FREIRE, VYGOTSKY AND SPECIAL EDUCATION:

Towards a Mediated Metacognitive Resource Model

by

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DEDICATION

I would like to dedicate this work to all the learners of Kings County, Nova Scotia, including professional staff, parents, and students.

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ABSTRACT

This thesis presents a critical review of the traditional "sub-system" of Special Education in Nova Scotia, and argues for a change of paradigm based on a mediated metacognitive approach to learning. Philosophical reasons why change is deemed necessary are offered as framed in the writings of Paulo Freire, and psychological reasons for change as framed in the beliefs of Vygotsky's social-cultural theory of intellectual development. The thesis developed an instructional pedagogy to support the notion that children can learn to modify and improve the way they engage in their learning through a mediated metacognitive approach.

The linkage between the views of Freire and Vygotsky were expanded upon through the conceptual development of a metacognitive model of intellectual sophistication. Two mental processes of imagery and inner language are hypothesized as primary influences affecting the development of metacognitive behavior. The nature and dynamics of both processes are discussed in terms of their phylogeny and ontogeny, as well as their symbiotic influences during any learning task.

The theoretical metacognitive model of the intellect was applied within the classroom through an exploratory school study involving three classrooms of students, parents, and professionals. The study sought to shed light on the notion that all students can learn to evolve their metacognitive behavior, and the way educators or mediators approach this direction matters. The mediated metacognitive pedagogy is evaluated quantitatively through a pre and post comparison and qualitatively through structured pre and post interviews with students, professionals, and parents. The belief that "thinking can be taught" has prompted this inquiry into the teaching/learning process to express the need to revisit our traditional roles as educators and special educators.

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Donald Marsh

PART I

SPECIAL EDUCATION: THE CASE FOR A PEDAGOGY OF THE OPPRESSED

CHAPTER I RATIONALE AND INTRODUCTION

> "The special perspectives and analytical ornaments of two distinct academic disciplines now provision contemporary efforts to teach thinking. We exist in a time of fortunate confluence between the need as perceived by a concerned public and educational leaders, and new and powerful ideas about ways and means to improve and further education emerging the disciplines of psychology, philosophy, and education."
> (Swartz and Perkins, 1990, p.7,8)

The purpose of this thesis is to provide a rationale for a change of paradigm within Special Education in Nova Scotia. The study will consider this change in terms of a critical inquiry into the evolution of our present delivery of services to the exceptional child, and will then present an alternative pedagogy based on the mediated metacognitive control of learners. The study will argue with philosophical reasons why change is necessary, psychological reasons how changes are purported to affect learning behavior, and will also propose a pedagogy which supports the notion that children can learn to modify the way they engage in their learning, and how educators attempt to enhance this metacognitive behavior, matters.

Part I will provide a rationale for considering special education in need of a pedagogy of the oppressed. The writings of Freire will be discussed in terms of traditional models of special education and the "mythology" surrounding the field of special education will be reviewed. The role of a mediated metacognitive pedagogy within special education will be discussed and cognitive and metacognitive literature will be reviewed. The socio-historical and cultural theories of learning proposed by Vygotsky will form a large part of this section. Vygotsky's (1962, 1978) contention that thought cannot be fully appreciated without consideration of the social, historical, cultural, and institutional context of learning throughout a life time on the one hand, and the mediational influences of such interactions within the mind on the other, provides a

marriage of philosophical and psychological understandings which is deemed absolutely fundamental in establishing an empowering pedagogy for both teachers and students. Without such a marriage, any form of inquiry or practice is destined to suffer a myopic perspective based on atomized falsehoods and fractionalized disciplinary boundaries. As Carl Rogers (1992) notes:

> "Humans don't consist of only overt responses, nor are they controlled by the external environment. People also grow, think, feel, dream, create, and do many things that make up the human experience."
>
> (Crain 1992 p.319)

Part II will attempt to demonstrate the link between Freire and Vygotsky through analyzing the social and institutional relationship with semiotic development. Imagery and inner language will be presented as two cognitive processes which are purported to play a critical role in executive cognitive control through enabling awareness of self-regulatory or metacognitive behavior. Indeed, both processes assume primary roles within a presented metacognitive model of the intellect. Considerable effort will be extended to reveal the dynamics of their intellectual interactions in thought representation. Imagery and inner language will be affectionately termed the "mother" and "father" of cognition because the analogy metaphorically expresses their postulated cognitive and metacognitive relationship.

Part III of this paper will attempt to demonstrate the efficacy of a "mediated metacognitive pedagogy" for exceptional and regular education students, alike. This is an exploratory study which is arguing for a philosophical and psychological alternative perspective of the teaching-learning process for all students and special education students in particular. It is not a definitive study that attempts to prove causal relationships within this perspective. Borrowing a distinction from Vygotsky (1934), it is a "genotypic", rather than "phenotypic", study; it illustrates a need and a process rather than describing specific parameters of cause and effect within this process.

It's about helping students learn to seek meaning for themselves, through learning how to represent their thinking at a variety of meaning seeking levels. Through imagery and inner language, the student is being encouraged to move beyond understandings of concrete facts, to more complex understandings, levels which permit them to make decisions, evaluate their understanding, and transfer these understandings to new or similar problem situations. The perspective offered involves a change of paradigm in how we think about children's learning and what we do with both regular and special education students in the classroom.

Reading comprehension will be the curricular focus of a study within three schools of Kings County, Nova Scotia. A mediated metacognitive intervention period of twelve weeks will be initiated that will include professionals, parents, and students as active participants. The study will attempt to link this pedagogy to Reading Comprehension, directly, and will also provide a barometer on the efficacy of this approach through the changes in opinions of professionals, parents, and students. If thinking can be modified, and this contention is a relatively new educational, psychological, and philosophical concept, then what is the impact of this contention within the paradigm of exceptionally? What changes are necessary in terms of instruction, assessment, and learning theory? In short, if thinking can be taught, how might this best be accomplished within an emancipatory pedagogy for the exceptional child? This portion of this proposal will rely heavily on the social learning theory of Vygotsky (1962, 1968), the mediational role of the teacher (Feuerstein, 1980, 1981, 1987) and metacognitive research involving both regular and special education populations (Lerner, 1993; Wong, 1992, 1991; Ellis, 1987; Derry, 1990; Costa, 1989; Paris, 1986, 1991; Meltzer, 1991; Pressley, 1985; Palinscar, 1984, 1988, 1991). If the reader accepts that special education requires revision in an emancipatory sense from Part I of this paper, and that metacognition is a social and cognitive behavioral construct that deserves primary consideration from Part II, then the aim of Part III is to illustrate to the

reader how metacognition can best assume its new role of importance; what paradigm shifts in terms of pedagogy and assessment will complement this direction? The distinct danger exists that without careful consideration of how to implement a metacognitive resource model, the initiative will diffuse into subject specific applications, and the opportunity will be lost to make fundamental pedagogical changes that are felt necessary. Much of this concern revolves around the teacher-learner relationship; the aim of this paper is to allow and encourage students to develop as much metacognitive control as possible for themselves, not to instruct or impose subject specific strategies that the teacher assumes every student should know.

For the greater part of this century our schools have essentially entrenched a sub-system of special education with its own pupils, teachers, supervisory staff, and funding system. Stainback and Stainback (1984) refer to this structural organization as a "dual system", which, though initially a positive step for education, is no longer required or appropriate. They argue that the need exists for one unified system for all students that does not deny differences, but rather, recognizes and accommodates for differences. Ysseldyke and Algozzine (1982, 1984, 1992) confirm this view through their description of learning disability research and practice as a primarily economic enterprise which sustains a self-perpetuating system of professionals, within a system of the self-perpetuating categorization of special needs students.

Inherent within this growing body of research on the potential "myth" (Sodhi, 1974) of special education, is doubt not that individual differences exist, but rather that our methods of dealing with differences has become counter productive, self-serving, and, perhaps, no longer in the best interests of the exceptional child, or society at large. Leitch (1986), provides an insightful perspective on the evolution of special education services in Canada, and speaks of the disenfranchised students affected by the theories, policies, and practices manifest in the special education process.

Leitch reports:

> "Such is the circumstance in special education where well-intentioned but misguided professionals enact a host of policies and practices designed to help the exceptional child, but which quintessentially remain putative."
> (Leitch, 1986, p.56)

A critical pedagogy is emerging within special education which describes the exceptional child in terms of oppression. Freire's (1970, 1973, 1985) plenary writings describe an emancipatory political practice:

> "Revolutionary praxis cannot tolerate an absurd dichotomy in which the praxis of the people is merely that of following the leader's decisions--a dichotomy reflecting the prescriptive methods of the dominant elites ... Manipulation, sloganizing, "depositing", regimentation, and prescription cannot be components of revolutionary praxis, precisely because they are components of the praxis of domination."
> (Freire, 1970, pp. 120-121)

For special education students, this oppression can be manifested in a paternalistic helping mentality which discretely and insidiously inculcates helplessness; the more we diagnose exceptionality through comparison to what society deems "normal", the more our expectations and practises reflect marginalization and subserviance for exceptional children. We may inadvertently be teaching exceptional students how to behave abnormally. Critical pedagogy can help expose the mythology of the institution of special education. The "company store" as noted by Giroux and McLaren (1986) encompasses the entire bureaucracy of specialists that espouse prescriptive remedies of publishing houses. The exceptional person is left in a voiceless sea of disempowerment.

Special education students have been particularly susceptible to the "banking" educational experience first presented by Freire (1970, 1985) and discussed by O'Loughlin (1989) and Shor (1987). The traditional delivery of services has meant more of the same didactic educational experience; more drill, repetition and telling. Freire's (1970) concern that people who are oppressed often exhibit low self-esteem and little

faith in their own ability to speak, to think, to know, or to understand, is especially descriptive for those who have been taught that they are in some fashion abnormal.

Liberatory or emancipatory pedagogy has not emerged within special education because the institution has never engaged in a self-critical dialogue. Special educators have not been aware of the history of their own institutional disempowerment because they have accepted the status quo of their own roles within special education. As Leonard (1990) notes, the social reality of all forms of exceptionality are determined as a "well behaved present" or a "predetermined future". A mechanistic perspective on normalcy and abnormalcy has prevailed which relies on a rigid behavioristic agenda; the special educator has been imposing remediation based on standardized differences, rather than considering each learner's unique learning behavior. The history of remedial interventions has never really reflected the need to change the learning culture within the classroom; remedial practices, regardless of the curricular deficit, have been based on the need for students to catch up or be "fixed" by receiving more time and drill, to gain more information. We have not acknowledged the need for changes in our own practises. The relationship between critical theory and practice for special education students must be seen as mutually informing and mutually transforming. O'Loughlin (1989) adds the need of the oppressed to have choices rather than follow prescriptions, to be actors rather than spectators, to be acting on the world rather than having the illusion of acting, and to have a voice to speak out rather than being silent. Critical pedagogy helps the oppressed to come to know for themselves. In terms of this study, the oppression imposed by the "subsystem" of Special Education affects educators and students, alike. An underlying aim of this thesis is to provide a fundamental alternative to the traditional practices of where and how special education students receive services. Revision involves more than a delivery system, the rationale is based on the need for changes in the entire paradigm of special services to reflect a critical pedagogy that enables ownership in learning on the part of both teachers and students The ownership involves more than setting; the regular

education initiative (Reynolds, Wong, Walberg, 1987; Lily, 1986, 1992; Wong, Reynolds and Walberg, 1986) that provides services through the regular classroom will not be effective unless a pedagogy that is based on ownership in learning is present. Similarly, the full inclusion model as described by Thousand and Villa (1991) and Villa and Thousand (1990), will not be successful in restructuring schools to include children with all severity levels in the regular classroom, unless both teachers and students engage in a dialogue of purpose in learning.

But, what is a dialogue of purpose in learning? What is meant by ownership in learning and how can the delivery of services for special needs students be reformed to reflect these goals? Cognitive psychology deals with the human processes of learning, thinking, and knowing (Lerner, 1993). Theories about the nature of cognitive and mental processes lead to a better understanding of how human beings learn and why cognitive characteristics of learning disabilities impede or deter learning. There is now invigorated appreciation of the relationship of cognitive processing to learning and learning failure (Wong, 1992; Meltzer, 1991). Instruction in learning strategies plays an increasing role as an instructional method for students with learning disabilities (Lerner, 1993; Meltzer, 1991; Wong, 1992). Grotelushen, Borkowski & Hale, (1990) describe this new direction well:

> "Instruction in learning strategies helps students with special needs to take charge of their own learning, become active learners, acquire a repertoire of learning strategies, be able to select those appropriate for the learning situation, and be able to generalize the strategy to other situations."
> (pp. 81-100)

A plethora of research during the last decade has overwhelmingly acknowledged the role of cognitive processes and strategies as a promising and critical pursuit (Flavell, 1977; Torgeson, 1979, 1980; Costa, 1989; Reid, Stone, 1991; Brown, 1980; Mann, 1980; Derry, 1990; Palinscar, 1991; Wong, 1992; Lerner, 1993). The implications of strategy instruction are profound for special education and regular education students, alike; if thinking can be taught or mediated, then we are essentially postulating that the intellect is

modifiable. The sophistication of the act of knowing can potentially be enhanced to levels that would not have been possible without cognitive strategy instruction. If thinking can be taught, then the opportunity exists to re-examine our traditional paradigms of instruction and exceptionality to reflect this new and exciting educational pursuit. The re-examination must, however, consider the philosophical and pedogogical implications that surround metacognitive modifiability, to ensure that the opportunity for a critical pedagogy emerges that enables special education to dismember its institutional history of dominance and oppression, and allows society to support differences in an emancipatory manner, through focusing on more efficient ways of knowing.

This study will attempt a critical inquiry into the philosophical, psychological, and pedagogical changes of paradigm that are felt necessary to reflect the notion that special educators can, and should, mediate the efficiency and sophistication of thinking as a primary educational goal. Indeed, it is an expressed hope that the simple statement, "thinking can be taught", will provide a common purpose and vision to both special and regular educators. This statement may provide a bonding of philosophy, psychology, and pedagogy that can help relieve the past susceptibility of educators to embrace one bandwagon after another (Neilson, 1991; Fullan and Miles, 1991). The reader is challenged to ponder the importance of connecting the goal of modifying cognitive behavior with all three constructs. Indeed, the primary purpose of this paper is to demonstrate this importance.

CHAPTER 2 A SOCIO-HISTORICAL PERSPECTIVE

This chapter will provide a socio-historical perspective on the paradigm of Special Education services for exceptional children. The purpose of the chapter is to demonstrate the history of Special Education services as being a paradigm of potential oppression and dominance; an institution that may have inadvertently lost perspective of original purpose and may, indeed, be considered a causal, rather than preventative educational construct. An institution that could encourage learning helplessness, rather than learning autonomy.

The history of the paradigm of Special Education reveals deep roots in functionalism (Flynn, 1991). Indeed, Flynn has traced the origins of Special Education in Canada to a Calvinistic functionalism paradigm that defines human behavior in terms of its utility in meeting the ends of a "pan denominational" acceptance of a worldly asceticism, which manifests itself as an objectification of Calvinistic doctrines through institutions of society. This historicity is revealing and important to a special educator because in Freire's (1970) terms, it is the knowledge of cultural history on behalf of the oppressed which enables an understanding of the entrenchment of theoretical constructs that help explain present and past practice. As Charlesworth (1982) notes, the historical relativity of scientific method is overlooked as it becomes entangled in the web of mythical symbols, rites, and beliefs of a culture.

The Protestant ideology known as "pietism" (Weber, 1958) demanded that Calvinist doctrines be objectified in the religious, scientific, and economic institutions of society; proof, pre-determination, duty, and grace were to serve as the guides for the socio-moral restructuring of the State (Flynn, 1991). Functionalism evolved into a behavioristic revolution within American psychology shortly after the turn of this century. The scientific theory of learning based on a stimulus-response paradigm (Watson, 1913; Skinner, 1938), sought general laws of learning based on reinforcement and conditioning. The relationships between the conditions of learning and the learning

outcomes were considered predictable. This "Newtonian" scientific outlook essentially ignored any form of mentalistic introspection and established a pedogogical role of the teacher as a "giver of information". Skinner's (1968) text, *The Technology of Teaching*, demonstrates the degree to which rigid reinforcement schedules and their effects on the speed and retention of learning prevailed from Pavlov's works (1927), to the mid 1960's. The absolute control of the learning environment stemmed also, from the rote learning tradition established by Ebbinghaus as early as 1885 (see Pavio, 1971) through minimizing the effects of pre-experimental associative habits and meaning, in order to reveal factors responsible for the formation of new memory associations. In short, a paradigm of control of the learning environment has prevailed within learning theory and educational practice from the turn of this century to at least the mid 1960's. The field of Special Education has, therefore, emerged within an era of behaviorism and positivism that bears all the earmarks of an institution of dominance that Freire describes in his seminal work, *Pedagogy of the Oppressed* (1970).

The history of Special Education services for the exceptional child in the United States and Canada has been described by Day (1985) as evolving through three phases:

- the first was associated with the administration of charity to handicapped persons
- the second was expansion of residential institutions;
- the third was demarcated by Legislative policies and practices regarding the provision of services.

Lerner (1993) describes a similar sequence within the field of learning disabilities: a foundation phase (1800 - 1930) based on early brain research, a transition phase (1930-1960) of implementation in public schools and a contemporary phase (1980-present) of emerging directions. Indeed, most traditional Special Education texts allude to an eclectic variety of theories and practices that demonstrate the need for diagnosis and remediation of a plethora of categories of exceptionality (Lily, 1979; Wiederholt et al, 1979; Smith et al, 1983; Day, 1985; Kephart, 1963; Kirk, 1982; Cruickshank, 1967).

What has been largely ignored within these texts is the politics of the institution of exceptionality and a critical perspective of the theories and practices of Special Education

The rapid proliferation of the "sub-system" of Special Education from the early 1960's has relied heavily on a medical model that has created an entire generation of school personnel anxious to identify with a high-status medical terminology for Special Education "clients" (Leitch, 1986). Exceptionality through the psycho neurological and psycho educational models are founded upon the belief that school failure is a function of neurological impairment (Bender, 1938; Gheitman, 1981), or psycho perceptual disorder (Kirk, 1982; Frostig, 1964). Indeed, from the initial brain injury dysfunction paradigm first presented by Strauss and Lehtinen (1947) through minimal brain dysfunction coined by Clements (1966) and learning disability first proposed by Kirk (1963), the same umbrella concept rooted in the assertion that school difficulties are a function of pupil pathology has become ingrained in the institution of Special Education. The "dysfunction" perspective, as discussed by Leitch (1986), is a manifestation of a pathology orientation that was once reserved for children labeled retarded, but has since proliferated to include an endless host of exceptionalities that require an endless list of "high status" positions to diagnose and remediate through an endless variety of prescriptive programs.

One of the tenets of Freire's (1970) description of an "oppressed" group is the absence of voice through antidialogical practice .....

> "Regardless of whether the intended goal is to educate, maintain social order, or bring about social change, the methodology employed seeks to inculcate a very specific world view that itself maintains relations of inequality. On the one hand stand those who, by virtue of their knowledge play the role of depositor, prescriber, domesticator. On the other hand stand the receptacles of this knowledge who are conceptualized as containers to be filled."
>
> (Freire, 1970, 58-62)

The "receptacles" in terms of Special Education include both teachers and students. Teachers have been inculcated with a paradigm of exceptionality beyond their control; they have become disempowered by the institution of exceptionality that has bequeathed them a status of inferiority in their role, by endorsing the concept that they absolutely require sanctions from other professions. Friendenberg (1974, 1975) refers to this disempowerment as the ability of an institution to alter or transform theory and practice into self-sustaining prophecies which move farther and farther from original intents.

The student is also oppressed and voiceless; the description of the "mythology" of their Special Education status has been the subject of an emerging critical perspective (Johnson, 1969; Silberberg and Silberberg, 1969; Sodhi, 1974; Leitch, 1986; Flynn, 1991, 1992; Ysseldyke and Algozzine, 1982, 1992; Skrtic, 1991, 1992). The concept of "surplus population" of mentally handicapped individuals first presented by Faber (1968) has criticized schools as bureaucracies committed to sustaining a certain social order (Johnson, 1969; Friedenberg, 1974, 1975). The Special Education ideology of labeling students into a myriad of categories of disorder, has tacitly deprived special needs students of self-efficacy as a member of that same society bequeathing the label, and self-efficacy as a learner within the institution of education.

Freire (1970, f.109) describes the lack of self-efficacy of any oppressed population as a mantle of silence and indifference. Educational programs that are directed by distant bureaucracies without regard for local interests, resources, or needs, produce boredom, frustration, and apathy.

> "For the act of communication to be successful, there must be accord between the reciprocally communicating Subjects. That is, the verbal expressions of one of the Subjects must be perceptible within a frame of reference that is meaningful to the other Subject."
>
> (Freire, 1973, p.138)

The institution of Special Education, through practices described, has effectively imposed indifference, apathy, and silence upon special needs students. This litany of imposition describes the need of the institution to diagnose, label, and "fix" any variance from whatever concept of normalcy society chooses to proffer. The didactic mode of telling the student that they are different, then telling the student how to remedy their dysfunction, effectively teaches them how to participate in their own oppression. The educational paradigm that they experience is not one of dialogue; the Special Education student is entrapped by a positivist attitude that views knowledge as neutral, valve-free, and objective. Learning in these terms is the learning of static facts and their subsequent description and classification. Ironically, this positivist description of learning also perfectly describes the resultant circumstance of the Special Education teacher, because they are participating in a role without critical consciousness.

Giroux's (1981) critique of positivism in education is particularly relevant to exceptional students:

> "Questions concerning the social construction of knowledge and the constitutive interests behind the selection, organization and evaluation of "brute-facts" are buried under the assumption that knowledge is objective and value free. Information or "data" taken from the subjective world of intuition, insight, philosophy and nonscientific theoretical frameworks is not acknowledged as being relevant. Values, then, appear as the nemeses of "facts" and are viewed at best, as interesting, and at worst, as irrational and subjective emotional responses."
> (Giroux, 1981, p. 43-44)

This pervasive "product" oriented educational paradigm applies to all learners, but has been particularly damaging to the "special" student because remediating the abnormality has usually been approached through more of the same mechanistic pedagogy; more time to practise more facts. The Special Education texts that have predominated during the emergence of Special Education services within public schools have all reiterated this "more of the same facts" mentality; the works of Dunn (1963),

Kephart (1960), Lily (1979), Cruickshank (1967), Kirk (1982), and Smith (1983) all attest to positivist notions of abnormality and positivist notions of remediation.

Apple's (1979) analysis of "labeling" points to the value of studying the language used to discuss the condition of the "oppressed". He argues that such labels work against the development of critical consciousness by mystifying the situations and relations that they describe, so that causality and complexity are hidden. Labels tend to tacitly focus blame on the victims and encourage solutions directed solely at them, while simultaneously directing attention away from the broader social, economic, and cultural factors that created the conditions being labeled. No other student population has suffered the dominance of the language of labels more than the Special Education child. Any critical theory leading to a liberatory pedagogy for Special Education students must consider a praxis which allows transformation of the thought-language process with which these students refer to their reality.

This process of allowing the Special Education student to transform their reality is discussed by Freire (1982) as not simply teaching students to think, but to exchange our ways of thinking with each other, and look together for better ways of approaching the decodification of an object. This concept of a dialogical education does not mean that teachers are considered "passive, accidental presences" (Freire, 1982), rather, that teachers listen to students to discover "themes" that they then organize and present as problems challenging student's previous perceptions. Essentially, the teacher is mediating the transformation of student's knowledge, rather than telling the student what to think. Freire (1981) describes this difference well:

> "The opposite of manipulation is not an illusory neutrality, neither is it an illusory spontaneity. The opposite of being directive is not being non-directive--that is likewise an illusion. The opposite both of manipulation and spontaneity is critical and democratic participation by the learners in the act of knowing, of which they are the subjects."
>
> (Freire, 1981, p. 28)

What is this praxis of transforming student understandings? The critical perspectives of the ideological underpinnings of the more positivist oriented traditional educational paradigm have been presented through the writings of Freire (1970, 1981, 1982), Apple (1979), Friendenberg (1975) and Giroux (1981). The critical perspectives of the history of the field of Special Education are represented by the writings of Leitch (1986), Flynn (1991), Sodhi (1974), Ysseldyke and Algonnizine (1982, 1992), Johnson (1969), and Wolfensberger (1984). A congruence between perspectives emerges as the need to explore the nonpositivist nature of the knowledge we are teaching Special Education students. A large portion of the nonpositivist knowledge rests within the notion that no knowledge is "finished". As learners change through dialogue they are continually transforming and refining understandings; the world in this sense is giving, not given. Shor (1992) alludes to this form of learning . . . .

> "What students and teachers reinvent in problem posing is their relationship to learning and authority. They redefine their relationships to each other, to education, and to expertise. They re-perceive knowledge and power. As allies for learning and for democracy in school and society, they stop being adversaries divided by unilateral authority and fixed canons."
>
> (Shor, 1992, p.35)

This constant dynamic of problem posing is emphasized by Freire as a democratic way for students to take part in the contention over knowledge and the shape of society:

> "Problem-posing education affirms men as beings in the process of <u>becoming</u>--as unfinished, uncompleted beings in and with a likewise unfinished reality . . . The banking method emphasizes permanence and becomes reactionary; problem-posing education--which accepts neither a "well-behaved" present nor a predetermined future--roots itself in the dynamic present and becomes revolutionary . . . Whereas the banking method directly or indirectly reinforces men's fatalistic perception of their situation, the problem-posing method presents this very situation to them as a problem."
>
> (Freire, 1970, pp.72-73)

Special education students have particularly endured the "banking" educational experience described by Freire. As O'Loughlin (1989) comments, people who are oppressed often have low self-esteem and little faith in their own ability to speak, to know, to think, or to understand. The traditional didactic educational experience has been compounded for all special needs students . . . . . more of the same drill, repetition, and telling that has inadvertently taught these students that they are indeed abnormal. The oppression is manifested through a paternalistic helping mentality which discretely and insidiously inculcates helplessness. Critical pedagogy can help expose the mythology of the institution of Special Education. The "Company Store" as noted by Giroux and McLaren (1986), encompasses the entire "expert" bureaucracy of endless specialists that espouse the prescriptive remedies of endless publishing houses. The exceptional child is indeed left voiceless and disempowered. The "historicity" of oppression is linked to our society's need to define normalcy, and hence, to define the parameters of what constitutes the needs of the abnormal. A reductionist agenda ensues which serves as a self-perpetuating agenda of helping those that cannot help themselves. The agenda serves as a fuel for a growing army of well meaning Samaritans that, inadvertently, may engage in a hidden curriculum of harm. Remediation is based on symptoms devoid of existential concern. No choice, no voice, and no control over their destiny describes the circumstance of both teachers and students. The very purpose of categorizing differences and segregating remedial settings to address a push for normalcy becomes contradictory, insidious, and hypocritical, because we disallow the student the opportunity to learn to learn for themselves.

The field of Special Education is replete with examples of hypocrisy. As Leonard (1990) notes, the social reality of all forms of exceptionality are always determined as a "well behaved present" or a "predetermined future". The adult workshop movement provides a graphic illustration of paternalistic hypocrisy. Society <u>decided</u> that mentally challenged adults had the right to work. The mentally challenged individuals, thereby,

became the "lucky" recipients of a Calvinistic purpose that most members of society would gladly relinquish if given the choice. Adult workshops, that may more accurately be described as adult sweat shops, grew by the thousands across North America to teach the mentally challenged how to behave in the workplace. Few, if any, adults from workshops ever graduated from this segregated setting into the work force. Financial pressures caused the workshops to procure the most mundane and monotonous tasks that society could offer; tasks that would almost certainly cause mental disorder for the lay person. The workshops became institutionalized institutions in their own right; the original purpose and mandate was quickly forgotten in order to perpetuate the structures and the keepers. The "inmates" were voiceless in the beginning and they are voiceless now, except the quality of their existence is now completely disrobed of existential well being under the mask of being working contributors of a society intent on the functionalist values that define human behavior in terms of its utility and pietism.

The main generative theme that special educators can glean from critical pedagogy is ownership and autonomy in learning. This theme must reject the total reliance on normative comparison, prescriptive remediation, categories, labels, and experts. It must focus on the teacher as student and student as teacher within a continuous formative relationship. There is no "fix-it" mentality; the process of learning itself becomes self-critical and is constantly transforming the understanding of the learning process.

The mastery of such transformations is found in Vygotsky's theory of thought and language, specifically in his examination of cognitive processes and their role as elaborating mechanisms that strive to resist the bounds of context (Vygotsky, 1962). Luria (1976) also alludes to the dynamics of cognitive processes and culture in his description of some of the psychological changes that took place in the Soviet Union during thirty years of profound social and economic transformation. This relationship between culture, history, and the concurrent intellectual and cognitive skills of the learner

is a critical relationship in striving to understand the rationale for change in Special Education, because if the reader accepts the implications of perceiving the institution of Special Education as a potentially oppressive and dominating one, then the corresponding cognitive and intellectual skills of Special Education students will reflect this same history of oppression through convincing themselves of abnormalcy, powerlessness, and dependency in learning. The reader must also appreciate the shared approaches of Vygotsky and Freire that emphasize a crucial intertwining of social and educational change; the psychological dynamics of Vygotsky are not only consistent with Freire's philosophical writings but are also deemed necessary in understanding the pedagogical changes that are purported for Special Education students. This is the praxis that this paper hopes to present, one that enables the Special Education student and teacher to constantly transform information. One that values the cognitive changes within the student that demonstrate control in learning. One that views the teacher-learner role as one and the same, through mutual reflection, observation, listening, and mediation. One that celebrates dialogue in education.

What are these cognitive or intellectual processes that enable any "oppressed" population to form a voice? Vygotsky (1962, 1978) speaks of the power of inner speech in allowing the learner to form dialectical tools to transform thought through language. Learners internalize language and unite diverse strands of their experience to form critical, human consciousness. Multiple transformations are necessary to "unfold" inner speech through meaningful interactions with members of their community. Telegrammatic inner language becomes the basis of competent oral communication. More complex transformations allow competence in written communication. The mastery of such transformations is determined by the internal cognitive processes from which writing derived and the social context in which it is produced. The original mental source of writing is "inner speech" which evolved from a child's egocentric speech

and is further abbreviated and personalized. Vygotsky (1962, I. 48) describes inner speech as the language of "self-direction and intrapersonal communication".

Self-direction or self-regulatory cognitive processes are not limited to language. Language is just one of the systems of symbols that can provide tools for thought. Non-verbal forms of thought may proceed adaptively and intelligently without the involvement of verbal thought. Wood (1988) reflects on Einstein's views of the relations between language and creativity:

> "The words or the language, as they are written or spoken, do not seem to play any role in my mechanism of thought ... in thought are certain signs and more or less clear images which are, in my case, visual and some of muscular type ... conventional signs and words have to be sought for laboriously only in a secondary stage."
>
> (Wood, 1988, p.182)

Bruner (1966a, 1966b, 1971) alludes to other methods of "knowing" in his description of the inactive, iconic, and symbolic modes of representation. His inactive mode draws close parallels to Piaget's (1976) notion of practical intelligence, and his iconic form of representation demonstrates how a child depicts the outcomes of sets of actions through imaging. Bruner argues, unlike Piaget, that instruction is a necessary requirement if a child's spontaneous activities are to be transformed into symbolic rational thinking, and that too often instruction involves attention to procedures and a neglect of conceptual understanding and self-control of the learner.

Valuing self-regulatory cognitive processes of the learner explicitly, is emerging as the primary educational goal for special educators. The focus of instruction is to stimulate and nourish student's own mental elaborations for knowledge and to help them grow in their capacity to monitor and guide their own learning and thinking (Learner, 1993). Extensive research demonstrates that metacognitive instruction is effective in enhancing self-control in learning (Wong, 1991; Lerner, 1993; Palinscar, 1991; Paris, 1991; Meltzer, 1991). Considerable danger exists, however, that metacognition as an

explicit intent of instruction for special needs students will follow the same mechanistic and positivist paradigm that has prevailed under the clinical deficit model of instruction represented by the texts of Lily (1979), Cruickshank (1967), and Kephart (1960), the maturational lag point of view discussed by Kirk (1982) and Koppitz (1973) or the proponents of behavioral psychological methods that advocate direct instruction, epitomized by Rosenshine and Stevens (1986). To follow any of these pedagogical routes would be a failure to appreciate the need for a critical pedagogy provided by Freire (1970, 1973) or to fully understand the relationship of thought and self-regulatory mental functions proposed by Vygotsky (1962, 1978) and Bruner (1966a, 1966b, 1971).

This chapter has attempted to reveal the importance of understanding the history of Special Education in the United States and Canada as potentially being a history of oppression that meets all of the criteria of dominance that Freire (1970) describes as an institutional "banking" process:

> "In the banking concept of education, knowledge is a gift bestowed by those who consider themselves knowledgeable upon those whom they consider to know nothing. Through the projection of an absolute ignorance unto others, banking education draws a distinction between teacher and student in a way that mirrors oppressive society as whole." (Freire, 1970, p.59)

The self-emancipation of an oppressed group will not result from humanitarian practices which remain distant from the oppressed by treating them as unfortunates while "presenting for their emulation models from among the oppressors" (Freire, 1970, I. 39). Nor will it result from "assistentialist practices which attack symptoms, but not causes, of social ills" by proposing solutions for the oppressed which are then superimposed upon them (Freire, 1973, I. 15).

The antidialogical practices inherent in labeling, categorizing, diagnosing, and remediating through prescriptions have abounded from the beginnings of Special Education services in public schools during the 1960's to the present time. A critical

perspective on Special Education in Canada (Leitch, 1986) must necessarily search for new perspectives surrounding the entire paradigm of Special Education. Within this search, an argument has been presented to consider a pedagogy that is based on the theoretical assumptions of Freire and Vygotsky, one that is founded on the cognitive and social dynamics of learning, and one that merits self-efficacy as a learner as a primary goal for both teacher and student.

CHAPTER III A SOCIO-HISTORICAL PERSPECTIVE: THE PSYCHOLOGICAL VIEW FROM VYGOTSKY

Awareness of the critical pedagogy inherent within the traditional paradigm of Special Education is not enough. The teacher, in seeking to empower both themselves and their students, must look to the psychology of learning to decipher how this might best be accomplished. Only through viewing the potential for oppression within the learner, can the special educator also be cognizant of the institutional potential for disempowerment. What psychological theory of learning can give voice and autonomy to special education teachers and students? The sociohistorical-cultural psychological theory of learning presented by Vygotsky (1978, 1986) is a theory that values the mental activity of the learner within a social and cultural framework. He speaks of the interiorization of social signs and the internalization of culture and social relationships. Mental development is considered a sociogenetic process. The structures of perception; voluntary attention and memory, emotions, thought, language, problem solving, and behaviors, acquire different forms according to the historical context of the culture, its relationships, and its institutions. The different forms of neuropsychic systems form part of the physiological activity of the human brain.

Higher mental processes, in a Vygotskian perspective, are not simply "superior human activity", but superior nervous activity that has internalized social meanings derived from the cultural activity of human beings and mediated by signs. As Blanck (1990) submits, Vygotsky refused to search for explanations of higher mental processes in the depth of the brain, or in the ethereal characteristics of the soul detached from the physical. Luria (1979) recalls that Vygotsky argued that signs restructure the consciousness of humans and influence the consciousness of others. Essentially, one's culture gives the learner tools of mediation which in turn, reorganize functional, not morphological neural structures. As the brain structures mature, the mediational signs or

tools are capable of higher and more sophisticated culturalization. Children utilize lower mental order processes, such as elementary attention, perception, and memory within a natural line of development. Through constant interaction with adults, however, the lower processes are transformed radically into higher mental processes. Children's mental functions, therefore, evolve from the inter-psychological processes of social interactions, towards internalized intra-psychological processes in adults (Vygotsky, 1978).

The ontogenetic development of mental processes was not viewed as a straight pathway of quantitative abilities, but as a series of qualitative, dialectical transformations. Higher mental functions form in stages, each a complex process of disintegration and integration. Each stage is distinguished by a particular organization of psychological activity. Vygotsky considered the acquisition of language as the most significant moment in the course of cognitive development, serving as a psychological instrument for the regulation of behavior. New varieties of memory and perception are formed and new thought processes are created (Luria, 1961).

Vygotsky regarded education, not only as central to cognitive development, but as the quintessential sociocultural activity. His theory of development has been described by Bruner (1987) as simultaneously a theory of education. Perhaps his most influential concept, the "zone of proximal development", is the best representation of the dynamics of becoming an autonomous thinker, because the difference between the potential understandings of the learner during any learning task is compared to the present socially mediated understanding. Vygotsky (1978) contended that maturing or developing mental functions must be fostered and assessed through collaborative, not independent or isolated, activities. Indeed, his presenting of the "zone of proximal development" was prompted by his reservations concerning Western I.Q. testing, which he critiqued as measuring static and fossilized products of mental functions. The zone reflects

Vygotsky's contentions of the inseparability of consciousness and human (socially and culturally mediated) behavior.

