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The relationship of cognitive and behavioral impulsivity to sense of competence, motivation orientation in the classroom and achievement

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City University of New York, 1992

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THE RELATIONSHIP OF COGNITIVE AND BEHAVIORAL IMPULSIVITY TO SENSE OF COMPETENCE, MOTIVATION ORIENTATION IN THE CLASSROOM AND ACHIEVEMENT

by

DORIS DEBRA ABOTT

A dissertation submitted to the Graduate Faculty in Educational Psychology in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York.

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And last, but certainly not least, thanks is expressed to my family for their encouragement, support and patience throughout.

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Doris Debra Abott

I. Introduction

The need to attend to individual differences in applied educational and psychological research has been argued by Cronbach (1957, 1975) and by Cronbach and Snow (1977). In general, they report that research in experimental psychology has focused on between-treatment effects "relegating individual differences to the ranks of an annoyance rather than a challenge" (Cronbach, 1957, p. 6). Cronbach (1975) suggests that the field of psychological research could benefit more from an applied correlational approach that would treat different people differently rather than the experimental psychological approach which attempts to find the one treatment that would suit all people.

Unfortunately, a review of educational psychological research indicates that "limited progress has been made toward an integrated understanding of the nature of individual differences in ability to learn" (Cronbach & Snow, 1977, p. 1). "Until we understand how individual differences interact

with different types of interventions, we will not be able to prescribe treatments differentially and will thus be inefficient in our case management of children" (Copeland, 1982, p. 208).

Some recent research has attempted to isolate the subject variables that effect treatment in order to better understand how individual differences influence outcomes (Copeland, 1982). Perhaps one particular treatment may be more appropriate for children high in characteristic x while an alternative treatment or combination of treatments would be more appropriate for those children low in characteristic x. This differential responsiveness to educational approaches has been noted by Cronbach and Snow (1977) who believe that "student's response to instruction is, in principle, conditioned by all his characteristics" (preface viii).

Cognitive Style

One set of subject characteristics that has received renewed attention is the notion of "cognitive style" (Sternberg, 1987). According to Cronbach and Snow (1977), "interest in styles developed in part because traditional research on ability failed to expose the processes generating individual differences" (p. 375). The term "cognitive style", first introduced by Kagan (1964), refers to an habitual pattern or preferred strategy of information processing. Kagan (1965) has distinguished a dimension of cognitive style, reflectivity-impulsivity, which refers to a relatively consistent tendency for fast or slow decision time in

situations of response uncertainty. This construct of "conceptual tempo", as originated by Kagan (1965), has been widely researched over the last two decades. Reflection-impulsivity, as Kagan describes it, is a tendency to take time and reflect on the validity of a problem solution under conditions of response uncertainty, (i.e., when there are several similar answers from which to choose a correct one). According to Kagan (1965), the dimension of reflection-impulsivity refers to a consistent tendency to respond to such uncertainty either slowly, with high accuracy or quickly, with low accuracy. This response style was assessed with the Matching Familiar Figures Test (MFFT) (Kagan, 1965).

Kagan's original research suggested that the reflective-impulsive personality dimension was stable over time (Kagan, 1965; Yando and Kagan, 1970) and manifested pervasive generality across various task situations. In general, findings from a variety of research studies indicate that reflectives generally perform better than impulsives on tests of logical reasoning (Kagan, Pearson and Welch, 1966), visual discrimination (Heider, 1971; Kagan, 1966; Zelnicker, Jeffrey, Ault and Parsons, 1972), reading (Kagan, 1965; Yando and Kagan, 1968, Weithorn, Kagen and Marcus, 1984); serial recall (Kagan, et al., 1966), concept formation (Nuessle, 1972), school achievement (Lopper and Hallahan, 1980; Messer, 1970; Weithorn, Kagen and Marcus, 1984) and problem solving (Kagan, et al., 1964; Odom, McIntyre and Neale, 1971; Ward, 1968). Further, research indicates that reflective children

demonstrated higher standards for task mastery (Kagan, 1965b), scored higher on measures of sustained attention (Zelniker, et al., 1972), teacher's rating and span of attention (Ault, Crawford and Jeffrey, 1972) and ability to use a more efficient and systematic scanning strategy (Ault, et al., 1972; Drake, 1970; McClusky and Wright, 1975; Siegelman, 1969; Wright, 1971).

Behavioral Impulsivity (Hyperactivity)

However, according to Weithorn and Kagen (1984), the body of research on cognitive impulsivity has been clouded because the term "impulsive" has been used to interchangeably define both the "cognitively impulsive" and the behaviorally impulsive (hyperactive) child. Although it is highly possible that the "behavioral impulsivity of the hyperactive child may be accompanied by an impulsive cognitive task-approach, these two types of behavior do not necessarily co-exist" (p. 484). As Bjorklund and Butter (1973) reported, measures of behavioral hyperactivity were not found to significantly correlate with either response time nor errors on the MFFT. Thus, it appears that the MFFT may well be measuring a characteristic of cognitive information processing that is not necessarily demonstrated in observable behavior noted on global behavior ratings (Seargeant,VanVelthoven & Virginia, 1979). Thus, research has demonstrated that behaviorally hyperactive children represent a heterogeneous population with distinct subgroups within them (Ackerman, Oglesby & Dykman, 1981; Bugental, Whalen & Henker, 1977; Weithorn, 1980;

Weithorn & Kagen, 1978). In reality, hyperactives may in fact consist of three subgroups; that is, those who are behaviorally impulsive (hyperactive), those who are cognitively impulsive and those who are both. As Weithorn and Kagen (1984) point out, "these groups sometimes are regarded as if they were drawn from the same population partly because the term `impulsive' has been used operationally to describe both" (p. 483). Further, studies of behaviorally hyperactive and/or cognitively impulsive children differ with respect to criteria for selection of subjects. Some studies (Meichenbaum & Goodman, 1971; Palkes, Steward & Freeman, 1972; Weithorn & Kagen 1979) selected subjects based on "overt behavioral activity" while other researchers (Meichenbaum and Goodman, 1969) used "cognitive impulsivity" as defined by the Matching Familiar Figures Test (Kagan, 1965).

Relationship Between Cognitive and Behavioral Impulsivity

However, the literature reports conflicting results with regard to the "degree of relationship between (behavioral) hyperactivity and cognitive impulsivity" (Weithorn & Kagen, 1984 p. 483). Some studies have found a significant relationship (Campbell, Douglas & Morganstern, 1971; Cohen, Weiss & Mundi, 1972; Hopkins, Perlman, Hechtman & Weiss, 1979; Juliano, 1974) while others have not (Bjorklund & Butter, 1973). Further, a review of the literature poses additional problems in that it is not always possible to glean from the data how generalizable an approach has been. The resulting lack of specificity and consistency in selection criteria and

assessment instruments further compounds the problem (Berler & Romanczyk, 1980). Very often diagnosis depends on factors related to the referral process. For example, Ault, et al., (1972) examined the teacher ratings of twenty-five pupils assessed on the Matching Familiar Figures Test (Kagan, 1965). He reported that teachers rated both the fast inaccurates (so-called impulsives) and slow inaccurates as more behaviorally hyperactive than the slow accurates (reflectives) or the fast accurates. Similarly, McKinney (1975) reported that boys more than girls were assessed as behaviorally impulsive by teachers on a behavioral inventory.

Another factor that has contributed to the difficulties encountered in interpreting results from the research on behavioral hyperactivity-cognitive impulsivity has been the use of clinically based samples and the consequent problems of selection bias (Sergeant, Velthoven & Virginia, 1979). Interesting findings reported by Bjorklund and Butter (1973) that have particular relevance to the present study concern children who were rated behaviorally hyperactive by their teacher but whose behavioral hyperactivity was not sufficiently serious as to require therapy. They concluded that classroom behavior does not necessarily predict cognitive impulsivity (Bjorklund & Butter, 1973). They did not find a significant correlation between measures of behavioral hyperactivity and either response times or errors on the Matching Familiar Figures Test (Bjorklund & Butter,1973). They concluded that "an individual's preferred conceptual

tempo does not appear to be part of a global impulsive behavior pattern, but rather is a relatively independent dimension of cognitive style" (Bjorklund & Butter, 1973, p. 191). Further, "it appears that only behavioral activity that is seriously hyperactive (excessive and extreme) seems to be an accurate predictor of cognitive impulsivity. Mild and nonexcessive hyperactive behavior measured in the classroom setting does not appear to be a correlate or predictor of conceptual tempo" (Bjorklund & Butter, 1973, p. 193).

Educational Implications of Cognitive Impulsivity

Thus, it appears that deficiencies resulting from a `cognitively impulsive' style are mainly educational in nature (Bjorkland & Butter, 1973). It has been found that cognitively impulsive children have deficits in problem solving (Ault, 1973); verbal mediation (Camp, 1977); information seeking (Finch & Montgomery, 1973); recall fewer words on tasks of serial recall (Kagan, 1966); and do more poorly than their reflective counterparts on tasks of inductive reasoning (Kagan, Pearson & Welch, 1966).

Attempts to Modify Impulsive Responding

Since discrepancies in performance have been reported between impulsive and reflective children on many school related tasks, attempts have been made to modify the behavior of impulsive children (Butter, 1971; Debus, 1970; Genshaft & Hirt 1980; Kagan, Pearson & Welch, 1966; Leon & Pepe 1983; Meichenbaum & Goodman, 1971; Ridberg, Parke & Hetherington,

1971; Schunk & Rice 1984; Swanson 1985). Therapeutic approaches have taken the form of cognitive and behavioral techniques for treating behaviorally hyperactive children (Bugental, et al., 1977). Self-instructional training (Meichenbaum, 1975) modeling (Bandura, 1971), and behavioral contingencies (Kazdin, 1972) have been the major components of this cognitive-behavioral treatment. However, studies have produced equivocal and sometimes conflicting data on the success of intervention strategies (Abikoff, 1979; Hobbs, Moguin, Tryoler & Lehey, 1980; Readence & Bean, 1978).

Inconsistent and Limited Progress of Self-Instructional Research

Harter (1982) and Karoly (1982) offer several reasons why research on self-instruction has produced only equivocal results. Harter (1982) believes there are at least two aspects that must be included in any study of self-instruction. According to Harter (1982), since most of the literature on intervention strategies concerns itself with modifying behavioral patterns that children may have no desire to change, one must look at the motivational constructs involved. Similarly, Karoly (1982) believes that, in order for self-management programs to be effective, a child must be affectively aroused and thereby "motivated" to work for behavior change. He further believes that it is not enough to simply assess whether a child understands rules, has the skills, and is aware of the consequences both long and short term. Karoly (1982) believes that more attention must be

directed toward the specific motivational parameters that may impinge upon a child's ability to actively engage in self-control. Harter (1982) also believes that, in addition to the motivational aspects involved in analyzing the effectiveness of self-management techniques, it is also important to understand the "self" in this process. Harter (1982) believes that "any comprehensive understanding of self-observation, self-evaluation and self-reward (all components of self-instructional training programs) must attend to the `self' as an active agent engaging in these processes as well as the `self' as an `object', or as the cognitive construction to which these processes are applied" (p. 167). Harter (1982) points out that there is a need to separate these two "selves" for heuristic reasons even though they are "housed within the same psychological skin" (p. 167). According to Harter (1982), when these self-instructional programs are instituted, it is assumed that all youngsters are capable of self-observation, self-evaluation and self-reward and this may not be so. While children may be capable of identifying the consequences of their actions (active self), they may not be as successful in mentally representing the "self" as an "object" which they themselves can objectively observe, evaluate and reward. In this regard, according to Harter (1982), it is important to understand whether a child initially has the cognitive abilities that are involved in the process of observing ones "self" as an "object" as well as what variables are responsible for the emergence of this

process. In Harter's model, this process involves, among other things, an analysis of an internalization process where rewarding statements from socializing agents have become internalized in the form of covert self-approving statements. But, even more importantly, it is essential to understand how events in a child's socialization history interact with a child's emerging "concept of self" as an "object" and how this process ultimately produces individual differences in behavior.

Kendall and Williams (1982) suggest the need to consider "self-management deficits". They point out that children's disorders are usually assessed with a standard battery of tests using a classification of the Diagnostic and Statistical Manual of Mental Disorders (DSM III). As they point out, there is unfortunately no standard battery to assess a "self-management deficit" which could involve deficiencies in any one or all of three areas, behavioral-skill deficiency; cognitive-development deficit and emotional interference. With regard to the present research, these areas may well parallel deficiencies among the behavioral impulsives (hyperactive) and cognitively impulsive youngsters involved in self-management programs while motivational concerns could be the cause of emotional interference. Deficits in behavioral skills involve a lack of specific behaviors in a child's repertoire which causes skill deficits that may culminate in problems of behavioral self-control. Inability to self-monitor, inability to use self-reinforcement and/or inability

to engage in self-management are all specific deficits of children who have a self-management deficit in the behavioral skill area. Similarly, deficits in cognitive development may result in a child's inability to comprehend what his role is in the learning process and also may limit the child's ability to take responsibility for self-control. In some instances a "self-management deficit" may involve neither the behavioral nor the cognitive domain but instead may be an overriding issue involving emotional arousal that interferes with and perhaps blocks the self-management process. It is important to examine the profiles of each child to determine whether one source of support has more of a contributing factor than another to one's sense of self-worth.

Summary

A number of studies have demonstrated that there are individual differences in ability to learn. Specifically, it appears that the cognitively impulsive and/or behaviorally impulsive youngsters show deficits in learning that distinguish them from the normal population. Attempts to isolate the reasons why this is so have met with only limited success. Part of the reason for these equivocal results is because these two groups have been compared and regarded as having been drawn from the same population because the term "impulsive" has often been used to designate both (Weithorn & Kagen 1984). Some studies have selected subjects based on overt behavior (Cameron and Robinson, 1980; Douglas, 1980; Meichenbaum and Goodman, 1971; Weithorn and Kagen, 1979) while

others were selected on the basis of Kagan's Matching Familiar Figures Test, a measure of "cognitive" impulsivity (Bender, 1976; Egeland, 1974; Kagan, 1965b; Meichenbaum & Goodman, 1969). Further, as Weithorn and Kagen (1984) point out, although a behaviorally hyperactive child may also exhibit a cognitively impulsive task approach style, these two types of behavior do not necessarily occur together.

Another issue of concern involves the question of individual differences in "competence motivation". There is evidence to suggest that for certain children this particular motive system has been attenuated in the course of development (Harter, 1975a; Harter & Zigler, 1974). It is highly possible that the cognitively impulsive and/or behaviorally impulsive youngster presents with a very different level of competence or competence motivation. Competence motivation occurs when a child has successfully internalized feelings of mastery and pleasure that have come about from being successful. The point is made that there is a relationship between pleasure and task difficulty. Feelings of mastery come from successfully completing "challenging" tasks. According to Harter (1978), some children may eventually master difficult items but will not experience the concurrent feelings of pleasure because of what the child perceives to be an excessive amount of time and effort that has gone into the solution. In such cases the child attaches a negative rather than positive evaluation to performance and will experience no pleasure. Instead he experiences feelings of annoyance,

embarrassment and frustration (Harter, 1978). For this reason, Harter suggests the need to examine a child's socialization history to understand how it impacts on the development and maintenance of competence motivation. For the cognitively and/or behaviorally impulsive child, it is highly possible that his degree of gratification has been consistently attenuated. He/she will therefore attach a negative subjective evaluation to his/her performance and, rather than experiencing pleasure, will instead experience anxiety which ultimately interferes with further involvement in challenging tasks. To the extent that the messages a child received are negative, one would expect him/her to have feelings of low self-esteem and be lacking in perceived competence. Further, given the prevalence of self-management techniques that are currently being used in our schools, it is important to look at the atypical child's pattern of responses before initiating a program. Harter (1982) points out, we must look at the "self" side of the equation to understand whether we are unknowingly asking specific individual children to perform behaviors that they are incapable of because these behaviors are not yet in their repertoire. When self-instructional programs are instituted, it is often assumed that all children are capable of self-observation, self-evaluations and self-reward but this may not be the case (Harter, 1982). Karoly (1982) also believes that in order for self-management programs to be successful, a child must be aroused and thereby motivated to work toward behavior change.

He further believes that it is not enough to simply assess whether a child understands rules, has the skills and is aware of the consequences. According to Karoly (1982), more attention must be directed toward the specific motivational parameters that may impinge upon a child's ability to actively engage in self-management. Finally, Kendall and Williams (1982) suggest the need to consider "self-management deficits". They point out, however, that there is no standard battery of tests that would assess these "self-management deficits" which could involve deficiencies in any one or all of three areas; behavioral-skill deficiencies; cognitive development deficit and emotional interference. According to Kendall and Williams (1982), identifying the major deficits as exemplified by his three deficiencies model may be helpful in identifying the source of the deficit which could then be remediated prior to institution of a self-management program.

The present research examines individual differences in children's learning ability by identifying the degree to which subject variables including sense of competence, motivational orientation, degree of social support, sense of control and anxiety interact to produce varying degrees of successful achievement. Specifically, it targets the atypical child, the cognitively impulsive and/or behaviorally impulsive youngster and attempts to understand what characteristics of the learner may interact to bias these children.

