedure whereby the overt verbalizations eventually become covert, allowing for greater subject mediated self-control. Finally, Meichenbaum & Goodman (1971) emphasized that during the self-instructional program, the child had an opportunity to use his own self-verbalizations rather than just the modeled verbalizations, as this took into account the individual linguistic capabilities. These three factors substantiate previous findings with respect to teaching children how to use language to influence their behavior.

The overall success of the self-instructional training program as an intervention strategy for reducing impulsivity can be attributed to the previously stated ability of children to use their language to control behavior but to other components of treatment as well. One of the major

variables contributing to the outcome of this intervention strategy was the inclusion of collaboration (Meichenbaum, 1977) between therapist and client. Previous self-instructional training programs, (Douglas, 1975; Novaco, 1976; Bornstein & Quevillon, 1976; Harris & McReynolds, 1977) have not made any clear references regarding the inclusion of this procedure in therapy. In this research study, the collaboration process with the client likely contributed to not only the subjects' understanding of the treatment, but to his/her recognition of the problem of conceptual tempo. Within the collaboration process, the therapist demonstrated to the subject the utility and advantages of self-instructional training. This was achieved by having the child successfully complete previously failed items (MFF questions), while employing the self-verbalization strategy.

Associated with the collaboration process were the efforts taken by the therapist to explore with the subjects as to what factors they attributed their own impulsive behaviors. It was important that the subjects realized that their conceptual tempo could be intrinsically controlled as this was a self-control intervention strategy. Finally, the implementation of an appropriate animated prompt, "Peter Parrot", created interest as well as contributed to the understanding of self-instructional training for these elementary school children. Therefore, the incorporation of collaboration, attribution style and an

animated prompt in the opinion of this researcher, enhanced treatment efficacy.

In attempting to overcome the obstacle of having the treatment generalize from the clinical setting to the classroom as well as across different situations, these measures were undertaken. As other studies have suggested (Meichenbaum & Goodman, 1971; Meichenbaum, 1975; Douglas, 1975; Camp, Blom, Herbert and VanDoorwick, 1976) the continual practising of a general planning strategy that could be used across different situations where impulsive behaviors might be activated, likely accounted for the overcoming of this barrier. In addition, having the subjects develop coping strategies, Meichenbaum & Goodman (1971) helped the subjects to maintain control when mistakes were made upon encountering new situations, where an impulsive response might be likely. Furthermore, the generalization across settings was possibly augmented by having the subjects role play within the clinical setting, activities and procedures similar to those exercised in their classroom. The researcher can also not rule out the possibility of a counter hypothesis to explain treatment generalization. That is, the presence of the experimenter within the classroom might have acted as a cue for the subjects to engage in their self-instructional program. Had this been the situation, it would not have become a concern for the researcher, as the eventual goal of the program is to have teachers implement self-instructional training within the classroom

and in so doing, their presence would be continuous.

A contributing and associated factor to the generalization capacity of the self-instructional program were the extended maintenance effects. What reasons might explain this sustained treatment effects? Firstly, the duration of training, 100 minutes a day, for two consecutive days, was considerably longer than Meichenbaum & Goodman (1971), and Bornstein & Quevillon (1976) studies. Another factor possibly contributing to the maintenance of treatment was the animated prompt of "Peter Parrot", as well as the utilization of games, "copy cat" and "robot". These procedures likely facilitated the subjects learning and memory of the training program. A counter hypothesis to explain treatment maintenance within the classroom might be that the subjects behavior changed positively and that the teacher knew that a study was being carried out. This could have caused the teacher's behavior to change towards these children, encouraging treatment maintenance. Here again, the new attitudes, however, are probably intrinsic to any classroom and may not have been operative except for being set in motion by the treatment.

In summary, the researcher has attempted to provide hypothetical explanations for the outcome as well as two possible counter hypotheses to account for some additional augmenting variables.

Implications for Future Research

As a result of this research study, several research questions have arisen which are deserving of investigation. The following represent some potential research projects:

1. Although the results of this study were promising, an imperative question as yet cannot be empirically answered. That is, what specific components of the self-instructional training program were responsible for behavior change? The possible variables included collaboration, the animated prompts and games, verbal modeling, fading of self-verbalizations, self-verbalizations themselves, ages of subjects, the treatment problem (conceptual tempo) or the personality of therapist. Was it a single variable or a particular combination of these components? These pose interesting research topics.

2. Research to determine the possibility of teachers developing and implementing self-instructional training programs within the classroom, merits investigation.

3. Studies to assess the efficacy of individual vs. group-self instructional training programs would be worthwhile.

4. Further investigations, to assess the long-term maintenance and generalization capabilities of self-instructional training are required.

Practical Implications of the Study

Several practical implications can be derived from this study.

1. The prospect of an individual using his language as an instrument to guide his behavior appears to be a natural and readily available instrument.

2. This study suggests that a self-instructional training program could be developed and initiated within a school setting by school teachers and other untrained clinicians, owing to its simplistic step-by-step procedures.

3. Because of covert self-verbalizations, a self-instructional training program becomes a useful intervention strategy within the classroom as the subjects' peers are unaware of the ongoing treatment. This prevents the subject from becoming embarrassed.

4. It would appear that the amount of time required to teach a child a self-instructional program is minimal. This serves a definite advantage to teachers who have busy schedules.

5. Because of the emphasis upon planning and coping strategies within self-instructional training, this intervention strategy enhances the possibility of treatment maintenance and generalization across situations and settings.

Footnotes

Footnotes

1. Meichenbaum, D. Cognitive behavior modification: An integrative approach. Plenum Press, New York, 1977, p.15.

2. Craighead, Edward W., Kazdin, Alan E., & Mahoney, Michael J. Behavior modification: Principles, issues and applications. Houghton Mifflin Company, Boston (1976), p.45.

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