Vygotsky's "zone" is considered a fundamental connecting concept between the critical theoretical perspectives of Freire and the psychological views presented by cognitivists. The emphasis is on the child's active creation or use of new means to accomplish or reorganize the experimental task. Valsiner (1988) comments that it is the observation of the process by which solution is reached that constitutes the Vygotskian equivalent of the "dependent variable" in traditional psychological experiments. The "zone", therefore, describes the process of a learner becoming autonomous from social and cultural mediation, which, taken from the broader philosophical perspectives of Freire, describes the process of developing a "voice". What Freire can offer to Vygotsky's theory is the constant potential of negative influences of social and cultural mediations which prevent the development of autonomous internalization of intra-psychological mental process. Autonomy in this sense implies the degree that the learner has formed the mental capacities to think critically about the very social and cultural mediational influences that allowed the critical mental capacities to evolve in the first place.

Thus, we have arrived at the fundamental intent of this work -- to rationalize the need to consider the autonomy or empowerment of student thinking in both a broad philosophical sense and in a narrower psychological sense. To fail to include both perspectives is to fail to understand the fundamental relationship of society and culture in learning. Blanck (1990) comments:

> "I believe that from the synthesis I have made of Vygotskian conceptualizations, we can infer that social relationships and culture are the sources of the mind, the working brain only its organ, and the unique social activity of each subject how it originates."
>
> (Blanck, 1990, p.49)

The "unique social activity" becomes the bond of the perspectives of Vygotsky and Freire, for the unique position of any oppressed population or individual has a psychological mental ontogeny which exasperates and perpetuates the oppressive circumstance. The psychological processes are a function of the socially contrived cerebral activity, and do not emerge autonomously in a Piagetian sense. In effect, the psychological processes tow development.

Perhaps Vygotsky's most important contribution is the acknowledgment of children as active agents in the educational process. As Moll (1990) states: "the polemical relationship between learning and development, crucially important to educators, was highlighted in Vygotsky's work". Pedagogy creates learning processes that lead development and this development creates new zones of proximal development. As the child receives orientation from an adult, a learning goal is achieved and another is offered. A constant dynamic between what the child can accomplish independently, and new mediated potentials, describes a perpetual transformation of knowledge into more and more independent and thoughtful understandings.

The educational ideal, in a Vygotskian sense, is to foster independent thinking through self-regulation. This ideal places educational emphasis on the dynamics of learning itself, rather than on the net gain of information. This ideal values autonomy in learning, rather than facts. It values the process of learning, rather than products. For a special educator and regular educator alike, the awareness that self-regulation in thinking is not a simple by-product of pedagogy, but an intent, is an awareness that demands drastic and fundamental changes in the paradigms of instruction, exceptionality, assessment, intelligence, and learning theory.

What is self-regulation and what higher mental functions permit self-regulation? What is the difference between lower and higher mental processes? The Vygotskian perspective can be interpreted as the transformation of basic, biologically determined processes into higher psychological functions which permit self-regulation (Vygotsky,

1978). The human infant is endowed with a wide range of perceptual, attentional, and memory capacities, such as the capacity to perceive contrast and movement, the capacity for eidetic memory, and arousal/habituation responses to environmental stimuli. The transformation of these elementary, or bottom-up lower mental functions, into different self-regulatory processes not bound by concrete and immediate stimuli fields, describes the ontogeny of autonomy in thinking. The infant's eidetic rudimentary memory processes are transformed into the capacity for top-down voluntary memory and the use of mnemonic strategies; the capacity to perceive salient stimulus features develops into the capacity for selective attention; arousal/habituation patterns develop into the capacity for vigilance, concentration, and sustained attention. The "common denominator" of these and other psychological transformations is the decreasing power of immediate environmental contingencies and the increasing role of self-formulated plans and goals in the regulation of behavior and cognitive activity (Diaz, Neal, Amaya-Williams, 1990). The "higher" processes are distinguished from the more basic in a number of ways presented by Wertch (1985):

1. self-regulated, rather than bound to the immediate stimulus field;
2. social or cultural, rather than biological in origin;
3. the object of conscious awareness, rather than automatic and unconscious; and
4. mediated, through the use of cultural tools and symbols.

Cognitive advances in the school years are marked by increased "executive" control (Sternberg, 1984) and self-regulation of perceptual, attentional, and memory processes.

Individual differences in self-regulatory capacities can be expected from differences in the quality of caregiver-child interactions. The sensitive and gradual withdrawal of the caregiver's mediation, and the takeover of the regulatory function of the child, is the aim of the learning process. Educational or paternal experiences which do not permit, or indeed may prevent, such mental transformations, fail to understand the importance of the Vygotskian perception of intellectual development. Such

transformations are not achieved through giving or telling facts; they are attained by a facilitative mediational role which constantly strives to allow self-regulation in learning.

What are the mental vehicles through which self-regulation develops? Vygotsky, and his colleague Luria, focused on the role of inner language or private speech:

> "By means of words, children single out separate elements, thereby overcoming the natural structure of the sensory field and forming new (artificially introduced and dynamic) structural centers. The child begins to perceive the world not only through his/her eyes but also through his/her speech. As a result, the immediacy of "natural" perception is supplanted by a complex mediated process: as such, speech becomes an essential part of the child's cognitive development." (Vygotsky, 1978, p.32)

Luria (1961) adds that during the first stage of the development of "inner language", the speech of others, usually adults, controls and directs a child's behavior. In the second stage, the child's own overt speech becomes an effective regulator, followed by a third stage during which covert language, or inner speech, gradually assumes a self-governing role. Recent research, into the nature and stimulation of the myriad of mental strategies a learner can generate through inner language, is an exciting and eclectic emerging field of inquiry. It provides the basis for cognitive-behavior modification (Meichenbaum, 1977; Broad, 1985), mediated intelligence (Feuerstein et al, 1981; Gardner, 1983; Sternberg, 1981, 1984), as well as a plethora of curricular and special education applications (Deshler et al, 1983, 1986; Meltzer, 1991). Indeed, the value of exposing students to a variety of self-questioning techniques is rapidly changing instructional practices across the curriculum. A "Socratic" teacher dialogue employing reciprocal teaching techniques (Brown and Palinscar, 1989; Palinscar and Brown, 1984, 1988) in reading, is aimed at promoting divergent questioning from both the teacher and student Self-monitoring, through inner language, is also the foundation for a variety of cognitive instructional models addressing thinking and study skills (Dansereau, 1979; Deshler and Schumaker, 1986; Lenz, 1989).

If inner language is a process fundamental to self-regulatory or metacognitive development, as this research implies, why has it been so well disguised within our educational ideals? Why are we not making students, parents and teachers aware of its potential, powerful influence on learning? Why aren't we evaluating its growth and versatility for each student? Why aren't we seeking pedagogy which enables its growth?

A second vehicle through which students attain self-regulation is postulated to be the mental capacity to internally visualize or imagine. Vygotsky did not attribute imagery or visualization with the same reverence as inner language and, indeed, this mental capacity has been given a rather perfunctory role by most learning theorists, including Bruner (1966) and Piaget (1976). Only Paivio (1975, 1976) and Kosslyn (1980, 1981), to this author's knowledge, have considered imagery on an equal footing. They present a convincing intellectual, developmental perspective of cognition in terms of both imagery and inner language, but do not clearly distinguish metacognitive or self-regulatory roles. Recently, however, a renewed interest in the self-regulatory functions of mental imagery (Pressley, 1976, 1977; Bell, 1986) has emerged in the form of "graphic organizers" (Lenz, 1989) and a variety of mental webbing or mapping techniques aimed at comprehension (Pressley and Miller, 1987) and study skills (Deshler and Schumaker, 1986; Dansereau et al, 1979).

Many of the same educational questions can be posed concerning the importance of imagery in learning as were offered for inner language. What is the ontogeny of imagery? Is imagery a universal mental capacity? Can students be taught to apply imagery across the curriculum? Will increased use of imagery sophisticate the process itself? We know so little about the nature of this mental function, yet, if as Vygotsky suggests, such mental mediational tools allow functional brain transformations which enable "higher" order abstractions, the importance of increasing our understanding of these learning dynamics becomes clear.

PART II

A MEDIATED METACOGNITIVE PEDAGOGY

CHAPTER IV METACOGNITION AS AN EDUCATIONAL IDEAL

"The idea that others may think differently from us is at first shocking and then fascinating."
Robert Sommer (1978)

If the critical perspective of the traditional paradigm of Special Education provides a philosophical "why" to consider change, then the job of Part II is to offer the psychological "how" this change might occur. The arena of cognitive psychology, or more specifically, metacognitive psychology, can provide an alternative avenue to what we consider important within Special Education. This avenue moves us from the need for comparison against peers, alone, towards consideration of how the student attempts self-control in their learning. We move from the belief that depositing of information is our primary purpose towards the need for awareness of how each student deals with their own learning. We begin to view our role more as a coach of meaningful learning, rather than a giver of information.

The main focus of this chapter is to offer a different perspective on contemporary cognitive theories of the intellect, through elevating the awareness of mental processes that allow cognitive development to occur. The need for a new intellectual model will be discussed, that reflects intellectual control of the learner over a lifetime. The perspective presented will consider the processes responsible for cognating. The word "process" in this sense refers to the means by which an individual acquires and controls information; the mental vehicles that enable us to monitor our thinking. Self-regulatory mental processes have been termed metacognitive processes (Baird and White, 1982; Brown, 1980; Reid and Stone, 1991). Students that strategically employ such processes display metacognition. The development of these cognitive tools are the means whereby students achieve self-appraisal and self-management of their own thinking (Paris, 1990).

But, what are these mental tools and how do they interact? Where does metacognitive awareness fit in terms of present and past learning theory? Perhaps, more importantly, are these mental processes modifiable? How do they help contribute to our understanding of intellectual development over a lifetime? If metacognition is modifiable, we are essentially suggesting that intelligence can be taught. Helping to provide a learner with a more efficient learning strategy can yield compounded dividends over a lifetime that enable a more sophisticated and enriched understanding for all future learning tasks. Thinking about thinking can be taught. This single statement has profound educational implications, because if thinking can be sophisticated, then the urgent need emerges to find out how this aim can best be accomplished. The growing body of research, over the last decade, overwhelmingly acknowledges the metacognitive arena as a promising and critical educational pursuit (Flavell, 1977; Torgenson, 1979, 1980; Costa, 1989; Reid and Stone, 1991; Brown, 1980; Mann, 1980; Derry, 1990; Palinscar, 1991; Gardner, 1985). However, extreme disparities exist between advocates of this direction concerning the role of mental processes in learning and how best to deliver educational supports.

METACOGNITIVE DIVERSITY IN THEORY

What are the common threads of understanding within metacognitive theory, and how can we weave these threads together in presenting a different perspective on cognitive development over a lifetime? This perspective is felt necessary to help us in connecting previous learning theory with a new outlook that delves into the act of cognating, rather than considering the structural intellectual patterns that emerge alone. The underlying theme of this work is the contention that we require at least equal consideration to the actual process of thinking itself, as well as an understanding of what such mental processes eventually produce. If we can reveal the means through which

understanding occurs, then we are placing a powerful awareness in the hands of teachers, a sort of "metaknowledge" of how learning occurs.

A large part of disparity in metacognitive research originates because of contributions from many diverse psychological and educational fields that have different interpretations of what metacognition encompasses. Cognitive developmental stage theory which first surfaced through the plenary works of Jean Piaget have alluded to metacognitive control, but only in terms of support for the structure of intellectual development, not as a viable intellectual construct in itself (Piaget, 1966, 1967; Furth, 1969). Contemporary stage theorists also clearly allude to metacognition without actually using the term. Pascual-Leone (1969) and Case (1985) begin to address how children evolve from one intellectual stage to another through a focus on the "B" or attentional factors that are responsible for an increased capacity to process more information with age. Although stage theories provide important insights into how the intellect "unfolds", the question of how children modify their thinking remains largely unanswered. Metaphorically speaking, the Piagetian theorists have provided us with a possible blueprint for a new house, but have not indicated who is responsible for building the house. The carpenters and bricklayers of intellectual development have largely been ignored or have been assigned to a back seat in importance.

Another body of research that deals with metacognitive control indirectly, stems from the information processing psychologists. This approach adopts a computer simulated perspective on intellectual growth through analysis of detailed "programs" of thinking during presented tasks. Klahr and Wallace (1976) and Siegler (1987, 1991) offer theories of strategic control and generalization abilities of learners, but do not delve into the actual mechanics of how learners engage in these cognitive functions. Again, the vehicles through which strategic control emerges are not given priority.

A third body of research emanates from criticisms of past intellectual assessment practices which revolve around I.Q. quotients and contentions that normative

comparisons of an unmodifiable construct of the intellect are valid and sufficient. The seminal works of Feuerstein, Gardner, and Sternberg provide a new modifiable and expansive view of intellectual growth that are flavored with an individual metacognitive perspective (Feuerstein et al, 1981; Feuerstein et al, 1980; Feuerstein et al, 1987; Gardner, 1983, 1985, 1989; Sternberg, 1981, 1984). Feuerstein's Instrumental Enrichment program is premised on cognitive modifiability accomplished through a plethora of verbal and visual activities that are mediated over time by the examiner The cognitive modification is assumed from improvement over time, but again, the cognitive processes responsible for this improvement are not directly addressed. Gardner contributes a more divergent and expansive intellectual construct through proposing multiple intelligences, but he provides no model of how, or why, each intelligence develops. Sternberg provides a much more definitive metacognitive perspective within his triarchic theory of human intelligence, and even alludes to "metacomponents" used to construct strategies that are responsible for most elements of developmental change. However, Sternberg as well, does not attempt to describe the nature of these metacomponents that form such an important aspect of his theory. Again, the vehicles that are responsible for development elude acknowledgment, yet their importance becomes more and more obvious with each emerging theoretical intellectual perspective.

Yet another field that has toyed with metacognition as a contributing, but not perpetuating factor in cognitive development, is the critical thinking movement that has swept the United States during the last decade. Proponents of this movement have indicated the importance of teaching for thoughtfulness (Paul, 1990; Resnick, 1987; Ennis, 1985; Beyer, 1987; Swartz, and Perkins, 1990; Raths, 1986; Barell, 1991; Mulcahy et al, 1991; Marzano, 1986) and metacognition, to varying degrees, is almost universally included. However, different interpretations of what metacognition encompasses yields different levels of assigned importance. None of the authors referred to have attempted a description of the actual mental processes that allow cognition to

occur; strategic task specific interpretations prevail, rather than a focus on what enables the individual to form these "mental strategies" in the first place. Most advocates of critical thinking relegate metacognition to a perfunctory, rather than quintessential, role.

A fifth area of metacognitive inquiry has evolved from the seminal works of Chomsky in the realm of psycholinguistics (Chomsky, 1965). Holistic pedagogy within language, reading, and writing instruction is founded on strategic awareness and control of the learner (Smith, 1973; Goodman, 1973, 1990; Holdaway, 1979). Contemporary language arts researchers are delving further into the task specific strategies that students employ, as well as the best methods of instructing or mediating strategic learning practice (Brown and Palinscar, 1989; Palinscar and Brown, 1984, 1988; Paris et al, 1990). Psycholinguistics has evolved into a myriad of subject specific research which addresses more and more aspects of cognitive behavioral modification. Metacognition provides the driving force behind this direction; the aim of all such research is to improve the learners self-regulation during any learning task Research suggests that the metacognitive control of learners can be mediated (Costa, 1988; Harris, Pressley, 1991; Reid, Stone, 1991; Palinscar, 1991; Paris, Winegrad, 1991; Ellis, Lenz, 1987; Meltzer, 1991). However, considerable controversy persists over how best to improve metacognitive behavior, or indeed, clarify what encompasses metacognitive behavior. The recurring question of "bridging" or transfer of a trained strategy to independent use by the student for similar tasks continues to be a most contentious research pursuit.

The field of exceptionality is also beginning to adopt a metacognitive veil. Rather than attempting to "fractionate" learning outcomes of the exceptional student, new approaches are analyzing the deficit areas in terms of strategic deficiency (Mann, 1980, Torgeson, 1979; Lerner, 1993; Swenson, 1987; Meltzer, 1991). For example, metacognitive considerations are essentially changing our definition of learning disability. A metacognitive definition defines in terms of the inability to self-regulate or to shift from one strategy to another, or a failure to even consider more than one approach

in rapid succession in order to arrive at a solution to a problem (Swenson, 1987; Meltzer, 1991). This interpretation also applies to conduct disorders and impulsivity; instead of controlled "token" intervention, new consideration is being given to self-controlling mediational therapy (Meichenbaum, 1977; Broad, 1985). Several questions, however, remain unanswered. What mental strategies do exceptional children fail to adopt for themselves and what mental processes allow the individual to develop these strategies consistently? A growing need to understand how learning develops in terms of a metacognitive paradigm is emerging as more and more areas of exceptionality begin to explore new pedogogical methods.

All of the metacognitive arenas reviewed, thus far, allow some confidence that strategic self-control is a fruitful, educational enterprise. The form of metacognitive training has now surfaced as the major contention. An element of educational philosophical pedagogy should accompany all metacognitive inquiry; how do we best enable a student to help themselves intellectually? The humanistic views of Maslow and Rogers requires the field of metacognitive inquiry to contemplate exactly how to achieve student self-actualization in a cognitive way, and to consider what form of student-teacher relationship best enables the acquisition of cognitive self-control (Maslow, 1968; Rogers, 1969, 1983). Without this philosophical ingredient, the diverse areas of metacognitive research may well be invidious, rather than collaborative. This is considered a fundamental point of this paper; any potential model of the intellect that attempts to shed light on the acts of learning must also shed light on pedagogical means of helping the learning to take place. The area of contemporary contention which ponders whether metacognitive strategies should be directly taught or infused within the curriculum is largely a function of the degree a learner acquires cognitive autonomy. Providing a mental process-based intellectual model favors the latter because the tendency to diverge into the training of task specific strategies of each subject is lessened through a better understanding of how such processes interact over a lifetime.

Understanding the mental dynamics enables a more mediational teacher-learner relationship, because the teacher becomes aware of the more universal metacognitive paradigm that permeates all learning tasks.

Chapter V BUILDING A RATIONALE FOR A METACOGNITIVE INTELLECTUAL MODEL

The first question to consider is why bother to build a process-based intellectual model? What can such a model contribute? The main reason is to provide a common point of reference for so many divergent areas of metacognitive inquiry. A second reason is to link current metacognitive research with past learning theory, in order to better understand its place in a more universal and historic sense. Metacognitive theory is not considered a separate educational or psychological entity; it is inextricably interwoven with prior theories of learning. A third reason, alluded to previously, is to help form some pedagogical consensus. Without a better understanding of the means through which we cognate, pedagogy will continue to diverge into more and more task specific fields of inquiry. Essentially, teachers can teach students how to think better if they have reached a better understanding of what mental mechanisms cause more sophisticated thinking. Knowing how the intellect unfolds in a Piagetian sense is important, but knowing what means the student learns to utilize provides a more tangible instructional agenda.

In order to fully elevate metacognition or self-regulation in learning as a fundamental educational ideal, one must first ponder the question of what counts as an appropriate description or explanation of underlying assumptions of learning. A central consideration occurs within the units of analysis that various schools of psychology choose. As Zinchenko (1985) and Wertsch (1991) have noted, Behaviorists have selected the stimulus-response associations, Gestalt psychologists have focused on gestalts, and Piagetians have examined schemata. The approach that a metacognitive perspective assumes is one of human action. The units of analysis can be grounded in action alluded to within the psychological "theories of activity" offered by Leont'ev (1981), as well as the sociological theory of Habermas (1984) and the "three-world" theory of Popper (1972). As Habermas (1984) argues, strategically acting subjects must be cognitively so equipped

that for them not only physical objects (Popper's first world), but decision-making systems can appear in the world through the expanding of the subject's own conceptual apparatus.

Concern with a student's "conceptual apparatus" focuses metacognitive inquiry within Popper's second world of "states of consciousness" and his third world of "objective contents of thought". If we add the world of "communicative action" from Habermas, the action unit becomes one of the interaction of at least two subjects capable of interpersonal relations. Metacognitive inquiry, therefore, becomes an inquiry not isolated within an individual, nor relegated solely to the physical reality of the Behaviorists; it becomes an inquiry of mediated action which is simultaneously oriented towards both the physical reality and the individual's conceptual apparatus that has been acquired through a social and cultural communicative history. Learning considered from this point of view is judged according to the criterion of the degree of understanding, and understanding is a constantly evolving mediated action between the individual and their interpersonal and physical reality.

Thusly described, mediated action is not entirely a teleological process isolated within the individual as Habermas would contend, it is a teleological process that is also a mediated socio-cultural process. As Wertsch (1991) aptly expresses, to understand human mental action, one must understand the semiotic devices used to mediate such action, and one must understand that communicative processes give rise to mental functioning in the individual. In Vygotskian terms, the individual dimension of consciousness is derivative and secondary (Vygotsky, 1979, I.30). Self-regulated or metacognitive behavior can, therefore, never be isolated from the socio-cultural mediational influences that shape mental functioning from birth. Inquiry into metacognition as a unit of action is, therefore, concerned with both the form that such mediated semiotic processes assume, as well as knowledge of the mediational socio-cultural influences throughout a lifetime.

The focus of analysis, in terms of units of action, does not assume that the appropriate focus of analysis is the solitary actor or that there exists a neat separation between ends and means. The relationship between action and mediational means is close to the notion of "voice" derived from Bakhtin (1981, 1986) and Wertsch (1991) which expresses communicative functioning as a dialogicality of mind; any utterance assumes a listener and is mediated by social and cultural influences. The need therefore exists to establish a model of such intellectual development which reflects the dialogical top-down nature of the mental processes which govern or regulate thinking. Such a model cannot be concerned with the net products of learning isolated from the individual in a Behaviorist sense, nor concern itself strictly within the bottom-up cognitive functioning of the individuals automatic perception of the environment. Such a model must reflect both, through revealing the history of the mental processes in terms of their social and cultural mediational ontogeny. Revealing the development of mental processes enables an understanding of the dialogical nature of the intellect that appears capable of unique and individualistic interpretations of the world, yet paradoxically remains a prisoner of social, cultural, and institutional influences.

This very brief overview of human action as a unit of inquiry does not pretend to do justice to the theories of Leont'ev, Popper, Habermas, Wertsch, Bakhtin, or Vygotsky. The main purpose, rather, is to provide a rationale and legitimacy for human action as a potential locus of control within inquiry. This unit will allow an overall picture of mental functioning that will provide a much more coherent account of human mental development throughout a lifetime, rather than continuing to pursue more and more divergent psychological and philosophical theories that seem more and more preoccupied with isolated aspects of research, as knowledge of psychological phenomena increases. Treating the "acts" of knowing as the primary criteria, enables a holistic level of analysis which does not treat mental processes as though they exist in a cultural, institutional, and historical vacuum. Indeed, a primary intent of this paper is to demonstrate that such

"acts" of knowing are a fundamental educational concern that has been largely overlooked or ignored as a purposeful educational construct worthy of a prominent pedagogical position for all students and for exceptional students, in particular.

The first consideration in developing a metacognitive intellectual model is to delineate what is meant by a metacognitive process. Part of the difficulty in discussing cognitive and metacognitive research is clarity of definition. Much of current research describes a psychological process and strategy as synonymous entities. Ellis and Lenz (1987) describe a learning strategy as an integrated system for attacking an academic problem. Strategies employ higher order cognitive processes and focus more on the manipulation of information. Kirby (1984) defines a process as a well learned strategy stored in memory. Neither approach delineates the properties of potential processes. What are Ellis and Lenz's "higher order" mental processes, and how well learned must a strategy become to be termed a process within Kirby's framework? It would seem more useful to make a clear distinction between a cognitive process and a cognitive strategy to avoid confusion and to allow a more cogent view of the mental dynamics of each. A cognitive process is considered a cognitive potential or capacity for the purposes of this paper. A cognitive strategy is any use of a cognitive process.

In describing a mental process as a human potential or capacity, certain properties of candidate processes emerge which helps distinguish them from bottom-up sensory perception and representation. Considering the "act" of knowing and controlling our mental behavior in a metacognitive sense necessitates a top-down view of mental representation; the mental means that humans employ to make use of bottom-up representation. This top-down executive control has been largely overlooked in the field of psychological inquiry, but is now considered the most important emerging area of inquiry within cognitive psychology (Gardner, 1985).

A top-down process must demonstrate willful use; the individual can apply the mental capacity purposefully to help them control and monitor their mental engagement

across a broad variety of learning tasks. The task specific ways such a process is utilized would describe the strategic use of that process for that specific task. Willful use implies that the learner can consciously choose to apply or engage this process, but does not imply that all learners will do so to the same degree; demonstrating willful use does not mean that all learners will choose to apply the process equally in either a quantitative or qualitative sense.

A second property of a potential metacognitive process is considered to be some demonstration of a degree of mental universality. Although individual learners may vary in the degree they learn to apply a metacognitive process, the human potential to mentally participate exists across cultures. The human is born with the potential to develop the process, but the process itself is a function of social and cultural influences, genetic and neurological influences, as well as each individual's unique mental interaction within their physical world. The seed of the process is present at birth, but its subsequent growth is determined by the units of intellectual action that the individual is exposed to over a lifetime. Different cultures may, therefore, favor or deter different executive or metacognitive processes. Different social niches within a culture may also favor or hinder metacognitive processes. Different neur logical systems within the brain may similarly favor or deter potential executive processes.

A potential metacognitive process should also demonstrate a linkage to sensory origins, but should not be considered equivalent to sensory systems. Herein lies the difference between bottom-up involuntary mental representations that are determined by the neurological nature of our sensory receptors, and top-down executive mental representations that empower the learner with the choice for voluntary control. Bottom-up representations provide the fuel through which the individual begins their journey of learning for themselves. This control is necessarily linked to sensory perception because our reality is functionally and morphologically dependent on our history of sensory reception and adaptation. Top-down executive control is considered to be the human's

primary survival mechanism; in a Darwinian sense, we have chosen to adapt along a different pathway which empowers the individual species member with mental choice rather than species protection through instinctual rituals that "fix" or "lock" individual members into behavior patterns that are largely involuntary. The genotypic description of mental processes, that have evolved into metacognitive processes, helps define the degree of "thoughtfulness" that any given species demonstrates.

A candidate process must also necessarily represent some form of mental universality which transcends the cognitive domain of Bloom (1956) into an effective and pyschomotor realm. To consider otherwise would lead metacognitive inquiry towards a phenotypic, rather than genotypic, outlook. Any phenotypic description void of the holistic phylogenic and ontogenic genesis of the process would provide a myoptic view at best; the disposition of the learner cannot be separated from cognitive development and any potential metacognitive process must, therefore, provide a linkage across these domains.

A potential metacognitive process should also not be thought of in terms of an evaluative cognitive relationship. In order to help explain the vast individual diversity of metacognitive application within cultures and across cultures, it is useful to consider a potential negative, as well as positive, metacognitive value to executive control. The presence, or absence, of the process, therefore, does not necessarily infer a positive cognitive relationship; they can exert a positive or negative influence depending on the task and the history of the learners mediated metacognitive interaction for that task. The term "mediated" in this context describes the cultural history of the learner in developing metacognitive control. If mediated opportunities are negative, or missing within the individual's learning experience, then the same metacognitive processes that could have fostered executive control will hinder or prevent the learner in thinking for themselves.

Candidate metacognitive processes should also demonstrate some degree of generality on the one hand and specificity on the other. Their potential can influence or

be applied to a broad range of learning tasks, but may also be essential or required for specific tasks. This property helps explain the common approaches to learning that each culture exerts as well as the absolute metacognitive individuality of each member of that culture; as a species there is commonality to our executive control and at the same time individuality.

Finally, candidate metacognitive processes should display both a voluntary and involuntary nature. They can operate with or without the learner's intervention. This property separates a cognitive from metacognitive analysis of semiotic functioning, hence helps us to understand a sort of middle road between bottom-up involuntary aspects of representation and top-down voluntary avenues. Metacognating is considered effortful, requiring a great deal of mental energy to sustain. Mental procedures which originally require a great deal of voluntary effort can become habitualized and automatic with practice; these habits of mind, therefore, cross over to involuntary mental patterns which could resemble bottom-up sensory representations that never required a metacognitive route for automatization.

This conceptual analysis of what comprises a metacognitive process is designed to clarify the distinction between a metacognitive process and a mental strategy. Two mental abilities that appear to meet metacognitive criteria are imagery and inner language. First, both can be described as mental capacities or potentials that can be willfully applied to a variety of learning tasks, or can be <u>required</u> for some specific learning tasks. Imagery, in this sense, refers to the mental capacity or potential to form "pictures in the mind" in the absence of physical referents. This interpretation does not include other mental images originating from other sensory modalities, because the linkage to a willful mental process is unclear, though the assumption is made that olfactory, haptic, kinesthetic and taste sensations do enrich the visual mental interpretations that the mind can generate. This definition is, therefore, narrower than some authors choose (Piaget, 1966, 1971; Bruner, 1966a, 1966b) when discussing

imagery, more in the line of what Paivio (1971, 1975, 1976), Hebb (1968), Shepard (1971, 1981) and Kosslyn (1980, 1981) describe in limiting their discussion to visual origins. Inner language refers to the mental ability to generate a private verbal dialogue -- essentially speech for oneself. Vygotsky (1962, 1978) refers to this mental process as not merely accompanying mental activity during a learning task, but serving as a tool of mental orientation. It is speech for oneself, intimately and usefully connected with a child's thinking. Luria (1969, 1976) describes the ontogeny of this mental process as evolving from overt control by adult speech at early ages, through a more covert self-regulatory function at approximately age seven or eight, to a completely self-governing role in early adolescence.

Imagery and inner language will be discussed in more depth as a metacognitive intellectual model is introduced, however, for the moment, both processes will be evaluated in terms of our criteria for metacognitive processes, accompanied by a discussion on why both are felt deserving of inclusion within a metacognitive model. As mentioned earlier, both mental abilities are capable of willful use; the learner can conjure either capacity at will, and each process can be applied to a wide variety of learning tasks. When a student studies, for example, they may conjure schematic visual representations of the material (Marzano, 1986; Barell, 1991; Bell, 1986; Beyer, 1987; Brown and Smiley, 1978; Costa, 1984; Dansereau et al, 1979; Hayes, 1981; Lenz, 1989) or they may regulate their comprehension through a range of verbal rehearsal strategies which emanate from an inner language mental process (Marzano, 1986; Barell, 1991; Bell, 1986; Beyer, 1987; Costa, 1984; Dansereau et al, 1979; Brown, 1980, 1989; Derry, 1990; Deshler and Shumaker, 1986; Duffy, 1987; Harris and Pressley, 1991; Lenz, 1989; Palinscar et al, 1991, 1988). Both processes can also transcend the cognitive domain of Bloom's (1956) taxonomy into affective and psychomotor domains. A good feeling towards a cognitive task can be generated through imaging prior positive experiences or recalling positive words affiliated with success; psycho dynamic therapy is now making

use of both cognitive processes as primary techniques in helping client's develop control of their mental and spiritual being (Rogers, 1980; Ellis, 1962, 1973). Similarly, the connection between both processes and athletic prowess is well documented; visualizing the downhill ski course and talking oneself into a positive motivational frame of mind exemplify common psychomotor practices (Barell, 1991).

Both processes are also directly linked to a sensory modality, imagery to sight and inner language to hearing. This criteria allows an evolutionary etiology that enables a neurological , as well as developmental, perspective. If the primary adaptive survival pathway of the human has been towards releasing the bonds of fixed instinctual behavior in favor of cognitive control for species members, then it follows that the evolution of metacognitive processes would favor the primary human sensory receptors through sight and hearing. It would be difficult to imagine an imaging capacity without binocular vision or an inner voice without the need for social and vocal communication. If we define metacognition in terms of executive control before, during, and/or after any given learning task (Swartz, Perkins, 1990), then it is conceivable that we have evolved metacognitive means through imagery and inner language because sight and sound have been our species primary sensory modalities. Imagery and inner language enable us to control our mental behavior before, during, and/or after any given learning task. The reader is reminded that, in terms of this paper, a process based intellectual model that sheds light on metacognitive self-control is dealing with the acts of metacognating or the vehicles through which we regulate our cognitive functioning. Because we are interested in how such a model reflects knowledge acquisition over a lifetime, an etiological perspective is considered prerequisite to labeling a mental function, a mental process. Both processes, to varying degrees, have been mentioned as crucial cognitive abilities which allow or enable cognitive development to occur (Bruner, 1966a, 1966b; Piaget, 1967, 1976, 1985; Case, 1985, 1990; Gallagher, 1988, 1991; Vygotsky, 1962, 1978; Paivio, 1971, 1974, 1975; Luria, 1969, 1976, 1978; Klahr and Wallace, 1976; Pascual-

Leone, 1969). None of these authors however, has dealt with either process in the context of a model that elevates their importance in cognitive control over a lifetime.

Both processes are not to be thought of in evaluatory terms. Their presence does not guarantee a positive metacognitive relationship; a learner can just as easily talk themselves out of cognitive control, or image worst case scenarios from the past, that will prevent optimal future use. Either process can result in negative learning behaviors, as well as positive. Costa (1988) describes negative learning behavior as "anti-intellectual" behavior that can be task specific or of a more general cognitive or affective nature. For example, "dogmatic" cognitive behavior implies an anti-intellectual inflexibility that may prevent a learner from even attempting a new strategy during a learning task. The contention of this paper is that increasing the awareness of positive strategic applications of imagery and inner language will provide a powerful mediational tool that can help modify present learning tasks in a more efficient and useful fashion for future applications, than the learner would likely acquire themselves. The collective influences of negative applications can often result in extreme anxieties that may even prevent much chance of future success. The concept of "learned helplessness" has been presented by many authors covering the entire range of school curriculum (Barell, 1991; Siegler, 1991; Resnick, 1987; Lerner, 1993; Wood, 1988). A candidate cognitive process that can be used as a metacognitive process must, therefore, be considered as a potential for useless or even harmful learning behaviors as well as beneficial.

The final criteria for a candidate process is displaying both a voluntary and involuntary nature. This property really describes the difference between cognition or thinking in spite of ourselves and metacognition or knowing how and when to purposefully regulate, mediate, or alter our thinking. Cognition and metacognition are not considered entirely separate mental functions; they occur simultaneous during the thought process. Metacognition serves as more of an adjective of cognition, implying the degree of control the learner exerts. We have all been guilty of thoughtless cognition

with little, or no, metacognitive influence. Reading a book, then suddenly realizing that although your eyes have interpreted the words, your mind has not translated the meaning, provides an example of cognition without metacognition. Similarly, when tasks are over-learned or automatized, the necessity to metacognate becomes less and less. We seldom think about how to drive a car or negotiate a staircase, yet we perform these cognitive functions. Imagery and inner language are often employed in cognitive behaviors that have become automatic; they can, therefore, be engaged involuntarily. Both processes can also be employed voluntarily to monitor any learning task in a regulatory sense. Generally speaking, the newer the task or the more difficult the task, the greater the degree of metacognitive intervention will be necessary, and the more inner images and inner dialogues will serve to mediate or regulate the problem situation.

Thus far, only two mental abilities or capacities have been delineated as cognitive or metacognitive processes. What other mental activities are excluded? Memory, for example, may at first appear to meet many of the presented criteria; it behaves as a mental capacity, can be generalized across many learning tasks, and is absolutely required for specific learning tasks. It can behave in a voluntary or involuntary manner, and it can also exert a positive or negative learning influence. Indeed, memory is considered a critical factor in many cognitive developmental theories (Pascual-Leone, 1969; Siegler, 1991; Case, 1985, 1987, 1990). The "B" factor, or attentional factor, presented in these theories is largely the memory load capacity of children of different ages. For the purposes of this paper, however, memory is excluded as a mental process because it is considered a cognitive pool of past experiences that originated through imagery and inner language. We remember what we have imaged and/or assigned a meaningful inner verbal code. The act of cognating or metacognating through imagery and inner language builds a pool of information that may, or may not, be accessed for future reference. Memory is considered a meaningless entity without either process and is, therefore, more accurately described as a cognitive or metacognitive strategy. For example, a learner may employ

an imaging process to help them remember a series of pictures, or a learner may rehearse the names of the object through inner language. In either scenario, memory is a strategic use of each process.

A strategy is, therefore, considered a cognitive or metacognitive use of imagery or inner language (or other processes that meet the criteria yet escape this author). The strategy may take the form of task specific ways an individual attempts a problem (Kirby, 1991) or may be applied in a more general learning sense to a wide variety of learning tasks (Kirby, 1984, 1991). A strategy can, therefore, be an integrated system for attacking an academic problem (Ellis and Lenz, 1987) or a more discrete method for approaching a task (Kirby, 1984). A strategy may have a positive or negative influence (Costa, 1984, 1988) on learning behavior and may transcend the cognitive domain into affective and psychomotor applications (Costa, 1984, 1988; Beyer, 1987; Bandura, 1977; Mulcahy, 1991). All strategies, for the purposes of this paper, have origins through imaging and inner language. The term, mental process, is limited to these two because of the presented criteria.

What other potential processes are excluded from a metacognitive intellectual model? Das (1979) speaks of simultaneous and successive mental processes which he presents as the two primary modes of sensory representation. They are excluded as potential processes within a metacognitive model because they cannot be voluntarily applied across learning tasks or easily linked to specific strategic application. Das's simultaneous processing is highly correlated with traditional tasks of spatial ability, however, and may well correspond to the metacognitive imagery process presented. Similarly, successive processing is correlated with serial recall and auditory stimuli which may closely parallel inner speech. Indeed, imagery and inner language may help provide a top-down metacognitive explanation whereas simultaneous and successive processing is considered a bottom-up and largely involuntary representation.