The recent emphasis away from special education has resulted in more heterogeneous classrooms where there is a

wide diversity of students many of whom will require special curriculum. This study considers the need to identify "self-management deficits" as has been suggested by Kendall and Williams (1982). It is also an initial attempt at identifying a number of evaluation measures that may be useful in identifying "high-risk" youngsters who cannot benefit equally and optimally from systems that apply self-management techniques as their treatment of choice.

II. REVIEW OF LITERATURE

Historically, Kantor (1924) was one of the first to advocate the interactionist position in psychology. Jessor (1958), Leeper (1963) and Rotter (1954) have all attested to the importance of Kantor's (1926) view, "no biological fact may be considered as anything but the mutual interaction of the organism and the environment" and the unit of study for psychology should be "the individual as he interacts with all of the various types of situations which constitute his behavior circumstances" (p. 369, p. 92). Likewise, Rotter (1954) clearly expressed the interactionist view in his main postulate for personality research. According to Rotter (1954), "the unit of investigation for the study of personality is the interaction of the individual and his meaningful environment" (p. 85).

According to Ekehammer (1974), "whereas the classical interactionist views were usually formulated within comprehensive personality theories, most often without empirical support, the more recent conceptualizations have usually been proposed in the absence of any elaborate theories, but often with some empirical support" (p. 1032). The "principle of interaction" was clearly stated by Sells in the mid 1960's (1963a, 1963b, 1966):

> "The principle that behavior represents the interaction of the individual and the environmental situation implies that the

> total variance of any response can be accounted for only in part by individual differences in characteristics of the participating persons: It depends also on the stimulus characteristics of the environmental situation (both physical and social) and in part on the interactions between aspects of each (1963a, p. 3).

Cronbach (1957) believed that, in order to have a complete psychological picture, one must analyze both the state of the organism and the situation in question in order to predict the behavior of "organism-in-situation". Meltzer (1961) argued that study of the interactions of group and individual variables are the essence. Allport (1966) revised his "personologist" view by stating that his earlier views seemed to leave out the variability contributed by ecological, social and situational factors. Block (1968) also advocated that personality research should integrate both situation and individual factors as fruitful areas of research. Vale and Vale (1969) concluded that the locus of study should include the organism-environment interaction and stressed the interdependence of both the organism and the environment as determinants of behavior.

More recently, Bowers (1972, 1973) defended the interactionist position by citing eleven empirical studies where the person x situation interaction was greater than the person or situation variance alone. According to Ekehammer (1974), Bowers (1973) came to the conclusion that "the psychological implications of these statistical interactions were that the major determinant of behavior is the

individual's perception (construction) of the situation and not the environment per se" (p. 1034). Bowers (1973) purports an interactional "biocognitive" view that puts a strong emphasis on the psychological environment stating that "the situation is a function of the observer in the sense that the observer's cognitive schema filter and organize the environment in a fashion that makes it impossible ever to completely separate the environment for the person observing it" (p. 328).

While Bower's interactionist stance was taken as an attack on situationalism, Argyle and Little (1972) took the same interactionist stance in opposition to the "personologist" or trait view. They argued that personality theories differ in the amount of behavioral variance "which they hypothesize can be attributable to individuals, to situations and to interactions between them" (p. 2). Mischel (1968) pointed out the "severe neglect of environmental variables in psychology theory and research" which is "reflected in the existence of literally thousands of measures designed to tap individual differences in traits and states while measures of the environment generally have been limited to a handful of fairly gross estimates to socioeconomic status" (p. 288). Mischel (1973) linked the important statistical person x situation interactions to the individual's constructions of the situation:

> "Given the overall findings of the discriminativeness of behavior and on the complexity of the inter-

> actions between the individual and the situation, it seems reasonable in the search for person variables to look more specifically at what the person `constructs' in particular conditions, rather than trying to infer what broad traits he generally has, and to incorporate in descriptions of what he does in the specific psychological conditions in which the behavior will and will not be expected to occur" (p. 265).

The importance of Mischel's (1973) position is that he recognized that, while the person is a function of the situation, likewise, the situation is a function of the person through the person's (a) cognitive construction of situations and (b) active selection and modification of situations. Mischel (1973) states that "a viable psychology of personality demands attention to person variables that are the products of the individual's total history and that in turn mediate the manner in which new experiences affect him" (p. 265). Further, as Ekehammer (1974) suggests, "in studying person x situation interactions, it is most relevant to measure the individual's perceptions of the situation, that is, the psychological environment" (p. 1037).

According to Cronbach and Snow (1977), although many interactions are found with considerable frequency in the study of personality, some variables and treatments seem to be more promising than others. However, they feel that no trends can be established due to the many inconsistencies observed in the research. Further, they suggest that "the substantive

problem before us is to learn which characteristics of the person interact dependably with what features of instructional methods" (Cronbach & Snow, 1977, p. 493). The questions about interactions that especially need to be asked in connection with instruction are first, "what characteristics make instructional situations `similar' in the sense that the situations all benefit the same kind of learner" and second, "what situations define `similar learners', that is, those ready to profit more or less equally from the same kind of instruction" (Cronbach & Snow, 1977, p. 3).

Of particular importance to the present study is the inconsistent and equivocal data that has emerged in recent years with regard to behaviorally hyperactive and/or cognitively impulsive children and their response to intervention strategies. Differences in how cognitively impulsive and reflective children respond to treatment have been noted in the literature, however, generalizat'ons are hard to glean from them.

Kagan Position

Kagan (1965a) has demonstrated that at least one factor that contributes to individual differences in cognitive functioning is a child's conceptual tempo referred to as "impulsivity-reflectivity". This dimension concerns itself with a person's consistent tendency to respond either slowly with high accuracy (reflective), or quickly with low accuracy (impulsive) in situations of response uncertainty. Kagan (1965a) operationalized this dimension with the Matching

Familiar Figures Test (MFFT) which requires a subject to choose an identical match to standard from six to eight very similar options. The "impulsives" are those subjects who choose quickly with many errors as opposed to "reflectives" who take time, equating all possibilities choosing more slowly with fewer errors. Based on eye movements during the course of the task, Drake (1970) concluded that cognitively impulsive children do not scan all the possible alternatives prior to responding. Zelniker and Jeffrey (1976) concluded from their research that cognitive impulsives are prone to using a less efficient global stimulus analysis rather than a more efficient detailed analysis which is necessary to be highly successful on the MFFT. The reflective-impulsive cognitive dimension is related to school performance whereby reflective children out-perform impulsive children (Barrett, 1977; Becker, 1976; Butter & Vallano, 1978; Denney, 1974; Haskins & McKinney, 1976; Kagan, 1965; Loper & Hallahan, 1980a; 1980b; Margolis, Peterson & Leonard, 1978; Readence & Baldwin, 1978; Readence & Searfoss, 1976).

Attempts to Modify Cognitive Style

Research indicates that numerous attempts have been made to modify cognitive style in an effort to improve the cognitive functioning of impulsive youngsters. Basically these studies have centered on four areas of modification featuring (1) direct instruction, (2) modeling, (3) reinforcement contingencies, and (4) verbal mediation training.

With regard to direct instruction, several researchers have attempted to instruct impulsive youngsters to be more similar to reflectives in their use of scanning strategies (Albert, 1970; Egeland, 1974; Nelson, 1969). This instruction involved making sure that each impulsive subject looked at all the alternatives in an array, breaking each choice down to its components and then checking each alternative individually with the standard. When such a procedure was used, subjects increased their latency scores on the MFFT and decreased their error scores. Meichenbaum and Goodman (1971) taught scanning strategies to two groups, one receiving only instructions in scanning strategies and the other group receiving these instructions plus an added instruction to verbalize aloud, "I have to look carefully at this one, then this one", etc. While both groups increased latency scores, only the verbally self-instructed group both increased response time and decreased their error score as well. Purdue (1973) in similar research with impulsive fifth grade children added reinforcement contingencies to each group, one group receiving self-reinforcement and the other receiving external reinforcement. They found that the self-reinforced group obtained fewer errors and longer response times than the externally reinforced group. Egeland (1974) concluded that forced choice and forced delay were sufficient to increase performance without the need to rely on specific verbalization instruction and/or scanning techniques. Zelniker, et al. (1972) attempted to modify impulsive responding by asking

subjects to note from a set differences from the standard. This forced responding caused the subject to become fully cognizant of the significant details of the alternatives. Zelniker (1972) concluded that impulsives improved their performance because they were forced to make more comparisons among the variants rather than just matching to a standard.

Several other researchers have used modeling to modify impulsive responding (Debus, 1970; Denny, 1972; Meichenbaum & Goodman, 1971). In these studies, children observed models who responded either rapidly, in an impulsive fashion, or more cautiously in a reflective manner while verbalizing, "I take my time"; "I check my answers"; "I look back and forth from one to the other. These studies were successful in increasing response time in the right direction but were unsuccessful in reducing errors. However, when Debus (1974) extended his original study to include the repeating of instructions by the experimenter as well as verbal positive reinforcement for the model's reflective verbalizations, not only were latencies increased but errors decreased as well.

In an attempt to modify impulsive cognitive style through the use of reinforcement contingencies, Briggs (1968) reinforced increased latency which resulted in longer response times and less errors whereas the reverse, that is, reinforcing decreasing latency resulted in shorter latencies and increased errors. While these effects generalized to the WISC Picture Arrangement response times, they did not generalize to a motor inhibition test. Weinberg (1969) in a

similar study, used social approval and tangible reinforcers to extend the range of reinforcement contingencies and was successful in improving latencies but not errors in the responses of impulsive subjects. Although these results occurred during training, they were not sustained during posttest on the MFFT. Scher (1971) attempted to reinforce error reduction rather than increase latency. Due to unexpected changes in the control group, no significant differences were noted between the experimental and control groups. However, there was a tendency in the data revealed that both withdrawal and reward affected the latencies rather than the error scores. Similarly, Heider (1971) attempted to reinforce error reduction of the MFFT. Again latencies were increased but errors remained unaffected. However, Errickson, et al. (1973) found that negative reinforcement was successful in both reducing errors and increasing the latency scores of children aged fourteen with a mean I.Q. of 71 enrolled in a special class. Hemry (1973) hypothesized that, "inasmuch as impulsive and reflective children appear to respond to stimuli differently, it is possible that their response to reinforcers would also differ" (p. 657). Hemry (1973) classified first grade boys on a continuum of reflective-impulsivity based on the MFFT and then assigned them to one of six possible experimental conditions, that is, verbal reward, verbal punishment, verbal reward plus punishment, nonverbal reward, nonverbal punishment and nonverbal reward plus punishment. He found that, regardless of classification, performance was

better under the punishment and reward plus punishment conditions rather than the reward conditions alone. Hemry (1973) concluded that "neither reinforcement type nor reinforcement combination appeared to be related to the response style of the child" (p. 657). However, Nelson, et al. (1975) suggest that Hemry's (1973) results "may have been more a function of the relative impotency of his reward ... than of the ineffectiveness of the technique in the problem solving situation" (p. 426). Nelson et al. (1975) used response cost with a clinical population and discovered that "impulsives in the response-cost condition made significantly fewer errors than those in the reinforcement and control conditions (p. 428). Further, reflective subjects, when compared to controls, performed better under the reinforcement condition. They contend that "although the reinforcements were highly valued by all the children, the impulsive children did not inhibit responding as well as their reflective counterparts" (p. 428).

Effects of Motivation

Nelson, Finch and Hooke (1975) take a somewhat different approach by suggesting that "the optimal approach in modifying impulsive responding might be one that integrates procedures to increase motivation with cognitive training and/or modeling techniques" (p. 428). They conclude that, "there is sufficient evidence to suggest that the degree to which a child pauses to evaluate the quality of his cognitive

processes is influenced not only by a relatively stable cognitive style but also by his immediate social environment" (p. 428). According to Ames and Ames (1984), "some commonly used educational practices (i.e., test-taking formats and reward structures) have a debilitating effect on motivations" (p. 10). They believe that motivation deserves to have a central role in evaluating educational quality, especially when children of different abilities, attainment levels and cultural backgrounds are concerned. Ames and Ames (1984) believe that it is essential to ask questions such as "what is the psychological meaning of success and failure to the student with different goal-reward-structures?" and how do these "goal structure(s) influence students' self-evaluations and cognitive-motivational thought processes (p. 178). In their research, they examine these broad issues in an attempt to understand motivational processes as they relate to cooperative, competitive and individualistic environmental settings (1981). They point out that, in an individualized classroom setting, consistency of one's performance over time is the dominant cue for self-evaluation. However, in competitive settings, which is the nature of many classroom learning environments, social comparison information alone is the cue utilized. Ames and Ames (1981) believe that learning under individualized or competitive classroom situations may in fact be tapping different motivational systems that have separate origins and differential meanings for students, particularly high and low achievers. They believe that

motivating children to self-improvement, which is at the core of self-management programs, may, in fact, be incompatible with the demands of competitive classroom situations where a student's main attention can undoubtedly focus on an outcome that involves winning or losing rewards rather than intrinsic learning.

Intrinsic and Extrinsic Motivation

The recent surge of interest by Harter and other researchers in intrinsic motivation and the distinction between intrinsic and extrinsic motivation has occurred partly because of several provocative studies performed by Deci (1971, 1972a, 1972b). These experiments were all similar in nature in that each subject was instructed to work on block puzzles that were three dimensional. Deci divided his subjects into three groups; the first group of subjects was told prior to beginning the task that they would receive payment for each completed puzzle; the second group were told after the task completion that they would be paid for each puzzle successfully completed and the third group of subjects were offered no money. Thus, he created three conditions, "expected money group"; "unexpected money group", and "no money group" respectively. After the puzzle tasks were completed, the subjects were left by themselves to either read magazines, work on additional puzzles or do whatever they liked. The instructor had left the room during this period and another experimenter unobtrusively observed the subjects involved. In these experiments Deci (1971, 1972a, 1972b)

operationally defined intrinsic motivation as the extent to which individual subjects returned to work on the puzzles available. He presumed that, since these subjects received no money for their performance at this time and since the subjects also believed that their performance was not being observed, that any work on the puzzles was the result of intrinsic motivation. The results indicated that those subjects who had never been paid (no-money group) spent more time working on the puzzles than the "expected-money", and the "unexpected-money" group spent as much time working on puzzles as the "no-money" group. Thus, subjects who expected payment attributed their performance to a cash payment and, therefore, once the experimenter left, saw no reason to work on the puzzles since no further payment would be forthcoming. It is assumed that whatever initial intrinsic interest they may have had, the fact that subjects subsequently attributed cash payment for successful completion decreased intrinsic interest in them. The reason given for the "unexpected-money" subjects' performance which was equally as good as the "no-money" group was that, because they were paid after the task, these subjects had at first ascribed performance to internal attribution. Because these subjects had not been working for money, they returned to working on the puzzles just as had the "no-money" group. Deci (1971, 1972a, 1972b) points out that in certain circumstances, extrinsic rewards may in fact interfere with and undermine intrinsic motivation.

Several studies have demonstrated the paramount

importance of motivational attribution. Lepper et al. (1973) recorded the amount of time children used felt-tip drawing pens during free-play. Then, subjects were divided into three groups; those who drew for a reward; those who received an unexpected reward; and those who received no reward. Two weeks following the experiment, children were again assessed as to how much time was devoted to drawing during a subsequent free-play period. The results indicated that the subjects who had initially drawn for a reward drew significantly less than the children in the other two experimental groups. Thus, similar to Deci's (1971, 1972a, 1972b) experiments, extrinsic reward diminished intrinsic motivation. This phenomenon of decrease in intrinsic motivation that is sometimes caused by the introduction of external rewards was termed the "overjustification effect" by Lepper et al. (1973). If a child is already intrinsically motivated to perform an activity, that is "adequate justification" for performing the activity. However, being given a tangible reward for performing an activity would be "overjustification" according to Lepper and his colleagues (1973). Lepper and Greene (1975) have also demonstrated that adult surveillance reduces the intrinsic motivation of children toward an activity. In this experiment, children had attributed their behavior to an external source, "I'm doing it because he is watching me" rather than, "I'm doing it because I like to do it". They found that when surveillance was removed, those children who had an external attribution were no longer motivated to

perform the task.

The notion that extrinsic rewards can have an adverse affect on overall motivation is not held by all theorists, however. In Atkinson's (1964, 1974) view, extrinsic motivation and achievement motivation combine to produce total motivation in any given situation. His view maintains that extrinsic motivation is necessary to "lure" a person into an achievement situation when that person's motive to avoid failure is greater than his motive to succeed. In this framework, positive extrinsic motivation must be added to a person's negative intrinsic motivation in order to bring about an achievement-producing situation. However, this notion is not supported by Deci's research because, if the two types of motivation were additive, then his "expected-money" subjects should have spent more, rather than less time, on puzzle tasks than the other groups.