Hart (1975) presented two similar cognitive processes to Das and termed them the S.S.M. and P.A.C. modes of thought representation. S.S.M. referred to symbol selection and manipulation and P.A.C. represented perception, analysis, and choice. Both processes formed his "Proster" theory of intellectual development. Hart's theory really describes symbolic (S.S.M.) and intuitive (P.A.C.) thought that closely correspond to the successive and simultaneous processes of Das. Hart linked symbolic thought (S.S.M.) primarily to left-hemispheric language functions and intuitive thought (P.A.C.) to the right hemisphere. It would not be much of a hypothetical jump to imply that inner language may be the vehicle responsible for Hart's S.S.M. process and Das's successive process, or that imagery may be the vehicle through which Hart's intuitive (P.A.C.) process and Das's simultaneous process takes form. Neither Hart, nor Das, were taking a "metacognitive" perspective, they were attempting intellectual developmental explanation over a lifetime; a metacognitive extension of their theories leads directly towards inner language and imagery as primary processes responsible for intellectual control.

Paivio (1969, 1971, 1975, 1976) names the processes of imagery and inner language directly as the two primary modes of thought representation. Paivio presents a convincing intellectual developmental perspective of cognition, but does not distinguish a metacognitive perspective, or attempt to integrate both processes into a metacognitive model which stresses the control or self-regulatory function of intellectual development over a lifetime. Still, Paivio's exhaustive research review of both processes provides fascinating insights into the nature of each, which definitely supports the need for inclusion of both processes in any model of top-down intellectual consideration and certainly adds to the credibility of selecting both processes as main factors from a metacognitive perspective.

The research of Shepard (1971, 1981) and Kosslyn (1980, 1981) has generated a great deal or controversy within cognitive psychology in elevating imagery as a legitimate form of representation worthy of consideration. Similar to Pavio (1969, 1971,

1975, 1976), Shepard and Kosslyn argue for a dual view of semiotic functioning which includes imagery as well as verbal prepositional representation. Their studies provide fascinating insights into the nature of imagery through analysis of the time that subjects require to internally rotate two dimensional and three dimensional figures in space. Although these studies definitely elevate the efficacy of including imagery in any discussion of cognition, they do not provide a metacognitive perspective of this form of representation and neither do they offer possible explanations of the relationship of this process to verbal propositional forms of representation. The most important contribution of Shepard and Kosslyn, in terms of this work, is the realization that the capacity to image is linked to visual perception, and is learned or sophisticated during infancy and perhaps beyond. Any potential model of metacognitive growth throughout a lifetime must, therefore, consider the social-cultural influences on the learner that help define the nature of this mental capacity.

To review our rationale for such a model, criteria for inclusion as a metacognitive process have been presented, and imagery and inner language have emerged as the two primary mental processes that display a predominant role in cognitive self control, mediation, and self-regulatory functions. Metacognitive strategies are considered off-shoots of imagery and inner language that describe various strategic forms of applying both processes to metacognitive functions. For example, when attempting to gain meaning from text, the learner may utilize an imaging strategy at the same time as they decode the information. Similarly, they may employ an inner self-questioning strategy to help them ascertain a particularly important passage. The degree that learners apply and habituate such strategies defines their metacognitive prowess for that learning task, at that particular time. Moreover, the knowledge of the practitionner concerning the metacognitive prowess of the learner provides an important expectancy for metacognitive modifvability . . . . . a new pedagogy emerges that gives student self-control in learning a level of importance on at least an equal footing to the traditional stimulus-response

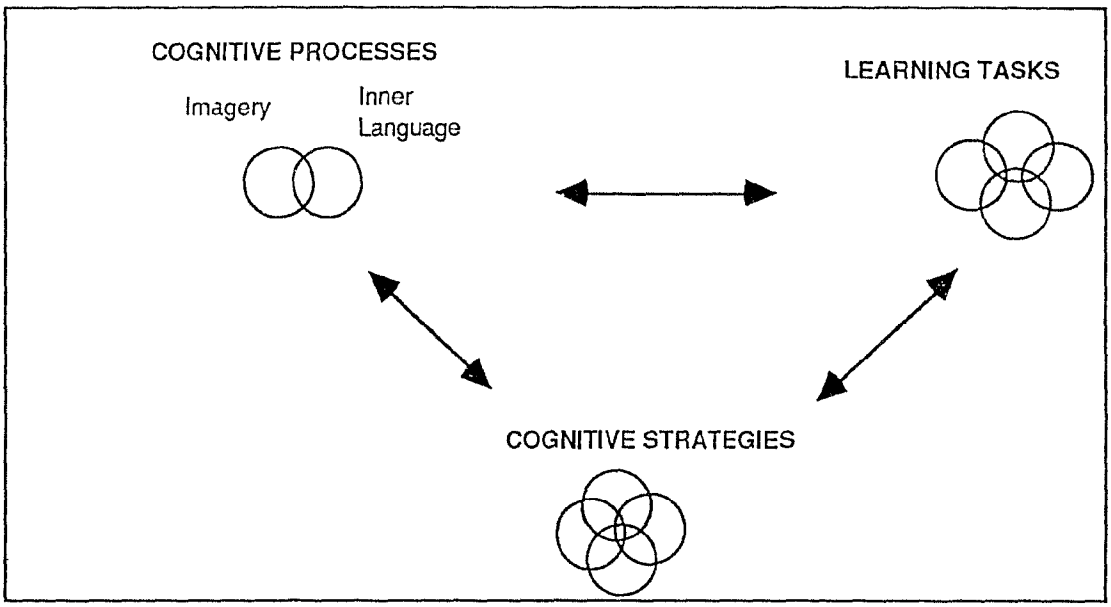
informational paradigm that has so dominated educational practice for the greater part of this century.

Several common intellectual constructs that have to varying degrees been included within a broader definition of "process" in research have been reviewed, and reasons for their exclusion have been discussed. The following chapter of this work will present a theoretical metacognitive model of the intellect, and will attempt to integrate this model with both historical and contemporary views of intellectual thought representation. Thus far, an argument has been presented which provides a critical perspective of the "institution" of Special Education, and an alternate paradigm has been introduced which considers the metacognitive sophistication and modifyability of all learners as an important educational ideal. In developing an understanding of this importance, human metacognitive "action" has been introduced as the unit of conceptual analysis and imagery and inner language are presented as predominant mental processes which are purported to help in defining a metacognitive model of intellectual development. The reader is reminded that this merging of philosophical and psychological understandings is considered of paramount importance in developing a new paradigm of pedagogy.

CHAPTER VI A PROPOSED METACOGNITIVE MODEL OF INTELLECTUAL GROWTH

The first phase in presenting a metacognitive intellectual representation is establishing the relationship between cognitive processes, strategies and learning tasks. (See Fig. 1.)

Fig. #1 The Dynamics of Processes, Strategies, and Learning Tasks



Imagery and inner language receive a predominant role. They are presented as cognitive processes that have the potential to behave in a metacognitive fashion. They are capable of exerting a cognitive controlling, monitoring, or self-regulatory function during any learning task. The learner applies imagery and/or inner language as vehicles or acts of learning <u>as</u> learning occurs. This model does not represent structural products of learning, it is presented from a metacognitive perspective which deals with the act of learning itself.

Different tasks will favor different strategic use of imagery and inner language for different learners. Some tasks may demand more support from either imagery or inner language than others; their input is considered dynamic, not a given constant. This dynamic relationship of both processes is a critical aspect of the presented model, and has prompted an analogy of imagery and inner language as the "mother" and "father" of metacognition. The analogy does not imply an hierarchical relationship; this marriage is premised on equal footings, but different roles for different tasks. The marriage is also assumed to imply some degree of mutual cooperation and communication that changes over time. Through this "marriage of the mind", we can be actively aware of how we could accomplish a task, how we do engage in that task, and how we did engage following the task. We can, therefore, predict, monitor, and evaluate our mental methods of dealing with our environment at a conscious and purposeful level. Essentially, both processes allow us to be thoughtful. It is difficult to imagine any form of thought representation, reflection, or control that does not conjure some form of mental image or inner verbal reference. When we describe metacognating in terms of this paper, we are describing the nature and dynamics of these two mental processes.

Within the criteria presented for imagery and inner language as mental processes, is an acceptance of each as a "potential" mental capacity or ability which in turn implies a continuum of competence and a question of active or latent potential. Because we can form images in a metacognitive manner, doesn't mean that we do. Because we can engage in inner dialogue, doesn't mean that we do. The underlying contention of this paper is that encouragement of increased use and application of both processes will allow a richer metacognitive representation for learners that will sophisticate the control and regulation of learning over a lifetime. Through modifying the use of both processes in a positive metacognitive fashion, the learner is constantly learning how to behave more intelligently.

To illustrate the dynamic interaction between cognitive processes, strategies, and tasks (Fig. 1), reading comprehension will be discussed from a metacognitive perspective. The "mother" and "father" of metacognition may play different roles for different children. Some children may engage in different strategic applications of either, or both, processes during reading. Inner dialogues may cue the reader on previous knowledge that serve as advance organizers (Ausubel, 1978; Mayer, 1987; Meltzer, 1991), or may serve a more regulatory executive function through cueing the reader when meaning is lost or unclear (Palinscar, 1991; Palinscar and Brown, 1984, 1988; Paris, 1986, 1991; Bell, 1986; Paris et al, 1983). Similarly, strategic use of the imagery process may prompt the reader to form a mental picture representation of the material (Pressley, 1976, 1977; Pressley et al, 1985, 1987; Reid et al, 1981, 1991) as they decode the words. The learner may also form graphic representations of expository text to help them organize and retain the information (Cook, 1989; Idol, 1987; Deshler, 1983, 1986; Dansereau, 1979; Bell, 1986). A plethora of individualistic strategies can be generated through both processes. Some of these strategies will deal with task specific previous knowledge, some will take the form of a particular strategic procedure, and some will serve as an executive monitoring system which allows the learner to become aware of progress or potential difficulties as learning occurs. All of these strategic forms of metacognition are presented as the progeny of the mother and father of metacognition.

Not all children behave the same, metacognitively. A number of investigators have noted that qualitatively different approaches are exhibited in the accuracy with which some children learn (Stone and Michels, 1986; Gerber and Hall, 1981; Lee and Hudson, 1981; Wong, 1991, 1992; Lerner, 1993). They often do not generate new information, systematically, in problem-solving situations which require flexibility, and they do not make good use of the data they generate to develop or revise their explanations (Stone and Michels, 1986; Wong, 1992; Lerner, 1993; Meltzer, 1991). Applying these differences in strategic applications to Fig. 1 of a metacognitive model,

implies that children differ in the effectiveness with which they mobilize imagery and inner language to generate strategic metacognitive control.

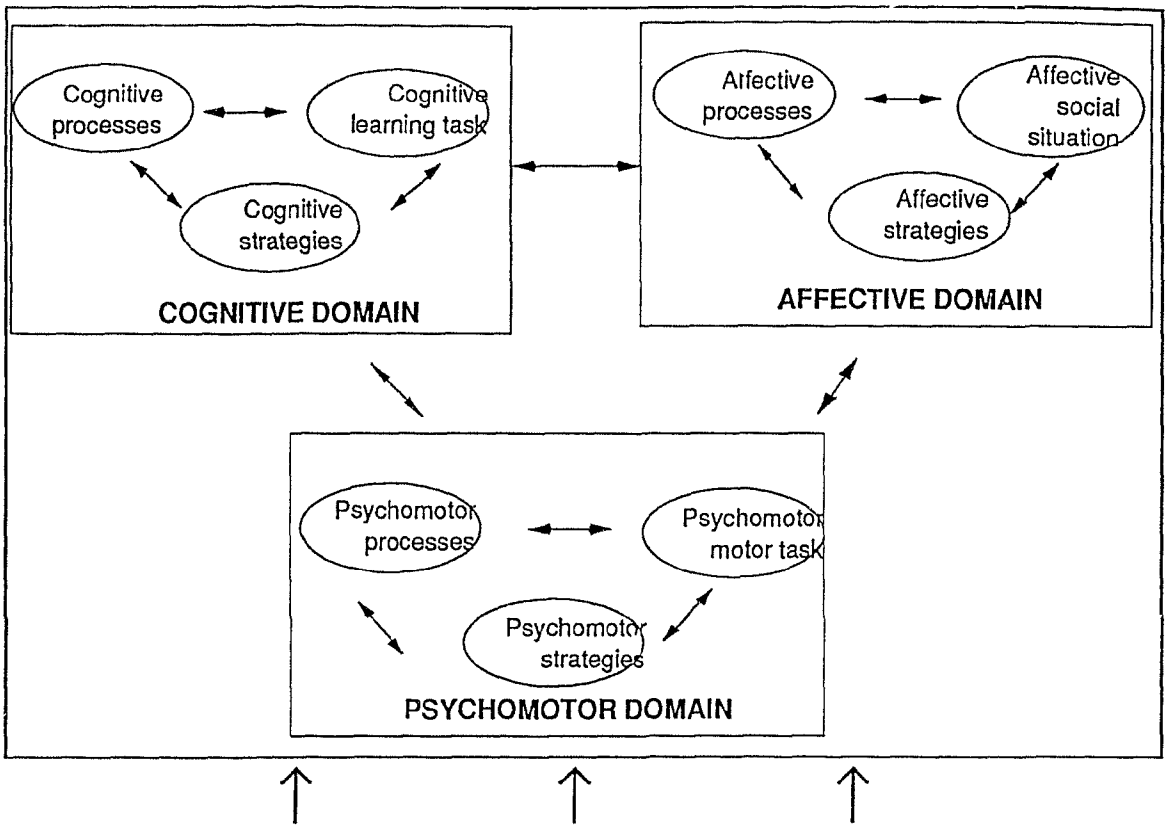
Children that do not easily engage in either process may, or may not, possess the same degree of potential within each process. Early experience with visual-motor perceptual activities have been linked to the development of an imaging mental process (Piaget and Inhelder, 1966; Hebb, 1968; Bruner, 1966; Paivio, 1971). Similarly, the ontogeny of inner language from early private and egocentric speech to a covert thought governing or self-regulating process was first discussed by Luria (1969, 1976) and Vygotsky (1962, 1978) and has since become the topic of extensive research into cognitive behavior modification (Meichenbaum, 1977; Broad, 1985), intelligence (Feuerstein et all, 1981; Gardner, 1983; Sternberg, 1981, 1984), exceptional children (Meltzer, 1991; Deshler et all, 1983, 1986; Lerner, 1993; Wong, 1991, 1992) and assessment (Campione, 1987, 1989; Paris, 1991; Clay, 1987; Meyers et al 1985; Meltzer, 1991). Both processes, therefore, have some credibility as important metacognitive functions that seem to be absent in children experiencing a wide range of learning difficulty. Their importance has not been directly addressed in terms of a prominent position within a metacognitive model that may help shed light on why and how such learning difficulties occur.

Some children, although they may possess the imaging or inner language process to the same degree as other children, may not employ the process across as many learning situations. An element of plain intellectual "luck" is speculated to exist which allows some children to literally "fluke" an appropriate and efficient strategy at that time. Perhaps a degree of intellectual curiosity also exists which enables some students to simply experiment with potential inner language or imaging strategies that other children fail to do. Hopefully, elevating the importance of both processes for teachers and students through this model, will help alleviate the chance of failing to apply strategies

that are efficient for the learner, or even in preventing learners from adopting negative learning behaviors which may actually hinder efficient learning.

The application of effective cognitive and metacognitive strategies is heavily influenced by motivational factors and self efficacy as a learner (Diener and Dweck, 1978 ; Barell, 1991; Bandura, 1977; Marzano, 1986). Children that experience difficulty in a type of learning situation may enter a negative cycle in which initial school problems produce maladaptive attributions for success, which, in turn, result in the deterioration of active problem-solving strategies. When confronted with difficult tasks, these children may consequently show decreased effort in conjunction with a deterioration in problem-solving strategies (Meltzer, 1991; Torgeson and Licht, 1983). Over time, the maladaptive metacognitive learning behaviors can become full blown task anxiety that greatly hinders present and future experiences. Math anxiety can become so severe that students are actually physically ill when confronted with mathematical learning situations. Fig. 2 is presented as the second interacting relationship between domains of learning borrowed from Bloom (1956).

Fig. #2 The Dynamics of Interactions Between Learning Domains (When Engaged in New Learnings)



Cognitive processes, strategies, and learning tasks of one domain affect cognitive processes, strategies and tasks of the other domains. The affective domain is included to reflect the potential for positive or negative metacognition previously discussed. The psychomotor domain is also included because motor efficiency and dexterity are postulated to also influence cognitive domain tasks and the affective domain tasks. Cognitive developmental models often neglect the affective and psychomotor consideration; Piaget's stage theory (Piaget, 1967, 1976, 1985) and the neo-Piagetian models of Pascual-Leone (1969) and Case (1985) are primarily concerned with the cognitive domain as well as information-processing theorists Klahr and Wallace (1976) and Siegler (1991). The affective domain is sometimes alluded to, but not as a critical,

active, and integrated component of all learning tasks. The psychomotor domain is seldom, if ever, mentioned in a metacognitive sense, yet most learning tasks require a motor component, particularly during early years of learning; control of motor movements for reading, writing, and speaking are necessary prerequisite learning tasks for more abstract cognitive domain learning in later years.

Fig. 2 indicates a simultaneous cognitive and metacognitive interaction between domains that is postulated to exert a global influence during any new learning task. The reader will recall that the model being presented reflects the act of learning or the mental vehicles through which learning takes place. The simultaneous dynamics between domains implies that any learning task will affect or influence future learning within all three domains. For example, if a child experiences efficient metacognitive strategic interactions through imagery and inner language when completing a jig-saw puzzle (cognitive domain task), they will re-assure themselves in such strategies for future reference on similar tasks (affective domain). The reassurance may manifest itself as a sense of efficacy, confidence, and determination. Kirby (1991) speaks of general and task specific strategies; the contention of this model is that general and task specific strategies also apply to the affective and psychomotor domains.

The simultaneous dynamics of Fig. 2 differ from the hierarchical intellectual nature of many learning theorists. Bloom (1956, 1984), Bruner (1966), and Gagne (1984) represented learning as a hierarchical succession of progressively more abstract cognitive skills from rote memory of information to analysis, synthesis, and evaluatory cognitive abilities. These linear representations of levels of abstraction deal with the structure of thinking, not the act of thinking; the perspective presented by a metacognitive model is concerned with the process of cognition through metacognition. The simultaneous and dynamic model presented, however, does pose the question of whether a linear structural representation remains plausible. The proposed model implies that knowledge is transformed and reconstructed during any learning task across all three domains of

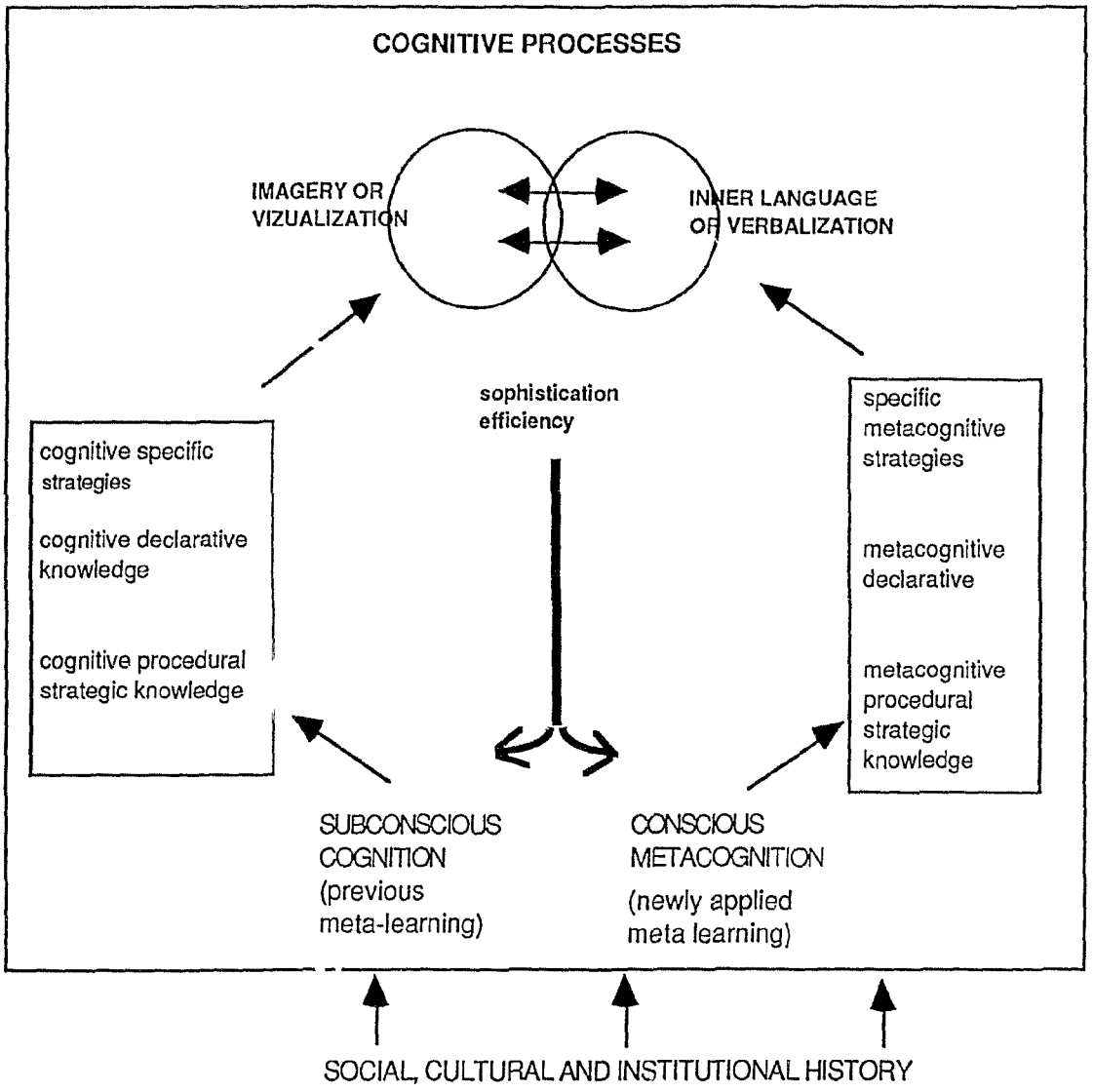
cognition first presented by Bloom; the implication of this model is, therefore, a simultaneous and dynamic acquisition of varying degrees of abstraction. Rote facts, analysis, synthesis, and evaluative judgments may, therefore, occur together as learning occurs, rather than in discrete steps. Bloom, Bruner and Gagne all stress the importance of "transfer" and "categorization" of information to a degree which makes one wonder whether a linear representation remains their intent, or indeed, whether such a representation was ever their original intent.

Gagne, for example, has gradually transformed his teaching model from the first edition of "Conditions of Learning" in 1965; within his more recent works he applies his learning theory to all varieties of learned capabilities or domains of learning (Gagne, 1984). His original views that were based on a neo-behaviorist psychological tradition and a task analysis model is now linked with a more general learning model derived from contemporary information processing views of learning which draw on cognitivistic research. He includes "executive control" and "expectancies" in his more recent works (Gagne, 1984), but his main emphasis remains on linear intellectual skills; self-regulation and motivation do not form an integrated aspect of his model.

Similarly, more recent writings of Bloom (1984) reveal an interest in what learner attributes influence mastery learning and what social and cultural conditions, in turn, support learner behavior during learning. Bruner (1966a, 1966b, 1971, 1973) was one of the first theorists to emphasize the importance of the ways in which culture forms and transforms the child's development; he seeks to "ground the account of the processes of mind in a theory of culture and growth, often drawing and building upon insights delivered by both Piaget and Vygotsky" (Wood, 1988). The ways that the learner utilizes and transforms social and cultural influences is reflected within the presented metacognitive model as a constantly changing, dynamic, and interactive process across all three of Bloom's domains of learning.

Indeed, Bruner (1966a) presents his interpretation of the act of knowing through three modes of thought representation: the enactive, the iconic, and the symbolic. The enactive mode is achieved through perceptual motor function and corresponds to knowing as doing. The iconic mode represents the ability to image internally and the symbolic mode was presented as representation in language. The model presented considers the act of knowing in terms of elevating the roles of imagery and inner language. Fig. 2 expanded the acts of knowing across three domains. Fig. 3 will attempt to establish the relationship of imagery and inner language to metacognitive sophistication over a lifetime.

Fig. #3 The Metacognitive Intellect Across Domains (over time)



Imagery and inner language assume a predominant position within this model. The model is designed to reflect the effects of cognitive and metacognitive applications of these two processes across domains, and over time. Metacognitive sophistication occurs as experience accumulates and the learner, hopefully, becomes more efficient in

applying strategies to new situations. For some students, as previously discussed, this rate of sophistication will be adversely affected through negative affective, cognitive, and psychomotor strategies that hinder efficiency. The quality of strategic application of the two cognitive processes matures for most children with time, effort and practice. The model postulates that the more a child sophisticates imagery and inner language, the more versatile their use will become. The more versatility in both processes, the more enriched the strategic interventions and hence, over time, the greater the depth of understanding of information. Continuously sophisticating metacognitive conrol is the main purpose of providing a metacognitive intellectual model.

The right hand side of Fig. #3 describes the conscious and purposeful use of imagery and inner language, and is, therefore, termed the metacognitive level of application. The left hand portion of Fig. #3 is termed subconscious cognition because it represents the pool of strategic applications of both processes from previous learning experience. Many of these previous learning encounters would have been learned to a degree of automaticity that allows automatic use of previous strategic applications to new situations on the metacognitive side of this diagram. The term "subconscious" is employed because the learner would not be required to relearn these strategic applications from the past in order to re-apply them to new situations. The term automaticity, in this sense, refers to a subconscious and automatic strategy that has been employed to a degree that it no longer requires conscious effort to apply. An automatic strategy might more accurately be described as a mental skill (Paris and Wasik, 1989; Vygotsky, 1978). However, for the purposes of this model, the inclusion of the subconscious cognitive portions makes this distinction unnecessary.

An important distinction exists, however, between the subconscious top-down cognitive aspect of this model, and the subconscious cognitive representation of involuntary bottom-up mental processes that never required a metacognitive stage to become automatic. This model is a metacognitive perspective and does not attempt to

represent the entirety of cognition. Subconscious cognitive processes that originate from top-down executive processing to gain automaticity are not the same as bottom-up mental processes that acquire automaticity in spite of the learner; the genesis of the former belongs to each individual species member, whereas the genesis of the latter belongs to fixed mental processes that have evolved from the learning of generations. For example, the capacity of an individual mind to schematically represent or image a chess board is a top-down metacognitive process which the learner can store with experience and automatically retrieve, and apply while "thinking", during any given game. The chess player, however, has little control over the way the eyes and the brain perceive and translate the light from the chess pieces.

The two halves of this model represent the constant interplay of the effects of imagery and inner language at a subconscious level of thinking and a purposeful conscious metacognitive level of thinking. Metacognition allows a transformation of previous learning which leads to a continuous revamping of new and richer understandings. This transformative relationship is contrary to the reductionist view of learning that assumes knowledge can be reduced to discrete steps and pieces of information. The relationship also implies a more simultaneous nature to knowledge acquisition over a lifetime than the sequential theories of Bloom, Gagne, and Bruner (Bloom, 1956; Gagne, 1984; Bruner, 1966a, 1966b, 1964, 1971). The ability of the subject to retrieve or mobilize previous knowledge into conscious metacognitive use describes the ability of the learner to reflect, experience puzzlement, to confirm or discard prior knowledge, to postulate and predict, and to motivate present and future intellectual endeavors. These collective experiences of the acts of knowing are proposed to be functions of the strategic uses of imagery and inner language over a lifetime.

The terms, specific metacognitive strategies, declarative knowledge and procedural strategic knowledge will be discussed in reference to imagery and inner language. Much of what we learn is believed to enter long term memory in the form of

either declarative or procedural knowledge (Anderson, 1983, Gagne, 1985). Declarative knowledge is exemplified by the organized collection of facts and concepts that describe the "what" of any knowledge base. Recalling the specific steps involved in a task specific strategy is an example of declarative knowledge. Essentially, learners acquire strategic declarative knowledge as sets of semantic links (Gagne, 1985) that were initially encoded as sets of facts or propositions (Neves & Anderson, 1981). The same information can also be stored as sets of procedures that are combined to form production systems (Anderson, 1983; Neves & Anderson, 1981). Procedural strategic knowledge represents the "how" of declarative strategies. Different procedures will be applied in different learning settings. As learners progress towards expertise, their declarative knowledge about their own learning is augmented by the emergence of increasingly powerful and efficient procedural systems that are created through many attempts in applying declarative knowledge. Complex procedural systems are acquired through long-term practice in a variety of situational contexts. The systems become automatized in long -term memory, awaiting conscious metacognitive access. For example, readers that possess procedural knowledge understand how particular reading skills operate and know how to use the various steps that are a part of that particular reading strategy (Billingsley & Wildman, 1990). The process of changing from a declarative to a performance based procedure has been described by Anderson (1983) as proceduralization. The creation of procedural encodings allows the learner to no longer rely on reminders and cues from declarative knowledge. Complex activities can be performed efficiently and easily, without much conscious attention. Frequently needed procedural sequences can be automatized to a degree that metacognitive interventions become largely unnecessary (Derry, 1990).

The distinction between declarative and procedural strategic intervention is important because it helps describe how a learner transforms information from a novice to more expert understanding. It also provides a partial explanation of the automatization

process necessary to free working memory for new learning tasks. A novice reader may rely on declarative knowledge of sounds for unfamiliar words, whereas a fluent reader has developed complex sequences of strategic procedures, to a degree that they no longer have to monitor metacognitively. Declarative knowledge represents knowing that a specific strategy is appropriate, procedural knowledge represents the ability to do something strategically. Activation of declarative information is described as a much slower mental function than procedural knowledge, which can be accessed and used quickly and automatically with practice (Derry, 1990; Billingsley & Wildman, 1990; Anderson, 1983).

Specific metacognitive strategies from Fig. 3 refers to task specific strategies or tactics employed during a learning task. The task specific strategies rely on declarative knowledge of the learner for the task and may help form the basis of more complex procedural strategies. For example, highlighting or underlining may be described as task specific strategies for allowing a simple scanning or focusing of important material from text, which in turn relies on a declarative knowledge base of the learner for the material within the text. The highlighted information may, eventually, help develop part of the procedural strategy of hypothesizing the relationships of this selected declarative knowledge.

Imagery and inner language are presented as the two primary cognitive processes that also enable metacognitive self-control and self-awareness in learning. This model contends that metacognitive strategies originate as some form of inner verbal or visual mediation. In order to highlight or underline the important aspects of a given text, the learner must engage in some form of self-questioning or follow some form of pattern analysis. The learner may not be consciously aware of establishing specific strategies; early learning tasks, such as walking or jumping, may initially be learned on a trial and error basis without active metacognitive control, similar to Piaget's concept of scheme building from circular patterns of motor movements (Piaget, 1976, 1985) or Chomsky's

(1965) conception of early language acquisition through a universal grammatical ability. The difference between purposeful metacognitive use of specific strategies and the subconscious cognitive use of specific strategies is represented by the right and left hemisphere of Fig. 3, respectively.

Similarly, imagery and inner language allow metacognitive declarative knowledge to guide self regulation during a learning task (right hemisphere of Fig. 3) or to store a myriad of networks of information for future access (left hemisphere of Fig. 3). The networks of cumulative declarative knowledge allow the gradual development of strategic procedures which can also be activated metacognitively, or are stored in a memory bank for possible future reference. For example, a child attempting to solve a jig-saw puzzle may choose the specific strategy of beginning with the corners and edge pieces. In order to do so, they will also tap their declarative knowledge of the relative size and shape of the puzzle, or they may attend to anticipated images from past experience. The child may also access a sequence of strategies from prior experience on similar tasks, such as beginning with the four corners then piecing in one side at a time. The interplay of specific tactics, declarative knowledge and procedural experimentation is a continuous dynamic process.

Over time, the dynamics of the cognitive and metacognitive interactions sophisticate. The learner becomes more efficient in applying specific tasks to declarative and procedural strategies. The use of inner language and imagery continue to mediate learning by prompting metacognitive behavior (or hindering as discussed under process criteria). The assumption is made that the more inner language and imagery are utilized, the more versatile their use will become over a lifetime. This assumption would be a contentious issue for those that view the intellect as a static predisposition for learning. The theories of Thorndike (1930) would be representative of the Behaviorist view that knowledge can be objectified as a series of physiological reactions, and that teachers can cause their students to react in appropriate ways. The Behaviorist influence has

permeated all aspects of education from the turn of this century and has ingrained, until recently, the view of the intellect as a static life-long potential. The cogent writings of Feuerstein's (1980, 1981, 1987) mediated learning dynamics and Vygotsky's (1978) "zone of proximal development" indicate the potential of a learner to sophisticate their ways of approaching learning. The cumulative affects of this sophistication over a lifetime lends credence to the statement that thinking can be taught. Essentially, through helping a student improve the process of learning, the educator is improving learning potential. Imagery and inner language are presented as two primary mental vehicles that enable a student to think about thinking.

This question of modifiability of mental functions in general, and imagery and inner language in particular, is fundamental to the issues presented in this paper. It would make little sense to propose a model of the intellect based on learning processes if said processes are beyond the realm of influence of the learner or teacher. The literature reviewed and the rationale presented hopefully lays to rest the question of modifiability and leads into the issue of how a learner can best be encouraged to modify the quality of their thinking. As stated at the beginning of this paper, consideration of the acts of learning without consideration of the pedagogical means through which cognitive modifiability is best accomplished, will lead to more and more divergent and disparate fields of cognitive inquiry.

CHAPTER VII A SOCIO-CULTURAL AND INSTITUTIONAL PERSPECTIVE OF THE PROPOSED MODEL OF METACOGNITION

Many psychologists and educators have been interested in the invariant aspects of learning . . . . . the unchanging aspects of intelligence in Behaviorist terms from Thorndike (1930) and the purposeful rejection of any form of semiotic introspection from the stimulus-response paradigm of learning presented by Skinner (1938) and Pavlov (1927). This paper expresses the need for a different paradigm of learning, one that considers learning as a continuous socio-historical and cultural process inextricably intwined within the semiotic functions of the mind. To consider learning thusly, a marriage of philosophical and psychological perspectives is deemed necessary. This necessity is enveloped within the contention that thought cannot be fully appreciated without consideration of both the social, historical, and cultural context of learning throughout a lifetime on the one hand, and the mediational influences of such interactions within the mind on the other. The marriage of the philosophical and psychological underpinnings of thought representation implies a similar marriage of social/cultural/historical influence and semiotic functioning. Any form of inquiry which fails to acknowledge this relationship is postulated to suffer a myopic perspective based on atomized falsehoods and fractionalized disciplinary boundaries.

The course that Western and Eurocentric psychology has pursued from at least the turn of the century, has been one of devastating reductionism that has sought to study the isolated individual or mental process in a vacuum. The resulting myopia has effectively severed the "instutution" of psychology from dialogue with other academic disciplines and with the public in general.

As Wertsch (1991) notes:

> "Instead of participating in the construction of a coherent theory of the human mind and human action, debates in

> psychology have all too often devolved into arcane internal arguments of little interest to anyone else but those directly involved. This has been a sorry state of affairs for the social sciences and for academic inquiry in general, and it has been particularly unfortunate for psychology".
> (1991, p.3)

The Behaviorist influence bases research on the assumption that it is necessary and desirable to sterilize methods of all social, cultural, and institutional influences; to excommunicate such influences from even the most prefunctory consideration. This avenue of inquiry has led the psychologist along a path far removed from the philosopher. Reductionism in this sense means an assumption that perpetually diverging aspects of positivist inquiry will some day provide a broader construct of conclusion, that the sum of the myriad of steralized stimulus-response experiments will eventually enlighten our understanding of learning and that this understanding is valid only if purified from all social, cultural, institutional, and semiotic influence.

There is never an end-point to such reductionist inquiry; the devolution process continues ad nauseam into more and more divergent pathways that become farther and farther removed from original intent and purpose. The contention of this paper is the need for a more holistic view of inquiry into learning through emphasis on the interplay and symbiotic nature of the develoment of self-regulatory mental processes as a function of social, cultural and institutional influences. A holistic view is concerned with the way mental processes change and evolve throughout a lifetime. Studies of segmented outcomes are still measures of outcome, giving little knowledge of the way in which cognitive change takes place. The process of cognitive change is based on human action as the unit of inquiry rather than net cognitive products at any given level of development. Objective research slices through the frozen moment to provide us with a picture of the inter-relationships which exist at that moment, but an understanding of the on going flow of change demands a different paradigm which requires the researcher to steep oneself in the events, and to approach the phenomena with as few preconceptions as

possible. A sort of naturalist observational approach describes the events and allows the drawing forth of those influences which seem most native to the learner.

In attempting to grasp and conceptualize the process of cognitive change in learning, one could look for elements which would mark or characterize change at various levels or stages of develoment in a Piagetian sense, but if the researcher is considering cognitive change as an entity rather than process, the search for scientific attributes can fail to recognize the continuum that describes transformations; the state of "changingness" that illustrates the flow of learning from stasis to process, from rigid structure to fluidity. The intellectual model presented is a model of constant "changingness" and transformation. The learner is born to self-regulate through imagery and inner language, and the mental processes of imagery and inner language are nourished and sophisticated through the social and cultural institutions that the learner is exposed to throughout a lifetime.