Competence Motivation

Central to the study of behavior has been the concept of motivation. White (1959) postulates a "competence motivation" or "effectance motivation" which he considers the directing force behind behavior. White's (1959) theory of "competence" attaches much importance to one's interaction with his environment. Competence refers to an ability to successfully interact with one's surroundings and encompasses all behaviors that make interaction possible, namely, manipulation, attention, exploration, perception, thought and communication. White (1959) believes that interacting behaviors are not

random but rather are selective, persistent and directed towards effective environmental interaction and are motivated by an "intrinsic" need to deal successfully with one's environment. The notion of competence motivation involves behaviors that allow one to have "feelings of competence" or "feelings of efficacy" which are one and the same in White's theorizing. According to White (1959), a person becomes intrinsically motivated to engage in behaviors that allow one to feel a sense of competence. This competence motivation involves a number of facets. First, there is a desire on the part of the individual to cause an "effect" on his environment. Second, one has the added goal to behave "competently" or "effectively". Third, successful resolution of the second facet leads to feelings of "competence" which is the motivating force behind maintaining behavior (see Appendix B). White (1959) explains that, in the young child, "competence motivation" is undifferentiated but, with experience, differentiation produces specific motives for mastery, namely, cognizance or achievement. These specific motives are learned through successful interacting experiences with one's environment.

Although White's notion of "competence motivation" is generally supported, it has little interpretive value because of the breadth of behaviors that have been subsumed under its umbrella (Harter, 1978). There has been little done to operationalize the construct thereby allowing it to be tested.

Harter (1978) has refined and extended White's

formulation translating the competence motivational construct into researchable hypotheses. She draws from White's (1959) theory in assuming that the individual possesses a motive force that impels him/her to engage in competent adaptive behaviors. However, in order to operationalize the construct of competence or effectance motivation, it became necessary to remove the notion from its original diffuse formulation and to cast it into a testable construct.

Harter's Self-Perception Profile for Children (1985)

In her Self-Perception Profile For Children, Harter differentiates five domains of perceived competence; scholastic competence; social acceptance; athletic competence; physical appearance; behavioral conduct; and overall global self-worth. Children are believed to reflect individual differences in the amount of energy that they will invest in these individual domains. According to Harter (1978), it would be expected that the child's perceived competence would reflect variation in domain's as the result of the child's socialization history.

Harter's Model

Harter's model begins with the assumption that the individual maintains an intrinsic motivational force that impels him/her to engage in mastery behaviors. In this regard, Harter's formulation is unchanged from White. However, unlike White, Harter postulates several competency domains; cognitive, social, physical and behavioral rather than a unitary global construct. Her aim was to break down

the construct so that it becomes easier to operationalize and therefore test. Also, her model suggests that there are individual differences in the amount of energy invested across all domains. A second characteristic that distinguishes Harter from White's initial formulation deals with the effects of both success and failure and how these impact on the individual's sense of competence. In order to understand individual differences in "competency motivation" it is essential to understand the individual and interacting effects of both success and failure on one's adaptive attempts. In this regard, Harter questions the balance of success and failure histories in an attempt to understand what antecedents interact to produce a basically intrinsically or extrinsically oriented individual.

Harter points out that, in order to understand the development of a competency motive, it becomes necessary to look not only at one's successful interactions but also the degree of gratification derived from successful mastery of a challenging situation. Harter suggests that there are two ways of looking at the relationship between pleasure and task difficulty (see model Appendix A). The first notion suggests a positive linear relationship between challenge and successful completion of tasks such that maximum pleasure is derived from the most difficult task. A second notion suggests that there is a curvilinear relationship between pleasure and successful task completion. This notion similarly postulates a positive relationship between

difficulty level and pleasure. However, this relationship does not consistently continue as task difficulty increases. This second notion postulates that an individual will eventually master more difficult items but will not experience the concurrent feelings of mastery because of the amount of time and effort expended on task. In such situations, one is expected to attach a negative subjective evaluation to his/her performance and therefore not experience maximum pleasure. According to Harter (1978), in such instances "feelings of annoyance, embarrassment, frustration, etc., serve to attenuate the gratification obtained" (p. 45). Harter's data has shown support for the curvilinear model that suggests a positive linear relationship between pleasure and task difficulty up to a point where there is challenge but not "excessive" challenge. What appears to mediate this finding is the "perceived solution time" in that subjects expressed dissatisfaction if they perceived that too much time had elapsed before solution. Harter (1978) concludes that the "optimal challenge model holds the most promise for describing the relationship between success and pleasure" (p. 46).

In her model, Harter stresses the importance of examining a child's socialization history and how it impacts on the development and maintenance of the components of competence motivation. From the developmental perspective, it is important to acknowledge that a young child is dependent upon "significant others" for approval in the form of an incentive to perform as well as a means of providing information as to

the adequacy of performance. Harter's model provides that, in the development of "competence motivation", a child must receive more positive reinforcement for mastery such that it counteracts negative reinforcement accrued. It is important that positive reinforcement begin in infancy and be forthcoming not only after success but also for the process of striving toward independent mastery. Healthful reinforcement is when it is bestowed as the result of independent successful mastery attempts rather than as the result of dependency on others.

Also of major importance is the exact function of approval or positive reinforcement. Harter suggests that reinforcement has several functions, one having a "motivational-emotional" component and the other an "informational" function. Within the "motivational-emotional" component, one can distinguish between the "incentive" which impels the child to act in anticipation of forthcoming rewards and an "affective" component which allows for the "feelings of satisfaction". Similarly, within the "informational" function of reward, a child is provided with a general level of informational feedback which serves to do two things; first, it assists the child in determining mastery goals by "defining" behaviors that are important and, second, reward serves an "evaluative" function in that is provides information as to successful approximations of the desired behavior. Therefore, the child is directed toward developing a "system of mastery goals" by both the "incentive" function

of reward and the "informational" function of reward which allows him/her to understand what behaviors are important for mastery. Concerning the "incentive" function, the probability of increasing a particular behavior depends on the amount of prior reinforcement. The child is simultaneously receiving confirmation as to the importance of a particular behavior as well. It is the processing of these two facets that allows for the child to develop a set of performance standards. In the final analysis, it is the internalization of these standards that supply the child with the necessary criteria that would allow him/her to administer a self-reward. The "affective" function of both positive and negative reinforcement impact on the degree of pleasure derived from a behavior. This degree of experienced intrinsic pleasure derived will affect the development of the child's self-reward system depending on the balance between negative and positive reinforcement. The "evaluative" function of reward provides feedback of which behaviors were successful and which behaviors were failures. By so "defining" it gives additional criteria that can ultimately be "self-rewarded". With regard to the general informational component, this provides a global perspective of what behaviors are important such as school performance, social skills, or athletics but the more specific nature of the evaluative functions serves to give feedback as to successes and failures on mastery attempts. It is this evaluative function that impacts on the child's sense of self-esteem or perceived competence. As Harter (1978) puts it:

> "The child is receiving messages with regard to whether he or she is a successful, good or worthwhile person. To the extent that this message is relatively positive, one would expect it to pave the way for the child's eventual feelings of high self-esteem. Conversely, negative evaluative feedback should lead to feelings of low self-esteem, to the lack of perceived competence" (p. 48).

Thus, according to Harter's model of competence motivation, the child who has received sufficient positive reinforcement for independent mastery attempts during his early years will eventually internalize two crucial systems, that is, a "self-reward system" and a system of standards called mastery goals. Under the "self-reward system", one is able to reinforce one's self for successful mastery attempts. A child also internalized the "mastery goals" of the socialization agent who has previously provided social reinforcers. Therefore, as a result of differential reinforcement and learning by observation, the standards of the "self-reward system" and the "mastery goals" become increasingly salient. Ideally, as this "internalization" of standards occur, dependence on external social reinforcement should diminish. According to Harter (1978), "the child has internalized standards of what is important, can evaluate whether or not his or her performance was successful, can provide an internalized rewarding message accordingly; can feel good or bad in reaction to this judgement, all of which

in turn will influence the likelihood of his engaging in this behavior again" (p. 50).

Thus, there are developmentally two sources of one's intrinsic motivation system and related pleasure derived. One concerns itself with the notion that is basic and biological in nature, namely, that from birth the organism is motivated to interact successfully with his/her environment thereby experiencing feelings of competency. The second source of intrinsic motivation is experiential in nature and depends upon a child's set of mastery goals that have been internalized from their socializing agent which reflects the socializing agents values. Also the strength of the child's self-reward system depends upon both the type (positive or negative) and amount of social reinforcers he/she has received. This second source is intrinsic because the child has "internalized" this experiential process. According to Harter (1978), in the optimally developed child, where his/her social environment interfaces successfully with his/her natural desires for mastery, the outcome should ideally be that the majority of behaviors are intrinsically motivated. Conversely, an "extrinsically oriented" person is one where negative outcomes occur because their socializing agents have not provided adequate reinforcement for mastery attempts or have reinforced dependency behaviors. In these cases, the child's natural intrinsic motivation and mastery attempts will diminish and other less positive motives will fill the void. For children who have experienced negative outcomes in their

early years, it is expected that they will have a need, in their middle years, for external approval as well as a dependency upon behavior that is externally defined. For these youngsters, the function of "incentive" is such that they will not be motivated to persist on independent attempts at mastery. Instead, their efforts will be maladaptively devoted toward a dependency on adults. "Affectively" they will derive little pleasure from independent mastery behaviors. Mastery situations for these youngsters are "anxiety" provoking particularly if these behaviors have been discouraged or actually punished by their socializing agents. With regard to the general "informational components" of the competence motivation paradigm, these actions lead to dependency behaviors with a concomitant need for adults to set standards and define goals. To the degree that a child has been deprived of hearing and imitating approving words, it would be expected that one would not be successful in internalizing a self-reward system. For these youngsters, there is a strong dependence upon adults or significant others to define their goals and to provide feedback. According to Harter (1978), these dependency needs can lead a youngster to believe that he/she has little or no "control" over events in his/her life. Concerning the evaluative function of reward, receiving disapproval for attempts at mastery gives a message that these behaviors are perceived as being unsuccessful and therefore failures. The message the child gets is that he/she is incompetent and therefore an unworthy person. This cycle

results in the child having relatively low self-esteem which in Harter's model is equivalent to a perceived lack of competence. How low one's self-esteem becomes depends upon the degree to which a child has imitated these disapproving messages. Children who experience these negative outcomes are said to develop extrinsic motivation rather than intrinsic motivation. They are dependent on others for approval and perceive themselves as not being in control of events in their lives. However, because of their developmental cognitive capabilities and their reinforcement histories, they too internalize certain values. However, they internalize a value system based on adult dependency and external validation. These children have internalized a "disapproving voice" which leads them to feel incompetent. Harter explains that these children have internalized a "self-punishing" rather than a "self-reward" system. It is important to note that internalization processes are functioning in the development of both the extrinsically motivated and intrinsically motivated youngster.

A New Self-Report Scale of Intrinsic Versus Extrinsic Orientation in the Classroom

In order to determine the degree to which a child is intrinsically or extrinsically motivated, Harter (1982) developed a measuring instrument called, A New Self-Report Scale of Intrinsic Versus Extrinsic Orientation in the Classroom to assess the level of intrinsic motivation in the elementary school child. This measure is useful in predicting

a number of behaviors including revealing individual differences in the potential success of self-management programs that utilize self-reward. This Self-Report Scale is used to predict what a child's sense of competence is in a classroom setting as well. Harter chose the classroom situation because she was concerned with ecological validity and because the classroom situation is where the motivational orientation of the child would be most relevant. Harter (1981) delineated five dimensions of classroom learning that could be examined from an intrinsic versus extrinsic motivational pole. These dimensions are (1)curiosity/interest versus learning to please the teacher, (2) incentive to work toward one's own satisfaction versus working to please the teacher and to get good grades, (3) preference for challenging work versus easy work, (4) desire to work independently versus dependence on teacher's help, (5) uses internal criteria to assess success or failure versus use of external criteria in the form of teacher feedback or grades to determine success or failure. Thus, Harter's (1981) scale identifies several components of motivational orientation rather than viewing motivation as a global or unitary construct as does Coopersmith (1967) with the Coopersmith Self-Esteem Inventory. Harter (1981) criticizes Coopersmith's procedure of summing a potpourri of diverse items including cognitive competence, personality traits, physical capabilities, acceptance by significant others, ideas on morality, physical characteristics and affective reactions and thereby forming an

index of "global self-regard". Such a procedure makes the assumption that children are unable to make accurate distinctions among the important domains in the lives (Harter, 1982). The Scale of Intrinsic Versus Extrinsic Orientation yields two separate overall subscale scores, one involving a motivational orientation that refers to the reasons "why" a child prefers to engage in mastery behaviors. A high scoring child is indicating that he/she is intrinsically motivated to engage in the processes of "mastery" in the classroom. The second group of subscales taps "cognitive-informational" structures. High scorers on this cluster are indicating what they have learned and "know" about what school behavior is expected and are capable of making these judgements relatively autonomously. According to Harter (1981), a child may manifest an intrinsic orientation in one of these clusters and have an extrinsic orientation on the other. Such a child may demonstrate a strong degree of "mastery motivation" but is also extrinsic on the second cluster which means that this youngster is dependent on his teacher for informational feedback. This pattern can be very different for each individual child depending upon the child's orientation. Thus, it appears that investigating the motivational differences between atypical children may in fact shed some light upon individual differences in ability to learn.

Most recently, there has been a renewed interest in notions of perceived competence and self-concept. McCarthy

and Schmeck (1988) are concerned with the role of the "self" in learning. They believe that one's "self-concept" is the most important cognitive structure whose purpose is to organize one's experience, while a person's "self-esteem" is believed to be the most important "affective" evaluator of experience. According to Hamachek (1978) and Wylie (1974), the "self-concept" organizes what we think we are, what we believe we can accomplish and how well we can succeed while one's "self-esteem" involves a reflection of whether or not we are pleased with our concept and feel worthy. These notions synthesize to form a "Self-Theory" that helps us both to predict our future behavior as well as explain our past behavior. According to Kuiper and Derry (1980), self-theory can be a valid interpretation of reality or an invalid, vague perception and, therefore, according to McCarthy and Schmeck (1988), can both facilitate and/or bias information processing. Self-theory also can affect the degree of "stylistic" consistency within an individual's behavior which may include a preference for certain learning strategies.

Four Aspects of One's Conception of One's Self

In McCarthy and Schmeck's (1988) view, one's conception of one's self involves four aspects that appear to influence learning, namely, self-reference, self-concept, self-esteem and self-talk. Rogers, Juiper and Kirker (1977) have described the self-concept as a "cognitive schema" that is both consistent and uniform, that has the function to encode, organize and elaborate information. The notion of "self-

reference" is used to describe this process and they believe that, "it is difficult to conceive of an encoding device that carries more potential for the rich embellishment of stimulus input than does self-reference" (p. 687). In their research, Rogers, Kuiper and Kirker (1977) demonstrated the importance of self-reference in their experiment that manipulated learning strategies. Subjects were asked to rate adjectives in one of four conditions. In the first, "structural" condition, the length of the word was rated, in the second "phonemic" condition the sound of the word was rated while the third "semantic" condition rated word meaning and the final "self-reference" condition rated the extent to which the word actually described each subject personally. Subjects were then unexpectedly asked to recall the words rated. The results indicated that subjects were able to recall the adjectives in the "self-reference" condition better than any other condition. These same results occurred in a similar experiment which caused Rogers and his researchers to conclude that "self-reference" allowed for superior memory and learning. Since their research, others have been successful in replicating their findings (Bower and Gilligan, 1979; Schmeck and Meier, 1984). Further, Bower and his associates (1981) successfully demonstrated that giving subjects the instruction to relate information to personal occurrences in their lives served to significantly improve retention. Also, Schmeck and Meier's (1984) experiment showed that subjects who consistently used a "self-reference" learning strategy had

superior memory. Finally, McCarthy and Schmeck (1982) demonstrated that "self-reference" used by a lecturer allowed for improvement in student's memory of the lecture because the lecturer served as a model for them, in turn, to use self-reference.

With regard to the "self-concept", both Markus (1977), and Bower and Gilligan (1979) believe that the self-concept operates no differently than any other schemata. However, Schmeck and Meier (1984) believe that the "self-schema" is special and that information dealing with one's sense of identity will be given more time and attention. They also point out that schemata that represent one's self-concept will be laden with added affective components. Research has indicated that subjects were more efficient in processing information that was "congruent" with one's self-concept (Kuiper and MacDonald, 1982). Further, MacDonald and Kuiper (1984) found that subjects rated adjectives more consistently when they were congruent to self-concept. Other research indicates that information that is congruent with one's self-concept is both processed faster (Kuiper and Olinger, 1988) and remembered better (Derry and Kuiper, 1981).

Of particular relevance to the present study is the work on "bias" that has emerged from the literature. According to McCarthy and Schmeck (1988), one's initial concept of self can bias future perceptions and encoding of self-referenced information to favor information that the subject feels is more congruent with prior expectations. Rogers, Rogers and

Kuiper (1979) presented subjects with adjectives and asked them to rate these adjectives for self-reference. Two and a half months later they asked subjects to recall the original adjectives. The researchers found that subjects were most likely to identify adjectives as part of the original list when they were congruent with the subjects self-concept.