This outlook on learning as a fluid and transformative process dispels many canons of traditional understanding within educational psychological circles. The socio-cultural theory of Vygotsky (1978) suggests a constant mediational process from the social and cultural history of the learner that governs or shapes the semiotic processes. This shaping, in turn, enables the sophistication of mental processes in ways that are unique to the learner. The mind essentially mirrors its culture of learning.

In Vygotsky's words:

> "We can see what has happened: any external operation has, so to speak, its internal representation. What does this mean? We make a certain movement and rearrange certain stimuli in various contexts. All of this corresponds to some kind of inner brain process. As a result of several such experiences in the transition from an external operation to an internal one, all the intermediate stimuli turn out to be no longer necessary, and the operation begins to be carried out in the absence of mediating stimuli."
>
> (Vygotsky, 1960/1981, p.183)

Vygotsky placed a great deal of emphasis on inner language or "private speech" as a primary mediational tool in the development of self-regulated behavior; the use of private speech transforms the structure of practical activity, creating and giving birth to the purely human forms of human intelligence. The child's cognitive operations gain greater flexibility, freedom, and independence from the concrete stimulus field allowing children to structure their perceptual field and restructure their perceptions in terms of their own goals and intentions. This is the beginning of volition in learning. Vygotsky adds:

> "By means of words children single out separate elements, thereby overcoming the natural structure of the sensory field and forming new (artificially introduced and dynamic) structural centers. The child begins to perceive the world not only through his/her eyes, but also through his/her speech. As a result, the immediacy of natural perception is supplanted by a complex mediated process: as such, speech becomes an essential part of the child's cognitive development."
>
> (Vygotsky, 1978, p.32)

Alexander Luria, a collaborator with Vygotsky on the social origins of self-regulation, expanded on Vygotsky's work through exploring further the role of speech. Luria's (1982) contributions suggest that at the beginning children are not capable of voluntary action; rather they are at the mercy of environmental contingencies and reflexive patterns of action. Caregivers gradually gain power over the child's behavior by instructing, guiding, and directing the child's actions with the help of speech. The voluntary act is initially a shared event because the action begins with the adult command and is completed by the child's motor action in response to such commands. At a later stage, the child "learns to speak and can begin to give spoken commands to himself/herself." (Luria, 1982, I.89). Finally, the child's external speech is internalized to constitute inner speech, the main regulating tool of behavior. Through the use of first external and then internal speech, the child gradually carries out the voluntary functions that were once shared by two people. The planning, guiding, reg ing functions of speech stem from social dialogue, but do not simply mirror or model the adult's guiding

speech; the child begins to expand on their own regulation as the child makes active attempts to solve the problem at hand.

Both Vygotsky and Luria treated the increasing self-regulation of cognitive functions as a universal phenomenon of development. The model of self-regulation presented differs from this contention only in degree of universality. Firstly, current research indicates extreme individual differences in children's use of private speech (Frauenglass and Diaz, 1985). Exceptional children are particularly susceptible in failing to engage in metacognitive behavior and this failure is often attributed to a lack of appropriate inner dialogue (Meltzer, 1991; Daly, 1991). Secondly, the model presented assigns an equal importance to the metacognitive use of imagery throughout a lifetime. Both Vygotsky and Luria assigned imagery a precursory role, a developmental view shared by Bruner (1964, 1966) and Piaget (1966, 1971). The intent of the proposed model is to represent self-regulation as a marriage of imagery and inner language dependent on the socio-cultural and institutional influences that shape the inter-relationship of both mental processes throughout a lifetime. As with inner language, current metacognitive literature appears to support the modifyability of strategic applications of imagery across a broad range of learning tasks (Pressley, 1976, 1977, 1987; Lenz, 1989; Bell, 1986). The notion that both processes can be in a life-long simultaneous state of modifyability and sophistication is a major theme of this paper and necessitates the elevation of both processes within pedagogical practices across the curriculum and beyond, into the realms of parenting, emotional behavior, and exceptionality.

A broader perspective on the potential affects of social, cultural, and institutional influences on self-regulatory behavior can be interpolated from a Vygotskian perspective to that of Freire and Shor in speaking of a pedagogy of the oppressed and student autonomy in learning, respectively (Freire, 1970, 1973, 1985; Shor, 1987, 1992). If imagery and inner language represent the two primary processes in developing self-

regulatory behavior early in life, and if both processes remain as active and fluid processes in continuously allowing the transformation of knowledge into more sophisticated critical thought, then the social, cultural, and institutional influences that enable such mental development to prosper must be studied and encouraged. Indeed, the last writings of Vygotsky, before his tragic early death, indicate an interest in a way to relate the psychological functioning of the individual with particular socio-cultural settings.

As Wertsch (1990) comments:

> "The task of Vygotsky's socio-cultural approach to mind was to specify how human mental functioning reflects and constitutes its historical, institutional, and cultural setting. In my opinion he clearly succeeded in producing an approach that is consistent with this goal, but he did relatively little in the way of specifying how his approach would apply to concrete settings. This may in part be due to the fact that most of his concrete research on interpsychological functioning focused on dyadic or small-group interactions rather than broader institutional or cultural phenomena. There is evidence, however, that he was becoming more concerned with these phenomena near the end of his life."
>
> (Wertsch, 1990; in Moll, 1992, p.115)

The broader concrete applications of Vygotsky's socio-cultural theory of learning belongs more to social philosophers than psychologists. He was, no doubt, influenced by the writings of Marx (*Capital*) and Engel's (*Dialectics of Nature*) and perhaps was indirectly influenced by Mead (1934). The most contemporary equivalent of the social rammifications of the failure of some sects of society to develop intellectual autonomy occurs within the writings of Freire (1970) in his description of a pedagogy of the oppressed. Oppressed populations are voiceless; voicelessness prospers under social settings which prevent critical thought. Critical thought does not have the same potential to prosper on an intra-psychological plane because oppressed populations are taught not to question. They become disempowered, not only in a social sense, but also a psychological sense.

Some astute linguists have also alluded to the dialogical and social nature of speech patterns and their role in thinking; Bakhtin (1986) focused his analytic efforts on the utterance as the unit of speech communication and stressed the idea that "voice" always exists in a social milieu. His contention that a dialogicality of multivoicedness is inherent in any utterance led him into analysis of the mediational aspects of social languages (see Wertsch, 1991). Vygotsky (1934) also cited Sapir (1931) in his analysis of the semantic properties of inner speech, and his discourse of the notion of "sense" as opposed to "meaning":

> "The sense of a word . . . is the aggregate of all the psycholoigcal facts emerging in our consciousness because of this word. Therefore the sense of a word always turns out to be a dynamic, flowing, and complex formulation which has severed zones of differential stability . . . As we know, a word readily changes its sense in various contexts. Conversely, its meaning is that fixed, unchanging point which remains stable during all the changes of sense in various contexts. This change in a word's sense is a basic fact to be accounted for in the semantic analysis of speech . The real meaning of a word is not constant. In one operation a word emerges in one meaning and in another it takes on another meaning.
>
> (1934, p.305)

Whorf (1956) also developed a complex set of ideas about how language shapes the habitual thought patterns of its speakers. Collectively, the writings of Vygotsky, Sapir, Bakhtin and Whorf can be considered the foundation of the contention that thought and language is not a unilinear development toward modern European racial and social forms.

The proposed model of metacognitive or self-regulatory development throughout a lifetime, which considers the intra-psychological mental processes of imagery and inner language as a function of social, cultural, and institutional influences, illustrates the need for a bonding of psychological and philosophical inquiry. It provides an outlook on mental development that considers learning as a dynamic, transformative and flexible life-long process, but a process that is, nevertheless, dependent on the cultural and institutional history of the learner. Any pedagogy which emerges from this perspective

must, therefore, consider both the intra-psychological development of the self-regulated mental functions of the mind and the inter-psychological consequences of the social, cultural, and institutional history of the learner. Such a pedagogy is important for all students, but special education students, in particular, have traditionally been enveloped within a potential disempowering institutional environment which may have inadvertently encouraged learning helplessness rather than learning autonomy. The remainder of this chapter will provide a conceptual synthesis of what we know, or do not know, about the relationship of imagery and inner language under social and cultural influences.

IMAGERY AND INNER LANGUAGE

The first premise in understanding the ontogeny of imagery and inner language as a function of social and cultural influences is the belief that neither process is present at birth; both are learned through the infant's social and cultural interactions with their physical environment. This premise implies that the newborn cannot speak to themselves, and cannot internally represent an object visually that is not immediately present in their physical reality. Piaget (1976, 1985, 1971), Bruner (1964, 1973) and Vygotsky (1934, 1962, 1978, 1993) all recognized this premise in describing the newborn's mental capacity as governed by bottom-up involuntary mental processes that are primarily concerned with sensory attention and perception. This is the realm of "primary circular reactions" during the sensorimotor period in Piagetian terms, the "enactive" phase of development in Bruner's language, and "instinctive reflectory attention" in Vygotsky's words.

Kohler (1925) captures the essence of the infant's metacognitive capacity at birth in his description of the mental functioning of adult chimpanzees:

> "The lack of an invaluable technical aid (speech) and a great limitation to those very important components of thought, so-called 'images', would thus constitute the causes that prevent the chimpanzee from attaining even the smallest beginnings of cultural development."
> (Kohler, 1925, p.277)

What distinguishes the child at birth from the adult chimpanzee is a predisposition to seek later metacognitive control of their semiotic capacity through sophistication of imagery and inner language, and what enables the child at birth to travel this road of mental development, are the social and cultural influences that trigger such activity. The new-born infant, then, is not capable of true metacognitive control because the child does not yet have the capacity to image and engage in inner language at birth. However, this does not imply that the child at birth is entirely helpless in a metacognitive sense;

phylogenically speaking, the neural fabric of the brain is morphologically awaiting social and cultural triggers to begin a functional ontogenological journey. The infant already exhibits a volition to not only seek repetitions of reflex actions, but can accommodate such actions for related activity. The "sucking" reflex, for example, transfers and habituates to fingers, thumbs, and anything else that can be manipulated in an oral sense. Luria (in Vygotsky and Luria, 1993) alludes to this early relationship of cultural and mental control:

> "Developing culturally, a child gains the opportunity to create himself (herself) those stimuli that in the future will influence him (her), organize his (her) behavior, and attract his (her) attention."
> (Luria in Vygotsky and Luria, 1993, p.189)

And, giving further reference:

> "Thinking in the first stages of childhood is the function of perceiving forms; it gradually frees itself, working out its own new cultural techniques."
> (Luria in Vygotsky and Luria, 1993, p.199)

Vygotsky's conception of early forms of later metacognitive control establishes a generative theme to mental development:

> "Behavior taken as a whole, goes through three main stages in its development; hereditary reactions (instincts), conditioned reflexes (training), rational or symbolic behavior. The nature of real human learning is not ritualized, mechanistic, or behavioristic, but generative."
> (Vygotsky in Vygotsky and Luria, 1993, p.30)

The term "generative", in Vygotsky's description of mental growth, provides an important key to understanding and accepting imagery and inner language as the two primary mental processes responsible for metacognitive development. The infant at birth is possessed of neither, yet as both processes emerge under social and cultural influences, they generate further sophistication of themselves through the gradual increased self-control of the learner. The sophistication of both processes helps us define the individual's mental freedom from the physical world and the social-cultural world, to thinking for oneself. One could argue that these bonds cannot ever be completely shed,

however, the degree and depth of metacognitive thought remains inversely proportional to the individual's dependency on external social and cultural messages throughout a lifetime. Metacognitive behavior, therefore, generates, or begets, metacognitive behavior.

The second premise in understanding the ontogeny of metacognitive behavior in general, and imagery and inner language in particular, is the notion that both processes are modifiable under mediation. This concept stems from the belief that metacognitive potential is enhanced under mediation to levels that would not otherwise occur without such mediation. Here, again, the writings of Vygotsky (1962, 1978, 1993) surface in his description of a "zone of proximal development" which describes intellectual potential in terms of the degree a learner can modify his/her understanding with optimal help. What is not apparent from his writing is the focus on imagery and inner language as the cognitive recipients of the benefits of optimal mediation. The learner has a metacognitive zone of proximal development as well as an informational zone of proximal development. As Kosslyn (1983) notes, persons differ in the speed with which they can generate images. "High" imagers are faster, and all imagers improve speed with practice. O'Sullivan and Pressley (1984) add that the generalization of instructed or mediated imaging strategies increases with age, up to and including adolescent years. Similarly, inner language sophisticates under social and cultural influence. Keil (1974) describes how children initially rely on visuo-spatial representations generated by bottom-up perceptual processes to define concepts, and only later do they verbally augment these definitions with functional and relational information. Vygotsky (1962) adds that in inner speech, the predominance of sense over meaning, of sentence over the word, and of context over sentence, describes the process of internalization of language from social to personal use--from an intermental process to an intramental process under mediational influences. Adult communicative style has recently been studied as an important mediational factor in helping children foster inner language; Wood, Bruner and Ross

(1976) and Diaz et all (1990) discuss "scaffolding" (a changing quality of adult support over the course of a teaching session). Sigel's (1982) notion of "distancing" specifies a particular form of verbal message that consists of open-ended questions or descriptions of relations not perceptually present in a task situation (e.g., What goes next? How are these alike?).

A third premise that this study offers is that imagery and inner language are both capable of sophistication throughout a lifetime, and that their relationship is symbiotic, each process being capable of mutually supporting and enhancing the other. This premise implies that there is no "end-state" to the self-regulatory potential that both processes can offer. The mediational influences become less critical in later life because the processes have established a level of metacognitive behavior that enables the learner to think for oneself, but the depth and richness of understanding has no finite parameter.

The significance of this third premise in discussing the ontogeny of imagery and inner language under mediation lies in the belief that metacognitive behavior literally "tows" intellectual development throughout a lifetime and that the quality of such mental regulation is a function of the quality of mediation. In Luria's words:

> "Thinking in the first stages of childhood is the function of perceiving forms; it gradually frees itself working out its own new cultural techniques. Natural behavior turns into cultural behavior; outer techniques and cultural signs learned from social life become inner processes."
> (Luria in Vygotsky and Luria, 1993, p.212)

Johnson-Laird (1983) also alludes to the legitimacy of considering learning in terms of mental models and in describing the individual as employing whatever medium is comfortable through words, images, or some hybrid of both, in order to represent information in a convenient and readily accessible manner. Gardner (1984) comments on the importance of considering the "how" of mental representation:

> "To my mind, the major accomplishment of cognitive science has been the clear demonstration of the validity of positing a level of mental representation: a set of constructs that can be invoked for the explanation of

> cognitive phenomena, ranging from visual perception to story comprehension."
>
> (Gardner, 1984, p.383)

Accepting the role of the [illegible]onal influences of culture, ranging from broad constructs of media mediation to [illegible] dynamics of the student-teacher relationship, establishes a two-fold agenda for education:

(1) to concern itself with the metacognitive development of the child as a primary ideal, and,

(2) to concern itself with the optimal mediational influences that foster metacognitive growth within students.

If, as this study purports, imagery and inner language are two mental processes largely responsible for metacognitive behavior and both processes are a function of the mediational environment of the classroom, than as educators, it behooves us to seek to understand this alternate paradigm of learning and instruction.

What remains unclear in cognitive psychology, is the ontogeny of imagery and inner language considered as separate mental processes, and the ontogeny of metacognitive behavior which considers both processes as mutually supportive throughout a lifetime.

The Ontogeny of Imagery

David Marr (1982) describes the role of early visual processing as being the construction of a 2 1/2 -dimensional internal sketch from a 2-dimensional sketch. This sophistication involves representation of properties of 2-dimensional images, such as intensity change, to a representation from the vantage point of the viewer concerning the depth and orientation of the visible surfaces. The final step of early visual processing, in Marr's view, is the transformation of shapes from a pure representation that is matched to the processes of perception into a 3-D representation that is suitable for recognition of a set of meaningful regions; the task is now object recognition that does not depend on a

particular momentary viewpoint. Gardner (1984) describes this sophistication as the end of purely perceptual processes and the beginning of "top-down" knowledge about the nature and construction of the objects of the world. Shepard and Metzler (1971) extended Marr's work through exposing subjects to geometric figures and then timing responses considering imaged rotations in space. Shepard comments:

> "Imagery should be thought of in its own terms, rather than as a cryptic version of verbal mediation or symbolic manipulation. Perhaps there are two separate and equally valid forms of mental representation. And perhaps a study of the less familiar imagistic mode might help to clarify some of the later stages of visual perception--and do so in a different way from either a neurological or an ecological perspective."
>
> (Shepard in Gardner, 1984, p.326)

Figure 4 is presented as a hypothetical continuum of the emergence of imagery as a mediated metacognitive behavior throughout a lifetime. The work of Marr and Shepard cited above establishes a linkage to visual perception during the object perception and object image stage of sophistication. These early stages involve more than actual object imaging, they represent orientations in space through locations and distances. Siegler (1991) describes "egocentric" representations, "landmark" representations and "allocentric" representations. Egocentric images are always considered in relation to the self, landmark images are capable of positioning a targeting relation to other objects, and allocentric images evolve in relation to more abstract spatial layouts; a sort of mental map or bird's eye view of features. An ontogenogical relationship exists between these imaging capacities; before age one, the child is limited to sensorimotor egocentrism (Piaget, 1971) in a visual imaging sense. By the age of 1 1/2 to 2 years old, the child can consistently show nonegocentric spatial representations on tasks that involve searching for objects from different starting points (Flavell, Everett, Croft and Flavell, 1981). Landmark representations begin in the first year and by five years old, object positions can be represented relative to multiple landmarks (Siegler, 1991). Allocentric imaging includes all the relations among entities in space and are not easily converted or reduced

to vert l clues. Most 4 to 6 year olds can form allocentric representations, but precision improves drastically with age (Lockman and Pick, 1984).

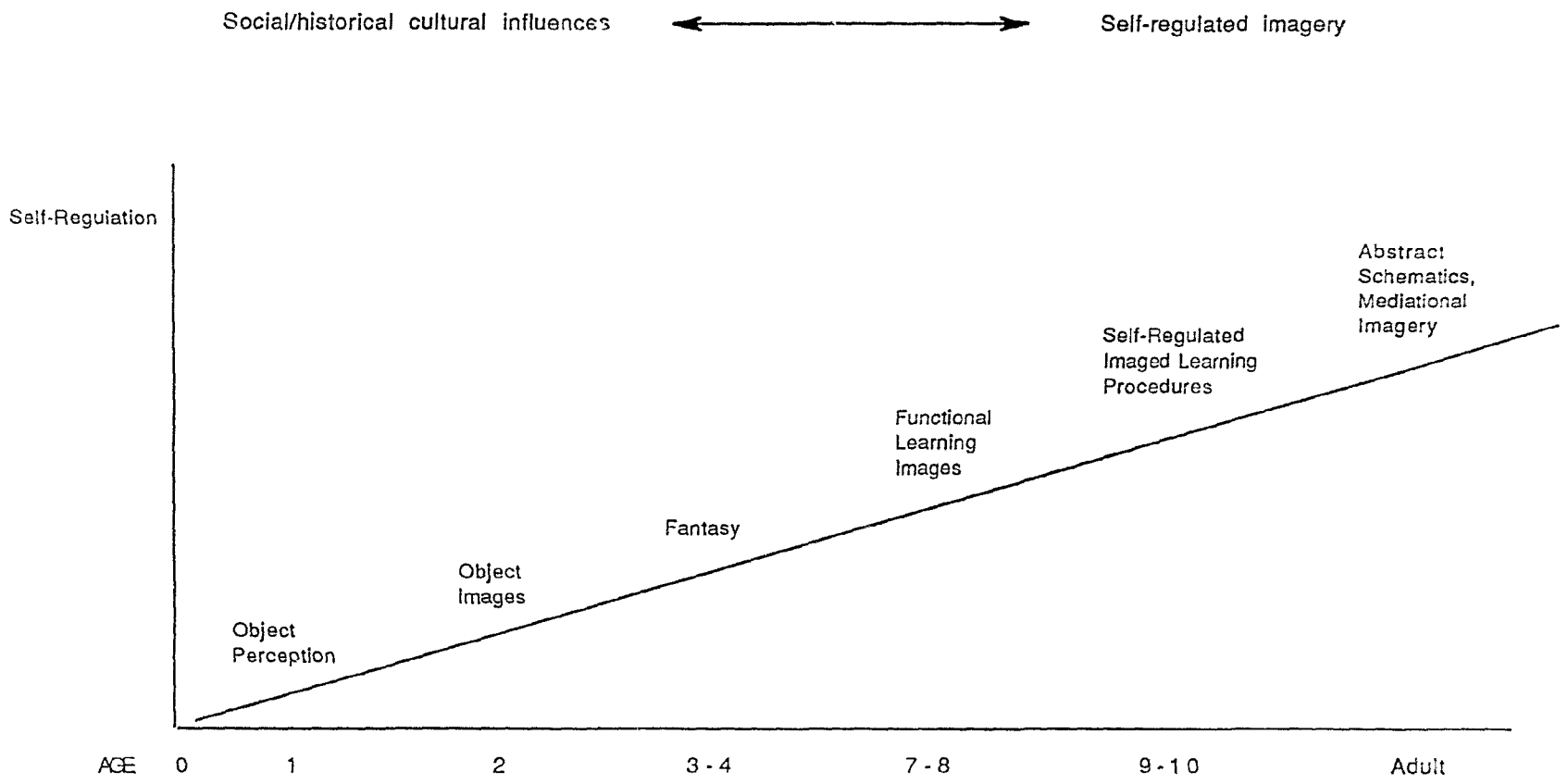
The work of Kosslyn (1980, 1983) has created somewhat of a Renaissance in interest in mental imagery. In seeking to discover the properties of mental images, Kosslyn and his colleagues have demonstrated that images actually preserve information about distances between objects. Subjects take more time to scan and informally represent greater distances. Pinker (1980) has added to Kosslyn's work by demonstrating that images preserve a 3-dimensional space, but can be altered at will to 2-dimensional representation. Images do not occur in a 3-D "tank", but rather more resemble pictures in bas relief. When subjects rotate or bend an image in depth, they tend to fill in the back as they see it, instead of initially representing the hidden depth. This research suggests that imagery can be thought of as a collection of relatively distinct abilities, such as the ability to rotate images, inspect images, change the perspective of images, and so on. Each ability evolves from perception to more and more sophisticated levels of internal representation. This sophistication essentially moves from concrete re-creations of the physical world into the capability of a personal imaginal symbolism that is unique to each individual.

What is not clear within contemporary literature on imagery is its ontogeny beyond childhood. Does the human have limits on their sophistication and application of their imaging capacity to new learning tasks? What is the relationship of this mental process to intellectual development? Sternberg (1985) offers:

> "The Renaissance in interest in mental imagery has produced a host of new facts about imagery and new ways of theorizing about it. We truly have learned more about imagery in the past fifteen years than in all the preceding centuries combined, and the end of progress is not in sight. (Sternberg, 1985, p.171)

Returning to Figure 4, the approach that this work offers is in redefining what is meant by intellectual development through a focus on the "acts" of metacognating.

(Fig # 4) THE ONTOGENY OF IMAGERY



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The locus of inquiry towards this end describes the units of human metacognitive action in terms of the ontogeny of imagery and inner language over a lifetime. The ontogeny of imagery sophisticates under cultural mediational influences towards more and more internalized mental self-control; this is considered a teleological process, largely predetermined from phylogenic development, but greatly dependent on mediational influences in order to mature and ripen to its full potential. As the child begins, through imagery, to represent the physical world in the eyes of their culture, they begin to develop control of this mental capacity for themselves. The real and surreal worlds unite when the child begins to image their own private scenarios that they have not necessarily experienced. Indeed, the entire realm of fantasy and play may be considered a practice period of internalization and control--a purposeful mental activity within the ontogeny of imagery (and inner language).

Between the ages of four and eight, the child learns to apply imagery in a functional manner to a wide range of task oriented, rather than play oriented, activities. The mediational influences of schooling prompt the task oriented mental behavior and the child adapts accordingly. As a child listens to an adult read a story, for example, they learn to image during this adult mediational influence; a mental activity that can later be applied by the learner when they attempt to gain meaning from reading, themselves. Similarly, as the early elementary teacher discusses goal oriented activities across a broad range of subject matter, the child learns to employ the imaging capacity or potential . . . . a discussion of the location of their home within their community may prompt an internal bird's eye view of the location, a view that can be further sophisticated in future years for a more global topographic perspective.

The hypothesis is offered that functional mediated imaging discussed above sophisticates with age and experience into self-initiated and self-regulated imaged learning procedures. The learner begins to experiment with the capacity for themselves

as they detach themselves from the need for mediational dependency. The child generates and applies task specific procedures with less and less reliance on concrete example or cueing from external mediators. This is the first evidence of true metacognitive behavior because it is thinking for oneself by oneself. The child that originally required a finger counting procedure to perform addition may learn to mentally "see" and manipulate digits internally. As the learner meets success in applying this specific strategy of the imaging process, their confidence and experience in applying this mental behavior to new tasks is increased. Thus the student studying reflections and rotations in Senior High Mathematics attempts a similar imaging procedure of various task specific strategies that they would not likely apply without their previous imaging experiences.

The learner enters a level of abstract schematics when their imaging capacity further sophisticates from concrete picture-like representations into schematically organized relational representations. Herein lies the realm of a much deeper or more expert neural capacity that can only be gained through a history of task specific experiences as well as a history of imagery as a primary form of representation. This view accepts the "mental model" outlook of mental development proposed by Johnson-Laird (1983) in presenting an alternative paradigm to formal logic or rationality, by acknowledging the form of representation as a credible theoretical endeavor; as Johnson-Laird comments:

> "We ought to think of individuals as representing information at several different levels of abstraction; moreover, the form of representation at one level need not be the same as the form of representation at another level. A psychological process might use only strings of symbols at one level, but involve images or mental models at a higher level of representation."
>
> (Johnson-Laird, 1983, p.165)

This may well be the arena of a form of emancipated usage of a metacognitive mental capacity, a usage that is reserved for an expert form of abstract representation through imagery. Chase and Simon (1973), in studying chess players, showed that

masters can perceive groups of position schema in space that novices can not. Their experience with moving pieces may well empower them to image at a higher level of position patterns (from a bird's eye view) rather than a simpler picture-like representation of individual pieces. This concept of a higher abstracting or symbolic property of imagery may be reserved for the expert in specific content areas, or like Einstein, may be a life-long preferred mode of thought representation, that enables a form of intuition, insight, wisdom, and creativity that would not otherwise be possible. Contrary to Piaget (1971), who considered imagery as a lesser and more primitive form of thought, the implication of this theoretical ontogeny of imagery presents an opposite view; although it may well emerge before inner language, it develops as an independent source of knowing in its own right, fully capable of sophistication into what Labouvie-Vief (1990) describes as a "system of systems" beyond the fourth stage of Piaget's theory of intellectual development. At this level of application the individual is truly emancipated in a metacognitive sense towards a love of knowing for oneself by oneself, because of the imaginal mode of representation.

THE ONTOGENY OF INNER LANGUAGE

Much has been written about the power of speech and the relationship between thought and language. Inner language is thought for oneself by oneself, the private voice that helps us monitor, regulate, and control our thinking. But, what is the ontogeny of this mental process? Like imagery, we are not born with the capacity to speak to ourselves. Figure 5 is presented as a theoretical view of the development of inner language as a metacognitive process. As alluded to earlier in this chapter, Vygotsky (1934, 1962) and Luria (1982) considered the emergence of this mental process as the most important psychological event in thought representation. Inner language is not simply covert oral language, or speech without sound. It serves an entirely separate speech function, that of organizing, planning, regulating and reaffirming our actions. It evolves from social speech to internal thought speech for oneself. Vygotsky describes inner speech:

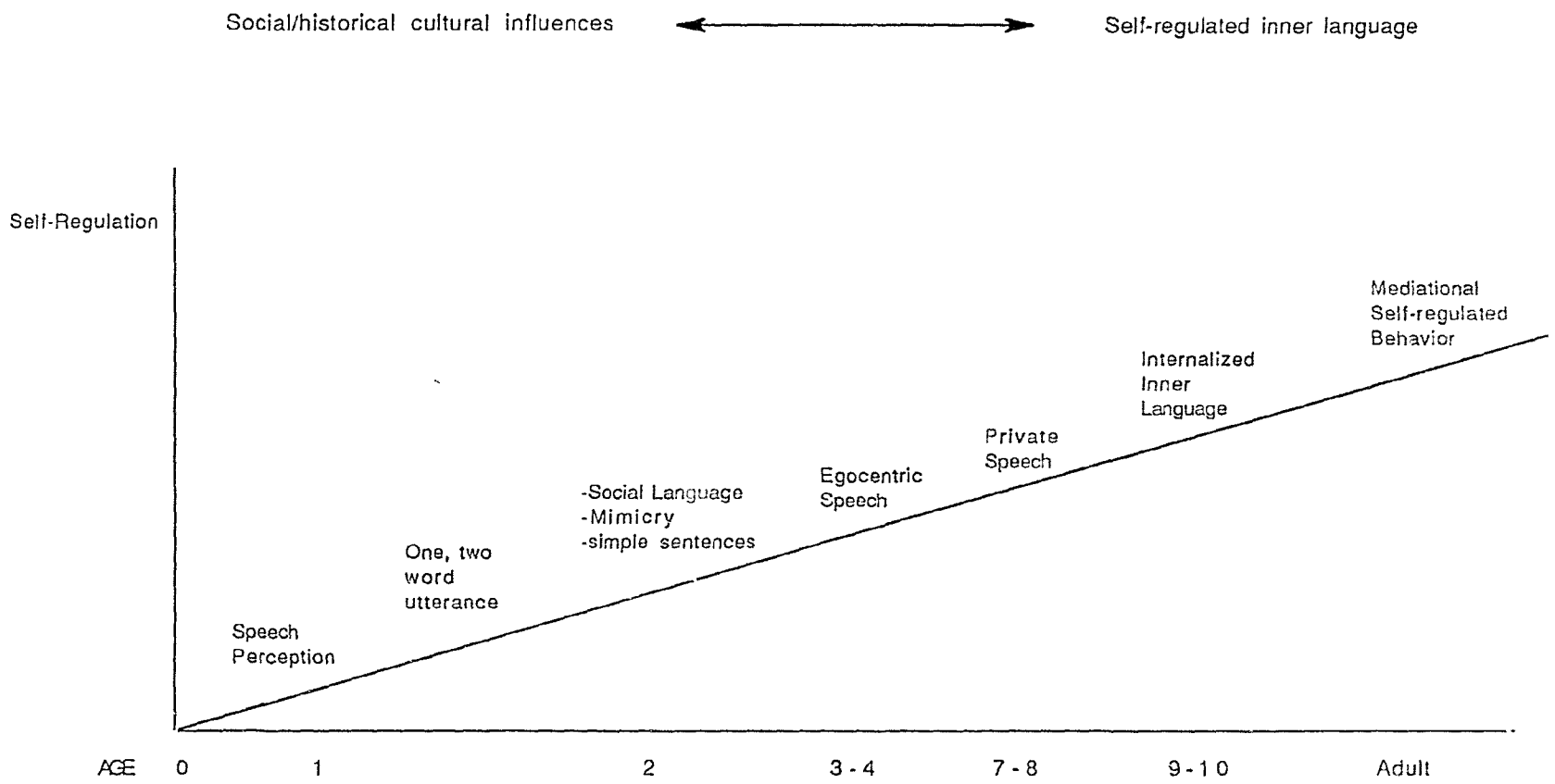
> "In inner speech, the "mutual" perception is always there, in absolute form; therefore a practically wordless "communication" of even the most complicated thoughts is the rule. With syntax and sound reduced to a minimum, meaning is more than ever in the forefront. Inner speech works with semantics, not phonetics."
>
> (Vygotsky, 1962, p.145)

The child's first words serve as convenient labels to classify the physical world. From early mimicry of sounds perceived through language, the infant begins one and two word utterances that are holophrastic, referring to immediately observable objects. Children at this level of speech production rely heavily on visuo-spatial representations generated by bottom-up perceptual processes to define concepts (Keil, 1974). At approximately two years of age the child's speech evolves from two-word utterances directly into an explosion of sentences from three to eight words in length. This is the stage of telegraphic language, which, although missing many articles, contains syntax and expresses relationships between words.

Chomsky's (1965) concept of a universal grammar within his theory of syntax describes a "deep" structure and "surface" structure aspect of language acquisition that may be related to the genesis of later inner speech. Deep structure or base grammar referred to semantic components of language that can be transformed into phonological surface components. Therefore, the initial deep syntactic structure is "read" for meaning while the ultimate surface structure is "read" for sound. Chomsky believes in a universal genetically determined grammar which is specified, sharpened, articulated, and refined under conditions set by experience, to yield the particular grammars found in specific groups of individuals. Like Vygotsky then, Chomsky attributes language development to social experience; to know a language is to be in a certain state of mind/brain. Language knowledge is, therefore, a series of states of the brain. Inner language could describe one of these states through a unique metacognitive genesis which relies on deep semantic structure. The explosion of language, which jumps from one and two word utterances within the 1- 1/2 year old, to three to eight word sentences in the 2 year old, may represent the transformation from socially mimicked words into meaning within and among words themselves, removed from primarily visuo-spatial origins. This transformation involves a convergence of thinking and speech which alters the structure of the mind into a new state with new potential for self-control through words, and is epitomized through the private speech of children from the ages of 3 to 6, that Diaz and Berk (1992) describe as the ontogeny of early private speech:

> "At first, private speech follows action, occurring as an after thought. Then speech occurs simultaneously with children's behavior. Finally, private speech moves toward the starting point of action and assumes a critical self-regulatory function--planning and modulating behavior on a moment by moment basis as the child grapples with challenging tasks."
>
> (Diaz and Berk, 1992, p.21)

(Fig. # 5) THE ONTOGENY OF INNER LANGUAGE



SOCIAL/HISTORICAL AND CULTURAL INFLUENCES

The child, therefore, begins to use words for themselves first as an accompaniment to behavior, then as a precursor to behavior. Their private speech or egocentric speech is oral, but differs in function from social and communicative speech, and transforms the course of cognitive development by allowing executive and metacognitive control over cognitive operations in the realms of memory (Flavell, Beach and Chinsky, 1966), attention (Berk, 1986), and problem solving (Wertsch, 1990).

Private speech is first used during problem solving in the late pre-school years (4-5 years old) when children become capable of decentration, peaks between 5 and 6 years of age, and then decreases during the middle to late elementary years when it is internalized and transformed into inner language (Diaz and Berk, 1992). The internalization of private speech between the ages of 6 to 10 occurs as the school aged child passes from unformulated to verbalized introspection. The child is now capable of perceiving meaning through words, and within words, and this new form of semiotic behavior prompts a shift to a higher form of inner activity, thereby permitting new mental possibilities through inner language (Vygtosky, 1978).

Once private speech becomes internalized in the form of inner language, the new mental capacity continues to sophisticate under mediational influences, enabling the learner to generalize, compare, relate, evaluate, and form their own opinions of knowledge. The quality of their self-questioning serves as a catalyst to a deeper understanding. The learner continues to make their knowledge their own, through releasing themselves from the need for mediational influences, which, ironically, were so necessary in helping the sophistication of inner language during earlier stages of understanding. This sophistication separates critical thought from thought and wisdom from intelligence; didactic information transforms into dialectical and dialogical understanding (Paul, 1990).

If, as this work purports, inner language serves as a critical catalyst which helps "tow" and define intellectual development, then why has so little research attempted to

reveal its properties? Beyond the internalization of private or egocentric speech between the ages of 3 and 8, a vacuum exists within the literature on the ontogeny of this mental process. Qualitatively and quantitatively speaking, what forms of inner language prompt intellectual behavior? Why do some children engage in this process so readily, yet others do not? Can this process help us to understand forms of exceptionality from a different perspective? How modifiable is this process for all learners? We know so little about this mental capacity, yet its importance from a metacognitive perspective becomes more and more clear.

THE ONTOGENY OF IMAGERY AND INNER LANGUAGE

The previous two portions of this chapter have described the ontogeny of imagery and inner language individually, and indeed, both mental processes are purported to possess individualistic properties that are absolutely necessary to intellectually engage in some learning tasks. If one is asked, for example, to mentally count the upper case letters of the alphabet which possess a "curve", the learner is forced to image each letter in the absence of any visual referent, internally. Similarly, if the learner is asked to mentally count the number of upper case letters that contain an "ee" sound within their label, the subject is forced to engage in inner language through internally saying the name of each letter. Different tasks may favor either form of representation. A great many learning tasks, however, can offer the learner an intellectual choice--the learner can represent the task through both mental processes, and this dualistic method of representation is purported to offer the learner a much richer and deeper method of learning than either form considered alone.