Thus, the self-concept is considered to be a powerful "cognitive prototype" through which incoming information is interpreted (McCarthy and Schmeck, 1988). Research indicates that, when self-reference is used by individuals, it acts to facilitate both learning and retention. Of particular importance is the research of Bryan and Pearl (1981); Gur and Sackheim (1979) and McCarrey, Edwards and Rozario (1982) all of whom found that when one has a poor self-concept, or when self-esteem is in jeopardy, self-reference decreases (subjects avoided looking in mirror) and bias increases in that subjects take credit for success but blame failure on external causes. Thus, according to McCarthy and Schmeck (1988), self-concept acts to moderate the relationship between self-reference and consequent learning in that it sometimes acts as a facilitator and, at other times, it acts as the cause of bias.

The third aspect of the conception of one's self involves the notion of self-esteem. A number of researchers have found that a relationship exists between self-esteem and the learning strategy one chooses. In research done by Dean (1977), adolescents considered high in self-esteem performed better on free-recall and non-verbal paired associates tasks

and were found to use more sophisticated learning strategies in general. It was found that subjects deemed to have high self-esteem were able to recall material in a reverse order than originally presented and also were able to more successfully use a clustering strategy on a test of free recall. In contrast, the low self-esteem subjects did not vary the output order from what was originally presented proving to be more inflexible in their approach using a repetitive strategy for rehearsal not realizing that there was a more complex strategy available that was also more efficient. Those subjects who were high in self-esteem appeared to prefer using deeper, more elaborate strategies while the subjects deemed low in self-esteem tended to employ a more shallow, repetitive strategy. McCarthy and Schmeck (1988) have characterized the deep and elaborate strategies as self-assertive in nature, indicating that the alternative shallow strategies are more passive and dependent in nature. Schmeck and Meier (1984) in their interesting study looked at the relationship between subjects use of this elaborate processing involving self-reference and their measures of self-esteem, self-concept crystallization, and defensive self-perceptions such as need for approval. They found that subjects scoring higher on self-esteem were more willing to involve their self-concepts in learning by using self-references more often. This is in sharp contrast to research that has demonstrated that subjects low in self-esteem actively avoided thinking about themselves while in a learning

situation (Bryan and Pearl, 1981; Gur and Sackheim, 1979; McCarrey, Edwards and Rozario, 1982). Further, research indicates that, when subjects employ their self-concepts while learning, it facilitates the perception of relationships between experience and self, thereby allowing greater self-concept crystallization. According to Schmeck and Meier (1984) it is highly probable that a reciprocal relationship may exist whereby use of self-reference will lead to greater self-definition, which ultimately increases the probability that additional self-references will be employed. Assessment of self-esteem proved very important in the research done by Einne, Woodlands and Wong (1982) who found that self-esteem significantly related to subjects interpersonal behavior patterns, their self-attributions concerning when they succeeded or failed as well as their academic accomplishments. In their work, they compared three types of children, namely, learning disabled, normal children and those who were deemed to be gifted. Winne and his colleagues (1982) demonstrated that the learning disabled students manifested significantly lower academic self-esteem than did either the normal or the gifted subjects. However, it is interesting to note that none of these groups differed on other self-esteem subscales involving home or general capabilities. The conclusion that can be drawn from this research is that the learning disabled subjects were in fact engaging in some form of compensation whereby being more successful in another domain such as their homelife protected themselves from poor academic performance.

These findings were supported by Strassberg-Rosenberg and Gaier's (1977) findings that children with learning disabilities can successfully substitute nonacademic goals to defend against poor academic performance. This research demonstrates clearly that self-esteem can be situation specific, if allowed to be, as well as cross-situational or stylistically consistent. Results of the research noted indicate that children differentiate in aspects of self-theory they believe to be important, namely, that the learning disabled youngster may look to bolster his/her sense of self-esteem by focusing on social-interpersonal or athletic domains, while the gifted child may focus more on the academic domain. Black (1974) found that reading ability had significant effect on self-esteem in that learning disabled youngsters identified as poor readers were significantly lower on measures of self-esteem than were learning disabled youngsters who were considered average readers. In Black's (1974) study, he found that self-esteem was not significantly related to measures of I.Q. He also found that a negative relationship existed between self-esteem and reading ability that also increased with age. Black (1974) concluded from his findings that a circular relationship exists whereby low self-esteem is indeed a contributing factor in school failure while school failure significantly lowers self-esteem. Several other studies have examined the effects of stress on measures of self-esteem. Boyle (1983) found that feelings about one's self can influence learning particularly in stressful

conditions and suggests the need to short-circuit this circular relationship between low self-esteem = failure = lowered self-esteem by providing less stressful, less competitive classroom conditions. Margalit and Zak (1984) suggest that individuals who are low in measures of self-esteem also exhibit the highest general anxiety indicating that these youngsters are indeed more susceptible to any stressors that are apparent in the classroom setting.

Finally, Meichenbaum and Goodman (1980) discuss a number of studies that demonstrate the relationship between positive and negative self-statements on affect as well as on one's performance. They conclude that poor academic performance is affected by negative self-statements and the associated negative affect from these statements. They also believe that these negative internal statements are directed toward one's "self" rather than the task at hand and that such negative statements are also self-defeating and "automatic" in the way they are used. Further, Meichenbaum and Goodman (1980) believe that whenever a youngster produces a remarkably low intellectual and/or interpersonal performance across a number of task situations, it is highly likely that some form of negative self-referent thinking is at work. In a related study, Henshaw (1978) used a "think aloud" format with subjects who were rated as high or low in creativity. His research demonstrated that, although both groups initially started with positive statements, the low creative group reverted to significantly more negative statements as time

passed. Also, the highly creative subjects expressed more facilitative notions as well as positive affect in contrast to the less creative subjects who were prone to making detrimental self-statements as well as negative statements about the task at hand displaying negative affect in general.

Margalit and Zak (1984) researched the relationship between self-esteem and anxiety in learning-disabled and normal children. They found that learning disabled children were significantly higher in anxiety and lower in self-esteem which was apparent in expressions of self-dissatisfaction, helplessness and negative self-references that blamed themselves for their failure. Margalit and Zak's (1984) findings suggest that the learning disabled youngster is more prone to using task-inhibitive self-reference in the manner that has been suggested by Meichenbaum and Goodman (1980). As indicated, Schmeck (1983) found that students with low self-esteem and high anxiety are more prone to shallow, surface learning strategies. He suggests that learning disabled youngsters use learning strategies that tend to lower their performance even more allowing for a further increase in negative self-statements. McCarthy and Schmeck (1988) believe that the core of one's self-esteem is a "global feeling" acquired early on but that this global feeling is re-interpreted depending upon the preponderance of successful and/or unsuccessful performance under conditions of competition and social comparison. Sharp and Muller (1978) and Margalit and Zak (1984) conclude that the consequences of

failure can be either positive/motivational or negative/disruptive depending on how one perceives the failure and also depending on the person's subsequent self-statements or "self-talk". These researchers believe that negative feedback can be constructive if given in a supportive way by serving to realistically lower the expectation level but not the performance level. In contrast, punitive feedback tends to lower both expectation levels and performance because it threatens one's global self-concept. Punitive feedback, according to Margalit and Zak (1974) serves to raise a person's anxiety level ultimately leading to circular negative self-statements which has an end effect of causing one to maladaptively distort one's actual ability level. Finally, it is suggested that higher self-esteem appears to be related to independence and versatility because it is possible to rely on internal judgements with its concomitant intrinsic reward (McCarthy and Schmeck, 1988). Higher feelings of self-esteem brought about in part by positive "self-talk" can help maximize potential and allow for the flexibility necessary in learning situations by allowing one to select appropriate rather than inappropriate strategies.

Summary of Literature

Many researchers have argued the need to attend to individual differences in children's learning. However, little progress has been made toward an integrated understanding of the nature of individual differences in learning (Cronbach & Snow, 1977). Until we become more

knowledgeable about how these differences impact on ability to learn, we will be hampered in prescribing differential treatment and will therefore be inefficient in our teaching of children (Copeland, 1982).

Attempts have been made to isolate subject variables that may affect treatment in order to have a better grasp on how these individual differences impact on learning. Kagan (1965) became interested in looking at "cognitive style" and distinguished a dimension of style known as reflectivity-impulsivity. This construct of conceptual tempo has been widely researched and has recently received renewed attention (Sternberg, 1987). It has been empirically demonstrated that reflective children outperform impulsive children on many school related tasks. Since this is the case, many researchers have attempted to modify impulsive responding in the direction of reflectivity but with limited success. Therapeutic approaches have taken the form of cognitive and behavioral techniques such as using behavioral contingencies, modeling and self-instructional training which is of more concern in the present study. Weithorn and Kagen (1984) suggest that the mixed results in this research may be the result of sampling issues that select subjects interchangeably on the basis of "behavioral impulsivity" and "cognitive impulsivity" and that a need exists to separate these two sample populations in order to have cleaner samples. The literature reports conflicting results with regard to the degree of relationship between behavioral impulsivity

(hyperactivity) and cognitive impulsivity. This study attempts to differentiate these two populations and examine the dynamics of these two groups.

Self instructional research has produced equivocal results because of several possible reasons. Harter in particular believes that there are at least two essential aspects that must be included in the implementation of self-instruction namely, an examination of one's motivational orientation, and examination of the aspects of the "self" side of the self-management issue. When self-instructional programs are instituted, it is often falsely assumed that all youngsters are capable of self-observation; self-evaluation; and self-reward, which are all crucial aspects of self-management programs. The process of understanding a child's capabilities must include an analysis of both the sense of competence as well as their motivational orientation in the classroom situation (Harter, 1982). This study attempts to examine these elements as an initial step in formulating a test battery that would allow for an understanding of the dynamic aspects of children involved in learning prior to an across-the-board implementation of self-management programs. Also, according to Harter (1982), any such analysis also involves an analysis of the socialization history and how these events interact with the child's self-concept.

Harter's (1985) research indicates that there are two antecedents that strongly influence one's global sense of self-worth. The first is the degree to which one is

successful in the domains of one's life that are deemed important (tapped by the Self-Perception Profile) and the second is one's perception of the attitudes that significant others hold toward the self (tapped by the Social Support Scale). This research examines whether the cognitive/ behavioral youngsters will show any significant differences from the average population on these measures.

Further, according to Harter's theoretical model, two other issues are important to examine in order to arrive at a fuller understanding of individual differences in competence and motivational orientation as well as to possibly understand the causal relationship as to why some children are unable to achieve. Research has shown that many classrooms are organized as competitive places where children must vie for a share of the rewards bestowed rather than involve themselves in intrinsic learning. Such an atmosphere has been shown to increase anxiety levels of non-competitive youngsters. Analysis of anxiety level could lend some insights into whether a youngster is anxiety ridden in mastery situations. Finally, it is important to examine one's sense of control to see whether the cognitively impulsive and/or behaviorally impulsive child does indeed differ from the average population.

The purpose of the present study is to examine the dynamics of individual differences in learning. Specifically, it targets the cognitively impulsive and/or behaviorally impulsive learner attempting to delineate whether these two

populations are distinct groups unto themselves or whether they are in fact "overlapping" populations. Cognitively impulsive and/or behaviorally impulsive youngsters have been shown to have deficits in learning which indeed distinguish them from the normal population. The present research asks the question whether degree of behavioral and/or cognitive impulsivity will impact on achievement. Further, the present study empirically examines characteristics of Harter's (1978) model that suggests a number of factors that impinge upon an individuals ability to profit from instruction and learning. Specifically, it looks at individual differences in competence motivation. Evidence suggests that, for certain children, this particular motive system has been attenuated in the course of development (Harter, 1975a); Harter & Zigler, 1974). To understand what variables may have resulted in this attenuation, it is important to examine the child's socialization history and how it impacts on development and maintenance of competence motivation. It has been suggested that degree of gratification for successful mastery attempts has been consistently attenuated in some children. In such cases, youngsters are thought to attach a negative subjective evaluation to their performance rather than a positive one. For these youngsters, rather than feeling a sense of pleasure for good performance, instead experience a sense of "anxiety" which ultimately interferes with further involvement in learning. To the degree that a child has been deprived by socializing agents of hearing and imitating approving words,

it would be expected that they would not be successful in internalizing a self-reward system. However, characteristically, when self-instructional programs are instituted, it is often falsely assumed that all youngsters are capable of self-observation, self-evaluation and self-reward and this may not be the case. This study attempts to examine whether the more cognitively and/or behaviorally impulsive child may in fact possess a "self-management deficit" that may bias them from benefiting from classroom instruction that incorporates self-management techniques to bring about behavior change. In order to investigate this issue, this study examines children's motivational orientation in the classroom. It has been suggested that an optimal approach to modifying impulsive responding may be an approach that integrates procedures to increase motivation with cognitive training and/or modeling techniques (Nelso, Finch & Hooke, 1975). This research concluded that there was evidence that suggests that the degree to which a child pauses to reflect on the quality of his cognitive processes is influenced by both his stable cognitive style as well as his immediate social environment. Further, it has been suggested that many traditionally used educational practices such as test-taking formats (i.e. multiple choice) and reward structures have a debilitating effect on motivation (Ames & Ames, 1984). Research suggests that learning under individualized or competitive classroom situations may in fact be tapping different motivational systems that may have

separate origins and differential meanings for students particularly the high and low achiever. Motivating children to self-improve (intrinsic motivation) which is at the core of self-management programs, may well be incompatible with the demands of competitive classroom situations where the main issue becomes one of winning or losing rewards rather than intrinsic learning. The current research examines children's motivational orientation in the classroom and assesses the level of intrinsic motivation in the elementary school child using the Self-Report Scale of Intrinsic Versus Extrinsic Orientation in the Classroom (Harter, 1980). This measure reveals individual differences in the potential success of self-management programs that utilize self-reward according to Harter (1980).

Finally, it has been suggested that an important contributor to successful academic performance has been an individual's expectation of whether they have any control over their academic successes and failures (Connell, 1980). It has been hypothesized that children differ along a continuum of perceived control whereby they view themselves as "in control" (internal); view "powerful others" as controllers (external) and/or do not know the source of control (unknown). Where children fall on this continuum may also be a contributing source to academic success or failure. This study examines this issue with the cognitively impulsive and/or behaviorally impulsive children in an attempt to understand whether they differ on these measures from the average population and

whether we can make predictions using these instruments.

Given the extent of self-management techniques that are currently being used in our schools today, and given the current trend away from special education to mainstream education, it becomes even more important to examine the atypical child's pattern of responses, which is the purpose of the present study, before initiating a program. Toward this end, the following hypotheses will be tested with a statistical technique of regression analysis.

Ho_1 Cognitive and Behavioral impulsivity is inversely related to self-worth. Specifically, subjects who score higher on the behavioral impulsivity activity level measure (ATQ) will score lower on the measure of global self-worth. Likewise, subjects scoring higher on the cognitive style, cognitive impulsivity I-R Index will score lower on the measure of global self-worth.

Ho_{1A} Patterns of the Self-Perception Profile will differ for those subjects scoring higher on the cognitive impulsivity I-R Index than those subjects scoring higher on the activity level behavioral impulsivity ATQ measure. Specifically, it is predicted that cognitive impulsivity will be negatively correlated with the Scholastic Competence measure.

Ho_{1B} Those subjects scoring higher on the activity level,

behavioral impulsivity ATQ measure are expected to demonstrate deficits in the Behavioral Conduct measure.

Ho2 Cognitive impulsivity and behavioral impulsivity will be differentially related to motivational factors. Specifically, cognitive impulsivity will show a negative relationship to extrinsic motivation (as measured by the Scale of Intrinsic Versus Extrinsic Orientation in the Classroom, Harter, 1985) while behavioral impulsivity will not be a factor.

Ho3 Cognitive impulsivity and behavioral impulsivity will be differentially related to informational factors that rely on teacher judgements and external sources of feedback (as measured by the two informational components of the Scale of Intrinsic Versus Extrinsic Orientation in the Classroom). Specifically, cognitive impulsivity will be negatively related to teacher judgements and external sources of control while behaviorally impulsivity is not expected to be related to these same factors.

$Ho4_A$ Cognitive impulsivity and behavioral impulsivity will be differentially related to three school

based anxiety scales as measured by the School Concerns Scale (Buhrmester, 1982). Specifically, cognitive impulsivity is expected to be related to the Scholastic Performance domain while behavioral impulsivity is not expected to be related to the Scholastic Performance domain.

$Ho4_B$ Behavioral impulsivity will be related to the Behavioral Conduct domain (as measured by the Adult Discipline domain of the School Concerns Scale) while cognitive impulsivity is not expected to be related.

$Ho4_C$ Teacher acceptance is related to both cognitive impulsivity and behavioral impulsivity. It is expected that those subjects who score higher on the cognitive impulsivity I-R Index and those who score higher on the activity level, behavioral impulsivity ATQ measure will score lower on the Teacher Acceptance measure.