The description of the individualistic properties of both processes is not meant to suggest a summative cognitive relationship. This is why these metacognitive capacities have previously been described as the "mother" and "father" of metacognition. The marriage of the mind is mutually supportive; the sum of the contributions of each does not describe the nature of their holistic influence over the mental control of the learner. Their symbiotic mental relationship can provide a depth and breadth of cognitive functioning that necessitates an ontogeny of both considered together. This ontogeny, in essence, describes the ability of the learner to control their mental functions, a control that Vygotsky (1993) refers to as cultural giftedness:

> "Cultural giftedness, in essence, means the ability to control one's own natural resources; it means the creation and application of the best devices for using these resources."
>
> (Vygotsky, in Luria and Vygotsky, 1993, p.230)

The "devices" that Vygotsky speaks of were considered cultural signs which the learner internalizes over time into their own mental tools. The contribution to his thinking, that this work hopes to offer, is an ontogeneological perspective of the sophistication of imagery and inner language as two cognitive processes which help the learner transform cultural signs into mental tools. Indeed, both processes are offered as an alternative perspective of intellectual development, that have themselves originated from cultural signs into the two primary mental tools, through which a multitude of mental strategies (or tools) will, in turn, develop from a multitude of cultural signs.

Pascual-Leone (1990) provides a very similar outlook in his description of wisdom as the emergence of the existential self, a vital reason:

> "A synthesis which anticipates and brings to the present events of the future or the possible by using either imagery or mental (internal) language. This imagination and/or mental language provide cues to steer the organismic performance in the willed for direction. An act of will is therefore a series of executive synthesis projected into the future as a conscious anticipatory praxis." (Pascual-Leone in Sternberg, 1990, p.258)

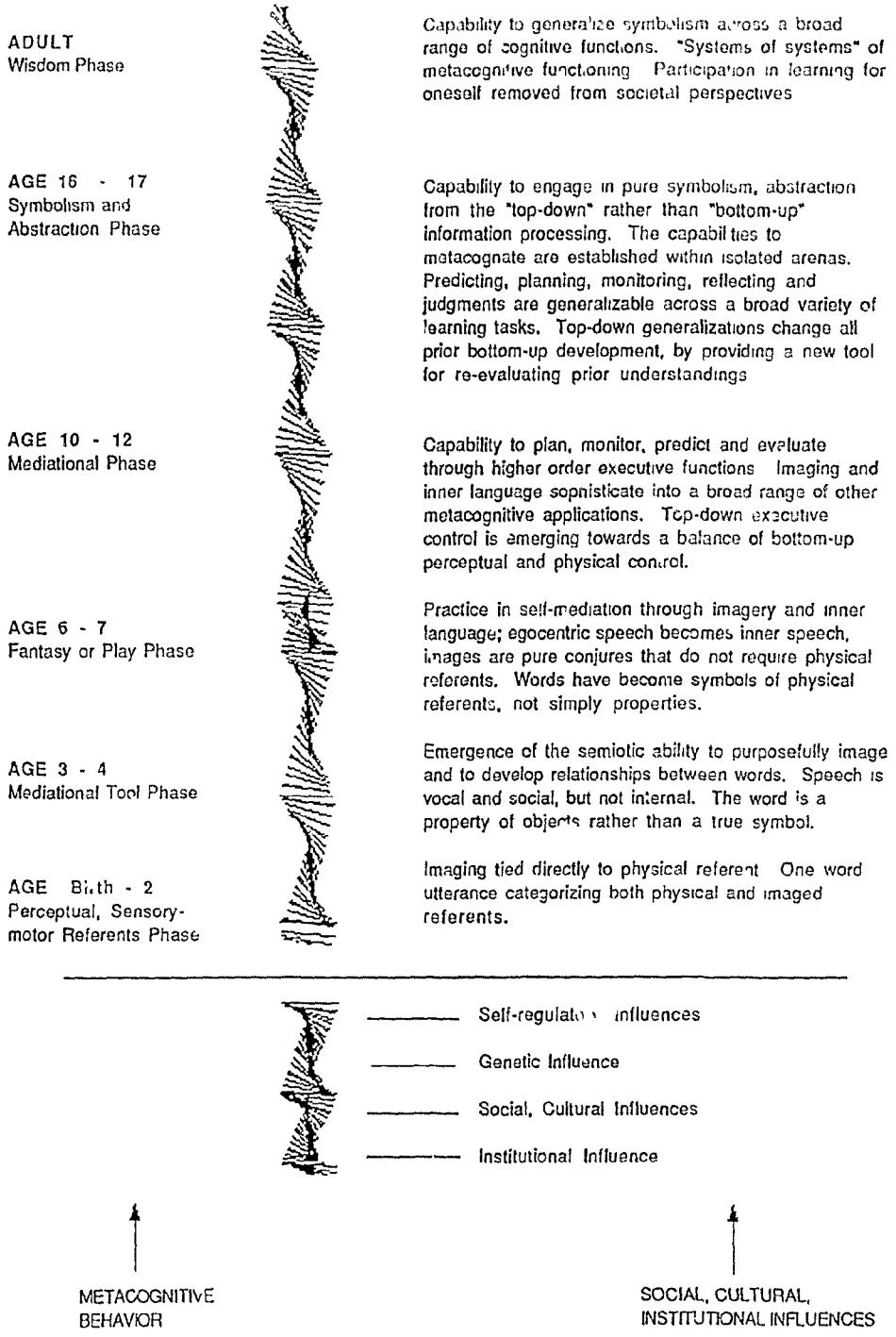
This emergence of the existential self is also close to what Habermas (1972) describes as emancipatory interests for one of three types of knowledge. Emancipatory interests are concerned with self-critical reflections and autonomy. The great "width" (empathy), "height" (intelligence), and "depth" (reflectivity) of the wise person allows him or her to form a more complex, or concrete, or abstract perspective on any problem. Here again, the contribution offered is an understanding of the mental vehicles through which we attain the mental vitalness of Pascual-Leone and the emancipatory knowledge of Habermas. The contention is offered that without the described symbiotic sophistication of imagery and inner language, and without the cultural opportunities that are so important in shaping this sophistication, the learner will not attain the emancipatory level of autonomy in thinking for themselves.

Figure 6 provides a conceptual ontogeny of the sophistication of imagery and inner language as a function of social/cultural, institutional, and genetic influences over a

life time. Ironically, the double helix form, so recognizable as the D.N.A. biological structure, also represents the conceptual structure of metacognitive intellectual development. Imagery and inner language sophisticate as a function of their own metacognitive use, the genetic make-up of the learner, and the social/cultural history of the learner. Each axis of the double helix is represented by either imagery or inner language and, as the learner becomes progressively more adept in their use, knowledge and experience are constantly reconstructed into enriched understandings.

This metacognitive view of top-down executive control of the learner describes a continuum of learning autonomy. Social/cultural influences trigger genetic neurological structures that help the infant release their learning from bottom-up involuntary perceptual and sensory-motor stimuli. The emergence of the ability to conjure an image in the absence of a physical referent and to label and categorize the physical world through words marks the beginning of learning autonomy or thinking for oneself. The young child practises these newly acquired learning tools through play and fantasy; the earliest forms of self-directed mental behavior that is not heavily socially mediated. These early phases of learning self- control in learning could be considered quasi-metacognitive mental behavior; an immature form which helps the learner to practise and apply their newly acquired mental skills. Reliance on the concrete-visual spatial world of representation would predominate as the learner gains experience in terms of declarative knowledge, self-directed mental procedures, and specific strategic applications of imagery and inner language.

Fig 6 IMAGERY AND INNER LANGUAGE AS THE PRIMARY MEDIATIONAL TOOLS IN MENTAL SELF-CONTROL



The mediational influence of school prompts further sophistication of imagery and particularly inner language. The child begins to image not only in pictures, but also abstract representations of concepts through letter and number symbols. The word also sophisticates to represent more than concrete classifications; these socially conceived representations become private thought representations for concepts farther and farther removed from the need for concrete referents. They become saturated with deep meaning that enables the learner to begin to predict, reflect, puzzle, and express feelings; language that earlier served a communicative function, now begins to also serve a thought function.

The learner continues to separate themselves from mediational influence as their repertoire of self-initiated and directed metacognitive behavior increases. They are now able to form their own judgements, opinions, and evaluations of information. They can make use of a wider and wider range of metacognitive strategies across a broader and broader range of problem solving activities. They have gained an intellectual flexibility and curiosity through applying imagery and inner language to a constantly enriched and reconstructed pool of previous understandings.

The learner attains the level of wisdom when their metacognitive sophistication empowers them with a love of learning; a comfort with the notion that everything is worth knowing and that no one can learn everything about anything. This is the emancipatory phase of autonomous thinking that could not occur without the learner's history of sophistication of imagery and inner language, combined with mediational experiences. This is the realm of the truly emancipated critical thinker, capable of perceiving, questioning, and reflecting upon the very social influences that earlier controlled the metacognitive development of the learner, yet provided the mediational means through which autonomy in learning is gained.

PART III

PEDAGOGICAL CONSIDERATIONS

CHAPTER VIII AN HISTORICAL PERSPECTIVE OF REMEDIATION

Part III of this study will consider the pedagogical changes of paradigm which are felt necessary to reflect a mediated metacognitive model of intellectual development. If, as Part I and II of this work purports, there exists a form of oppression within the traditional paradigm of the delivery of services for exceptional students, and this oppression can be ameliorated through at least an equal focus on the metacognitive process of learners, then what form of educational philosophy and psychology are deemed necessary within instruction. What form does mediation assume within the classroom?

Before these questions can be addressed, it is felt necessary to first describe the history of remediation for exceptional children to reveal its inherent educational philosophy and psychology.

Remediation as a "sub-system" of education first coined by Dunn (1968) is a relatively recent phenomenon that emerged during the 1960's across North America as a result of parental pressures, the increase in professional information, advocacy groups, and legislative mandates that required support services. To gain a richer understanding of the evolution of remedial practice however, an historical overview of the many theories, concepts, and research findings that shaped remedial practice may prove useful in developing the critical perspective that this paper purports to offer.

Lerner (1993) provides a useful chronology in tracing the roots of the field of learning disabilities; she describes a *Foundation Phase* (1800-1930), a *Transition Phase* (1930-1960), an *Integration Phase* (1960-1980), and a *Contemporary Phase* (1980-present). The *Foundation Phase* is a period of basic scientific research on the brain and its disorders. Broca (1824-1880), Gall (1758-1828), Jackson (1835-1911), Goldstein (1878-1965), Head (1861-1940) and Hinshelwood (1859-1919) are representative of an

early field of inquiry into brain dysfunction that was primarily the realm of the medical profession. Their research provided the foundation for the development of intervention approaches for disorders of spoken and written language, as well as perceptual and motor processes. Remedial programs would have been based in institutional settings or guided home rehabilitation programs.

The *Transition Phase* (1930-1960) describes the application of scientific brain studies to the clinical study of children and the formation of remedial programs. Psychologists and educators began to play important roles: Grace Fernald developed a multi-sensory approach to remedial reading that became known as the "Fernald Method" (Fernald, 1943), and Marione Monroe developed a diagnostic reading test and a program to remediate reading difficulties. Samuel Orton (1937) offered a program for "dyslexic" children based on a theory of cerebral dominance known as the Orton-Gillingham method. Mildred McGinnis (1963), a speech pathologist, was another early investigator and teacher of children with language disorders and aphasia.

During the *Transition Stage,* Alfred Strauss and Heinz Werner developed the concept of a "brain-injured" syndrome of learning behaviors at the Wayne County Training School, Northville, Michigan. Strauss and Werner (1943) worked extensively with mentally "challenged" children that were diagnosed as experiencing exogenous retardation and were described as hyperactive, emotionally labile, perceptually disordered, impulsive, distractible, and perseverative. The Wayne County Training School for brain injured children became a "hot bed of professional activity and served as a reference point, a model, and a home base for many of the pioneers in the field of learning disabilities, including William Cruickshank, Newell Kephart, Samuel Kirk, Ray Borsch and Elizabeth Freidus. This facility has also directly or indirectly affected the work of other specialists such as Marianne Frostig and Gerald Getman." (Ariel, 1992, I.36).

The acceptance of this concept of "brain injury" from Strauss as a causal factor in an individual's ability to acquire school learning was viewed as a welcome change from the Freudian psychoanalytic contentions that these children suffered "psychogenic manifestations" of inner conflict as a result of poor motivation. As McCarthy (1971) notes, "the child who cannot learn", was viewed as "the child who would not learn". The failure of psychiatrists, psychologists, and social workers to help children with learning disabilities during the 1930's, 1940's, and 1950's, paved the way for acceptance of "brain injury" or "minimal brain dysfunction" as a cause for learning disabilities. McCarthy (1971) and Strauss and Lehtinen (1947) presented a plan for teaching these children that differed dramatically from the materials, methods, and setting of the regular classroom. Students were placed in isolated cubicles and all manner of visual and auditory stimuli were removed from the learning environment, even to the degree of recommending that teachers avoid jewelry and dress in a manner that would avoid distraction. Special materials were constructed to aid students in the perception of visual forms and in the organization of space and form of figures, letters, and numbers in a Gestaltist tradition. As Lerner (1993) comments, Strauss's work filled a great void by offering an alternative diagnosis for children who previously had been labelled behavioral misfits, lazy, careless, and stupid, and for parents who had been blamed for causing psychological distress in their children.

Following the work of Strauss, a rapid proliferation of research into learning disorders ensued. The term "brain injury" was modified by Clements (1966) to "minimal brain dysfunction" and over thirty symptoms of the disorder classified the children into either a biological condition such as neurological dysfunction, or a behavioral condition such as hyperactivity. Samuel Kirk (1963) coined the term "learning disabilities" as an umbrella concept for many diverse types of learning disabilities without identifying the specific area of the student's learning deficiencies. This term is now written into law in the United States and Canada.

The *Integration Phase* described by Lerner (1993) is characterized by the establishment of learning disabilities as a discipline within the schools. By the 1960's, public school programs were rapidly being established. Most remedial services during this period followed the traditional delivery system through self-contained classes, where the rationale that small classes and less distractible environments would allow more retention, was the general rule. As legislative mandates increased during this period, the additional funding enabled the development of Resource Programs to serve the needs of a rapidly growing number of children identified as learning disabled. In Nova Scotia, this proliferation was initiated by the Walker Report in 1981 which, for the first time, allocated school districts a funding formula for Special Education that was based on a total pupil enrollment. Prior to this date, schools were forced to budget for their individual Special Education needs that were consequently limited to reading specialists at the elementary school level. Following the Walker Report, Resource Programs were rapidly initiated at the elementary level, and secondary schools also began to establish services and programs for adolescent students experiencing difficulty.

This Phase is also characterized by a virtual explosion of published programs and materials designed to help remediate individual deficit areas. The large majority of such programs were still delivered in self-contained classroom settings and were based on the Skinnerian mastery learning concept of repeated drill and practise. Many of these programs were based on a perceptual remedial model which operated on the very dubious contention that practise and improvement in a specific perceptual area would transfer this improvement to reading, writing and math achievement. The Dubnoff Visual Motor Program (1968) and the Frostig Visual Perceptual Program (1963) are illustrative of this form of remediation, which, at its worse, even subjected children to memorizing endless series of digits on the dubious premise that improving this form of auditory memory would also help the student retain sequences of sounds within words. Many subject-specific programs based in rote learning were also introduced under the guise of

continuous progress. The Sullivan Programmed Math Series (1975) and the S.R.A. Morphographic Spelling (1979) are indicative of a mastery-learning remedial approach which essentially eliminates the teacher/student and student/student relationships from the learning environment and illustrates an isolated and barren premise of learning far removed from the social, cultural, and institutional tenets of a Vygotskian perspective presented within this paper.

The *Contemporary Phase* of emerging directions described by Lerner (1993) mentions the regular education initiative, the non-categorical concept, and the collaborative consultation model as changing administrative issues. The regular education initiative is an influential movement across North America for integrating regular and special education, through teaching students with disabilities in the regular classroom. The basis of this initiative is a shared responsibility in planning and teaching for Special Education students. The initiative was first proposed in 1986 by Madeline Will, in the United States, who was then Director of Special Education within the U.S. Office of Special Education (Will, 1986). Although no such mandate (or position, for that matter) was implemented in Canada, a similar movement of inclusion has virtually swept every Province, largely due to the continuing growth and power of advocacy groups, such as the Council for Exceptional Children (C.E.C.) and the Canadian Association for Community Living (C.A.C.L.).

The regular education initiative has provoked unusual levels of confusion, emotion, and debate within the Special Education community (Lerner, 1993; Jenkins and Pious, 1991). Merely shifting the responsibility from the resource teacher to the regular teacher, or a consultant, is not enough to ensure success. The initiative must be based in sound philosophical and psychological practice that this work purports to offer. The regular education initiative is commendable in helping to alleviate the potential for harm in self-efficacy that plagues segregated school settings, but an equal potential of oppression, in Freirian terms, can easily evolve from Special Education children being

plopped in content driven classrooms without support. Special Education students under these circumstances are destined to feel and behave just as isolated, regardless of setting. It is somewhat ironic that such an initiative could gain momentum throughout North America without any clear pedagogical foundations. The authenticity of placing Special Education students in a regular classroom is still not based in sound psychological remedial practice; it has become the most recent bandwagon mentality whose purpose, though not clear at the beginning, becomes even more obscure as the initiative becomes ingrained.

The non-categorical placement described by Lerner (1993) emphasizes the common characteristics among students with disabilities and the common instructional methods for teaching students with a broad variety of learning problems. Students with learning disabilities, behavior disorders, mental retardation, and sensory handicaps are grouped together. This initiative is yet another recipe for disaster, because it is not based on sound philosophical or psychological remedial practice without which non-categorical or heterogeneous placements will all evolve into dumping grounds. A watered-down and content-driven curriculum of remediation will suit no student's needs. The contention that all Special Education students will prosper from common instructional methods is flawed at the start and, indeed, is a primary reason for this dissertation. "Common" instructional methods for Special Education students are all based on some form of Skinnerian mastery learning which, historically, completely ignores the individual semiotic functions of the learner and judges success by society's arbitrary norms of how much information a student should gain in a specified amount of time.

A third emerging direction noted by Lerner (1993) and Ariel (1992) is termed collaborative consultation. The concept of consulting implies that one teacher is helping another and the concept of collaboration implies that both the classroom teacher and the Special Education teacher are equals in the consultation process. The emerging role of the special educator involves consultation and collaboration with classroom teachers in

specific teaching strategies for meeting the needs within the constraints of the classroom situation (Robinson, 1991; Greer, 1988; Wang and Walberg, 1987). This approach involves a team mentality for planning and evaluating support that may, or may not, be classroom based. A main theme of this paper is to expand on the collaborative-consultative model by elevating the role of metacognition as a primary purpose for both Special Education and Regular Education students. The rationale is, that through exposing and discussing the strategic methods through which all students exhibit control in learning, a common purpose based in sound philosophical and psychological theory will emerge for teachers, students and parents, alike. Without such purpose, the collaborative-consultative model will simply become a way of discussing and perpetuating a flawed paradigm of support; one that values norms and information rather than metacognitive modifiability and thoughtfulness. This model does, however, have real potential in helping to dispel the expert mentality so prevalent in traditional services that have been inherited from the medical and psychologist professions. The collaborative-consultative model can provide an educational autonomy and empowerment that has never previously emerged.

The most recent and most exciting new direction in remediation is cognitive behavior modification and, more specifically, metacognitive control in learning. It is interesting that current texts in learning disability (Lerner, 1993; Ariel, 1991; Wong, 1991; Pressley, 1991) all allude to some aspect of cognitive strategy instruction that did not appear in texts a brief decade ago. As Ariel (1991) submits:

> "Studies in cognitive function and information processing and their implications for individuals with learning disabilities have guided research and practice in implementing strategic learning and metacognitive approaches with learning disabled students. Principles of applied behavior analysis and cognitive behavior modification have guided the use of task analysis, curriculum-based assessment and instruction, and behavior management systems."
>
> (Ariel, 1991, p.42)

Lerner (1993) adds:

> "Contemporary theories of cognitive learning incorporate, broaden, and elaborate many of the earlier concepts of learning and thinking. The focus of instruction is to stimulate and nourish student's own mental elaborations for knowledge and to help them grow in their capacity to monitor and guide their own thinking and learning. Extensive research supports instruction based on theories of cognitive learning. (Lerner, 1993, p.201)

Although the support for cognitive-based strategy instruction as the prominent remedial practice is now predominant in current texts, the form that such instruction assumes is generating considerable controversy. The basic question is whether to teach students a common set of strategies directly, or whether to infuse cognitive instruction across the curriculum. The stance that this paper offers favors the latter and contends that an entire change of paradigm in what we value as our educational ideals and goals as special educators is necessary to fully understand the importance of cognitive behavior modification in general, and mediated metacognitive instruction in particular.

The cognitive remedial paradigm must consider both the broader philosophical view of Freire (1970) and the psychological views of Vygotsky (1978). It must be concerned with student and professional autonomy and empowerment towards a culture of thoughtfulness on the one hand, and it must focus on the etiology of changes in intra-mental cognitive processes on the other. It must consider learning as a constantly transformative social process of dialogical metacognitive modifications throughout a lifetime. The paradigm change is one from valuing the products of information alone, to one of also valuing the mental processes responsible for intelligent thought. Cognitive behavior modification becomes the primary educational construct around which instruction, achievement, and assessment are judged, rather than normative comparison, categorizing, and labelling around society's arbitrary conception of the net gains of pieces of information.

The term "cognitive behavior modification", however, is considered too broad an educational construct, one that could easily fall prey to excluding the importance of the teacher-student relationship within learning. Instructing children in specific strategies which are external to the student's learning experience and are, therefore, cognitively imposed, is not the same goal as providing the learning environment that would enable the student to experiment and apply their own unique metacognitive strategies to the learning task. "Cognitive behavior modification" somehow infers that the student will be told how to think, rather than be coached. Although even a telling metacognitive pedagogy is considered superior to one based on the telling of inert information, such a pathway would fall well short of empowering the learner with a classroom environment that infuses the expectation for metacognitive change within every aspect of the curriculum. Under such a pedagogy, teaching for thoughtfulness is the primary educational ideal rather than teaching a student to be more thoughtful within any particular subject.

To reflect this fundamental instructional difference, the term "mediated metacognitive pedagogy" has been selected as the form of cognitive behavior modification sought within the classroom. The addition of the word "mediated" implies the importance of the teacher-student relationship in coaching, facilitating, encouraging and anticipating metacognitive sophistication across the curriculum for all learning tasks. The form that the mediation assumes within the classroom is considered a critical catalyst of empowering the learner to adopt life long learning tools which they can later apply to future learning tasks for themselves. Student autonomy in learning is the net goal. Chapter IX will review the history of metacognitive instruction in detail and will reinforce the pedagogical distinctions between cognitive behavior modification and mediated metacognitive instruction.

CHAPTER IX: FACILITATING COGNITIVE CONTROL IN LEARNERS

In order to ensure more valid and fruitful applications of any applied theory of development, Resnick (1984) notes the necessity to desc clearly: the overt behaviors and underlying competencies to be acquired; the processes and mechanisms by which those competencies and behaviors are acquired; and the kinds of actions that can be taken to aid the acquisition or improvement of competencies through delineating the circumstances under which interventions may work or fail. She defines applied developmental theory as psychological theory designed to guide interventions in development; its purpose is to either correct problems in children's functioning or further enhance the functioning of children who have no difficulty. Thus far, this paper has attempted to present the mental behaviors of learners as a function of strategic cognitive and metacognitive applications of the mental processes of imagery and inner language. This chapter will focus on the kinds of actions that can be taken to aid the acquisition or improvement of information through attention to the mental dynamics of both processes within the presented metacognitive model of the intellect.

There are two distinct pedagogical traditions within the cognitive behavioral field of inquiry. The first tradition emphasizes the teaching of critical, analytical, and productive thinking skills that are addressed largely through "packaged" instructional programs for teaching thinking independently of the subject matter areas in the curriculum. The Productive Thinking program of Covington et al (1974), the Philosophy for Children program of Lipman et al (1980), the Problem Solving and Comprehension program of Whimbey & Lockhead (1982) and the CORT program of deBono (1985), are all examples of programs that view the instruction of thinking as a separate subject in its own right.

The difficulty in following this view, as alluded to in Chapter VIII, is one of philosophical outlook. Can we maintain the content oriented status quo within the curriculum and simply add on "thinking" as a new educational ideal? It makes little sense to consider thoughtfulness in the same light as any particular subject area. The absurdity of teachers following any such program, without also infusing thinking strategies across the curriculum, is obvious; the inference that it's "time to think" implicitly reciprocates that there is also a time "not to think"!

The second tradition within applied cognitive developmental theory emphasizes the teaching of a broad range of cognitive and metacognitive strategies designed to promote the acquisition, storage, retrieval, and application of knowledge. The terms "learning and thinking strategies" or "cognitive learning strategies" are frequently used to describe such programs (Mulcahy, 1991). Examples of programs that would follow a cognitive strategy approach would include the Informed Strategies for Learning program of Paris et al (1984, 1986), the Reciprocal Teaching technique of Palinscar (1986, 1991), the Learning Strategies Course of Dansereau (1979, 1985), the Cognitive Learning Strategies program of Weinstein (1978, 1985), the Learning Strategies Curriculum of Deshler (1983, 1986), the SPELT program of Mulcahy et al (1986, 1991) and the LSET program of French (1983, 1991).

Many of the above programs are designed for specific subject areas or are restricted to certain age levels. The programs of Paris and Palinscar are primarily concerned with reading comprehension and the program of Dansereau is designed for college level students. Other programs are focused on special student populations; Deshler's work is centered on the learning disabled student, and Weinstein's program was designed primarily for armed forces personnel at the college level. A large part of the rationale for presenting a model of the intellect that reflects the nature of the acts of learning is to provide a theoretical basis for all learners that can provide a basis for cognitive-developmental pedagogy. Without this understanding, the field of cognitive

inquiry will continue to address special interest student populations and will retain its present divergent and disparate course.

The programs of Mulcahy (1986, 1991) and French (1983, 1991) represent an important emerging direction in cognitive behavioral modification through considering the dynamics of the teaching-learning process, and by infusing metacognitive awareness and instruction within the existing curriculum. The importance of the role of the teacher within the learning process is reflected by the inclusion of teacher inservicing as an active and fundamental aspect of both programs.

At the root of all pedagogical issues in cognitive training is the question of how to promote control over the management of the cognitive mechanisms underlying learning in the hands of the learner. The goal is to enable the student to achieve more and more self-control in learning through raising metacognitive awareness and through making this awareness an implicit and explicit educational enterprise. The presented model may help elevate the awareness of the learner about ways to control their strategic interventions in all forms of learning. The assumption is made that if students know they can regulate their thinking through strategic use of imagery and inner language, they will learn to apply this knowledge to a wide variety of learning situations. The second assumption is that the student will learn to apply the metacognitive knowledge more quickly, efficiently, and flexibly if the teacher makes this knowledge both an implicit and explicit aspect of instruction.

Both assumptions have considerable backing in research. Students that demonstrate a high degree of metacognitive knowledge perform to higher degrees of achievement across a broad range of subject areas (Derry, 1990; Barell, 1991; Beyer, 1987; Resnick, 1987; Cook, 1989; Ennis, 1985; Marzano, 1986; Palinscar, 1991). Indeed, many forms of exceptionality are now being referenced in terms of a failure to develop strategic self-control (Paris, 1991; Meltzer, 1991; Reid, 1981; Wong, 1991, 1992). The dynamics of the teacher-learner relationship in making strategic intervention explicit

through infusing cognitive theory across the curriculum is the premise of many recent cognitive instructional programs (Mulcahy, 1986, 1991; French, 1983, 1991; Marzano, 1992; Ruggiero, 1990; Hogan, 1992). However, without a fundamental understanding of the dynamics of the vehicles or mental processes of metacognating, even these programs will diverge into many disparate views concerning which strategies to make explicit and how these strategies are related within the dynamics of thinking.

What seems to be missing is a philosophical understanding of what pedagogical issues are attempting to accomplish. The field of cognitive developmental inquiry may well benefit from a critical pedagogical perspective steeped in the writings of Freire (1970, 1973, 1985). The goal of providing a means of "enlightenment" is achieved through engaging in self-understandings through ideological critique. The "Pedagogy of the Oppressed" in Freire's terms, applies to any population without voice. What critical pedagogy can offer to cognitive behavior modification is a rationale for the need to generate student ownership in learning. This generative theme focuses on the mediational and facilitative role of the teacher (Feuerstein, 1980; Vygotsky, 1978) to help each student discover more about how their learning occurs. The pedagogical process is always self-critical and is constantly transforming the teacher's and student's understanding of learning dynamics. The traditional role of the teacher as a "giver" of my information in my terms, gives way to a mediating function through listening, observing, questioning, and evaluating the changes in the way a student approaches learning across the curriculum. Essentially, the teacher must establish a "meta" awareness of the best methods to promote independent thinkers as students. The parallels in terms of the roles of teacher and student are becoming much closer, inextricably entwined, and perhaps, the same. The teacher is a student of the metacognitive behavior of their students and the students are teachers of their metacognitive behavior.

Inherent within this view of pedagogical and philosophical considerations of this mediational dynamic is attention to scaffolding instruction (Reid & Stone, 1991) within a

student's "zone of proximal development" (Vygotsky, 1978) and an awareness of proleptic social conditions that help or hinder strategic learning interventions (Piaget, 1976, 1985; Callagher & Wansart, 1991). Packaged cognitive strategy programs will not provide student self use of metacognitive functions because the student-teacher relationship does not deal with these considerations. Programs that infuse strategic interventions across the curriculum may also fail to consider critical pedagogical issues depending on how they choose to implement the program. The purpose of presenting a model of the metacognitive acts of knowing, is to promote student self-knowledge of how they learn across the curriculum and over a lifetime. The hope is that elevating student and teacher knowledge of the mechanics of metacognating, may provide a more cogent instructional agenda for all students at all grade levels. This model, too, however, will fail to contribute if the critical pedagogical issues reviewed fail to materialize.

CHAPTER H A CHALLENGE TO TRADITIONAL SPECIAL EDUCATION PRACTICE: CHANGES OF PARADIGM

The purpose of this chapter is to focus more directly on what changes of paradigm are deemed necessary within the philosophical, psychological, and pedagogical delivery of services for exceptional children. It is not by accident or oversight that regular education students and special education students have so far been considered within this work as one and the same population. The critical perspective offered through Freire and Shor (1987) applies to education in general and special education in particular. The psychological ramifications of a metacognitive focus towards learning discussed through the writings of Vygotsky and Luria (1993) are similarly considered equally appropriate for both the regular and special education student.

The exceptional student, however, appears particularly susceptible to educational practices which do not value learning autonomy. Through constantly being evaluated against "normative" criteria, constantly being labeled as somehow different and inferior in learning, and constantly receiving interventions that do not consider the level of their own control in thinking, the traditional sub-system of special education may actually inadvertently harm the learner by providing all the mental cues externally, that all students should learn to adopt for themselves to become independent or autonomous thinkers. Whether the support is given within the classroom setting or external to the classroom, the quality of the student-teacher dynamic is critical in helping or preventing meaningful learning. If exceptional students learn to rely on external settings or teacher cues to engage in learning, they are not learning to experiment with learning strategies and procedures that enable them to function mentally for themselves. Unless it is an explicit and implicit purpose of intervention to mediate the students metacognitive process and flexibility as a fundamental and integral aspect of all curricular tasks, the

learner will not attain the degree of metacognitive control that could otherwise be attained.

It is fascinating, yet tragic, how little student self-control in learning has been addressed throughout the history of remediation as reviewed in Chapter VIII. The medical model of Strauss (1943) and Clements (1966)_ still predominates within assessment and placement practices for the entire range of exceptional children. Indeed, as Ysseldyke (1982, 1984) and Skrtic (1991, 1992) comment, an overwhelming majority of time, money, and effort is spent on the assessment of learning disorders, with very little time, effort, or money being spent on analyzing the quality and dynamics of learning for special education students. Even most recent special education issues discussed by Lerner (1993) and Ariel (1992) focus on placement issues rather than the quality of student learning; non-categorical placement, mainstreaming, integration, and collaborative consultative models have all emerged primarily from the concerns of advocacy groups over societal perceptions of handicapped students, rather than concern for the quality of student learning in terms of strategic control.

What has been missing is the outlook that all children, regardless of handicapping conditions, are capable of metacognitive change; they can gain levels of independence and control in their learning under positive mediational influence, that they could not otherwise have attained for themselves. The increments of metacognitive modifiability will differ, of course, according to the severity of the condition, but the expectation for change does not differ. Quality learning in this sense implies demonstration of meaningful learning, not simply the acquisition of facts belonging to any given subject. The simple statement, "thinking can be mediated" demands fundamental changes of paradigm in how we perceive, assess, intervene, and evaluate the entire sub-system of special education. The remainder of this chapter will discuss the nature of paradigmatic change in terms of intelligence, learning theory, assessment, and exceptionality.

(A) METACOGNITION AND THE PARADIGM OF INTELLIGENCE

"The critical attribute of intelligent human beings is not only having information, but knowing how to act on it."
(Costa, 1989)

Until recently, the perception of intelligence has been viewed as a life-long predisposition for learning, largely unchanging ... a "fait a complis". Measurements of intelligence have reflected this view through "product" oriented tasks which compare development among peers, but totally neglect the ways that individuals acquire information. Through this neglect, we miss trying to understand reasons for intellectual performance. We circumvent extremely important insight into analysis of learning behaviors responsible for cognitive development. Intellectual potential should attempt to measure metacognitive strategies as well as information gained throughout a lifetime. We compare development through norming procedures which allow comparison among peers of the net acquisition of information without knowledge or impetus to also understand why or how this information is retained. We are losing so many opportunities to learn more about learning.

The traditional paradigm of intellectual development is based on a variety of psychometric differential theories which deal with differences between individuals in net performance of "factors" purported to measure cognitive potential. From the initial 2-factor model of Spearman (1927) and the 7-factor theory of Thurstone (1938), to the 150-factor theory of Guilford (1967), a plethora of mental scales and measurements have evolved to evaluate the differences in the elusive "g" or general intellectual equivalent. Because this perspective is based on differing performance of subjects on both verbal and nonverbal tasks without the need to understand individual learner strategies in performing such tasks, intellectual results have historically served more as program placement

devices rather than providing a future educational agenda. It is useful for the educator to gain normative knowledge of where a learner "fits" from a developmental point of view, but it is also fundamental that we seek knowledge of reasons for student success or weakness, as well as knowledge of how modifiable and flexible the learner is under a variety of mediational approaches.

The change of our intellectual paradigm began a decade ago through the work of Dr. Reuven Feuerstein, an Israeli psychologist unable to employ traditional intellectual measures; due to the severe deprivation of "street children" orphaned through war. The development of his Learning Potential Assessment Device (L.P.A.D.) and Instrumental Enrichment Device (I.E.D.) has prompted a re-evaluation of our perspective on intelligence and learning, because teaching thinking is now considered possible (Feuerstein, Rand, Hoffman & Miller, 1980; Feuerstein, Miller, Jensen, 1981; Feuerstein, Rand, Jensen, Kaniel & Tzuriel, 1987). Intelligence is modifiable. Recognition of this simple statement demands our understanding of learning behaviors which are responsible for change and places a new emphasis on the teacher's role in prompting change. A test-teach-retest mentality moves beyond normative comparison, alone.

Feuerstein's work, together with the writings of Gardner and Sternberg questioning the product-oriented paradigm of intellectual performance and the usefulness of I.Q. scores, challenges the educator to expand our view of learning potential. (Gardner, 1983; Sternberg, 1981, 1984). The evolution towards inclusion of why and how scores are attained changes the nature of assessment into a dynamic prescriptive "learning strategy profile" rather than total reliance on a static and diagnostic normative score of questionable future use for the educator. Scaled scores and IQ's do not provide instructional insight for the teacher. Far more value could be obtained by also evaluating the learning behaviors of the subject. These learning behaviors then provide an instructional goal for the student, teacher and parent. Evaluating changes in learning can

then be accomplished through evaluating change in efficiency on the task (test-teach-retest) and change in the efficiency of learning (metacognitive change).

Indeed, as we become more knowledgeable of the metacognitive behavior of the student, the value of administering a traditional intellectual measure far removed from classroom practice is likely to become more and more questionable. Although a normative perspective may prove useful to the educator, a mediated metacognitive analysis of potential can be infused directly within the curriculum over long periods of time and can, therefore, provide a constant barometer of intellectual modifiability for each learner. The need for age equivalency gives way to the need for knowledge of intellectual changes. This is a child centered perspective of cognitive functioning that does not necessarily require a societal metaphor of intellectual "normalcy".

Current intellectual measures do not help us understand the intellect. They provide summative comparisons of performance to peers, but do not give us any formative information on how or why success or failure on learning takes place. A simple analogy to present measures would be to grant a driving license to students on the basis of a written test alone, without acknowledging the importance of the road test which allows us to observe, discuss, teach, and reteach a student how to drive.

Present intellectual measures reflect a model of intelligence as a static quotient virtually unchanging through life. Modifiability of learning is ignored; subjects have no opportunity to demonstrate learning. The importance of the role of the examiner interacting with the subject is not acknowledged. We manipulate the subject to make him/her "fit" the standardized procedures and scoring format of the measure. Results are, therefore, considered more important than individual strategies or approaches employed. Indeed we <u>discourage</u> opportunities towards understanding reasons for success or failure by conforming to standardized testing procedures. For example, many subtests of traditional intelligence tests are timed; are we valuing rapid rote thinking or thoughtfulness?