Ho5 Source of control will be related to cognitive impulsivity and behavioral impulsivity. It is expected that those subjects who score higher on the cognitive impulsivity I-R Index and those subjects scoring higher on the activity level behavioral impulsivity ATQ measure will perceive

themselves as less in control.

$Ho6_A$ Source of support will be differentially related to cognitive and behavioral impulsivity. Subjects who score higher on the activity level behavioral impulsivity ATQ measure will score lower on the parental support measure. Cognitive impulsivity is not expected to be related to parental support.

$Ho6_B$ Behavioral impulsivity will be negatively related to teacher support. Cognitive impulsivity will also be negatively related to teacher support.

Ho7 School achievement is differentially related to cognitive impulsivity and behavioral impulsivity. It is expected that those subjects scoring higher on the cognitive impulsivity I-R Index will score lower on measures of school achievement as measured by the Metropolitan Achievement Tests. There will be no relationship for behavioral impulsivity.

III. METHODOLOGY

SUBJECTS

The subjects of this study included 63 children chosen from the third to fifth grades of a suburban Long Island elementary school from regular education classes. Their ages ranged from eight years two months to eleven years nine months. All subjects were administered the Kagan Matching Familiar Figures Test as well as a number of scales described below. Teachers were asked to fill out the Conner's Abbreviated Teacher's Questionnaire for each subject.

MATERIALS

Cognitive Impulsivity

The Matching Familiar Figures Test (Kagan, 1965a), a test of cognitive impulsivity, was administered in the usual way whereby latencies were recorded up to the first response and all errors made on each item were summed across the total test consisting of twelve items. In order to avoid the methodological problems cited by Block et al. (1974) with the traditional use of the double-median splits, an impulsivity-reflectivity (I-R) index described by Bentler and McClain (1976) and Loper and Hallahan (1980) was used. To compute this I-R index, errors and latencies were transformed into t scores. Then the distribution of the standard scores for latencies was inverted whereby higher scores signified shorter latencies. Finally, the standard scores for

both response times and errors was summed forming the I-R index. Thus, all scores above 100 were considered impulsive and those below 100 reflective similar to a procedure used by Weithorn, Kagen and Marcus (1984). To verify this procedure, Weithorn et al. (1984) checked the validity of this I-R index by using the traditional dichotomization which is based on median splits for errors and latencies. Weithorn found that none of the impulsives scored below 100 nor did the reflectives so identified score above 100.

Behavioral Impulsivity

To determine behavioral impulsivity, the Conners Abbreviated Teacher Questionnaire (Conners, 1973) was administered. This instrument requires teachers to rate the activity level of the subjects. The reason for using this instrument is its traditional use in research to determine degree of behavioral impulsivity. The Conners ATQ is made up of ten items which include questions on how much the child is bothered by restlessness, fidgeting, temper outbursts, etc. Teachers are asked to respond in one of four ways; not at all; just a little; pretty much or very much which connotes a score of zero to three respectively.

Self-Perception

To determine the subject's level of perceived competency and self-adequacy, the Self-Perception Profile For Children (Harter, 1985) was administered. This scale consists of five

domains measuring scholastic competence; social acceptance; athletic competence; physical appearance and behavioral conduct as well as a sixth measure of global self-worth. Each of these subscales yields a separate score thereby allowing for an examination of the profile of a child's evaluative judgements. The rationale underlying this instrument is the notion that measurement of one's perceived competence in different domains as well as an independent assessment of global self-worth provides a more diversified and differentiated picture as opposed to measures that include a potpourri of items that produce a single self-concept score. The Self-Perception Profile For Children taps a child's perception of himself or herself and allows for the examination of differences in a child's score across many domains in their lives and provides a most accurate picture of their self-concept. In order to avoid a tendency that true-false formats have of tending to pull for socially desirable responding, children are asked to respond in one of four ways. First, they are asked to decide what kind of child is most like themselves and then they must decide, is this response "sort" of true of them or "really" true of them. This type of format implies that half of the kids in one's reference group think of themselves one way and the other half view themselves another way. Therefore, any answer becomes a legitimate and valid choice. An example question is, "some kids often forget what they learn" but "other kids can remember things easily". A child's response involves first selecting

which of the two descriptions more accurately depicts him or her and then decide whether this is "sort of true of me" or "really true of me". The child's responses are scored from 1 to 4 where one indicates low perceived competence and a score of four reflects high perceived competence. Harter (1985) reports internal consistency reliabilities for four samples that range from .71 to .85.

Scale of Intrinsic Versus Extrinsic Orientation in the Classroom

The Scale of Intrinsic Versus Extrinsic Orientation in the Classroom was administered in an attempt to understand the degree to which a child's motivation for classroom learning may be determined by their degree of intrinsic interest in learning and mastery, curiosity, preference for challenge versus an extrinsic orientation where children are motivated by teacher approval, grades and dependency on teacher's guidance. Five dimensions of classroom learning were studied, where each dimension was characterized by either an intrinsic or extrinsic motivational level. These five dimensions include (1) preference for challenge versus preference for easy work assignments; (2) curiosity/interest versus pleasing teacher/getting grades; (3) independent mastery versus dependence on teacher; (4) independent judgement versus reliance on teacher judgement and (5) internal criteria used to judge success versus external criteria as sources of evaluation. Each of the five subscales

are made up of six items each. Within each subscale, three items are worded to begin with the intrinsic orientation while the other three have an extrinsic orientation. Within the total test, no two items are from one subscale and also no two items are keyed in the same direction. The scales can be administered both in group or individually. The question format is one that first asks the child to decide what type of child he/she is, i.e., "some kids know when they've made a mistake without checking with the teacher", or, "other kids need to check with the teacher to know if they've made a mistake. Then the child is asked to make the decision as to whether the question is "really true for me" or "sort of true for me". Harter (1980) points out the advantages of this type of format in that it legitimizes either choice because the format implies that half the kids in one's reference group view themselves one way and the other half view themselves another way. The child thereby has a broader more accurate choice of answering one out of four possibilities as opposed to true-false formats with their subsequent pull for socially desirable responding. Each item was scored on an ordinal scale from 1 to 4 with a score of one indicating a maximum extrinsic orientation and a score of four indicating a maximum intrinsic orientation. Thus, for the example given, a child who indicates that he is aware that he has made a mistake without the need to check with his/her teacher and believes that this is really true of himself/herself would receive a score of 4 while the child who believes that this statement is

"sort of true for me" would receive a 3. However, a child who indicates that he/she needs to check with the teacher and further says that this is "sort of true for me" would receive a score of 2 while a child who says that this is "really true for me" would receive a score of 1. Harter (1980) reports factorial validity scores which "clearly reveals that a five-factor solution, reflecting the five subscales we identified, is appropriate". The average loadings for items on their designated factors range between .46 and .53 and also it is reported that no items systematically cross-loaded on other factors. Harter (1980) reports reliability scores for each subscale using Kuder-Richardson Formula 20 which provides an index of internal consistency. Reliabilities are reported as .78 to .84 for challenge; .68 to .82 for independent mastery; .70 to .78 for curiosity; .72 to .81 for judgement and .75 to .83 for criteria subscales.

Social Support Scale for Children (Harter, 1985)

In order to evaluate the child's perceived level of support and regard which significant others manifest toward the self, the Social Support Scale For Children was administered. This measure, according to Harter (1985) "allows us to investigate the hypothesis that perceived regard from others would directly impact perceived regard for oneself" (p.1). The Social Support Scale allows for the identification of those forms of social support which can best predict one's sense of global self-worth as a person. Self-worth has been defined by Harter (1985) as "the degree to

which one likes oneself as a person, likes the way one is leading one's life, is satisfied with oneself, in general, is happy with the way one is" (p.1) and is operationalized with the Global Self-Worth subscale of the Self-Perception Profile for Children (Harter, 1985). The Social Support Scale anticipates the forms of social support that may be the best predictors of global self-worth. The items in the scale tap the degree to which the child perceives others treat them like a person, liked them the way they are, cared about their feelings, understood them, and listened to their problems in general, assessing social support in the form of the central construct of "positive regard" from others. Assuming that the degree of support will vary from one significant other to another, the Social Support Scale identifies four possible sources of positive regard (1) parents, (2) teachers, (3) classmates and (4) close friends. Since each source of support is defined as a separate subscale, it becomes possible to determine an individual's profile of support across the four sources of support deemed important. The content of the parent support subscale taps items that explore the extent to which parents are perceived to understand them, want to hear about their problems, care about their feelings, etc. The classmate support scale looks at the extent to which a child perceives his/her classmates as liking them the way they are, don't make fun of them, ask them to join in games and are friendly. The teacher support subscale assesses the degree to which the child perceives that their teacher helps them if

they are upset, care about them, are fair to them and help them to do their best. The "close friend" subscale is somewhat different than the other three in that it does not make the assumption that each child has a close friend but instead asks whether the child indeed "has" a close friend who can respond in certain ways such as being there to listen and understand his problems and spend time with him/her. Each of the four subscales contains six items totaling 24 items for the entire scale. The question format is similar to the Self-Perception Profile and the Intrinsic-Extrinsic Orientation Scales whereby the child is asked to respond to questions in one of four ways whereby a score of 4 on an item represents the highest level of support and 1 representing the lowest level of support. The actual questionnaire that is filled out by the child is called "People In My Life". Harter (1985) reports reliabilities ranging from .72 to .82 and correlational validities ranging from .35 to .69.

A Multidimensional Measure of Children's Perception of Control (Connell, 1980)

To assess to what degree perceived control plays in motivational and cognitive behavior, the Multidimensional Measure of Children's Perception of Control was administered. Perceived control is defined as the level to which one understands the locus of cause of successes and failures in one's life. Three perceptions of control are indicated: (1) internal source of control; (2) powerful others as source of control and (3) an "unknown" source of control.

According to Harter and Connell (1984), knowing the source of control operating in the classroom may be a necessary condition for competent academic performance. Conversely, a child who does not "know" the reasons for his/her successes and failures in the classroom may inhibit good performance and increase the need to focus on an extrinsic source of information and feedback in order to guide future achievement. Each of the three sources of control were assessed in three behavioral domains, (1) cognitive; (2) social and (3) physical as well as a fourth "general" domain. The total test consists of 48 items scored on a four-point Likert format with each item being presented to the child asking him/her to circle one. A score of 4 indicates a high level of internal control. Connell (1985) reports test-retest reliabilities ranging from .60 to .78.

School Concerns Inventory (Buhrmester, 1982, 1985)

In order to assess the child's level of concern or anxiety and how these factors may impact on learning, the School Concerns Inventory was administered. The inventory bridges the two anxiety measures traditionally used, that of test anxiety or general anxiety by providing information about both "specific" and "general" anxiety tendencies. The School Concerns Inventory provides a profile of specific anxieties as well as a sum of general anxiousness across six domains (1) scholastic performance; (2) athletic competence; (3) peer hostility/rejection; (4) physical appearance; (5) behavioral

conduct (adult discipline) and (6) teacher acceptance. Each subtest consists of seven items for a total of 42 questions that can be group administered and scored on a four point scale with high "worrying" equaling the score of 4 and low "worrying" receiving a score of 1. Items that make up the scholastic performance subscale represent academic related situations children are prone to worry about (i.e., taking tests; getting report cards). The peer acceptance subscale deals with items involving making and keeping friends and provides a measure of social anxiety in the child. The adult discipline (behavioral conduct) subscale taps how much the child is anxious about getting into trouble and misbehaving. The sports competition subscale taps concern over athletic performance and how anxious they become when pressured to compete in sports. The newer School Concerns Inventory (1985) added physical appearance and teacher acceptance scales that deal with these areas of anxiety. The value of this School Concerns Inventory lies in the fact that one is able to analyze the more general anxiety score into component scores that indicate a more specific cause for anxiety. Buhrmester (1982) reports reliability coefficients ranging from .75 to .92 and concurrent validity for the inventory yielding correlations of .60 for boys and .50 for girls. Buhrmester (1982) reports that the fact that these correlations are not higher attests to the need for situation-specific measures.

PROCEDURE

The Matching Familiar Figures Test (Kagen, 1965) was individually administered as per the directions delineated in the test booklet (see Appendix C for specific directions). All subjects were also administered the Self-Perception Scale, the Scale of Intrinsic Versus Extrinsic Orientation in the Classroom, the Social Support Scale for Children, the School Concerns Scale and the Children's Perception of Control Measure (see Appendix C for specific instructions for administration) in a group setting in two sessions of 45 minutes each. All questions were read aloud to the children to avoid possible differences in reading ability. The school concern inventory was always given last so as not to introduce notions of "worry" that could influence the scores on the other measures.

In order to asses the activity level of the children involved in this study, teachers were asked to fill out the Conners ATQ (Conners, 1973) since this is the instrument traditionally used for this purpose. Teachers were instructed as follows: "Listed below are items concerning children's behavior or the problems they sometimes have. Read each item carefully and decide how much you think this child has been bothered by this problem at this time: Not at all (rated 0); Just a little (rated 1); Pretty much (rated 2); or Very much (rated 3)."

In order to assess the child's academic achievement, the

subjects most recent scores on the Metropolitan Achievement Tests for reading, math and language were used.

Data Analysis

Regression analysis using continuous variables was used. Behavioral impulsivity is a continuous variable using the traditional Conners ATQ scoring procedures and degree of cognitive impulsivity is also a continuous variable based on the impulsivity index developed by Bentler and McClain (1976). Following is a restatement of the hypotheses tested and specific analysis including factors.

Ho1 Cognitive and behavioral impulsivity is inversely related to self-worth. Specifically, subjects scoring higher on the behavioral impulsivity measure will score lower on the measure of global self-worth and the Cognitive Impulsive I-R Index will have a significant negative correlation. The specific analysis including factors is as follows:

Ho1 Global Self Worth

y Global Self Worth

x1 Subjects scoring higher on the measure of behavioral impulsivity (as measured by the Conners ATQ).

x2 Cognitive Impulsivity (as measured by the Cognitive Impulsivity I-R Index).

$y_1 = Bo+B1x1+B2x2$

B1 = Significantly Negative

B2 = Significantly Negative

$Ho1_A$ Patterns of the Self-Perception profile will differ for those subjects scoring high on the cognitive style I-R Cognitive Impulsivity Index and those subjects scoring higher on the activity level ATQ Behavioral Impulsivity Measure. Specifically, it is predicted that cognitive impulsivity will be negatively correlated with the Scholastic Competence domain. The specific analysis including factors is as follows.

$Ho1_A$ Scholastic Competence

y Scholastic Competence

x1 Behavioral Impulsivity

x2 Cognitive Impulsivity

$y_{1A} = Bo+B1x1+B2x2$

$Ho1_A$ B1 = 0

B2 = Significantly Negative

Those subjects scoring higher on the behavioral impulsivity activity level ATQ measure are expected to demonstrate deficits in the Behavioral Conduct domain. The specific analysis is as follows:

$Ho1_B$ Behavioral Conduct

y Behavioral Conduct

x1 Behavioral Impulsivity

x2 Cognitive Impulsivity

$y_{1B} = Bo+B1x1+B2x2$

$Ho1_B$ B1 = Significantly negative

B2 = 0

Ho2 Cognitive Impulsivity and Behavioral Impulsivity will be differentially related to motivational factors. Specifically, cognitive impulsivity will show a negative relationship to extrinsic motivation (as measured by the Scale of Intrinsic Versus Extrinsic Orientation In The Classroom, Harter, 1985) while behavioral impulsivity will not be a factor. The specific analysis is as follows:

Ho2 Motivation

y Motivational Factors (3 subscales of Scale of Intrinsic Versus Extrinsic Orientation In The Classroom).

x1 Degree of Behavioral Impulsivity

x2 Cognitive Impulsivity

$y_2 = Bo+B1x1+B2x2$

Ho2 B1 = 0

B2 = Significantly negative

Ho3 Cognitive impulsivity and behavioral impulsivity will be differentially related to informational factors that rely on teacher judgements and external sources of feedback (as measured by the two informational components of the Scale of Intrinsic Versus Extrinsic Orientation In The

Classroom). Specifically, cognitive impulsivity will be negatively related to teacher judgements and external sources of control while behavioral impulsivity is not expected to be related to teacher judgements. The specific analysis is as follows:

Ho3 Informational Feedback

y Informational Components

x1 Behavioral Impulsivity

x2 Cognitive Impulsivity

$y_j = Bo+B1x1+B2x2$

Ho3 B1 = 0

B2 = Significantly Negative

$Ho4_A$ Cognitive impulsivity and behavioral impulsivity will be differentially related to three school based anxiety scales as measured by the School Concerns Scale (Buhrmester, 1982). Specifically, cognitive impulsivity is expected to be related to the Scholastic Performance domain while Behavioral Impulsivity is not expected to be related to the Scholastic Performance domain. The specific analysis is as follows:

$Ho4_A$ Scholastic Performance

y Scholastic Domain

x1 Behavioral Impulsivity

x2 Cognitive Impulsivity

y_{4A} = Bo+B1x1+B2x2

$Ho4_A$ B1 = o

B2 = Significantly Positive

$Ho4_B$ Behavioral impulsivity will be positively related to the Behavioral Conduct domain (as measured by the Adult Discipline domain of the School Concerns Scale) while cognitive impulsivity will not be related. The specific analysis is as follows:

$Ho4_B$ Behavioral Conduct

y Behavioral Conduct Domain

x1 Behavioral Impulsivity

x2 Cognitive Impulsivity

y_{4B} = Bo+B1x1+B2x2

$Ho4_B$ B1 = Significantly Positive

B2 = 0

$Ho4_C$ Teacher acceptance is related to both cognitive impulsivity and behavioral impulsivity. It is expected that those subjects scoring higher on the Cognitive Impulsivity Index and those high on the Activity Level ATQ measure will also score higher on the Teacher Acceptance measure. The specific analysis is as follows:

$Ho4_c$ Teacher Acceptance

y Teacher Acceptance Domain

x1 Behavioral Impulsivity

x2 Cognitive Impulsivity

$y_{4C} = Bo+B1x1+B2x2$

$Ho4_c$ B1 = Significantly Positive

B2 = Significantly Positive

Based on theory and research by Harter and Connell (1984), it is hypothesized that knowing the source of control operating in a classroom may be a necessary condition for competent performance and an intrinsic motivational orientation. Conversely, it has been suggested that ones not knowing the reasons for success and failure in the classroom may inhibit performance and increase the need to focus on extrinsic sources of information and feedback in order to guide future achievement. Considering this, the following hypotheses are proposed:

Ho5 Source of Control will be related to cognitive impulsivity and behavioral impulsivity. It is expected that those subjects high on the Cognitive Impulsivity I-R Index and those subjects scoring high on the Activity Level ATQ measure will perceive themselves as less in control. The specific analysis is as follows:

Ho5 Source of Control

y Oneself

x1 Behavioral Impulsivity

x2 Cognitive Impulsivity

y_5 = Bo+B1x1+B2x2

Ho5 B1 = Significantly Negative

B2 = Significantly Negative

It is expected that the profile of degree of support will differ between those scoring higher on the cognitive and behavioral impulsivity than those scoring lower on these measures. Since cognitive impulsives experience their most difficulty in school related tasks, the following hypothesis is proposed:

$Ho6_{A\&B}$ Source of support is differentially related to cognitive and behavioral impulsivity.