The primary change in considering the efficacy of a mediated metacognitive outlook on intelligence, rather than one of normative differences, is the understanding and active involvement that this information can provide for the educator. A mediated metacognitive outlook considers the modifiability of student learning across a broad range of both verbal and nonverbal learning activities, as a function of the mediational influences. How well does the student adopt more efficient learning strategies when coached? How heavily do they rely on mediator cues? What mental strategies do they employ and how efficient are these strategies for this student? Over time, how well does the student perform on the same activity for themselves? How well can they adjust their metacognitive prowess to similar tasks? The aim of this outlook is to discover how intellectually flexible the learner is, or could be. This paradigm shift always considers the dynamics of the student-teacher relationship, and becomes as much an instructional outlook as one of assessment of intellectual potential.

Why have educators accepted the established model of intelligence and our ways of attempting to measure learning potential? Intelligence tests were first developed to address a specific need of society at a specific point in time; the Weschler Tests were developed to quickly evaluate which soldiers would make the best officers during mobilization of troops before the Second World War. The armed forces required a quick evaluation of learning potential for a specific purpose at a specific time in history. The model of intelligence and the tools of measurement have essentially not changed since that time. Does it make sense that this model and these tools of measurement were adopted by educators in the first place? Does it make sense that we still rely solely on these tests to assess learning potential? Would parents so readily accept IQ quotients knowing the original purpose and time of their development?

A second fallacy of the educator was acceptance of intelligence as a virtually static and unchanging entity. Ironically, this acceptance implies acceptance of anything but a potential to learn. If we treat the intellect as a "fait accompli", then we also accept

that a teacher's influence on learning is minimal. We accept our own shortcomings. The intellect is an open -- not closed -- door. All students learn. All teachers can greatly enhance this learning. The real problem is that we have never understood or explored what happens within the mind. What makes some students so much more efficient in learning than others? What distinguishes a mentally handicapped individual from a regular student in terms of thinking? We think they think, but we must know they think -- we must know how they think, why they think, when they think, where they think, and what they think.

The bottom line for a teacher should be supporting, indeed demanding ownership in learning from students. How can we realize these expectations when we do not demand ownership of teaching for ourselves? If we could imagine all educators as one individual, we would have to describe that individual as a remarkably passive person, exhibiting an overwhelming dependency on others to guide their every step. We must seek to overcome this image and accept that we are the primary mediational influence in demanding ownership in learning from students.

Recent thought describing the intellect as a dynamic and modifiable entity capable of change can help us claim ownership of our profession. We are the perpetrators of change for students. We have to discover how best to facilitate ownership of learning for students. We can't do justice to this goal unless we explore the nature of the control of learning for students. Control implies awareness on the student's part, of the ways one learns when engaged in any task -- the do's and don'ts of learning.

Considering the intellect from this perspective demands a new perspective on the range of learning. We can no longer accept that some students are "mentally handicapped" without pursuing metacognitive reasons for a lag in normal cognitive development. We should never "accept" the condition. A non-verbal "profoundly" handicapped student, for instance, may have been forced into unusual metacognitive strategies because he or she could not mediate learning through inner speech in the usual

manner. What is the usual manner? Does he or she employ a language of their own? Do they understand the context of our speech? Can they learn through visualizing? To what degree? A never ending series of questions replaces a *mind set* of the individual as a point on a continuum. The Special Educator adopts an experimental attitude geared towards any improvement in the efficiency of learning, rather than acceptance of a diagnostic exceptionality which favors a caregiver mind set.

Regardless of the ability or disability, the *mind set* of the teacher in control of teaching through this Socratian dialogue remains the same. This *mind set* can be further described as an attitude towards instruction which demands ownership from the instructor on instruction, towards ownership from the learner on learning. Ownership means nothing if taken at face value -- we can always learn more about learning. We haven't even scratched the surface. The *mind set* shields us from uncertainty, bandwagons, psychologists, and publishers. Our self-esteem can improve because we have gained control of our own role in the learning process. We can learn to ask better questions rather than being eliminated from the process through the imposed "voicelessness" from other professions.

In terms of changes in practice deemed necessary to reflect a "mediated metacognitive" perspective of intellectual development, the role of the school psychologist becomes one of evaluating the metacognitive modifiability of the learner over time, rather than perpetuating the traditional "one-shot" clinical evaluation that relies heavily on standardized measures external to authentic classroom learning. The psychologist seeks to understand both the metacognitive prowess that the student demonstrates, as well as the metacognitive changes that emerge under mediational influences. Teachers and parents become active participants in this process, rather than recipients of an "expert" opinion which generally intimidates both parents and teachers with psychological jargon far removed from classroom practice. A fundamental change in role of the school psychologist occurs through the philosophical approach; a

predetermined battery of standardized measures gives way to a child-centered mediated metacognitive outlook. Instead of the testing battery controlling the psychologist, the psychologist controls the assessment process through carefully monitoring the degree of ownership in learning the student demonstrates over time; the psychologist deals directly with the individual's process of learning, rather than a descriptive perspective of the student as a point on a differential peer continuum.

The role of the teacher and resource teacher would similarly change towards perceiving themselves as active participants in assessing, mediating, and evaluating the intellectual development of the student. A collaborative relationship would, therefore, evolve between the school psychologist, resource teacher and teacher, which links intellectual assessment and mediation directly to classroom practice. The nucleus of this process is the cognitive modifiability of the learner across the curriculum, and the degree of metacognitive autonomy the student demonstrates over time. The focus on the sophistication of imagery and inner language provides a barometer from which the strategic control of learners can be monitored. This pedagogy provides a purpose to collaboration and partnerships in education which moves beyond collaborating for the sake of collaboration. Under this pedagogy collaboration is a purposeful given, rather than an external goal of intervention.

The roles of the student and parent also emerge towards learning autonomy. The expectation of metacognitive growth within students, by students, encourages learners to become intellectually more flexible and thoughtful; they come to perceive themselves as active agents of change of their own engagement in learning because of the mediated metacognitive pedagogy. Parents also change from perceiving themselves as inactive and detached influences on their children's learning, to active and involved agents of their children's intellectual modifiability.

The intellectual change of paradigm, therefore, moves beyond traditional perspective into the ways and means of indiviudal learning. The ways and means involve

both the intellectual control and modifiability of learning, as well as consideration of the mediational influences which hinder or augment individual learning. Student autonomy in assuming control of their intellectual functioning is being assessed in terms of their history as a learner as well as their flexibility in changing their learning behavior over time. Imagery and inner language have been presented as two primary intellectual processes that can help us move in this direction. The recognition that both processes largely define the independence that learners can demonstrate through the myriad of individual strategies that each learner applies to learning tasks, helps us to focus on metacognitive change as a primary educational ideal.

(B) METACOGNITION AND THE PARADIGM OF LEARNING THEORY

> "Neither stimulation nor acquiring facts will improve thinking skills. Massive doses of mediated learning experiences are needed."
>
> (Reuven Feuerstein, 1981)

For the greater part of this century, research into learning has been based on a simple two element paradigm: *Instruction --> Learning (stimulus --> response)*. The mechanism of the relationship between instruction and performance was largely ignored, and individuals were considered solely as sources of random variation within a group. This auto-instructional model is commonly referred to as the *Connectionist* outlook on learning, with strong accent placed on the produce of instruction and little, or no, emphasis placed on the human influence. (Baird and White, 1982).

Pavlov, Watson, Guthrie, Thorndike and Skinner, collectively termed the Behaviorists, all contributed to this paradigm which promotes the products or end results of learning without acknowledging the importance of the social roles of the instructor and student. Cognitive psychology, beginning with Ausubel's (1968) inclusion of the learner's memory into the equation, as well as Piaget's (1963) writings of stages of development, introduced a cognitive functioning component to learning with understanding. Although the influence of the learner is realized within this early *cognitivist* paradigm, variations between people within a group or stage are still regarded as random error variations. The energy exerted by the learner was still not considered a significant factor influencing the efficiency of learning.

During the last decade, metacognitive research has expanded the paradigm to include the importance of the individual's involvement during the learning process. The shift includes a focus on the variance of factors affecting the efficiency of learning and

the importance of the student's role in mediating the learning experience (Vygotsky, 1978; Meltzer, 1991; Reid, 1988). This increasing appreciation of the complexity of the learner's role has generated increasing complexity in the learning equation, because a myriad of affective and cognitive behaviors within the individual are now considered significant.

A second factor receiving a great deal of attention during the last decade involves the role of the teacher or mediator, as well as the energy of the individual. The influence of Feuerstein (1980, 1981, 1987) and Vygotsky (1978) indicates that modifiability in a learner's approach to any learning task is enhanced through mediated experiences within the "zone of proximal development". The learning paradigm, therefore, becomes even more complex through having to address the power of student-teacher interactions as significant influences in learning.

The changes of paradigm in terms of a mediated metacognitive philosophy of learning are centered on the degree of importance one assigns to the learning dynamics between the learner and mediator. A mediated metacognitive outlook values the autonomy of the learner. This could, therefore, be termed an emancipatory learning theory in a critical theorist Freireian (1970, 1973, 1982, 1985) or Habermasian (1972, 1973) sense, because the individual and social learning processes and outcomes, form the locus of inquiry. The form that the mediation assumes in shaping the metacognitive prowess of the learner will largely dictate the degree that the learner can learn for themselves in a truly emancipated sense; beyond any given field and beyond any given societal, cultural or historical perspective.

A mediated metacognitive outlook on learning also has close ties with constructivist learning theory which views the child as an inherently active, self-regulating learner, intelligently acting on a perceived world rather than passively responding to the environment (Paris and Byrnes, 1989; Harris and Pressley, 1991). As Poplin (1988) describes, the constructivist views real understanding when children

participate fully in the development of their own knowledge through the self-regulated transformation of old knowledge to new knowledge. In effect, the learner constantly reconstructs previous understandings.

A mediated metacognitive pedagogy is also a child-centered pedagogy (Rogers, 1980). The relationship between student and teacher is of paramount importance in helping the student gain learning confidence and thinking independence. Any given knowledge or information base takes second place to metacognitive modifiability within this pedagogy. The role of the teacher constantly changes from a director and modeler to mediator and facilitator of more sophisticated student thinking. The teacher constantly seeks and encourages a dialogical and dialectical learning climate which demands a focus on how the student represents and deals with information. When Carl Rogers (1980) speaks of "becoming" a learner, a mediated metacognitive pedagogy listens, and accepts that no learner can ever know everything about anything and that learning autonomy has no end state.

Elements of the discovery paradigm of John Dewey (1969) also belong to a mediated metacognitive paradigm. Dewey believed that intelligence is creative and flexible, and unless the learner struggles personally with an issue, the information will likely be committed to memory in a lifeless and mechanical manner--so called "static" or "cold storage" knowledge. A mediated metacognitive theory is also seeking intellectual flexibility and modifiability--evidence that cognitive change through strategic applications of imagery and inner language are constantly coached through problem solving and problem finding activities. The strategic metacognitive sophistication of the learner is the primary ideal across the curriculum and infused within the curriculum.

A mediated metacognitive learning theory is, perhaps, best described as a social learning theory. The learner is not depicted as a lone investigator or a passive receptacle, but rather as a part of a social culture of learning. The writings of Vygotsky (1962, 1978) are particularly influential because the dynamics between the teacher and learner are

considered fundamental--the ways we teach can help or hinder metacognitive development.

Acceptance of these recent changes in our understanding of learning demands a closer look at our present educational process for both regular and special education students. The responsibility of the teacher becomes making students more aware of better ways to gain information as well as providing learning settings which allow optimal growth. Teachers must, therefore, begin to perceive themselves as facilitators of learning rather than "givers of information". Similarly, students must begin to perceive themselves as active learners in control of their learning and capable of modifying the efficiency of their learning, rather than simple "receivers" of information. This mind set on both the teacher and learner's part is necessary to reflect the changes of our understanding of learning theory.

METACOGNITION AND THE PARADIGM OF ASSESSMENT

PREFACE:

> "Some of the most important desired effects of education are among the most difficult to measure and least frequently considered aspects of educational quality."
> Organization for Economic Cooperation and Development. Carr-Hill, Magnussen (1973)

The primary changes of paradigm within assessment of student learning is a shift from summative comparison of peers, to at least equal consideration of the formative assessment of the sophistication of thinking within the individual. Evaluation procedures reflect changes in the ways that students approach their learning, as well as the quality of their responses. The how's and why's of learning become as important to monitor as any given retention of information. Further, assessment should be directly related to instruction by contributing directly to the teaching process (Meltzer, 1991). Assessment methods should consider the cognitive, as well as academic, components of learning by generating and testing hypothesis which are unique to a particular child and setting (Meyer, 1985).

Traditional summative evaluation is made after instruction is formally over and is usually portrayed as a rank or mark in either a criterion or norm referenced fashion. Formative evaluation is part of an on going instructional process--a marriage between what is intended to be taught and an understanding by the teacher of what is involved in gaining the information. This marriage leads towards an appreciation of what steps might be taken to improve both instruction and learning (Biggs and Collis, 1982; Cornfield, 1987; Idol and Nevin, 1987). Formative assessment, therefore, lends itself to a mediated metacognitive pedagogy because the manner in which students represent information and strategically intervene during the learning process forms a primary educational goal or ideal.

The major change in "mind set" for educators would be a shift from emphasis on summative procedures, presently used, towards formative evaluation which provides information for future learning. Summative assessment of learning outcomes leans towards an empirical comparison of peers without necessarily providing insights of learning behavior within an individual student or among students in general. The learning outcome is essentially considered more important than the processes or strategies which allow or prevent retention. The "products" of learning, therefore, assume control, and ownership is lost for teachers, parents, and students.

Formative evaluation not only allows, but demands, this ownership from teachers, parents, and students. It provides a dynamic perspective on learning which prompts us to learn more about learning. Formative evaluation should, however, move beyond curricular profiles of students' work samples alone towards profiles of learning behaviors which promote or deter development. Assessment must be interwoven with curricular demands and methods of instruction to help the educator identify an individual's "learning profile" through on going work samples, as well as indications of how the student produced the information by continuously monitoring the specific strategies, or lack of strategies, employed. Traditional assessment, based primarily on test scores, does not permit us to focus on this direction (Meltzer, 1981; Meyer, 1988; Campione, 1989; Paris, 1991).

Part of the need to re-evaluate how we evaluate students' learning is related to changes in instructional methodology and learning theory. The movement towards more divergent or open ended educational situations relies heavily on student involvement, with the teacher providing a lower level of structure by employing discovery methods of teaching and informed methods of evaluation (Vygotsky, 1978; Reid, K., Stone, A., 1991). The aims of this paradigm are "process" rather than "content" oriented. The intent is to have the educational experience affect the student rather than to simply learn subject matter. Historically it has been difficult to specify these effects in advance or measure

them directly. Acceptance of the importance of strategic instruction demands that we learn how to evaluate changes in the efficiency of learning.

Formative evaluation will not be successful, however, unless it achieves a necessary partnership among learning objectives and teaching objectives. "Good teaching demands that the goals and objectives of a program, the methods of teaching, and the evaluation practices be equal partners in the teaching-learning process" (Making the Grade, 1987). Further, assessment procedures should represent a collective and cumulative wisdom; a consensus framework within which a student's learning behavior can be observed, judged, and analyzed (Kemp, B., 1989). Ironically, this direction implies a "meta-knowledge" on the part of the teacher-assessor towards supporting and enhancing a meta-knowledge on the part of the learner. In a nutshell, teachers must know what they are doing and why (Brown and Palinscar, 1982; Palinscar, 1991; Daly, 1991).

Two key elements in adopting appropriate formative procedures are observational and questioning techniques which are conducive to establishing a learning profile for the student. Accurate record keeping of how students approach the learning task and how flexibly they adjust through questioning is considered a necessary component. Demonstrated changes in the efficiency of metacognition should also be supported within qualitative changes in work samples compiled across the curriculum.

Assessment of student achievement by the teacher	=	Assessment of changes in efficiency of learning (learning profile)	+	Qualitative changes in responses (work samples)
Assessment of student achievement by the student	=	Assessment of changes in my efficiency of learning (learning profile)	+	Qualitative changes in my responses (work samples)
Assessment of student achievement by the parent	=	Assessment of changes in efficiency of learning (learning profile)	+	Qualitative changes in responses (work samples)

These assessment equations will only make sense in the context of reflecting the intersection of other educational paradigm shifts in the same direction. They cannot be employed constructively without an understanding of the importance of the interaction of the student, parent, and teacher together in learning. All parties must understand this interaction; it is equally important for students and parents to perceive themselves as at least equal partners in all forms of evaluation, rather than recipients of ranks imposed by the educational institution.

Portfolio collections of students' work can provide a powerful assessment technique to keep track of student intellectual sophistication if they are structured to reveal the increments of self-understanding, reflection, and awareness of the learner's own metacognitive prowess. Thinking "logs" can be infused within the curriculum to provide a cumulative record of learning behavior as well as providing samples of each student's skill development. The teacher is observing, modeling, and facilitating more sophisticated learning behavior through evaluating the qualitative changes which emerge in the depth of understanding through student self-questioning and imagery. Over time, the student is encouraged and coached in applying both forms of representation in a myriad of strategic applications across the curriculum.

Portfolios which seek to reveal metacognitive change, over time, can also include parents as active and important participants of the learning process. The history of summative comparison to peers, through norm referenced or criterion referenced comparisons, has effectively intimidated and excluded parents from knowledge of their children's authentic learning, as well as empowerment to act as agents of intellectual change. Marks and grade equivalents may provide some perspective on where the student places or fits amongst peers, but provides virtually no knowledge on the past, present, or future "how" of the child's learning. Under a mediated metacognitive pedagogy, the parent is considered a partner in the learning process, fulfilling the metacognitive coaching role in cooperation with the classroom teacher. Figure #7

provides an illustrative example of an assessment approach which could be part of a portfolio collection, or could be applied specifically to classroom instruction. The fundamental purpose of such an instrument is for teachers, students, and parents to evaluate metacognite change, over time, as well as assessing what additional mediational supports may be necessary. The "goal" of learning and the ways that are decided upon to meet the learning goals can be mutually arrived at through consultation with student and parent. The "change scale" establishes a time line and helps the student, teacher, and parent gain consensus on the degree of success.

FIG. #7

HOW I CAN HELP MYSELF

NAME:..... DATE STARTED:.....
SCHOOL:..... GRADE: DATE REVIEWED:.....

MY GOAL:

.....
.....
.....
.....
.....

THE WAYS THAT I WILL TRY TO IMPROVE (MY STRATEGIES):

.....
.....
.....
.....
.....
.....
.....
.....
.....

My Change Scale

No Change	Little Change	Some Change	Lot of Change	Reached My Goal

My Teacher's Opinion

Strongly Disagree	Mildly Disagree	I Don't Know	Mildly Agree	Strongly Agree

My Parent's Opinion

Strongly Disagree	Mildly Disagree	I Don't Know	Mildly Agree	Strongly Agree

All partners in learning are involved in the expectation of change in a learning bahavior. This approach to formative assessment is more accurately termed authentic assessment (Hill & Ruptic, 1994; Rhodes, 1993) because evaluation of learning is infused as a regular part of classroom learning and instruction, and helps teachers plan curriculum and instruction to meet the needs of each student in a child-centered learning environment. Heavy emphasis is placed on teacher anecdotal observations and dialogue with parents and students. The locus of control of assessment should rest with the student in determining their degree of learning autonomy they can demonstrate and anticipate. Teachers and parents are the primary mediational influences in helping the student towards self-control in learning across the curriculum (Meyer, 1992). Anecdotal notes from all parties, conferences, observational surveys, interviews, and samples of student work can all be employed to collect information on student learning in a variety of contexts.

The real difficulty in establishing portfolio assessment is in deciphering what student information to collect over time, and articulating the purpose for any particular aspect of assessment. Without care, masses of information can be collected that have no over-riding meaning. Just as any given "mark" or "grade" can lose meaning in terms of the learning they represent under a product oriented paradigm for students, parents, and teachers, portfolios can quickly become detached from original purpose if they are not generated with thoughtfulness under a child-centered process oriented paradigm. The theme of this document has been examining the emergence of student control, or autonomy in learning, through a focus on imagery and inner language as primary mental processes which can sophisticate under positive mediational influences. At least a portion of assessment should, therefore, reflect the gradual metacognitive control a student exhibits across the curriculum through strategic applications of imagery and inner language. Fig. #8 is presented as a potential assessment instrument which may help students, teachers, and parents explore and evaluate the mediated metacognitive progress

of students. Any form of likert scale could be employed to represent the level of competency that students demonstrate in representing information verbally (through inner language) and graphically (through imagery). The student should be able to demonstrate competency through receptive and expressive language, retention of information within a concept, relating concepts, applying concepts, and forming opinions and judgments using related concepts. This sequence is not intended to be hierarchical in nature; the student will apply all levels of engagement as they "reconstruct" previous understandings. The focus on encouraging students to represent their depth and breadth of understanding through both imagery and inner language, teaches them to become intellectually flexible, creative, and curious in the manner which they mentally represent information, concepts, problems, and opinions.

FIG. #8

EVALUATING THE MEDIATED METACOGNITIVE GROWTH OF STUDENTS

NAME:..... ..... DATE:.....

SUBJECT AREA: .....

1 = POOR 2 = LIMITED 3 = SATISFACTORY 4 = PROFICIENT 5 = EXCEPTIONAL

		VERBALLY (INNER LANGUAGE)						GRAPHICALLY (IMAGERY)				
		5	4	3	2	1		5	4	3	2	1
1. Overall student autonomy within this subject	oral											
	reading											
	writing											
		5	4	3	2	1		5	4	3	2	1
2. Understands the language associated with this subject.	oral											
	reading											
	writing											
		5	4	3	2	1		5	4	3	2	1
3. Understands individual concepts presented.	oral											
	reading											
	writing											
		5	4	3	2	1		5	4	3	2	1
4. Can relate presented concepts (analyze, synthesize)	oral											
	reading											
	writing											
		5	4	3	2	1		5	4	3	2	1
5. Can apply presented concepts to other areas, previous learning (transfer of learning)	oral											
	reading											
	writing											
		5	4	3	2	1		5	4	3	2	1
6. Can make judgments, opinions and evaluations of concepts.	oral											
	reading											
	writing											

Variations on this format for evaluation can be applied to more specific subject areas or learning behaviors. Fig. #9 focuses more on the strategic applications of imagery and inner language across a variety of mediational learning environments. Similar approaches could be adapted to evaluate progress of a wide variety of classroom activities, projects, learning behaviors, and learning environments. The intent of monitoring the sophistication of the student's strategic usage of imagery and inner language at different symbolic levels of representation can be a useful purpose of assessment along with the inclusion of student, teacher, and parent opinions of progress linked to classroom instruction.

FIG. #9

PROBLEM SOLVING, PROBLEM FINDING

NAME:..... DATE:.....

SUBJECT AREA: .....

1 = POOR 2 = LIMITED 3 = SATISFACTORY 4 = PROFICIENT 5 = EXCEPTIONAL

SUBJECT

		VERBALLY (INNER LANGUAGE)						GRAPHICALLY (IMAGERY)				
		5	4	3	2	1		5	4	3	2	1
1. Represents new words.	oral											
	reading											
	writing											
		5	4	3	2	1		5	4	3	2	1
2. Forms and explains a plan (selects a strategy).	oral											
	reading											
	writing											
		5	4	3	2	1		5	4	3	2	1
3. Carries out plan and demonstrates possible solutions.	oral											
	reading											
	writing											
		5	4	3	2	1		5	4	3	2	1
4. Extends problems to new problems, relates to previous problems.	oral											
	reading											
	writing											

ATTITUDES:

	STUDENT RATING					TEACHER RATING					PARENT RATING				
	5	4	3	2	1	5	4	3	2	1	5	4	3	2	1
1. Works independently.															
	5	4	3	2	1	5	4	3	2	1	5	4	3	2	1
2. Shares, collaborates, questions, seeks and takes advice.															
	5	4	3	2	1	5	4	3	2	1	5	4	3	2	1
3. Perseveres, willing to seek alternate solutions, find new problems.															

METACOGNITION AND THE PARADIGM OF INSTRUCTION

> "As students gain self-knowledge, they'll also become self-teachers -- and only self-teaching has any lasting value."
> (Gatto, 1990)

The paradigm shift in terms of instruction cannot be separated from any other changes in thinking; instruction must reflect and augment similar views within learning theory, assessment, intelligence, and exceptionality. Two aspects of instruction are felt important to address: classroom instruction in general, and metacognitive instruction in particular.

Classroom Instruction

The effects of accepting that efficiency in thinking is trainable has profound implications for the classroom teacher. The fundamental change must be in how teachers perceive their role. If a student can be influenced to become a more efficient learner, then the teacher has to learn how to enhance this goal. Essentially, a teacher has to learn how an individual learns.

The change in paradigm, therefore, involves instruction becoming more child-centered rather than driven by content. Helping students acquire information through mediating "meta" knowledge of ways to learn allows meaningful use of information to occur, rather than gaining information for the sake of information. The traditional role of the teacher as a "giver" of my information in my terms gives way to a mediating function through listening, observing, questioning, facilitating, coaching and evaluating the changes in the way a student approaches learning across the curriculum. The teacher must, therefore, establish a "meta" awareness of the best methods to promote independent thinkers as students. The parallels in terms of the roles of teacher and student are

becoming much closer, and perhaps the same. The teacher is a student; the student is a teacher.

Given that teachers perceive the importance of their changing role, instruction will reflect this perception by evolving methodology. Regardless of the subject matter, the teacher as an observer has to know what to observe. They are observing changes in the ways students approach or engage in the material through the quality of student's written and oral responses as well as their affective learning behavior. Similarly, they will learn how to listen, question, facilitate, coach, and evaluate these changes consistent with Vygotsky's (1979) "zone of proximal development", Feuerstein's (1980, 1981, 1987) "mediated" test-teach-retest model, and Piaget's (1975, 1985) "proleptic" social influences of the learner's environment.

This evolving methodology will greatly alter instruction from traditional or conventional methods. Lecturing becomes mediating; providing answers gives way to facilitating student's responses. Putting up hands in response to teacher questions becomes personal reflections from cooperative student learning experiences. The teachers thirst for closure across the curriculum evolves into a Socratic dialogue aimed at continuously allowing the student to learn and relate new information to old. Indeed, a primary purpose of this form of instruction is to allow the student to learn meaningfully in their way. Further, instruction must constantly allow the student opportunities to become aware of how they, and others, learn.

The teacher emphasizes "how did you do it" as much as "what did you do". Learning tasks can involve the process of learning through consideration of strategic applications of imagery and inner language. The means of obtaining an answer assumes equal importance to any given answer. The mediational metacognitive teacher recognizes that content is only one component of learning and that students can improve their learning through self awareness of how they, and others approach learning.

Classroom instruction under a mediated metacognitive paradigm tries to employ what Freire (1970, 1981) terms a "critical consciousness", developed by searching with the students for the ideas and experiences which give meaning to their lives. These generative themes are then organized and represented dialectically so that issues, problems, historical context and the importance of ideas emerge as problem posing co-investigations. Problem posing or problem finding should not be confused with problem solving; encouraging students to relate ideas, question ideas, and create new ideas is not the same as problem solving strategic procedures imposed by the teacher. Problem finding promotes what Sigel (Ellsworth & Sindt, 1994) terms "distancing" or separating ourselves mentally from the ongoing present. The representational competence of the learner and distancing opportunities through mediation help define the quality of metacognitive control.

Metacognitive Instruction

Metacognitive instruction works. A plethora of research supports this statement (Costa, 1988; Harris, Pressley, 1991; Reid, Stone, 1991; Palinscar, 1991; Paris, Winegrad, 91; Ellis, Lenz, 1987; Meltzer, 1991). The form that this instruction takes, however, is controversial. The recurring question of "bridging" from a trained strategy to independent use by the student for similar learning tasks persists. The following review of cognitive methods of instruction will demonstrate the diversity in application.

COGNITIVE INSTRUCTION

Cognitive Instruction implies that students are viewed as inherently active "apprentice learners" (Collins, Brown, and Newman, 1989). Mental strategies are implicitly or explicitly modeled, demonstrated, and discussed as they are utilized in the social and meaningful context of task completion. Children are not expected to generate strategies independently; continual dialogue between peers and teachers is an essential

feature. Providing students with opportunities to reflect on their strategies allows puzzlement to occur, hence planning of an alternate method. This opportunity for reflection will often not occur in a classroom because teachers are consistently "short circuiting" reflection on learning through their self-imposed need to obtain closure.

The underlying principle of cognitive instruction is to make students more aware of their own cognition and to allow them opportunities to imitate and analyze more efficient learning strategies. Organizational and management structures of instruction vary according to the purpose or content of instruction, as well as the amount of structure imposed (Reid, Stone, 1991). This variance extends from models of direct instruction of thinking strategies relying heavily on instructor input, to methods which focus on peer opportunities to reflect and collaborate in learning facilitated by the instructor.

In ***Direct Instruction***, the steps of the strategy targeted for instruction are presented by the teacher in a sequential fashion, generally determined through task analysis. Students practice these steps as the teacher provides and eventually fades prompts. The teacher tells, shows, models, demonstrates, and teaches the skill or strategy to be learned. This model may rely too heavily on teacher targeted instruction; the problem of inert knowledge (Whitehead, 1929) surfaces in that improvement may be limited to targeted strategies. Generalization of this learning may, or may not, occur. Learning the strategy does not mean that the strategy will necessarily be employed as a learning tool by the student. "Bridging" from a learned strategy to functional use across a variety of similar learning tasks continues to be a primary concern of current cognitive research.

The ***Cognitive Behavior Model*** (CBM) of instruction represents strategies as a series of discrete steps similar to Direct Instruction. Strategies are selected and modeled by the teacher with no occasion to evaluate the student's representation of learning activity (Ryan, Weed and Short, 1986). More focus occurs, however, on the importance of social learning theory (Luria, 1976; Vygotsky, 1978; Meichenbaum, 1985). An

emphasis is placed on the importance of students' cognition in facilitating self-control, drawing researchers' attention from overt behaviors to the ways in which students were mediating those behaviors. Research indicates that CBM is an effective model, however the flexibility of strategy use, and whether or not students generalize or internalize strategies metacognitively, remains unclear.

The ***Strategies Intervention Model*** addresses the generalization issue by monitoring how the students apply instructed strategies in the general education setting. Instruction similar to the Direct and Cognitive models is also preceded by assessment of the student's current strategy use in specific contexts. Research indicates that this model is effective in improving strategy use as well as content learning Palinscar et al, 1991; Paris, 1990).

Direct Explanation (Duffy et al, 1986; Duffy et al, 1987) is distinguished from the previous models in several respects. It is an approach suggesting that any skill can be recast as a strategy. The teachers "talk aloud" about the mental processes they use when experiencing difficulty in understanding, the way in which application of the skill can increase comprehension, and the mental steps that should be taken to use the skills strategically. Strategies are modeled, guided through practice, and are then evaluated through independent practice.

The Informed Strategies for Learning (ISL) model represents a curricular approach to strategy instruction (Paris, 1986). ISL consists of 20 modules addressing four comprehension processes: planning for reading; identifying meaning; reasoning while reading; and monitoring comprehension. Each module highlights a different strategy (e.g., finding the main idea), and each strategy is taught in three lessons. The lessons inform students about the value of the strategy, provide metaphors that assist in understanding, and offer guided practice. A distinguishing feature from previous models is group dialogues in which the teachers and students discuss their thoughts and feelings about the strategies and their usefulness, emphasizing personal aspects of strategy use.

Reciprocal Teaching (Brown & Palinscar, 1989; Palinscar & Brown, 1984, 1988) features the instruction of four strategies that are taught and practiced as a set of complementary activities to be used flexibly in reading, as the text, the needs of the reader, and the demands of the text suggest. Greater emphasis is placed on the collaboration of teachers and students to use specific strategies to render the text meaningful. Discussion focuses on generating questions from the text, summarizing the text, clarifying portions that impair understanding, and predicting upcoming content based on clues that are provided by the content and structure of the text. Research indicates that gains in reading comprehension are significant, and are maintained as well as generalized beyond the experimental setting (Paris, 1990; Palinscar, 1984).

In terms of a mediated metacognitive approach, the relationship between the teacher and learner is stressed. Aspects of all training approaches cited above are infused within the curriculum for all subjects. The teacher will sometimes explicitly discuss imagery and inner language, will sometimes coach and encourage students to experiment with metacognitive behavior, will sometimes model metacognitive behavior, or will sometimes simply observe and record changes in student metacognitive prowess. A continuous socratic dialogue probes for reasonableness, thoughtfulness and meaning. Students learn to become intellectually flexible, learn to evaluate their strategic behavior across the curriculum, and learn to represent information at a variety of symbolic levels for a variety of applications. The teacher is essentially coaching metacognitive behavior. Fig. #10 represents the mediational dynamics between teacher and student (or parent and student). Imagery and inner language provide an important barometer of mental control, because as students learn that they are expected to represent information both verbally and/or visually, they eventually learn to sophisticate and apply such behavior independently through becoming more intellectually aware, flexible, curious, confident, predictive, reflective and self critical.

The teacher's role as director, modeler, facilitator, observer, recorder and evaluator of metacognitive behavior promotes a learning environment which anticipates and expects metacognitive change from each learner. Regardless of the subject matter, each child is encouraged to demonstrate their reasoning and experiment with new mental procedures. Over time, a metacognitive reciprocity between teacher and student emerges; the teacher becomes more aware of the individual learning style of each student and the student recognizes that they are expected to experiment and demonstrate meaning and thoughtfulness during any given learning task.

It must be stressed that imagery and inner language are encouraged at different levels of symbolic behavior or abstraction. Both processes can certainly be applied to a memory level, however, the student is also encouraged to constantly represent related concepts within any aspect of the curriculum, and to also represent and apply both processes to new levels of application. As the student learns to ask "higher level" questions to themselves and are asked to graphically represent "higher level" understandings, they learn to reconstruct previous knowledge in a richer, more insightful and more personal manner. The focus on imagery and inner language; throughout this work is because both processes are considered the two primary avenues through which "higher order" thinking can be acquired. A mediational metacognitive pedagogy demands that the importance of both processes are exposed and encouraged.

FIG. #10

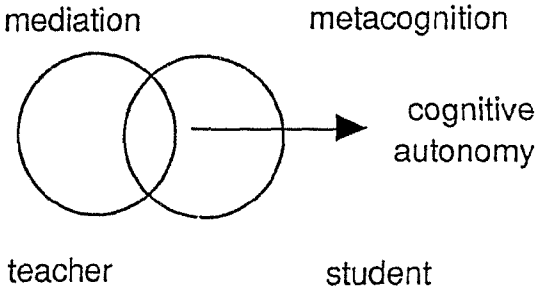
A MEDIATIONAL METACOGNITIVE PEDAGOGY

LEARNING AUTONOMY

- self-control in learning
- self-puzziement
- meaning oriented
- goal oriented
- motivation/volition to learn

INSTRUCTIONAL ROLES

Teacher as:
director
modeler
facilitator
observer
recorder
evaluator



METACOGNITIVE BEHAVIORS

Student as:
self-questioner
self-imager
intellectually aware
intellectually flexible
predictive
reflective
curious
self-critical
intellectually confident

INSTRUCTIONAL STRATEGIES

expectency of intellectual change (Feuerstein, 1980; Piaget, 1985)
awareness of student's intellectual zone (Vygotsky, 1978)
socratic dialogue (Paris, 1986)
metacognitive reciprocity (Brown and Palinscar, 1989; Palinscar, 1991)
metacognitive transference/transcendence (Feuerstein, 1980)
child-centered learning (Rogers, 1980
metacognitive distancing (Sigel, 1994)\
metacognitive scaffolding (Reid and Stone, 1991)
emancipatory/democratic classroom climate (Freire, 1973, 1982; Shor, 1987)
dialogical/dialectical (Paul, 1990)

A MEDIATED METACOGNITIVE PEDAGOGY AND THE PARADIGM OF EXCEPTIONALITY

> "We must believe that all humans can become increasingly more gifted than they are presently capable of demonstrating."
>
> (Costa, 1989)

Understanding that efficiency in learning is modifiable is altering traditional views on the very definition of exceptionality, and will no doubt change the focus of delivery of services in the future. The paradigm change is one from considering exceptionality in terms of developmental deficiencies compared to peers, towards considering metacognitive deficiencies and/or potentials within the mind of each child.

The field of learning disabilities, for example, illustrates that the great majority of research prior to the last decade concentrated on a diagnostic disparity in terms of achievement and intelligence, explained through developmental delays in language or perceptual functions. Traditional approaches have attempted to analyze or "fractionate" learning outcomes of the learning disabled student (Mann, 1980; Torgeson, 1979) without analyzing the particular process deficiencies which result due to these developmental delays. This has historically caused a large gap between diagnosis and remediation because we have never fully understood the effects of these delays in terms of the authentic learning of exceptional students. Consequently, remediation generally focused on a myriad of deficiency areas far removed from actual classroom learning and instruction. Understanding that a student with a visual perceptual delay has not been able to employ imagery to help learn geometry, or follow a plot in reading, provides an instructional direction directly related to the curricular task. Psychological processes which become metacognitive processes, therefore, provide the educator with a "missing link" by bridging the gap between perceptual skill dysfunction and low achievement.

Indeed, metacognitive consideration is essentially changing our definition of a learning disability. The metacognitive definition defines in terms of the inability to shift from one strategy to another, to abandon inappropriate strategies or even to consider more than one approach in rapid succession in order to arrive at a solution to a problem (Swanson, 1987; Meltzer, 1991).