$Ho6_A$ Subjects who score high on the activity level ATQ behavioral impulsivity measure will score lower on the parental support subscale. Cognitive impulsivity is not expected to be related to parental support. The specific analysis is as follows:

$Ho6_A$ Parental Support

y Parental Support

x1 Behavioral Impulsivity

x2 Cognitive Impulsivity

Y_{6a} = Bo+B1x1+B2x2

$Ho6_A$ B1 = Significantly Negative

B2 = 0

$Ho6_B$ Behaviorally impulsivity will be negatively related to teacher support. Likewise cognitive impulsivity will have an inverse relationship to teacher support. The specific analysis is as follows:

$Ho6_B$ Teacher Support

y Teacher Support

x1 Behavioral Impulsivity

x2 Cognitive Impulsivity

$Y_{6B} = Bo+B1x1+B2x2$

$Ho6_B$ B1 = Significantly Negative

B2 = Significantly Negative

Ho7 School Achievement is differentially related to cognitive impulsivity and behavioral impulsivity. It is expected that those subjects scoring higher on the cognitive impulsivity I-R index will score lower on measures of school achievement as measured by the Metropolitan Achievement Tests. Behavioral impulsivity ATQ will not be related to school achievement. The specific analysis is as follows:

Ho7 School Achievement

y School Achievement as measured by Metropolitan Achievement Tests

x1 Behavioral Impulsivity

x2 Cognitive Impulsivity

Y_7 = Bo+B1x1+B2x2

Ho7 B1 = 0

B2 = Significantly Negative

IV. RESULTS

Correlation of Variables

Correlation coefficients between ATQ ratings and the I-R index (r=.12) suggests that these two variables do not measure the same behaviors and share only 1% of variance. Correlation coefficients between the independent variables and dependent variables are presented in Table 1[1]. Teacher's estimate of functioning (ATQ) showed strong negative correlations with all achievement measures, i.e., reading (r= -0.30, P>0.01); math (r= -0.34, P<0.01); language (r= -0.36, P<0.01) and total achievement (r= -0.38, P,0.01). The I-R index showed a strong negative correlation to math achievement (r= -0.44, P<0.01). A stronger relationship exists between ATQ and global self-worth (r= -0.33, P<0.01) than between the I-R index and global self-worth (r= -0.16). However, both independent variables are strongly correlated to scholastic competence (ATQ, r= -0.39, P<0.01; I-R index, r= -0.30, P<0.01). Similarly, a strong relationship is evident between global self-worth and scholastic competence (r=0.57, P<0.01). The independent variable ATQ was significantly correlated to nineteen of the twenty-three dependent measures; fifteen at the .01 level and four at the .05 level. To a lesser extent, the independent variable of I-R index was significantly correlated to nine

[1] Full correlation matrix with all variables may be found in Appendix D. It should be noted that results should be interpreted with caution because of the number of correlations examined and the possibility that chance factors produced significance by chance in some cases.

Table 1

Correlations of Independent Variables ATQ and the I-R Index with Each Dependent Variable

Variable	ATQ	I-R Index
Global Self Worth	-.33**	-.16
Scholastic Competence	-.39**	-.30**
Behavioral Conduct I	-.33**	-.25*
Preference for Challenge	-.41**	-.17
Curiousity Interest	-.32**	-.21*
Independent Mastery	-.39**	-.28**
Total Motivation I	-.40**	-.23*
Independent Judgement	.31**	.20
Internal Criteria	-.16	-.15
Total Motivation II	.06	-.01
Cognitive & Scholastic Performance	.36**	-.01
Behavioral Conduct II	.06	-.13
Teacher Acceptance	.27*	.10
Total Anxiety	.22*	-.01
Unknown Source	.29*	.17
Powerful Others	.38**	.33**
Internal Source	-.24*	.08
Parental Support	-.17	-.27*
Teacher Support	-.44**	-.20
Reading Achievement	-.30**	-.17
Math Achievement	-.34**	-.44**
Language Achievement	-.36**	-.10
Total Achievement	-.38**	-.31**

* $p < .05$
** $p < .01$

dependent measures of which five were at the .01 level and four at the .05 level.

Means and Standard Deviations

Table 2 presents the means and standard deviations for the group of 63 subjects on all the independent and all the dependent measures.

TABLE 2

Means & Standard Deviation for Variables of Individual Hypotheses and Achievement Measures

	Mean	S.D.
Global Self-Worth	3.3	0.68
Scholastic Competence	3.1	0.68
Behavioral Conduct	3.1	0.73
Preference for Challenge	2.9	0.86
Curiosity Interest	2.9	0.53
Independent Mastery	2.9	0.79
Total Motivational Factors	8.6	1.96
Independent Judgement	2.3	0.70
Internal Criteria	2.5	0.89
Total Informational Factors	4.8	1.28
Scholastic Performance	2.3	0.85
Behavioral Conduct	2.7	0.90
Teacher Acceptance	1.9	0.66
Total Anxiety Measure	15.3	4.60
Unknown Source of Control	2.2	0.63
Powerful Others	2.2	0.50
Internal Source of Control	3.1	0.39
Parental Support	3.6	0.57
Teacher Support	3.5	0.52
Age (Years & Months)	9y9m	1.4yrs
Reading (%tile)	77.3	18.1
Math Achievement(%tile)	82.1	16.4
Language	82.0	16.0
Achievement(%tile)	83.0	15.1
Total Achievement(%tile)		
Independent Variables		
ATQ	2.4	3.3
Latency (MFFT in Seconds)	189.3	94.7
Errors (MFFT)	6.3	3.5

Testing Hypothesis

Hypothesis 1, 1A, and 1B suggests that cognitive impulsivity (as measured by the MFF I-R Index) and behavioral impulsivity (as measured by the Conner's Abbreviated Teacher Questionnaire or ATQ) are factors that impact on a child's functioning. Specifically, Ho1 suggests that those children who score higher on the ATQ activity level measure and the MFF cognitive style measure will score lower on their measure of self-worth. The results indicate that behavioral impulsivity has a significant relationship to global self-worth. Table 3 shows results of the regression analysis involving the behavioral impulsivity, cognitive impulsivity and global self-worth factors. The regression analysis used a general model where the dependent variable is predicted as a function of the two independent variables. The results of the regression analysis produce a total r^2 based on the full model as well as beta weight for each independent variable corresponding to the unique variance associated with that independent variable, and an F test is used to determine significance. For example, using self-worth, we see that the full model leads to an r^2 of .12, the I-R index has a beta weight of -.12 accounting for only 1.5% of the variance and a non-significant F of 1.03; the ATQ has a beta weight of -.31 accounting for 9.8% of the variance and an F score of 6.69 which is significant at the .05 level. Therefore, in Table 3, behavioral impulsivity does have a significant negative relationship to global self-worth ($F = 6.69$, $p<.05$), while cognitive impulsivity does not.

Hypothesis 1A suggests that those children scoring higher on the cognitive impulsivity I-R Index will score lower on the measure of scholastic competence. The results indicate that cognitive impulsivity is related to the scholastic competence measure ($F = 5.12$, $p<.05$). The results also show a statistically significant relationship between behavioral impulsivity and scholastic competence ($F = 9.77$, $p<.01$).

Hypothesis 1B predicts that children scoring higher on the measure of behavioral impulsivity will score lower on the behavioral conduct measure. The results confirm this prediction ($F = 4.50$, $p<.05$).

TABLE 3

Percentage of Variance of Dependent Variables Accounted for and F Values for Cognitive Style (I-R Index) and Activity Level (ATQ) as Factors

Dependent Variable		Cognitive Style Cognitive Impulsivity (I-R Index)			Activity Level Behavioral Impulsivity (ATQ)		
	r^2	B	% VAR	F	B	% VAR	F
Global Self-Worth	.12	-.12	1.5	1.03	-.31	9.8	6.69*
Scholastic Competence	.22	-.26	6.7	5.12*	-.36	1.27	9.77**
Behavioral Conduct	.15	-.21	5.1	3.10	-.31	9.2	4.50*

*p < .05
**p < .01

Hypothesis 2 empirically examines extrinsic versus intrinsic motivational factors and suggests that cognitive impulsivity and behavioral impulsivity will be differentially related to those motivational factors. Specifically, Ho2 predicts that children who score higher on the MFF cognitive style I-R Index will score lower on the measure of extrinsic versus intrinsic motivational orientation. However, behavioral impulsivity was not expected to be significantly related to measures of extrinsic motivation. The results indicate a significant inverse relationship between those subjects scoring higher on the activity level behavioral impulsivity ATQ measure and the motivational variables of the measure of extrinsic versus intrinsic motivational orientation, Preference for Challenge ($F = 11.46$, $p<.01$); Curiosity Interest ($F = 6.00$, $p<.05$); Independent Mastery ($F = 9.71$, $p<.01$). A significant relationship was not found between those subjects scoring higher on the cognitive impulsivity I-R Index and the measure of extrinsic versus intrinsic motivational orientation.

Table 4 presents the regression analysis with the percentage of variance of the motivational dependent variables accounted for and F ratios for cognitive style (cognitive impulsivity I-R Index) and activity level (ATQ) as factors.

TABLE 4

Percentage of Variance of Dependent Variables Accounted for and F Values for Cognitive Style (I-R Index) and Activity Level (ATQ) as Factors

Dependent Variable		Cognitive Style Cognitive impulsivity (I-R Index)			Activity Level Behavioral Impulsivity (ATQ)		
Motivational Variables	r^2	B	% VAR	F	B	% VAR	F
Preference for Challenge	.19	-.12	1.5	1.09	-.40	15.6	11.46**
Curiosity Interest	.13	-.18	3.0	2.09	-.30	8.7	6.00*
Independent Mastery	.20	-.23	5.3	3.99	-.36	12.9	9.71**
Total Motivation	.19	-.18	3.1	2.34	-.38	14.0	10.41**

*p < .05
**p < .01

Hypothesis 3 suggests that cognitive impulsivity and behavioral impulsivity will be differentially related to "informational factors" that involve individual judgement, in particular one's own independent judgement versus reliance on teacher judgement and whether one uses internal criteria to judge successful outcomes or instead relies on external criteria for validation. Ho3 predicts that cognitive impulsivity will be positively related to teacher judgements and external sources of control while behavioral impulsivity will not be significantly related. Table 5 depicts the regression analysis with percentage of variance of the informational dependent variables accounted for and F ratios for cognitive style (cognitive impulsivity I-R Index) and activity level (ATQ) factors. The results indicate that a

child who scores higher on the activity level behavioral impulsivity ATQ measure will also score significantly higher on the informational factor measure of independent judgement ($F = 5.56$, $p<.05$).

TABLE 5

Percentage of Variance of Dependent Variables Accounted for and F Values for Cognitive Style (I-R Index) and Activity Level (ATQ) as Factors

Dependent Variable		Cognitive Style Cognitive impulsivity (I-R Index)			Activity Level Behavioral Impulsivity (ATQ)		
Information Variables	r^2	B	% VAR	F	B	% VAR	F
Independent Judgement vs. External Judgement	.12	-.16	2.6	1.77	.29	8.2	5.56*
Internal Criteria vs. External Criteria	.04	-.13	1.7	1.06	-.14	2.0	1.27
Total Information Factors	.00	-.01	0.0	0.01	-.06	0.3	0.21

*p < .05
**p < .01

Hypotheses 4A, 4B, and 4C attempt to examine causal factors that may contribute to some students inability to profit from instruction. Specifically, hypothesis 4A suggests that cognitive impulsivity and behavioral impulsivity will be differentially related to anxiety over scholastic performance as measured by the scholastic performance subtest of the School Concerns Scale. It was predicted that cognitive impulsivity would be significantly positively related to concern over scholastic performance while behavioral

impulsivity would not be significantly related to the same factor. Table 6 presents the regression analysis with the percentage of variance of the dependent variables accounted for and F values for cognitive style (cognitive impulsivity I-R Index) and activity level (ATQ) as factors. The results indicate that those children who scored higher on the activity level ATQ test also scored higher on the scholastic performance subtest of the School Concerns Inventory ($F = 9.17$, $p<.05$).

Hypothesis 4B predicts that cognitive impulsivity and behavioral impulsivity will be differentially related to anxiety over behavioral conduct as measured by the behavioral conduct subtest of the School Concerns Inventory. Specifically, it was predicted that subjects scoring higher on the behavioral impulsivity ATQ activity level measure would also score higher on the behavioral conduct domain of the School Concerns Scale. The results did not reveal a significant relationship between anxiety over behavioral conduct and either cognitive or behavioral impulsivity.

Hypothesis 4C suggests that teacher acceptance is differentially related to both the cognitive style cognitive impulsivity I-R Index and the activity level ATQ behavioral impulsivity scores. It was predicted that students scoring high on these two measures would also score high on the teacher acceptance subscale of the School Concerns Inventory. The results indicate that a significant relationship exists between the high scores on the activity level ATQ scores and

the measure of teacher acceptance ($F = 4.29$, $p<.05$).

TABLE 6

Percentage of Variance of Dependent Variables Accounted for and F Values for Cognitive Style (I–R Index) and Activity Level (ATQ) as Factors

Dependent Variable		Cognitive Style Cognitive impulsivity (I–R Index)			Activity Level Behavioral Impulsivity (ATQ)		
Anxiety Variables	r^2	B	% VAR	F	B	% VAR	F
Scholastic Performance	.13	–.05	0.3	0.21	–.37	13.1	9.17**
Behavioral Conduct	.02	–.14	2.1	1.20	–.07	2.3	0.34
Teacher Acceptance	.08	–.06	0.4	0.26	–.26	6.6	4.29*
Total Anxiety	.05	–.04	0.1	0.09	–.22	4.9	3.09

*p < .05
**p < .01

Hypothesis 5 assesses the degree that perceived internal control (i.e., unknown source of control; powerful others as source of control; internal source of control) plays in motivational and cognitive behavior. It suggests that "source of control" is related to cognitive impulsivity and behavioral impulsivity. Specifically, it was expected that there would be an inverse relationship between high scores on the cognitive style I-R index and the source of control measure (low scores on the source of control measure indicate less internal control). Likewise, there would be an inverse relationship between high scores on the activity level ATQ measure and the source of control measure. Table 7 presents

the percentage of variance of the dependent variables (source of control whether "unknown", belonging to "powerful others" or "internal") accounted for and F values for cognitive style (cognitive impulsivity I-R Index) and activity level (ATQ) factors.

The results indicate that all three sources of control are related to degree of behavioral impulsivity, i.e., unknown source ($F = 4.96$, $p<.05$); powerful others ($F = 9.34$, $p<.01$); internal source ($F = 4.21$, $p<.05$). Powerful others as source of control is significantly related to degree of cognitive impulsivity ($F = 6.33$, $p<.01$)

TABLE 7

Percentage of Variance of Dependent Variables Accounted for and F Values for Cognitive Style (I-R Index) and Activity Level (ATQ) as Factors

Dependent Variable		Cognitive Style Cognitive impulsivity (I-R Index)			Activity Level Behavioral Impulsivity (ATQ)		
Source of Control	r^2	B	% VAR	F	B	% VAR	F
Unknown Source	.10	.14	2.7	1.27	.27	10.4	4.96*
Powerful Others	.23	.28	8.1	6.33**	.35	12.0	9.34**
Internal Source	.07	.10	1.2	0.79	-.26	6.5	4.21*

*p < .05
**p < .01

Hypotheses 6A and 6B assess the child's perceived level of support and regard which significant others manifest toward their sense of self as measured by the Social Support Scale.

It was expected that source of support (i.e., parental support; teacher support) was differentially related to cognitive and behavioral impulsivity. Specifically, hypothesis 6A predicts that those subjects scoring higher on the activity level ATQ behavioral impulsivity measure will score lower on the parental support subtest of the Social Support Scale. Conversely, hypotheses 6B predicts that those subjects scoring higher on the cognitive style I-R Index measure of cognitive impulsivity would score lower on the teacher support subtest of the Social Support Scale. Table 8 presents the percentage of variance of the dependent variables (parental support; teacher support) accounted for and F values for cognitive style (cognitive impulsivity I-R Index) and activity level ATQ factors.

The results indicate the reverse in that subjects who scored high on the activity level ATQ measure scored lower on the teacher support subtest ($F = 13.76$, $p<.01$) and subjects who scored higher on the cognitive style I-R Index measure of cognitive impulsivity scored lower on the parental support subtest ($F = 4.19$, $p<.05$).

TABLE 8

Percentage of Variance of Dependent Variables Accounted for and F Values for Cognitive Style (I–R Index) and Activity Level (ATQ) as Factors

Dependent Variable		Cognitive Style Cognitive Impulsivity (I–R Index)			Activity Level Behavioral Impulsivity (ATQ)		
	r^2	B	% VAR	F	B	% VAR	F
Parental Support	.09	-.25	6.3	4.19*	-.14	1.9	1.26
Teacher Support	.22	-.14	2.2	1.68	-.43	17.9	13.76**

*p < .05
**p < .01

Hypothesis 7 states that school achievement is differentially related to cognitive impulsivity and behavioral impulsivity. It was expected that those subjects scoring high on the cognitive impulsivity index would score lower on achievement measures as exemplified by the scores on the Metropolitan Achievement Tests in reading, math, language and total achievement. It was expected that behavioral impulsivity would be inversely related to achievement but to a lesser degree. Table 9 presents the percentage of variance of the dependent variables (reading achievement; math achievement; language achievement and total achievement) accounted for and F values for cognitive style (cognitive impulsivity I-R Index) and activity level (ATQ) factors.

The results indicate that a strong inverse relationship exists between cognitive impulsivity and mathematics

achievement (F = 13.45, p<.01). An inverse relationship also exists between cognitive impulsivity and total achievement (F = 5.60, p<.05). Further, the results indicate that an inverse relationship also exists between behavioral impulsivity and reading achievement (F = 5.38, p<.05); math achievement (F = 7.28, p<.05); language achievement (F = 8.10, p<.05) and total achievement (F = 8.81, p<.05).

TABLE 9

Percentage of Variance of Dependent Variables Accounted for and F Values for Cognitive Style (I-R Index) and Activity Level (ATQ) as Factors

Dependent Variable		Cognitive Style Cognitive impulsivity (I-R Index)			Activity Level Behavioral Impulsivity (ATQ)		
	r^2	B	% VAR	F	B	% VAR	F
Reading Achievement	.11	-.14	2.8	1.34	-.29	11.3	5.38*
Math Achievement	.28	-.41	16.6	13.45**	-.30	9.0	7.28*
Language Achievement	.13	-.06	0.4	0.24	-.35	13.1	8.10*
Total Achievement	.22	-.28	7.6	5.60*	-.35	11.9	8.81*

*p < .05
**p < .01

V. DISCUSSION

Findings of the present study have provided some important information regarding how degree of cognitive and behavioral impulsivity is differentially related to sense of competence; motivational orientation; degree of social support; level of anxiety; sense of control and achievement.

Sense of Competence

According to Harter, children are believed to reflect individual differences in the amount of energy that they will ultimately invest in various domains of their lives (i.e., scholastic; behavioral) and understandably will differ in their sense of global self-worth.

The first group of hypotheses (1, 1A, 1B) suggested that those children who have a higher level of cognitive and/or behavioral impulsivity have realized over the course of time that they are not performing up to expectations and this realization has impacted negatively on their sense of competence and self-worth. It was suggested that the cognitive and behavioral impulsive children would demonstrate a different pattern with regard to the areas in which they felt less competent. Specifically, it was predicted that those children scoring higher on the cognitive impulsivity measure would feel less competent in the area of scholastic achievement while those children scoring higher on the behavioral impulsivity measure would feel less competent in

the behavioral conduct domain.

The results indicate a significant inverse relationship between degree of behavioral impulsivity and global self-worth and only partially supports the notion that both the cognitive and behaviorally impulsive child[2] feels a lowered sense of self-worth. The data supports the hypothesis that cognitive impulsivity is related to scholastic competence. An unexpected finding was that behavioral impulsivity too was related to scholastic achievement to an even larger degree. Further, the data supported the hypothesis that behaviorally impulsive children feel that they are less competent in their behavioral conduct.

Motivation Orientation

It has been suggested (Harter, 1980) that the degree of a child's motivation for classroom learning may be determined by the degree of desire to learn for the sake of intrinsic self-reward.

The current research (Ho2) suggested that cognitive and behavioral impulsivity would be differentially related to motivational factors. An attempt was made to understand the degree to which a child's motivation for classroom learning may be determined by their degree of intrinsic interest in

[2] For purposes of readability, "cognitive and behavioral impulsive child" refers to degree of cognitive impulsivity and involves those subjects scoring higher on the cognitive impulsivity I-R Index and "behavioral impulsive child" refers to degree of behavioral impulsivity and involves those subjects scoring higher on the activity level behavioral impulsivity Conners ATQ measure.

learning and mastery; curiosity; preference for challenge versus as extrinsic orientation where children are motivated instead by teacher approval, grades and dependency on teacher's guidance. It was hypothesized that degree of cognitive impulsivity would show a negative relationship to extrinsic motivational factors.

The data strongly supports the notion that it is the behaviorally impulsive child rather than the cognitively impulsive child who manifests an extrinsic motivational orientation in the classroom. It appears that the behaviorally impulsive child needs to look to the teacher for guidance and approval and must see grades in order to determine his classroom orientation.

The third hypothesis suggested that cognitive and behavioral impulsivity would be differentially related to informational factors. Specifically, it examined what informational criteria was used to validate successful outcomes, i.e., using one's independent judgement versus reliance on teacher judgement or whether one uses internal or external criteria for validation. It was predicted that cognitive impulsivity would be negatively related to teacher judgements and external sources of control.

The results did not confirm this conclusion. Rather, a significant positive relationship was found between degree of behavioral impulsivity and independent judgement.

Source of Anxiety

The fourth group of hypotheses (4A, 4B, 4C) attempted to examine possible contributing causal factors that may influence a student's inability to profit from instruction thereby inhibiting their learning capabilities. Research has demonstrated that many classrooms are organized as competitive places where children find it necessary to compete for their share of teacher rewards rather than involve themselves in more constructive intrinsic learning. Since this kind of classroom atmosphere has been shown to increase anxiety level of non-competitive children, an analysis of a student's anxiety level was deemed important to determine the extent to which they may be anxiety ridden in mastery situations. Hypotheses 4A, 4B, 4C, suggest that cognitive impulsivity and behavioral impulsivity will be differentially related to three school based anxiety measures. Hypothesis 4A predicted that cognitive impulsivity would be positively related to anxiety over scholastic performance while 4B predicted that behavioral impulsivity would be positively related to anxiety over behavioral conduct. Hypothesis 4C made the prediction that both cognitive and behavioral impulsivity would be positively related to anxiety over teacher acceptance.

The results indicated that behavioral impulsivity rather than cognitive impulsivity showed a significant positive relationship to anxiety over scholastic performance. A significant positive relationship was found between behavioral but not cognitive impulsivity and anxiety over teacher acceptance.

Source of Control

Hypothesis five suggests that an important contributor to successful academic performance is an individual's expectation of whether they have any control over their academic successes and failures. It is believed that children differ along a continuum of perceived control whereby they view "themselves"; "powerful others" or "unknown sources" as in control of their lives. This hypothesis suggests that where children fall on this continuum may be a contributing source of academic success or failure. Specifically, it predicts that source of control will be related to cognitive and behavioral impulsivity in that subjects scoring higher on each of these measures will perceive themselves as less in control of events in their lives.

The results support the hypotheses and indicate that indeed both cognitive and behavioral impulsives view themselves as being controlled by "powerful others". This relationship is even more powerful for behavioral impulsivity which also showed a positive relationship to "unknown" source of control. Also, the results show that behavioral impulsivity is inversely related to an internal source of control suggesting that children who score high on the behavioral impulsivity measure believe that they themselves do not have the capacity to control their own lives.

Social Support

Hypotheses 6A and 6B shed some light on the notion that

perceived regard from others would directly impact on perceived regard of self. It investigates the degree of perception of support a child feels emanating from a parental source and a teacher source. It was predicted that the pattern of support would differ from the cognitive and behaviorally impulsive child. Specifically, Ho6A suggests that the child who scores higher on the behavioral impulsivity measure will score lower on the perception of parental support scale. Ho6B suggests that children who score higher on either the behavioral impulsivity or cognitive impulsivity measure will score lower on teacher support.

The results suggest that cognitive impulsivity rather than behavioral impulsivity is inversely related to parental support. The prediction that both cognitive impulsivity and behavioral impulsivity would be inversely related to teacher support was only partially born out. It appears that a strong inverse relationship exists between behavioral impulsivity and perception of lack of teacher support.

Achievement

According to Bjorkland and Butter (1973), deficiencies resulting from a cognitive impulsive style are mainly educational in nature. Previous research has demonstrated that cognitively impulsive children have been shown to have deficits in a number of school related tasks.

The current research (Ho7) investigated the notion that cognitive impulsivity and behavioral impulsivity would be

differentially related to school achievement. Specifically, it was anticipated that those subjects scoring higher on the cognitive impulsivity measure would score lower than their behaviorally impulsive counterparts on the Metropolitan Achievement Tests.

The results show that degree of cognitive impulsivity and achievement was strongly confirmed in the area of mathematics. It is not surprising that this is so given the nature of the mathematics test formats that may bias the cognitively impulsive learner. Contrary to what was predicted, it was those subjects who scored higher on the behavioral impulsivity measure who scored significantly lower on all three measures of achievement, namely, reading; math and language. The results appear to indicate that degree of behavioral impulsivity is an overriding factor in school based performance.

In Summary:

A. Cognitive Impulsives have (are)
    1. less scholastic competent
    2. perceive "powerful others" in control of events in their lives
    3. feel less parental support
    4. diminished mathematics achievement

B. Behavioral Impulsives have (are)
    1. diminished feelings of self-worth
    2. less scholastically competent
    3. concerned with their behavioral conduct

4. needs teacher's guidance and approval and see grades in order to determine classroom orientation
5. acts on his/her own judgements
6. anxiety over scholastic performance
7. anxious to be accepted by the teacher
8. believe they are controlled by "powerful others" or "unknown" sources
9. feels diminished teacher support
10. score lower on all three measures of achievement (math, reading, language)

C. They both share:

1. poorer scholastic performance
2. feeling "powerful others" control events in their lives
3. poor mathematics achievements

D. They are different in their:

1. feelings of self-worth
2. concern over behavioral conduct
3. needs of teacher support and grades to determine classroom orientation
4. anxiety over scholastic performance
5. anxiety over teacher acceptance
6. belief that events in their lives are controlled by "unknown" sources of control
7. perceptions of social supports
8. achievement levels

Educational Implications

The findings of the current research clearly show that significant individual differences exist between the cognitively impulsive and the behaviorally impulsive child. Therefore, it is important that the educational community recognize these differences and begins to address the notion that differential treatments must be introduced to target the needs of the cognitively impulsive and behaviorally impulsive child. In a practical classroom situation this may mean introducing different methods of instruction. For example, the cognitively impulsive child should be taught to slow down his/her impulsive cognitive processes such that they are encouraged to analyze the gestalt of what is required in the learning situation using verbal mediation as a means of checking before responding. However, a different approach would be necessary when dealing with the behaviorally impulsive child who may need to add a motoric component to the learning situation where writing may be introduced into the learning process.

Further, it is important to foster a broader understanding in the educational community of the nature of problems that the atypical child faces in school. Teachers and administrators must understand that when Johnny" jumps out of his seat and raises his hand constantly, that he is not fully in control of his

behavior and that his behavior may be physiological in nature. When teachers and parents become more educated about the individual needs of these atypical children, they may become more liberal in their approach and more accepting of dealing with them in the classroom. Teachers may come to realize that a different positive attitude will perhaps result in kids feeling better about themselves and about how they are doing in school thereby increasing their feelings of self-worth.

It is important for teachers to maximize the students feeling of personal control over consequences thereby fostering a feeling of personal responsibility. Knowledge of these contingencies, coupled with the idea that a youngster has some internal control over events in his/her life (particularly in the classroom situation) would be a motivating force. In order for these positive changes to occur, the child must feel secure and safe in his/her educational setting. It follows that classrooms must be organized such that they are non-punitive and non-competitive thereby fostering positive "affective" responses. The "positive affective chain" that would allow for optimal development would involve a feeling of perceived control over outcomes; objective evaluation of competence; positive affective reaction to one's appraisal leading to a motivation to engage in future mastery attempts. It is important for educators to pay attention to all the links of the chain which includes

these affective/motivational variables as well as the cognitive/behavioral variables. For the child, this translates into his/her "recognizing" the process of, "Why did I succeed"? and "What did I actually do to succeed"? so that the process can be understood and repeated.

Data appears to support the notion that if a child perceives adult authority figures as in "control", the success of self-control programs instituted in the classroom will only meet with limited success since it fosters the notion that the children themselves are not responsible for successful outcomes. Perhaps adoption of the "ultracognitive" approach suggested by Wiener (1981) should be encouraged whereby the child is encouraged to move away from the notion that attributes poor achievement to lack of ability but instead channels attribution toward "effort" which can be individually controlled. Such a goal would instill in the child a notion of their being "responsible" and ultimately "in control".

Suggestions For Future Research

The current research showed clearly that there are differences between children who may be characterized as cognitively impulsive and behaviorally impulsive confirming what Weithorn and Kagen (1984) found. There is a need to understand the dynamics of these differences before we are able to prescribe the best educational

treatment for children. Future research must begin to learn more about the differences and distinctions between these two populations and the kinds of educational treatment these children require.

Also, a need exists to develop more fine tuned assessment instruments that can help researchers to identify the atypical child before the spiral of failure is put into motion. This study revealed that behavioral impulsivity was an overriding factor in a number of school based measures. This may have been due to the instruments themselves. The behavioral ATQ measure consists of teacher judgements based on professional observation over the course of many months. In contrast, the MFFT is a single performance measure based on a fifteen to twenty minute task performance which has no intrinsic nor extrinsic motivation for the child. The reliability of this instrument could be suspect. Before using the construct of cognitive impulsivity in classroom situations, a better measure of the construct is needed.