Similar changes are affecting many categories and degrees of exceptionality. Mental retardation is now redefining in terms of modifiability of learning rather than as a comparison of peers of net acquisition of information (Feuerstein et al, 1980, 1981, 1987; Sternberg, 1981, 1984; Gardner, 1983). This change allows the educator a point of departure towards future learning and instruction, rather than acceptance of a categorical learning "condition" from the past. A very important philosophical change consequently occurs within the teacher, geared towards modifiability of <u>any</u> sort rather than a mentality of adapting expectations and instruction towards the "perceived" unchanging condition.

This philosophical switch is also apparent within the field of the emotionally or behaviorally deviant student. Instead of strictly controlled "token" interventions of behavior modification, new consideration is being given to the self-control of affective and social interactions through mediational therapy directly focused on helping the student understand and alter their own metacognitive strengths and weaknesses (Meichenbaum, 1977; Broad, 1985). This is accomplished by helping the child develop strategic use of overt and/or covert language in regulating their own behavior (Vygotsky, 1978; Luria, 1969). Regulation is approached through a mediational process which enables the child to acquire <u>independent</u> means of self-control that transfer to future similar, and perhaps dissimilar, learning situations. Essentially, through helping a child employ inner language in a positive behavioral context, we are not only helping the child apply inner language to their metacognitive repertoire in future behavioral circumstances, but also to a wide variety of learning tasks.

The metacognitive paradigm may also be applied to sensory exceptionality. The hearing and/or visually impaired child is faced with particular difficulty developing metacognitive control because of the lack of adequate sensory stimuli. The hearing impaired or deaf child, for example, may experience difficulty in employing inner language strategically, because of the absence of consistent sensory input which demands such energy from the learner to process, that they are unable to develop a metacognitive framework making use of inner speech.

Similarly, a visually impaired or blind child may have difficulty developing strategic imagery, due to the lack of consistent visual stimuli. This does not mean the child cannot develop or be taught to use visualization as a learning tool; indeed, blind or visually impaired children may be adept in applying visualization strategically, however, they will require other sensory options to help them nourish this ability (kinesthetic, hepatic, auditory, etc.). The important point to make for these children, regardless of sensory impairment, is that metacognitive consideration is essential in helping them overcome the sensory deficit by helping them become aware of their own strategic control. Again, metacognition provides a bridge between condition and information.

A mediated metacognitive pedagogy changes the purpose of support and the delivery of services for the exceptional child. The role of the Resource teacher also becomes supporting the prevention of inappropriate learning strategies for all students as well as intervening for children experiencing difficulty. Through discussing metacognitive behavior with all children in the classroom, the Resource teacher is helping to prevent the "learned helplessness" of many children that may or may not have been identified with traditional standardized assessment batteries and skill oriented remediation. The Resource teacher is modeling for the teacher how children develop efficient strategic procedures, and how this direction can be infused across the curriculum. The classroom teacher and Resource teacher adopt a similar metacognitive purpose. The classroom teacher seeks curricular means to infuse critical thinking for all

students and the Resource teachers provides support from a learning behavioral point of view for all children and the exceptional child in particular. This is, therefore, an inclusive model because the classroom setting provides the nucleus through which students are identified and remediated by both the classroom teacher and the Resource teacher. It is also a child centered Resource model because the metacognitive behavior of every student becomes the locus of control rather than the deviation of any student from an arbitrary grade or age level expectancy. Changes in the sophistication of children's thinking across the curriculum is the main intent for all children at all grade levels. Children demonstrating weakness in metacognitive behavior receive more time, support and encouragement from both the classroom and Resource teacher.

A mediated metacognitive Resource Model relieves the need to label or categorize children because regardless of the nature or epistemology of the disorder, helping the learner become more autonomous through improving their unique learning strategies remains constant for all learners. Whether the child is learning disabled, mentally challenged, hyperactive, or passive, the child is encouraged to expose and improve their thinking across the curriculum. The increments of metacognitive modifiability will obviously be different for different forms of exceptionality, but the purpose is the same.

A mediated metacognitive Resource Model accepts the parent as an active and valued participant towards metacognitive sophistication of the learner. This model helps the parent become more aware of how their child behaves metacognitively and guides the parent in methods of instruction. Again, the purpose is metacognitive change, not simply skill or fact retention. The parent is encouraged to question their child about how they are attempting to learn and are also facilitating, observing, recording, and evaluating metacognitive modifiability in collaboration with the classroom and Resource teacher. Including the parent as an active partner in their children's learning will not be initiated easily because of the degree they have historically been excluded from the learning process. As has been discussed throughout this study, the "subsystem" of special

education has effectively intimidated and disempowered the parent (and teacher and student) to a degree that will require considerable long term communication between the home and school to overcome.

A mediated metacognitive Resource Model demands thoughtfulness from all children and professionals. The "special" word evolves into a different context that accepts that all children are special in their unique learning behavior rather than denoting any given deviant population. Increments of thoughtfulness will differ from student to student, and professional to professional. This model forces self-reflection from the student in terms of their learning and forces self-reflection on behalf of the professional in developing a philosophy and psychology of teaching that best supports student autonomy in learning.

CHAPTER III A MEDIATED METACOGNITIVE SCHOOL RESEARCH STUDY: METHODOLOGY

The school based research portion of this paper will attempt to evaluate the efficacy of a mediated metacognitive approach to pedagogy. The aim of this section is (a) to explore the effect of a mediated metacognitive approach on achievement, and (b) to evaluate the efficacy of such an approach through the opinions of practitioners, parents, and students. If thinking can be mediated, how might this best be accomplished within an emancipatory pedagogy for the exceptional child? This portion of this proposal will rely heavily on the social learning theory of Vygotsky (1962, 1968), the mediational role of the teacher (Feuerstein, 1980, 1981, 1987) and metacognitive research involving both regular and special education populations (Lerner, 1993; Wong, 1992, 1991; Ellis, 1987; Derry, 1990; Costa, 1989; Paris, 1986, 199_; Meltzer, 1991; Pressley, 1985; Palinscar, 1984, 1988, 1991). If the reader accepts that special education requires revision in an emancipatory sense from Part I of this paper, and that metacognition is a social and cognitive behavioral construct that deserves primary consideration from Part II, then the aim of Part III is to offer the reader an illustration of how metacognition can assume a new role of importance within the classroom. The distinct danger exists that without careful consideration of how to implement a metacognitive resource model, the initiative will diffuse into subject specific applications, and the opportunity will be lost to make fundamental pedagogical changes that are felt important.

It should be emphasized at this time, that this is an exploratory approach which does not attempt to link any particular usage of imagery and/or inner language directly to achievement. Rather, the study is attempting to explore whether such a pedagogy can influence achievement in general terms, through examining a range of potential applications of imagery and inner language across a variety of representational levels as students are coached into seeking meaning. It attempts to extend student self-awareness

of the ways they gain meaning, as well as illustrating a process of instruction which enhances this self-awareness.

RESEARCH METHODOLOGY

Study Description:

Study Overview

Reading Comprehension has been selected as the curricular focus to illustrate the alternative paradigmatic and pedagogical changes that this document purports to offer. The study will, (a) attempt to link a mediated metacognitive pedagogy to achievement and, (b) evaluate the efficacy of this pedagogy through the change in opinions and practices of practitioners, parents, and students.

The linkage of the mediated metacognitive pedagogy to reading comprehension is quantitatively evaluated through a pre and post testing design over a twelve week treatment period. Qualitative data evaluating the efficacy of this approach takes the form of pre and post treatment interviews of professionals, parents, and students.

Three triads of professionals from three different elementary schools were involved in this study. Each triad consisted of the principal, resource teacher, and classroom teacher from randomly selected schools of the Kings County District School Board. The principals of all elementary schools of Kings County were requested to approach staff at a determined grade level (four, five, or six) to enter into a collaborative relationship based on the mediated metacognitive instruction of three classrooms of students (N - approx. 75). Nine of eighteen schools responded affirmatively after principals discussed the study with staff. The schools selected for the study were the first three schools involving teachers of equivalent grade level (Grade 4).

The purpose of the study was discussed with each triad, and parent permission forms were sent home to each class. With the exception of a single student in one class, all parents gave permission for their children to participate. Parents were also requested to volunteer for interviews. The first three parents to volunteer in each class were selected to participate in pre-post interviews. Eight parents volunteered in class one, twelve in class two, and nine in class three.

The intervention consisted of six classroom sessions occurring approximately 10 days apart, over twelve weeks, and was directed by the researcher. Classroom teachers attended each session and were encouraged to write down their observations of student involvement throughout the intervention. Resource teachers were also invited to attend as many sessions as their busy schedules would permit. The Resource teacher from Classroom 1 attended three of six sessions, classroom 2 attended four of six sessions, and classroom 3 attended four of six sessions. Principals were also invited to attend as many sessions as their schedules would permit. The principal from classroom 1 attended two sessions, however administrators from classrooms 2 and 3 were unable to attend any session.

All triad members were encouraged to discuss the intervention sessions amongst themselves throughout the study. Discussion between the researcher and classroom teachers occurred directly after each session. Discussion with Resource staff and principals proved far more difficult due to time and scheduling constraints; meetings between the Resource staff and the researcher were scheduled a minimum of four times during the intervention and Principals were scheduled for two discussion opportunities.

Quantitative Data

The Grade 4 level of the Alberta Diagnostic Reading Inventory (1986) and the Analytic Reading Inventory (1977) were administered by Resource staff, to all students within the three classrooms receiving the intervention, as well as the additional classroom of Grade 4 children serving as a control group. The control group selected was the fourth

Grade 4 class volunteering to participate in the study. The Alberta Diagnostic Reading Inventory comprehension questions are designed to evaluate information about how the student can infer, analyze, associate, and synthesize information from presented passages. (See samples of all instruments in Appendix E.) The Cloze procedure from the same measure is designed to evaluate how well a student predicts and monitors while reading; the student is given a passage with every fifth word deleted and is asked to supply the missing word. The Analytic Reading Inventory passage comprehension divides questions into six types: main idea, factual, terminology, cause and effect, inferential, and conclusion.

These measures were chosen because they attempt to relate reading comprehension a variety of comprehension abilities, including higher order thinking skills of analyzing, synthesizing, inferring, and evaluating material. Imagery and inner language are providing a range of potential possibilities for students to gain meaning from print through learning how to apply both processes to help them reflect, monitor, and predict. These three metacognitive areas each involve deliberate use of representations for memory, inference, judgment, analysis, and synthesis of information. If imagery and inner language are "teachable", then the student's improved thinking control through reflection, monitoring and prediction should have an influence on these traditional reading comprehension factors.

Alternate forms of the same measures were readministered following the twelve week intervention, serving as a post treatment comparison. Resource staff were instructed to administer all three comprehension measures to all students, regardless of reading ability. Students were not helped in decoding any specific words and were encouraged to make their best effort to respond to all comprehension questions. Post-tests were administered by Resource staff within three school days of the sixth and final intervention session.

Qualitative Data

The linkage to evaluating the efficacy of the mediated metacognitive approach itself, was accomplished through structured pre and post treatment interviews with professional staff (three triads N = 9), as well as separate interviews designed for three randomly selected parents and five randomly selected students from each class (parents N = 9, students N = 12). The aim of the pre and post interview format is to evaluate the value of metacognitive change, through changes in the opinions and/or practices of practitioners, parents, and students. Interviews were performed by a person knowledgeable in the field of cognitive psychology and special education, and approved by the chair of the research committee. Interview formats were reviewed with the interviewer to assure as much consistency as possible, and interviews were discussed and practised beforehand to limit leading statements. (See Appendix B)

Triad (N = 9) interviews were structured through open-ended questions which serve to expose practitioner knowledge and opinion of (a) a critical perspective of the traditional paradigm of Special Education in Nova Scotia; (b) the metacognitive control of learners through the strategic application of imagery and inner language; (c) the mediational role of the practitioner; and (d) the nature of metacognitive modifiability of learners. Changes in the knowledge and opinions of each member of the professional triad through comparison of pre and post treatment interviews are purported to provide an illustrative example of the efficacy of this treatment, and will also, hopefully, reveal emerging themes within this pedagogy which can be generalized across the curriculum.

The efficacy will be exposed through evaluating individual changes in opinion concerning the value and importance of such an approach, as well as the ease with which a mediated metacognitive pedagogy is understood and applied to classroom practice.

Parent interviews were structured with open-ended questions which are purported to evaluate changes in parents' perceptions of how their children approach reading for meaning. Parent opinion and knowledge of the efficacy of this approach, from a parent

point of view, should serve as a barometer in demystifying the nature of metacognitive mediation, as well as empowering parents as active and valued mediational agents of potential metacognitive changes within their children. The parental aspect of the treatment period will involve the clear understanding of their participation throughout the study, and active encouragement to reinforce the same metacognitive mediational techniques at home. Analysis of pre and post interview data are expected to reflect increased understanding of their children's metacognitive control for reading comprehension, as well as increased feelings as active and empowering agents of change within this process.

Student interviews were structured with open-ended questions which are purported to reveal individual changes in their knowledge and application of their metacognitive behavior for reading comprehension. Differences between pre and post treatment interviews will be analyzed in terms of the value that students associate to strategic metacognitive control before, during, and after reading a variety of narrative and expository material. The interview process should also provide a subjective evaluation of the importance students assign to their adoption of mediated strategies within their own metacognitive repertoire for independent comprehension during reading. (See Appendi . B)

An underlying intent of this study is to purposely include all of the stakeholders that can impact on fostering student autonomy through an emphasis on student metacognitive behavior. The importance that this study hopes to achieve stems from the efficacy that professionals, parents, and students assign to this metacognitive initiative. The importance of this study will also be directly proportional to how much each of these stakeholders can generalize the potential benefits in reading comprehension across the curriculum and across grade levels. Indeed, it is hoped that the value of a mediated metacognitive pedagogy can extend beyond the parameters of school years to preschool ages on the one hand, and life-long learning on the other.

Student journals or "thinking logs" were also included to provide opportunities for teachers to experiment with mediated metacognitive activities between intervention sessions. Students were given opportunities to share and compare their entries with peers.

Each classroom session was then reinforced by information sent home to be practiced with children. (See detailed intervention descriptions Appendix D.) Techniques to help parents become more aware of the ways their children approach reading for meaning were reviewed.

Pre-post treatment interviews were qualitatively analyzed to rate their opinions concerning the value of this mediated metacognitive approach to learning. The degree of parental involvement may also provide a barometer of the willingness of parents to become actively involved in the learning of their children.

The classroom teacher and resource teacher were actively engaged in the classroom throughout the treatment period; the administrator was encouraged to monitor the progress of the study, become knowledgeable about metacognition and a mediated metacognitive pedagogy, and provide an administrator's point of view of the efficacy and importance of this initiative.

Description Of Treatment:

General Overview

The duration of the intervention is twelve weeks; six treatment sessions were classroom based and lasted approximately one hour each, at 10-day intervals. Professionals were encouraged to pursue their own initiatives between sessions to reinforce presented activities. Professional readings were provided to triad members on an ongoing basis, throughout the study. Readings included.

> The Nature of Cognitive Strategy Instruction: Interactive Strategy Construction. Harris & Pressley (1991).
>
> What Human Beings do When They Behave Intelligently and How They can Become More So. Costa (1988).
>
> Empowering Through Metacognition. Barrell (1991).
>
> Why is Cognitive Instruction Effective? Underlying Learning Mechanisms. Reid & Stone (1991).
>
> The Role of Metacognition. Swartz & Parks (1994).

The purpose of these readings was to familiarize triad members with the concepts of metacognition and strategy instruction. Readings also provided a forum for discussion of the educator's role in promoting metacognition as a primary educational ideal.

Classroom teachers attended each classroom session and were encouraged to gradually experiment with intervention initiatives between sessions. Resource teachers and principals were invited to attend as many classroom sessions as their schedules would permit and were also encouraged to engage in dialogue with each other to share their thoughts over readings and classroom sessions. The researcher met with all teachers to discuss readings and intervention sessions after each school session.

The intervention of this study has been described as a mediated metacognitive pedagogy. As stated beforehand, the term "mediated" describes the teacher-student relationship as a dynamic relationship which constantly seeks student autonomy in learning through elevating student metacognition as a primary educational ideal. Student

autonomy simply implies the degree the student seeks meaning for themselves and has been described as the ability to assume control of their own learning through improved reflection, monitoring and prediction. The teacher enters this relationship, initially, by assuming a directive role in explaining and discussing what metacognition means, and by establishing an expectation for metacognitive flexibility within the learner. Metacognitive processes and strategies are introduced, discussed, modeled and practiced as the role of the teacher gradually evolves from director to mediator to facilitator to observer of metacognitive modifiability. As the learner gains confidence and experience in adapting a new mental process or strategy to their individual metacognitive "toolbox", the teacher purposefully fades their direct influence, but continues to encourage and observe independent usage by the student.

This is not considered a linear process, but rather a dynamic interplay of teacher roles that constantly change from student to student, activity to activity, and strategy to strategy. The overall goal, however, is always to move from coaching and modeling metacognitive behavior to observing and evaluating independent usage by students across a broad range of individual applications.

This is an empowering pedagogy because its intent and purpose is to constantly foster more critical mental behaviors that enables students to expand their intellectual methods of dealing with information. The teacher is not "telling" the student what metacognitive processes and strategies to adopt from a recipe of potential intellectual attributes; the teacher is mediating the student to experiment with, and critically examine, their own mental methods of learning as well as observing and adopting the metacognitive prowess of others.

The term "metacognitive" within the description of a mediated metacognitive pedagogy describes the mental control or self-regulation that students exhibit before, during, or after, any given learning task (reading comprehension, for the purposes of this study). The two mental processes or capacities of imagery and inner language provide

the metacognitive nucleus around which students strategies will be discussed and fostered. The intellectual ways that students incorporate imagery and inner language to help them understand before, during, and after, reading material are being directly addressed within this treatment. Sessions were designed to introduce students to a variety of strategic applications of imagery and inner language beyond literal recall to include analysis of unfamiliar words, categorizing information, making inferences, drawing conclusions, and forming opinions and evaluations of information read. Although the researcher focused on a range of strategic applications of imagery and inner language throughout the six intervention periods, a second purpose of each session was to model for professionals how to infuse metacognition across the curriculum. Reading comprehension provided the intervention focus, but a more global application was constantly discussed with professionals throughout the 12 week intervention period. Essentially the treatment is considered a model of the change process, addressed within Part I and Part II of this work, which seeks to elevate the importance of mediated metacognition as a primary educational ideal, through an example of a pedagogy which re-orients the teaching learning process away from the "banking" educational experience described by Freire (1970, 1973) or the "correct answer" paradigm presented by Gardner (1991) and Perkins (1987). This intervention is felt to exemplify the changes of paradigm that are offered within Part II; a mind-set is being modelled for the professionals which attempts to link a philosophy and a psychology of learning through mediated metacognition. To reiterate statements made under the description of the quantitative aspect of this study, the intervention is considered an exploratory inquiry, seeking to introduce an alternate pedagogy rather than to relate cause and effect. In short, it seeks to discover the efficacy of this approach rather than analyze specific variables within this approach.

A mediated metacognitive pedagogy describes a dynamic relationship between teacher and student in learning, which can be further described as a mutual metacognitive

intimacy that is achieved through dialogue about learning. This pedagogy seeks to establish a proleptic expectation towards an understanding of the metacognitive manner through which meaningful learning occurs (or fails to occur). Proleptic expectation describes the subtle expectation that a mediator can offer to the learner to prompt more meaning oriented behavior. It describes a culture of learning which anticipates student demonstration of thinking behavior. If a student knows that they are expected to be responsible for giving reasons for their mental actions, they learn to consider these actions more carefully. They learn that they are expected to take control of their learning because they know that the teacher will seek knowledge and proof of this control through an ongoing dialogue that demands reasons for mental actions. This expectation helps prevent superficial learning that occurs when students arrive at answers without knowing how or why their answers can be used or applied to future learning. Simply stated, the teacher asks the student to behave meaningfully for themselves and, because of this expectation, students learn to consider the "why" and "how" factors of their own learning behavior. This is described as an emancipatory or liberatory pedagogy in a Freirian sense because it empowers a student to constantly self-analyze their intellectual methods of dealing with information, and in so doing, fosters an intellectual modifiability that may not otherwise have emerged. It is described as an emancipatory or liberatory pedagogy in a Vygotskian sense because the social context in which learning occurs encourages student self-control and autonomy in their own learning. The teacher is constantly evaluating the parameters of student understanding and adoption of metacognitive strategies; instruction is scaffolded towards the expectation of cognitive flexibility and change. Each student's "zone of proximal development" is viewed from an intellectual, as well as an informational perspective.

More specific to classroom instruction, a mediated metacognitive pedagogy utilizes a perpetual Socratic dialogue that seeks to constantly reveal student metacognitive behavior before, during, and/or following any given learning task. Each

question from the teacher is designed to expose such behavior, and each response from the student provides an impetus for the next teacher question. Over time, this Socratic process reveals a progressively more insightful profile of student mental behavior that provides an instructional agenda which values an anticipatory modifiability in metacognition. If we don't talk about the ways students attempt to seek meaning, we don't know whether meaning occurs.

The Socratic dialogue also provides professionals with student metacognitive information upon which to scaffold further instruction. The teacher becomes aware of each student's degree of metacognitive potential to modify the way they approach a learning task. Through learning activities, students are constantly challenged to attempt metacognitive sophistication that is tailored or scaffolded to their optimum level of individual needs. The aim of such scaffolding is to encourage intellectual change through balancing individual student's comfort zones to change, with the highest level of abstraction and depth that can be attained at that particular time and place.

A third classroom instructional strategy within this pedagogy is explicit dialogue about metacognition; classroom discussions of learning behavior set an expectancy for metacognitive change and also serve to demystify what is meant by learning behavior for parents and students. Discussions are accompanied by learning activities which give students opportunities to better understand how learning occurs and how they can begin to take charge of their own mental habits of mind. A variety of cooperative learning opportunities are designed to augment explicit dialogue and raise individual metacognitive awareness, as well as foster an appreciation within the students that different people assume metacognitive control in different ways and that students are in charge of their own unique form of mental sophistication. An intimacy develops between learning knowing and knowing learning.

A fourth instructional strategy is described as proleptic expectancy: this strategy is implicit and involves the social culture surrounding a dialogical teacher-student

relationship. If this relationship values student autonomy, then this expectation provides an optimum atmosphere for a hidden curriculum that serves as a catalyst for students to assume this self-control. Students will sense this philosophy of the relationship between teacher and student that helps establish a myriad of subtle mental expectations that may not emerge under a different culture of learning.

A fifth instructional strategy will be the introduction of individual student "thinking journals". Students will be given frequent opportunities to reflect upon and record their changes in how they regulate their learning during reading. Journal entries will sometimes be structured through teacher-posed questions which focus on metacognitive reading comprehension strategies before, during, and after reading opportunities. Students will be encouraged to evaluate their attempts in modifying their own strategic methods of applying imagery and inner language across a wide range of reading material. Journal entries will be discussed in groups to raise individual student awareness of other students metacognitive applications, and to encourage all students to attempt mental control and change. These journals will help professionals experiment with activities between intervention sessions, and will provide opportunities for the researcher to discuss classroom applications between sessions.

The instructional strategies described are not new in and of themselves, they are being offered together and described as a mediated metacognitive pedagogy.

Before beginning the intervention, all classes were given pretests. Following the pretests, each of the three classes receiving the intervention were introduced to the study through a general discussion of the purpose of the research and a simplified description of what is meant by "thinking about thinking" or metacognition. The terms "imagery" and "inner language" were also introduced and discussed.

Please refer to Appendix D for individual session activities and correspondence to professionals and parents.

TREATMENT SCHEDULE:

Pre-Interviews for Triads, Parents, Students
Pre-Assessment administration to students

Description	Time		Role of Researcher as:
Group discussion with triad members (N=3) to explain the purposes of the study. Initiation of a "thinking log" for triad members to reflect on increments of change in their own classroom practices and beliefs. Group discussion with parents to explain the purposes of the study. Initiation of a "thinking log" for parents to record student's changes in metacognitive behavior. (N=3)	Week 1		*Director*
Group discussion with students to explain the purposes of the study and to introduce "thinking about thinking". Initiation of a "thinking log" for students and parents.	Week 2		
Classroom activities to explain Metacognition/ Imagery/Inner Language. Corresponding information sent home to parents.	Week 3	Session 1	
Classroom activities to explore metacognition and reading comprehension. Corresponding information and activities sent home to parents.	Week 4	Session 2	
Reinforcement of metacognitive instruction before, during, and after reading. Student opportunities to explore their own metacognitive behavior.	Week 5	Session 3	

Student opportunities to explore the meta-cognitive behavior of peers.			*Director Mediator*
Corresponding information sent home.			
Meetings with triad members to evaluate progress; beginning of initiative to move from Director to Mediator of study objectives.	Week 6		
Brainstorming future activities across a broader range of reading material.			
Classroom activities presented jointly by researcher, resource teacher, and classroom teacher.			
Mediation of planned activities.	Week 7	Session 4	
Continuation of thinking logs.			
Brainstorming session following classroom activities.			
Corresponding information sent home.			
Repeat of Week 7	Week 8	Session 5	
Triad initiated activities to augment and reinforce metacognitive behavior.	Weeks 9 - 12	Session 6	
Role of researcher changes from Mediator to Facilitator to Observer during this time frame.			*Director, Mediator Facilitator*
Post-testing schedule of students.			
Final entries of "thinking journals" for student self-appraisal of metacognitive change.			*Director, Mediator Facilitator, Observer*
Collection of parent opinions and updated information from the study.	Post-Testing		
Discussion of the agenda to maintain the focus on metacognition.			

Ethical Considerations:

This study has been ethically approved through the graduate studies ethical committee of Dalhousie University. Official approval appears in Appendix C.

Permission to proceed with this study was requested in writing from the Superintendent of Kings County District School Board, followed by an in-depth discussion of the purposes of the study, including any potential issues of confidentiality or concerns that might potentially arise.

Parent permission forms were signed for all students participating in this study. Testing results were kept strictly confidential and no student names appear in this document, or will be released for any purpose, unless signed permission is obtained.

Administrators and involved staff were informed of the purpose and methodology of the study and signed permission forms were obtained from all participating professionals. Names of professionals, parents, or students will not be included in any published or unpublished documentation. (See Appendix C for permission letters.)

Assumptions / Limitations

The most obvious limitation of this exploratory study is the very brief intervention period of twelve weeks; the process of learning self-control in learning is obviously a long term goal for students, parents, and educators. The assumption is presented that this study represents a very early initiation towards this direction that may apply to the learning of all students across the curriculum, at all age levels.

A second limitation of this exploratory study occurs within the standardized reading comprehension measures employed within the quantitative design. Improvement on these measures cannot be directly linked to changes in the metacognitive behavior of students. The assumption is made that at least a portion of change within test scores can be attributed to more sophisticated application of strategies presented during the intervention.

A third limitation of this study is concerned with the qualitative interviewer design. An element of coaching towards the purposes of the study during interviews is unavoidable. The inclusion of a pre-post interview design and the use of an impartial interviewer helps compensate for this limitation, but the "coaching" variable remains a concern.

CHAPTER XII A MEDIATED METACOGNITIVE SCHOOL RESEARCH STUDY: RESULTS AND IMPLICATIONS

Introduction:

The purpose of this exploratory study is to illustrate the application of a mediated metacognitive pedagogy through helping students become more aware of how they can control meaning seeking behavior when reading. Results and discussion of the school-based research portion of this work begins with a detailed description of the six classroom intervention sessions accompanied by researcher observations and student work samples. Quantitative comparisons will then be presented employing a parametric T-score statistical analysis to evaluate pre and post test results on three measures of reading comprehension for each student. Qualitative data will be reviewed through examining pre and post interview data of professionals, parents, and students. The chapter will close with a discussion of the results of this work in terms of the teaching/learning process and the implications of applying the presented philosophy and psychology of learning to classroom practice.

A) CLASSROOM SESSIONS -- OBSERVATIONS AND STUDENT SAMPLES

Each of the six sessions of the intervention was designed to explore a particular aspect of the usage of imagery and inner language before, during, and after reading, ranging from memory levels of representation to higher order critical thinking aspects of reading (analysis, synthesis, inference, problem finding and problem solving). Students are being encouraged to think about and experiment with their images and inner language to allow them to represent and manipulate the information provided, as well as to attempt to reinvent prior understandings into new meanings (reflection and prediction). Essentially the learner is being coached into becoming their own pilot during the learning process.

Session one concentrated on opportunities for the students to think about their "private voice" and "pictures" in their heads when listening to a story. This activity links storytelling and listening comprehension with later reading comprehension through a focus on imagery and inner language as vehicles through which students seek and gain meaning. When young children listen to a story (or adults, for that matter), they are inadvertently being encouraged to image scenarios and engage in inner dialogue because no pictures or printed words are present. Explicit and implicit dialogue about imagery and inner language may help these learners form more vivid and meaningful representations. When children are introduced to print largely through picture books, many learners may fail to apply their listening strategies to this new learning task. It may well be that the pictures in picture books replace, or prevent, internal images and the printed words similarly replace the need for inner dialogue. The focus on imagery and inner language may help the learner maintain reading comprehension engagement by encouraging the continuance of listening comprehension as a simultaneous expectation to decoding words.

Applying this session to the model of metacognitive development within Part II, both processes are being explicitly discussed and applied, illustrating for the students ways of engaging in the story, strategically. Through discussing both processes explicitly, then implicitly anticipating application by the student, the notion that both processes can "tow" listening comprehension is being applied; the more the student attempts to use imagery and inner language, the more engaged they become in the listening process and, therefore, their comprehension is improved.

The book Sleeping Dragons All Around (Fitch, 1989) was read to the class and a discussion was prompted about what their images looked like and what their inner voices sounded like. Students were then questioned about their usage of both processes during their own reading to seek meaning. A variety of questions was posed to each class about individual characteristics of imagery and inner language: Are your images in

color? Always? Do they look like a snapshot or a movie? Can you make the images of different characters speak in different voices? Can you do this with other sounds like rain or thunder? Do you ask yourself questions when you read? How often? Do you think these questions help you understand better?

This group dialogue prompted a great deal of discussion in all three classes. At the beginning of session one many students were somewhat mystified about the terms "imagery" and "inner language". However, by the end of the discussion period most students were actively involved in their own self-analysis of how they attempt to understand what they listen to, or read, for themselves. An interesting observation of the classroom discussion is concerned with the range of usage of both processes at this grade level. A small number of children did not believe that they could image at all. Similarly, some children did not think that they ever "talked" to themselves when listening to a story or reading for themselves. Many children reported that their images were always in color, but some insisted that theirs were black and white. Most children were capable of moving their images, but some could only conjure up "snapshot", stationary representations. It was certainly evident that not all children image or speak to themselves in the same fashion. A great deal more research is necessary to evaluate the nature of both processes, as applied to listening comprehension.

Session two was designed to provide opportunities for students to apply imagery and inner language directly to the reading process. The role of the mediator is also being modelled for professional staff through employing "reciprocal teaching" methods from Palinscar and Brown (1984), as well as "distancing" techniques from Sigel (1982, 1990). Reciprocal techniques involve dialogue with students (and among students) about explaining and sharing their own learning behavior. The teacher's role is to keep the dialogue active through posing more questions which prompts further student evaluation. The self-questions and images that occur help the students to distance themselves from the immediate task of decoding words towards searching for meaning. The students are

being encouraged to read while thinking about their own usage of imagery and inner language. Here again, the notion that their metacognitive behavior can "tow" the student towards making such behavior more abundant, flexibly applied, and eventually automatic, draws the student into more meaning oriented reading behavior.

Students were first reminded of the terms "imagery" and "inner language", followed by a group discussion of individual characteristics of each process from material in their personal background experience. Following this discussion, reading passages were modeled encouraging students to place a "P" for picture above any word or phrase which prompted an image as they were reading. The students then reread the passages and placed a "Q" above any word or phrase which prompted internal questions. Following this exercise, a group discussion was initiated to evaluate which mental process individual students found easier and how useful both processes could be in helping to remember and understand written material.

It became obvious to the researcher that the children at this level had experienced few opportunities to overtly discuss their reading behavior through imagery and inner language, an assumption that is later verified through teacher post intervention interviews. Many of the students' comments during and after this activity allude to their understanding of reading as a purely decoding process. Many were unaware that they could, or should, exert mental control -- "Nobody told me I should picture", "I didn't know to do that at the same time", were common comments from all three classes. These observations illustrate the notion that unless we make metacognitive behavior both an explicit and implicit aspect of instruction, many students may fail to apply useful trategies for themselves, by themselves. Indeed, part of the purpose of suggesting paradigmatic changes is to avoid metacognitive "luck" in applying a useful strategy, or negative metacognitive behavior which may adversely affect future learning in an affective sense.

When students were asked to write down some of their self-questions and images, a range of applications in terms of quantity and quality emerged which illustrated to the researcher the need to explore the "modifiability" of both processes. Some children's self-questions were considered very literal or "elementary" in Vygotskian terms. For example, one child's question to the phrase, "he needs an ax" was "how big is the ax", a sample of a self-question that may not lead the learner into meaningful insight and is considered more a question for the sake of a question, rather than helping the learner predict potential story outcomes. A second student's response was, "I wonder if he is really going to kill the runt", a question which may help the learner anticipate potential story sequence. Through exposing these self-questions, it may be possible to prompt more sophisticated questions across a broader range of representation to seek meaning. The more children are encouraged to ask themselves questions, perhaps the deeper and more sophisticated they will be able to represent their thoughts. It may be possible to detach a child's dependence on presented information towards reflection and prediction which involves making more sophisticated judgments and opinions through inferences not immediately present in text.

STUDENT SAMPLE #1 GUIDING IMAGERY AND INNER LANGUAGE ("P"s and "Q"s)

CHARLOTTE'S WEB

"Where is Papa going with that ax?" said Fern to her mother as they were setting the table for breakfast.

"Out to the hog house," replied Mrs. Arable. "Some pigs were born last night."

"I don't see why he needs an ax," continued Fern, who was only eight.

"Well," said her mother, "one of the pigs is a runt. It's very small and weak, and it will never amount to anything. So your father has decided to do away with it."

"Do *away* with it?" shrieked Fern. "You mean *kill* it? Just because it's smaller than the others?"

Mrs. Arable put a pitcher of cream on the table. "Don't yell, Fern!" she said. "Your father is right. The pig would probably die anyway."

Fern pushed a chair out of the way and ran outdoors. The grass was wet and the earth smelled of springtime. Fern's sneakers were sopping by the time she caught up with her father.

"Please don't kill it," she sobbed. "It's unfair."

Mr. Arable stopped walking.

"Fern," he said gently, "you will have to learn to control yourself."

"Control myself?" yelled Fern. "This is a matter of life and death, and you talk about *controlling* myself!" Tears ran down her cheeks as she took hold of the ax and tried to pull it out of her father's hand.

"Fern," said Mr. Arable, "I know more about raising a litter of pigs than you do. A weakling makes trouble. Now run along!"

"But it's unfair," cried Fern. "The pig couldn't help being born small, could it? If *I* had been very small at birth, would you have killed *me?*"

Mr. Arable smiled. "Certainly not," he said, looking down at his daughter with love. "But this is different. A little *girl* is one thing, a runty pig another."

"I see no difference," replied Fern, still hanging onto the ax. "This is the most terrible case of injustice I ever heard of."

A queer look came over John Arable's face. He seemed almost ready to cry himself.

"All right," he said. "You go back in the house and I will bring the runt when I come in. I'll let you start it on a bottle, like a baby. Then you'll see what trouble a pig can be."

E. B. White. *Charlotte's Web* New York: Harper and Row, 1980.

Observations during and after this activity again suggest a broad range of student application of both processes, similar to those reported from session One concerning listening comprehension. Some children found the exercise very difficult for one or both processes, even though they had no difficulty decoding the passage. Others reported that they "never see pictures in their head when they read." One young man commented that he could only make pictures or questions if he stopped reading, but never at the same time as reading. Some students reported easy usage of both processes together, while others expressed a definite preference for either imagery or inner language. It would seem a reasonable assumption, however, that given long term practise employing a variety of materials and activities to prompt students to activate and apply imagery and inner language, some learners can learn to focus their reading on meaning, and they will learn to apply both processes at a more and more automatic and sophisticated level of metacognitive control.

Parent information was sent home with the children, along with a reminder to log their thoughts when working with the children at home. (See Appendix D)

Session three was designed to apply imagery and inner language to vocabulary development as a form of seeking meaning and understanding for unfamiliar words during the reading process. A chart of common scientific prefixes and suffixes was provided to the children and explained. The word "Lineatus Bicephalotriped" was written on the board and the students were asked to try to picture the imaginary creature in their heads and then draw their animal. The same mediated metacognitive approach is being applied at a word level of analysis: students are being coached into applying imagery and inner language through explicit and implicit dialogue, and opportunities for students to share their strategic applications are provided to foster this form of intellectual flexibility, puzzlement, and experimentation.