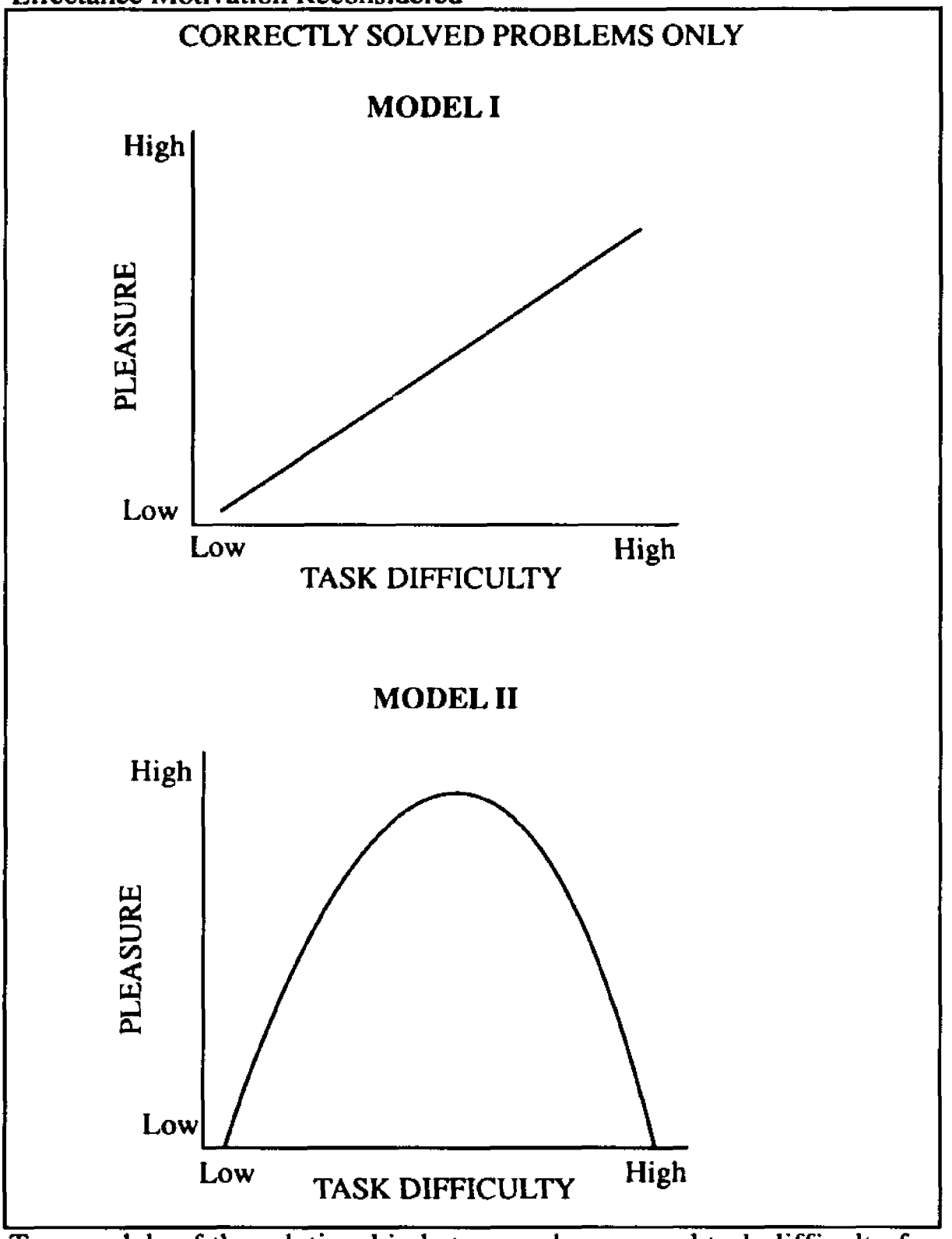
Further, there has been speculation as to the stability of the individual characteristics in this study. Behavioral and cognitive impulsivity may be transient characteristics and therefore important to test this possibility in a longitudinal study which would consider the extent to which these characteristics remain over time. For example, it would be interesting to retest these children in junior high school and again in

high school to determine whether these characteristics persist with development, remain stable or even increase with age.

The trend away from special education as the answer to every child who does not fit into mainstream education is a thing of the past. The atypical child is appearing and will continue to appear in mainstream education and it becomes essential that the educational community recognize the individual needs of all children.

APPENDIX A

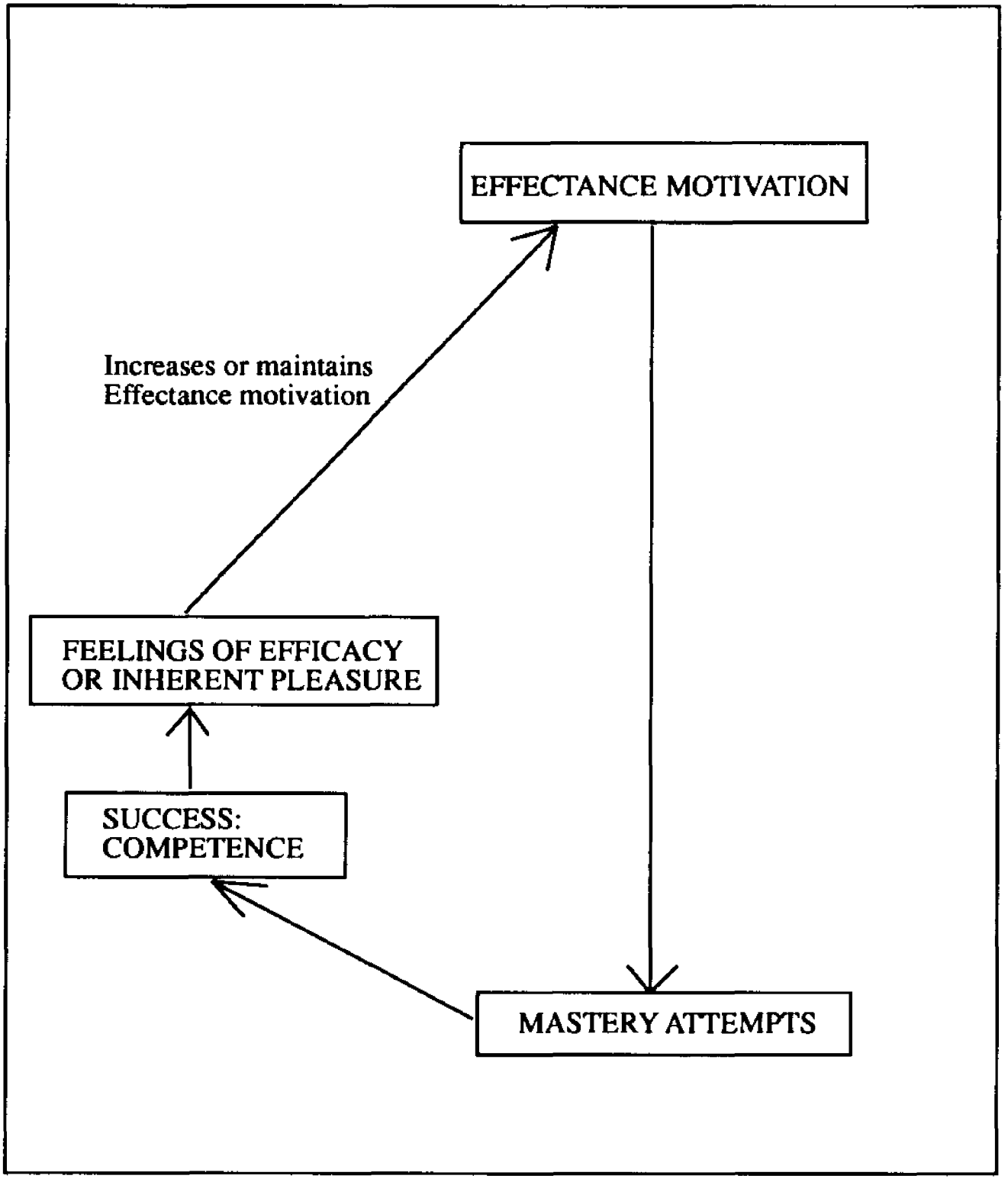
Effectance Motivation Reconsidered



Two models of the relationship between pleasure and task difficulty for successful outcomes only.

APPENDIX B

Harter



White's basic model of effectance motivation.

APPENDIX C

Instructions For Administration of the Matching Familiar Figures Test (Kagan, 1965)

The examiner will say the following to each child: "I am going to show you a picture of something you know and then some pictures that look like it. You will have to point to the pictures on this bottom page (point) that is just like the one on this top page (point). Let's do some practice." The examiner will then show two practice items to the child and help the child find the correct answer when necessary. Then the examiner will continue: "Now we are going to do some that are a bit harder. You will see a picture on top and six pictures on the bottom. Find the one that is just like the one on top and point to it." If the subject responds correctly the first time, the examiner is to tell the subject "that's right". If, however, the subject supplies a wrong answer, he/she is to be told "no, that is not the right one. Find the one that is just like this one (point to top page)." The child is to continue choosing items until he/she finds the correct one or makes the maximum six errors possible. The examiner will then show the child the correct answer.

The examiner will record the time in seconds until the child gives his/her first response and will also record the number from one to six of the items picked. A final time will be computed by summing the time to the first response over total test as well as the total number of errors across all

items.

Instructions For Administration of the Self-Perception Profile For Children

Subjects are to be instructed as follows: "We have some sentences here and, as you can see from the top of your sheet where it says `What I am Like', we are interested in what each of you is like, what kind of a person you are like. This is a survey, not a test. There are no right or wrong answers. Since kids are very different from one another, each of you will be putting down something different. First, let me explain how these questions work. There is a sample question at the top, marked (a). I'll read it outloud and you follow along with me. (Examiner reads sample question). This question talks about two kinds of kids, and we want to know which kids are most like you. (1) So, what I want you to decide first is whether you are more like the kids on the left side who would rather play outdoors, or whether you are more like the kids on the right side who would rather watch T.V. Don't mark anything yet, but first decide which kind of kid is most like you, and go to that side of the sentence. (2) Now, the second thing I want you to think about, now that you have decided which kind of kids are most like you, is to decide whether that is only "sort of true for you", or "really true for you". If it's only sort of true, then put an X in the box under sort of true; if it's really true for you, then put an X in that box, under really true. (3) For each sentence you

only check one box. Sometimes it will be on one side of the page, another time it will be on the other side of the page, but you can only check one box for each sentence. You can't check both sides, just the one side most like you. (4) OK, that one was just for practice. Now we have some more sentences which I'm going to read out loud. For each one, just check one box, the one that goes with what is true for you, what you are most like."

Instructions For Administration of the Scale of Intrinsic Versus Extrinsic Orientation in the Classroom

Subjects will be instructed as follows: "We have some sentences here and, as you can see from the top of your sheet where it says `In the Classroom', we are interested in what kinds of things you like to do in school. This is not a test. There are no right or wrong answers. Since kids are very different from one another, each of you will be putting down something different. First let me explain how these questions work. There are two sample questions at the top. I'll read the first one out loud, which is marked (a), and you follow along with me. (Examiner reads first sample question.) This question talks about two kinds of kids. (1) What I want you to decide first is whether you are more like the kids on the left side who would rather play outdoors, or whether you are more like the kids on the right side who would rather watch T.V. Don't mark anything down yet, but first decide which kind of kid is most like you, and go to that side. (2) Now,

the second thing I want you to think about, now that you have decided which kind of kid is most like you, is to decide whether that is only sort of true for you, or really true. If it's only sort of true, then put an X in the box under sort of true; if its really true for you, then put an X in the box, under really true. (3) For each sentence you only check one box. Sometimes it will be on one side of the page, and other times it will be on the other side of the page, but you can only check one box for each sentence. Do you have any questions? (4) OK, let's try the second sample one, which is (b). (Examiner reads and goes through the same explanation above in points 1, 2, and 3.) (5) OK, those were just for practice. Now we have some more sentences which I'm going to read out loud. For each one, just check one box, the one that goes with what is true for you, what you are most like."

Instructions for Administration of the Social Support Scale

Subjects are to be instructed as follows: "We have some sentences here and, as you can see from the top of your sheet where it says `People in My Life,' we are interested in several kinds of people in your life. This is a survey, not a test. There are no right or wrong answers. Since kids are very different from one another, each of you will be putting down something different. First let me explain how these questions work. There is a sample question at the top, marked (a). I'll read it out loud and you follow along with me. (Examiner reads sample question.) This question talks about

two kinds of kids, and we want to know which kids are most like you. (1) So, what I want you to decide first is whether you are more like the kids on the left side who would rather do fun things with alot of other people, or whether you are more like the kids on the right side who would rather do fun things with just a few people. Bon't mark anything down yet, but furst decide which kind of kid is most like you, and go to that side of the sentence. (2) Now, the second thing I want you to think about, now that you have decided which kind of kids are most like you, is to decide whether that is only sort of true for you, or really true for you. If it's only sort of true, then put an X in the box under sort of true; if it's really true for you, then put an X in the box, under really true. (3) For each sentence you only check one box. Sometimes it will be on one side of the page, another time it will be on the other side of the page, but you can only check one box for each sentence. You don't check both sides, just the one side most like you. (4) OK, that one was just for practice. Now we have some more sentences which I'm going to read out loud. For each one, just check one box, the one that goes with what is true for you, what you are most like.

Instructions for the Administration of the School Concerns Scale

Subjects are to be instructed as follows: "I am going to read some questions to you. When I have finished reading the question, I would like you to circle one of the four possible

answers that is most like you. Let's do the sample question together." The examiner reads the sample to the children as follows: "How worried do you get about crossing the street alone? Do you get very worried, somewhat worried, not too worried or not at all worried. Circle the one that is most like you. There are no right or wrong answers because this is not a test. Since kids are very different from each other, you will all be putting down different answers." The examiner continues to read each question to the subjects until all 42 items have been completed.

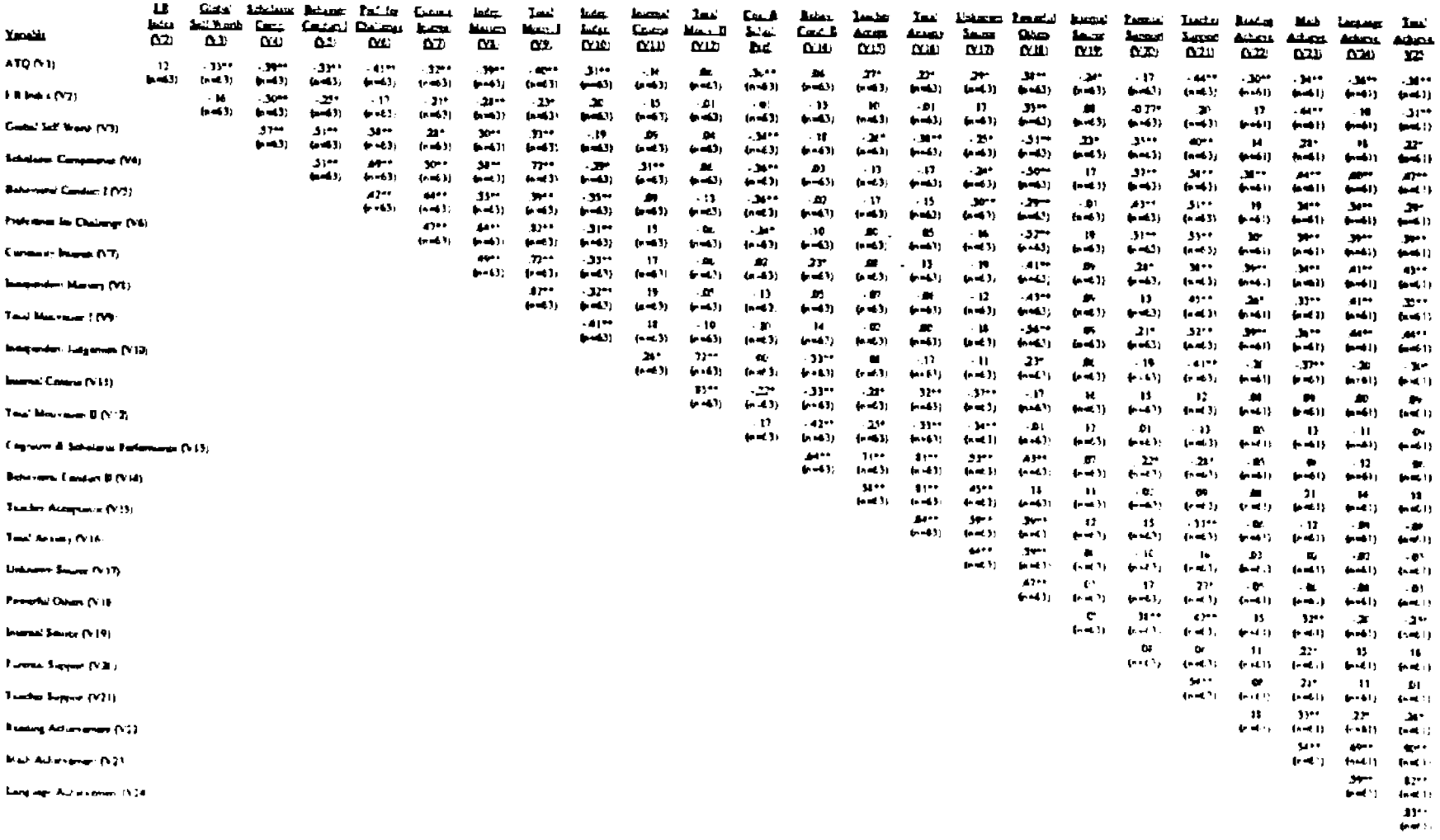
Instructions for Administration of the Children's Perception of Control Measure

Subjects are to be instructed as follows: "We have some sentences here about a lot of things that happen to people your age. We would like to know how true you think these sentences are. This is not a test. There are no right or wrong answers. Since kids are different from one another, each of you will be putting down different things. What we want to know is what you think about these sentences. If you look at the top of the first sheet you'll see two sentences. The first one says `I like chocolate ice cream better than vanilla ice cream'. Below this sentence we want you to circle whether this sentence is very true for you, sort of true for you, not very true for you or not at all true for you. Only circle one of these. The second sentence says `most kids really like spinach'. Do you think that this is very true,

sort of true, not very true or not at all true. Circle the one that says how true you think it is that most kids really like spinach. These sentences were just for practice. Now I'm going to read you some more sentences about `why things happen' to you and to other kids. Remember, circle the words that say how true you think each sentence is. Is everybody ready? Any questions? OK, here we go."

APPENDIX D

Coefficients of Correlation Between All Independent and Dependent Variables



*P < 0.05
**P < 0.01

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