Many of the children expressed surprise that parts of words have meaning. The dialogue with students and between students prompted many questions which extended

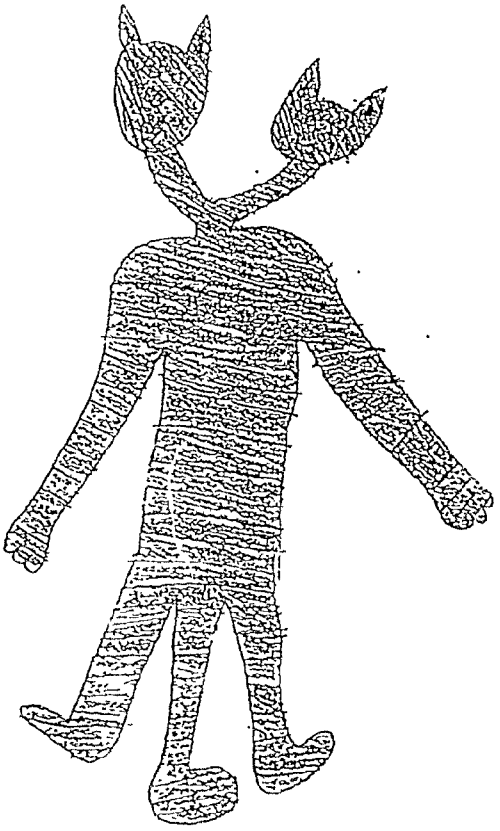
beyond the scientific words presented. Questions such as, "Do all word parts mean something?" and "Why did they use quadro for four?" were common to all classes and illustrate that many students may never have been presented with the opportunity to pose questions about strange words, or to share their questions with peers. Through imagery and inner language, these students are learning that word parts can maintain meaning and that they have choice in experimenting with a variety of ways to seek this meaning. Essentially, the students are learning how to consider seeking meaning. This dialogue helps the learner mentally move away from the "banking" nomenclature of Freire (1970, 1973) or the "correct response" nomenclature of Gardner (1991), Perkins (1987) and Paul (1990). The student is being coached into learning that parts of words maintain meaning and that they can help themselves access this meaning through their choice of self-questions and/or images.

STUDENT SAMPLE #2 DRAWING A LINEATUS BICEPHALOTRIPED

CREATURE VOCABULARY CHART

[illegible]	melano — black
[illegible]	leuco — white
tri — three	erythro — red
quadro — four	bruno — brown
penta — five	lineatus — lined
pedi — foot	punctata — dotted
cornis — horn	
cephalus — head	

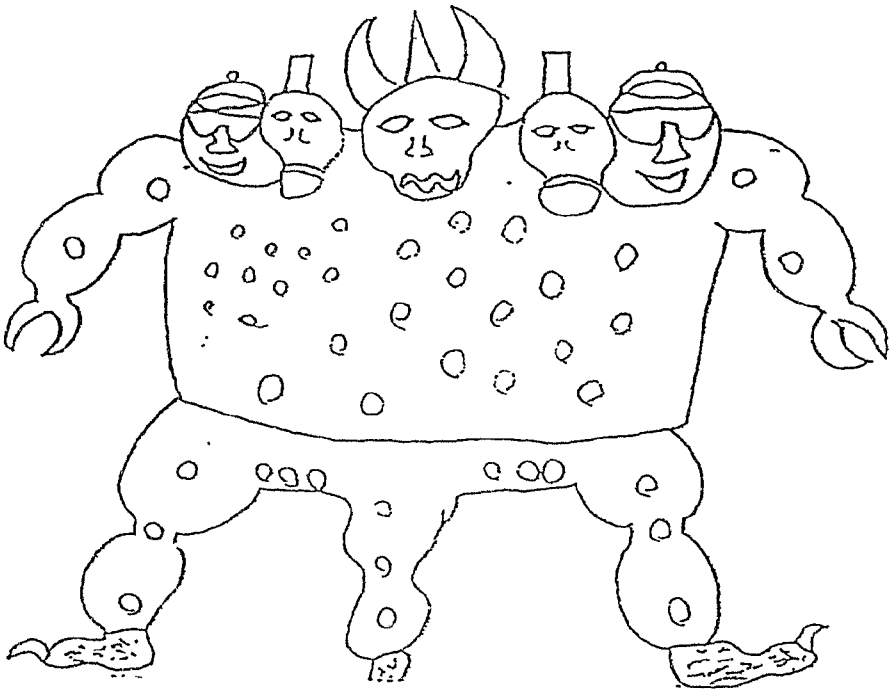
Draw a picture of a Lineatus Bicephalotriped.



Following this activity students were asked to make up their own creature choosing prefixes and suffixes from the provided chart. A group discussion about how scientists name plants and animals and how we can gain meaning from parts of new words to help us make images and ask ourselves better questions preceded the naming and drawing of their own creature.

STUDENT SAMPLE #3 STUDENTS NAMING THEIR OWN CREATURE

2. Make up your own name for your own monster. Draw your monster below. rricornispentocephaluspunctata



The students thoroughly enjoyed creating their monsters. Every child in all three classes was able to apply the scientific prefixes and suffixes appropriately and were also able to draw meaningful renditions of their creatures' names. An interesting group discussion during drawing revealed that although most children could imagine the entire

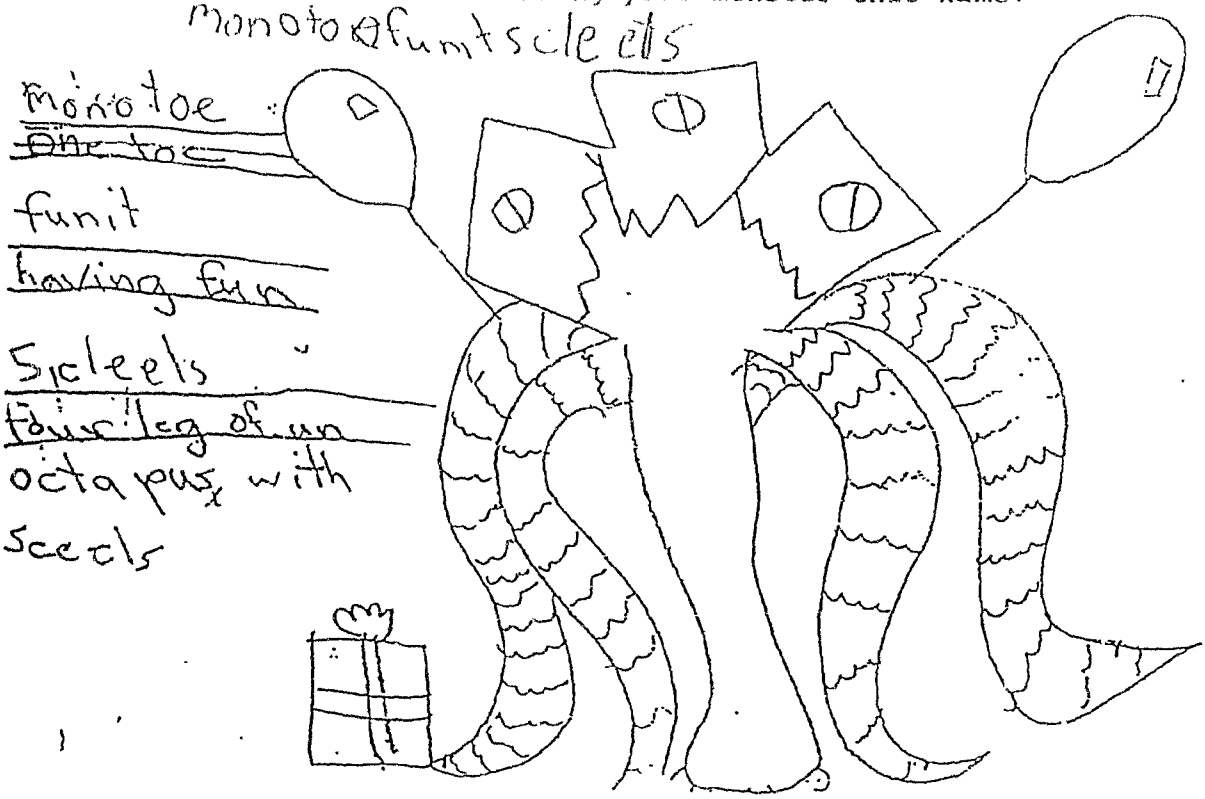
picture of the monster before drawing some children were unable to do so and applied the strategy of drawing portions of the ster without knowing how the final product would appear. One wonders whether this failure is because these students do not know how to plan their thinking by representing their learning approach through internal images and/or self-questions. Perhaps some young learners impulsively jump into an activity without planning, monitoring, or predicting potential learning outcomes. Perhaps they do so because the teacher does not set up the learning task with these expectations in mind.

The children were then asked to make up their own name and drawing for a creature not using any prefixes or suffixes from the chart. They were also requested to provide reasons for the parts of their name.

STUDENT SAMPLE #4 GIVING REASONS FOR NAMING CREATURES

3. Make up a new name for a monster that isn't taken from the chart. Give reasons for calling your monster this name.

Monotofunitscleets



The sophistication with which the children named their own creatures varied greatly across these classes. Some children invented extremely creative word parts which resembled common letter patterns and which provided meaning in a descriptive and/or functional sense.

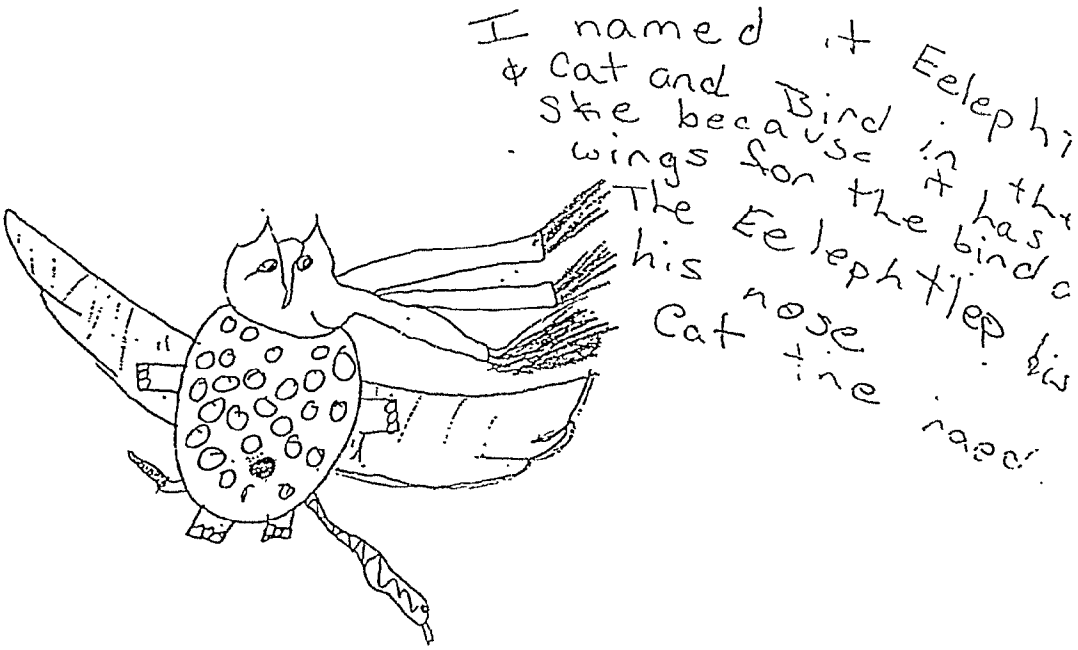
This student first "talked" to himself to invent the name of his creature (Sample 4), then imaged the creature after completing the full name. The level of sophistication may also indicate sophisticated usage of both processes for this activity.

Some students had difficulty inventing their own name (Sample 5). The difficulty could be related to inexperience or immature knowledge of word structure, or could be related to an inability to self-direct their learning through internal questions. It may also be arguable that some children have not learned how to distance themselves from teacher directed activities (Sigel, 1990) to a degree that enables them to engage in an open-ended activity, which demands a degree of metacognitive sophistication.

STUDENT SAMPLE #5 IMMATURE SAMPLE OF CREATURE NAMING

3. Make up a new name for a monster that isn't taken from the chart. Give reasons for calling your monster this name. Draw this creature.

Eleptlex Cat and Bird in the sky.



This student failed to apply the concept of naming for function and/or description with a single word. This student drew the picture first, without knowing what the entire creature looked like, until completely drawn and then attempted the naming process. It would have been interesting to pursue changes in this student's strategic sophistication in trying to image the entire creature before drawing, or in trying to invent a name before drawing the creature, had time permitted. It would also have been interesting to apply similar imaging strategies to words they encounter in their own reading; perhaps having the student associate a meaningful image to new words would help them retrieve word meanings for future use.

It also raises an interesting potential linkage between learning word meaning and the form of representation a child chooses. Perhaps some children impulsively choose an initial strategy that really doesn't work that well; if the student above had attempted to name the creature first, would her name and drawing have been more sophisticated? Did she simply forget to pose self-questions because she wanted to do the drawing? Can we teach children to seek better forms of representation? All children?

Session four is to provide students with opportunities to experiment with imagery and inner language at differing levels of abstraction ranging from memory of rote facts to more sophisticated analysis and synthesis of information, as well as inference of information not provided.

These activities continue to encourage the students to read for meaning through experimenting with representations they may not have attempted before, or through re-affirming and practicing strategies they may have experimented with themselves. The first activity was designed to illustrate for students (and professionals) how to apply imagery during the reading process. Although a number of researchers have examined imagery and reading comprehension (Pressley, 1976, 1977; Paris, 1991), this activity encourages the student to attempt a more sophisticated topographic representation that may or may not be related to future applications for mathematics problem solving and/or study skills. Again, to revisit the metacognitive model presented within Part II, focusing directly on the process itself from early age, may help the student sophisticate the symbolic level of representation beyond picture-like images to images based on allocentric representations (Siegler, 1991) which enable the student to represent many images in relation to each other from a variety of perspectives. Imaging your house from a side view is not the same as imaging your house from a bird's eye perspective. To this author's knowledge, very little research has addressed the ontogeny of imagery in terms of more symbolic forms of representation, yet if this process provides a major avenue to helping a learner consider a problem, then the need for more study becomes clear.

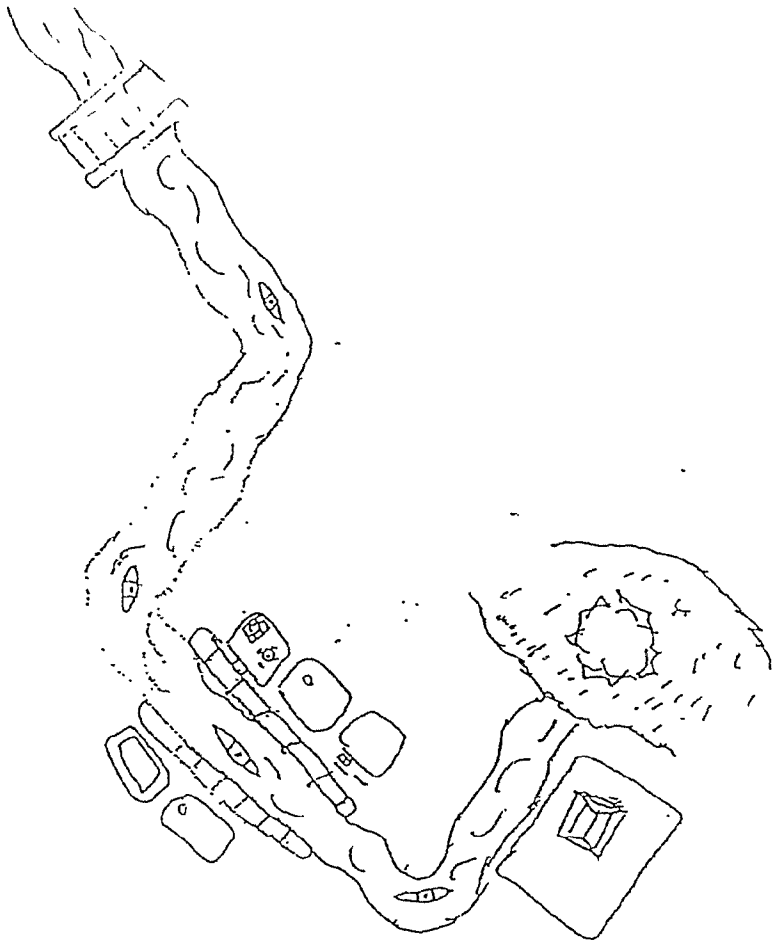
The following passage was introduced to the children and they were asked to image, or map out, what they saw as they read.

> A man is rowing a boat down a river. He travels 5 kilometers and then passes underneath a bridge. Just past the bridge the river turns sharply to the right and the man continues rowing for another 5 kilometers. The river takes another sharp turn to the right as it flows through the middle of a small town and the man keeps rowing for another 5 kilometers. The river takes another sharp turn to the right beside a large church and the man keeps on rowing for another 5 kilometers.

Draw a map of the man's journey showing the river, the bridge, the town, and the church.

It is interesting how some children are able to image from a topographic bird's eye view compared to other children that seem to have to represent in a flat, horizontal plane. Student Sample #6 represents a student with a very sophisticated map-like, or more abstract, representation from the paragraph.

STUDENT SAMPLE #6 SOPHISTICATED SAMPLE OF IMAGING FROM READING

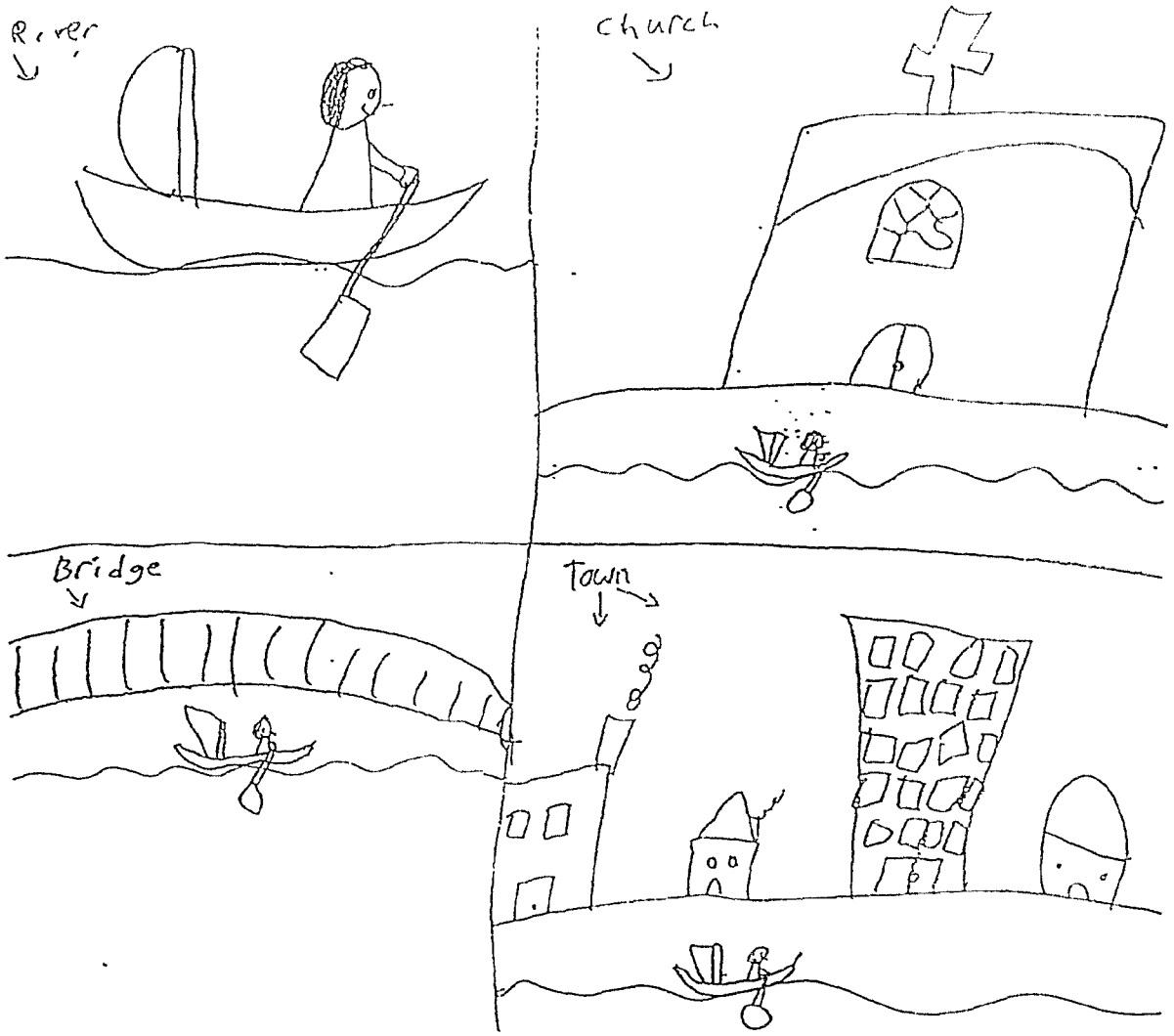


Notice how this student has even represented a top-down view of the boat, the river, and buildings. Compare this to Student Sample #7. This student chose to provide picture-like vertical views to represent their images. The question remains, "Is a top-down view a more abstract representation for children? Can we encourage or help children to develop this more abstract level of representation?" Does a topographic view enable a learner to better represent information in other subject areas? Is this form of representation a precursor to the ability of some students to rotate shapes internally or form their own conceptual graphic organizers?

The reader may also note that the topographic imager did not correctly represent the printed directions which should have formed a square shape; even more sophisticated images must be accompanied by an inner dialogue which helps orient and monitor the learning task. The relationship between both processes as a learner seeks meaning is felt to be an extremely important direction for future study, a point of view expressed within Part II, as a life-long mutual sophistication. Exposing children to a variety of strategies employing both processes may help provide them with a better mental "tool-box" to cope with future learning tasks. The need for continual dialogue about the learner's representation also accompanies this importance. Children have to be asked about their representations and to be given opportunities to share their representations with peers to become aware of what is in their mental tool-box and they need lots of opportunities to practice and experiment with their mental tools so that they are used across a wide variety of problems.

STUDENT SAMPLE #7

UNSOPHISTICATED SAMPLE OF IMAGING FROM READING



Activity two was designed to explore how children infer, analyze and synthesize information through self-questioning. A passage was given, and the students were asked to provide reasonable explanations of the meaning behind the passage and reasons why they felt these explanations were valid.

This activity was preceded by a class discussion of what sorts of questions to ask oneself. The large majority of children in all three classes experienced initial difficulty expanding their questions into what Freire (1973, 1982) and Shor (1987, 1992) would term "problem posing" rather than "problem solving" self-questions. The former requires inference and divergent thinking applications; the later requires more analysis and synthesis of presented information through a more convergent questioning process. A mediated metacognitive pedagogy attempts to directly address the nature of self-questions, giving students the opportunity to practise higher order inferential and opinion forming applications. The need emerges for teachers to become knowledgeable about how to coach the learner into applying "higher order" questions, as well as learning how to evaluate the sophistication of such questions across a variety of learning tasks. Figures 8 and 9 within Chapter IX present potential formats through which such evaluation can take place. Again, through focusing on the way the student attempts metacognitive control, and profits from metacognitive mediation, the sophistication of this control may help tow or encourage a student towards adopting life-long strategic application. If a child learns to use appropriate self-questioning or imaging strategies, then their learning success may prompt them to attempt similar mental protocols for new learning tasks. Metaphorically speaking, empowering the learner with better images and self-questions, is like the interest gained from investing money over a life time -- the more money invested, and the longer time, the more financially independent the individual becomes. The more positive images and self-questions a learner applies, the more cognitively self-sufficient they become and, over time, this behavior begets more metacognitive behavior. This contention relies on Vygotsky's notion of proximal development and appropriate scaffolding (Vygotsky 1962, 1978), and opposes those who believe the child's intellect unfolds within its own developmental time frame with or without our help in a Piagetian sense. The contention that the child is not "ready" to learn a given concept gives way to trying to discover the appropriate mediation to coax development along.

STUDENT SAMPLE #8 INFERRING THROUGH SELF-QUESTIONING

The way to do it is actually very simple. First, you put all the things into different groups. Of course, one pile may be enough depending on how much there is to do. If you have to go somewhere else because of a lack of facilities, that is the next step. Otherwise, you are pretty well set. It is important not to overdue things; that is, it is better to do too few things at once than too many. In the short run, this may not seem important, but problems could easily happen. A mistake can be expensive, as well. At first, the whole way of doing this will seem hard. Soon, however, it will become just another thing to do. It is difficult to tell whether people will have to do this job in the future.

After you are finished, you sort everything into different groups again, so that they can be put into their proper places. Soon, they will be used again and the whole cycle will have to be repeated. However, that is part of life.

1. Tell me what could be happening in this paragraph. What reasons do you have for your choices?

① I think that they are doing math becaues it Says that you have to Short them into groups.

②. Do they mean that math is a part of life?.

③. maybe they can be dividing cooking ingreadince.

④. Are they in School doing math and dividing them into different groups?

This student's responses are considered highly sophisticated for this age level. When this student was asked about how she guessed at the meaning of the passage, she said she kept looking for words that would give her some hints and then she imaged people doing different things that suited the words best. She focused on "pile" and arrived at doing math and cooking as reasonable options. She has, therefore, learned to puzzle through problems by applying a reading strategy (looking for key words) through self-questionning and then representing this strategy with imagery to seek meaning and reasonableness.

Many of the Grade 4 children found this exercise extremely difficult, possibly because they have had little experience in this sort of activity at more abstract levels of reading and seeking meaning, and partly because at least for some children, they did not seem to be able to ask themselves appropriate questions to make reasonable guesses or, indeed, even try to make reasonable guesses. It is postulated that for some children with a tendency to wish for information to be spoon-fed, or to become immediately attainable, potential mental consequences may be that they will never develop this level of sophistication of imagery and/or inner language that would enable higher order thinking to the same degree that could otherwise occur. Again, imagery and inner language may help "tow" intellectual metacognitive behavior through puzzlement.

Session five was designed to help children organize their thoughts, and represent their thoughts, through imagery and inner language. The first activity attempts to show the children that they can try to remember lists of information they need by both imagery and inner language, through classifying items according to different properties or functions. An interesting discussion followed this activity with the children comparing which mental process they found easier to employ to help them remember their list of items. Student Sample #9 illustrates a child's efforts to remember some items through imagery in a picture-like form and some items through verbal classification (cars).

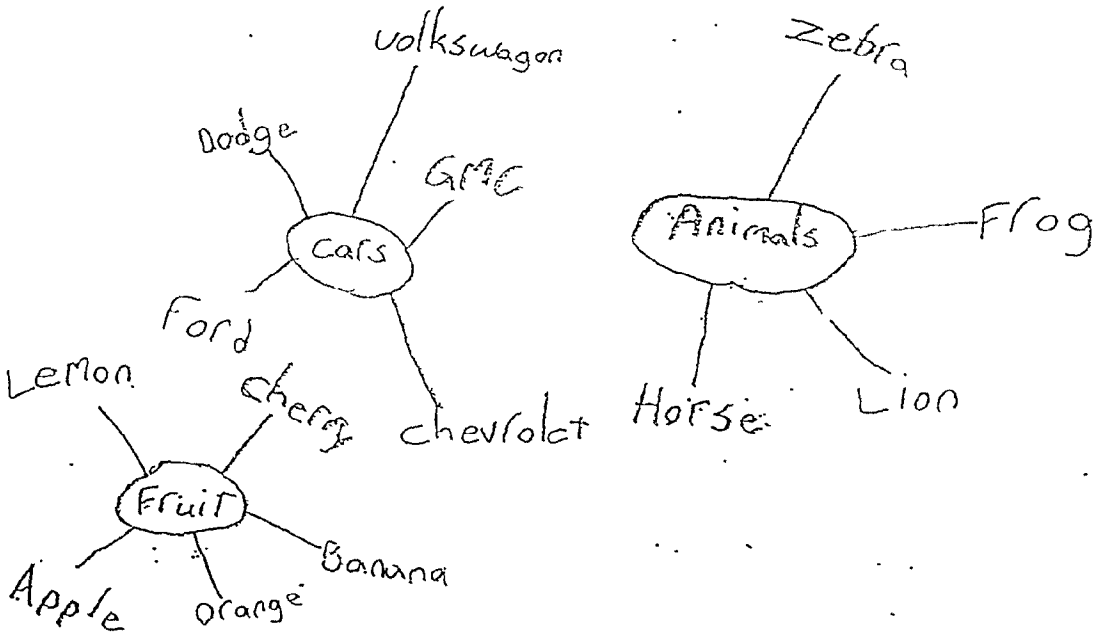
STUDENT SAMPLE #9 PRACTICE IN CATEGORIZING AND RETAINING INFORMATION THROUGH IMAGERY AND INNER LANGUAGE

Did you use imagery or inner language. How?

FIRST TRY: Lion, orange, fish, cherry, Chevolet
Horse, Ford, banana, GMC, zebra, Dodge
Lemon, Frog.

Did you use imagery or inner language. How?

SECOND TRY:



A large number of researchers have examined memory and its relationship to representation (Paivio, 1971; Siegler, 1991; Flavell, 1977, 1966) of information. The working memory capacity of children has also formed a large part of the Neo-Piagetian theories of Case (1985, 1990) and Pascual-Leone (1969). This activity explores the idea that perhaps some of the working memory capacity can be improved through helping children learn how to represent information more efficiently in groups or categories. A mediated metacognitive pedagogy attempts to discuss, model, facilitate, and evaluate student efforts to apply mnemonic strategies to their learning. It may well be that working memory capacity increases with age because of metacognitive memory strategies that the student gradually adopts. If we can help students learn to do this quicker, more efficiently, and with more versatility, then perhaps we are also empowering them with increased memory capacity.

This activity also implicates the representational choice available to learners through imagery and inner language. Sometimes instruments that purport measuring a universal learning construct forget that learners can approach the same learning task in very different ways. For example, the Raven's Coloured Progressive Matrices test, which purports to measure visual/spatial processing, may in fact represent the ability of some learners to "talk" their way through visual spatial reasoning. Similarly, the Digit Span subtest of the Wechsler Intelligence Scales may represent the ability of some learners to "see" orally presented digits within their minds rather than remembering these digits from an auditory memory recall strategy.

A second activity presented the children with an historical map of the Atlantic Region and the students were required to ask themselves as many questions as they could to enable them to study the map in depth. The purpose of this activity was to encourage the students into inferential forms of thinking through guiding them into more sophisticated self-questions. The map approach was selected to demonstrate to the students that we can "read" our own minds for meaning without words, as well as with

words. This activity also helps the student (and professionals) understand the difference between problem solving and problem finding or posing, because they are being asked to consider both what is present and what is not present, as well as providing reasons for their statements. This activity is also felt to provide a metacognitive stepping stone for students to move from "elementary" to "scientific" reasoning in Vygotskian terms (1978), or from monological to dialogical and/or dialectical understandings within Paul's (1990) frame of reference. In other words, many young learners are locked into a very concrete learning world in which everything is black and white. They have not yet learned to consider other points of view, and they consequently form opinions based on superficial understandings. Applying this line of thought to the presented metacognitive outlook of development within Part II, this activity helps the student evolve their metacognitive behavior from self-control at a skill or informational level to self-control of their reasoning and opinion forming ability.

Student Sample #10 illustrates one student's efforts that are considered reasonably sophisticated for a Grade 4 student. Many students had extreme difficulty asking themselves questions beyond simple statements.

STUDENT SAMPLE #10 SELF-QUESTIONING FROM AN UNTITLED MAP

1. Tell me what you think you know about this map. Give reasons for why you think these things?
2. Write as many questions as you can about things you don't know about this map.
3. What can this map tell us about history and the people that record history?

1. I think I know the r is old, Because people dress differint,
2. I think I know there are alot of fish because alot of people are in boats.
3. I think I know people live differnt because they have differnt houses.
4. I think I know there is alot of oxagin because there is alot of trees.
5. I think I know that the person who wrote this is french because all the words are strange
6. I think I know there are no tvs because everyone is working.

It is interesting that not a single student in all three classes responded to question number 2. The students at this level were unable to pose questions to themselves that would consider what they don't know. This is not overly surprising considering that traditional educational methodology is centered around finding facts and problem solving rather than problem finding. The question remains whether a mediated metacognitive pedagogy might help students develop this form of reasoning rather than assuming that students will do this on their own.

Session six was designed to encourage the children to use their imagery and inner language to relate their reading to real-life situations. This form of comprehension requires the student not only to analyze and synthesize information, but also to evaluate and form judgments from the information. These levels of comprehension are not normally addressed or focused upon within the elementary curriculum. Part of the purpose of their inclusion within the intervention is to illustrate the need for this inclusion not only at the Grade 4 level, but from Primary onwards (perhaps before, from a parental point of view).

The activities presented attempt to help the student apply print to related metaphors and look for inferred meaning. Within a Vygotskian perspective, reading has become a cultural tool of mental development which will continue to alter mental development into new forms of sophistication; at this stage reading is critical thinking, problem solving can also be problem finding, monological thought can be dialectical and dialogical thought, and intelligence can become wisdom or the "vital reason" of Pascual-Leone (1969), the liberatory thinking of Freire and/or the emancipatory thought of Habermas (1972). Imagery and inner language, once helping the infant to make sense of their physical reality, are now capable of helping the older student emancipate their thinking from elementary (monological) concepts into more abstract, symbolic, and self-initiated understandings. It may also be that the nature of both processes have also changed with practise at more symbolic applications. The learner may now be able to

represent their thoughts with more schematic, rather than picture-like, images. The learner may be able to saturate words with richer meaning within their inner dialogues. The relationship between both processes may also alter in terms of the speed, variety, and sophistication of representations. This is the level of seeking meaning which places reading as a means to apply information to one's own applications, a level that describes a truly autonomous or self-thinking learner, because the main purpose of reading now has evolved as a tool of understanding, rather than understanding serving as a tool of reading. This is the level where a reader reads for pre-planned purpose and learns to seek printed information to augment actual life concerns. The reader is not only concerned with translating the author's meaning, but they are also verifying their own meaning. At this level, thinking drives the reading process rather than vice versa.

The first passage that the children read was a section from the novel, Charlotte's Web (White, 1980). Student Sample #11 required the children to decide what other choices Mr. Arable had, rather than his decision to kill a runt pig. The children were also asked to try to relate this exercise to real-life events. This exercise was adapted from a similar activity which appears in Swartz and Parks (1994).

STUDENT SAMPLE #11

HIGHER ORDER THINKING SKILLS THROUGH IMAGERY AND INNER LANGUAGE (CHARLOTTE'S WEB)

1) Mr Arable made a decision to kill the runt pig. What other choices or decisions could he have made? List as many as you can think.

1) He could have gave it away.
2) He could have let it live to see if it would grow bigger.
3) He could have let it die on it's own.
4) He could of hurt it instead of kill it.
5) He could of gave it to Fern.
6) He could of left it alone.
7) He could of let Fern cry.
8) He could have sent Fern to her room or grabbing the ax.
9) He could have let Fern scream.
10) He could have saved it's life.

(2) Can you think of any other real life things that would be nearly the same as the disagreement between Fern and her father?

1) In the newspaper, two people were fighting over who would be presadent.
2) In the newspaper, people were fighting over who would be vice presadent.

Again, many of the children had difficulty with this exercise because of their lack of experience in applying imagery and inner language at this level. Some children appear to lock themselves into a very concrete and literal mode of dealing with written information; they find it extremely difficult to read between the lines or produce their own thoughts. One wonders whether these students have had opportunities to attempt linking reading with thinking. Indeed, one wonders what influence a "banking" pedagogy might have on the will or volition of these students to move towards more self-control of their learning behavior. Is it possible that a "telling" pedagogy might even prevent such behavior?

The second activity was adapted from the book, Franklin in the Dark (Bourgeois, 1986). The children read information which tells of a young turtle afraid to be alone in his shell. They were then asked to think of different ways to help Franklin's mother help Franklin to get over his fear of the dark. Student Sample #12 shows amazingly creative responses of one student.

STUDENT SAMPLE #12 HIGHER ORDER THINKING SKILLS THROUGH IMAGERY AND INNER LANGUAGE (FRANKLIN IN THE DARK)

(1) List as many ways as you can to help Franklin and his mother. Please use full sentences

(1) I think telling him good things about shells, will help.

(2) I think his mother should demonstrate going in her shell, and show him there is nothing to be afraid of.

(3) I think his mother should get him a pet, to sleep with so he won't be so scared.

(4) I think he should have a sleep-over once in a while that way he'll see his friends aren't as scared as him.

(5) I think he shoud have a night-light in his shell.

(6) I Think he should ask more people if they're scared of the dark like him.

(7) I think his mother should stay with him until he falls asleep.

(2) Which way (or option) do you think is the best? why? Give reasons.

I pick 7, because he won't be scared because he knows his mom is with him.

Students were also asked to give their opinion of the best option that they selected. Here again, they are being encouraged to exercise their inner language at an evaluation level to decide which of their own options would be most suitable. Given more time, students could also be encouraged to share their ideas and discuss their ideas with their peers. From a more psychological perspective, how many of these children

employed imagery to help them create or invent options? What is the nature of these images in terms of color, perspective, motion or symbolism? Is there a relationship between the quality or quantity of self-questions? What about inner dialogue lending itself more to the affective realm . . . do children generating positive inner dialogues participate in more images or inner dialogue? Is there a relationship between increased usage to achievement? Should we be considering evaluating thinking comprehension rather than reading comprehension? If so, how would such assessment differ from traditional measures of reading comprehension? Again, hopefully, more questions and directions are posed from this intervention that may permit the educator to move in a mediated metacognitive direction.

Taken as a whole, intervention sessions were chosen to sample a range of applications of seeking meaning from print through a mediated metacognitive pedagogy in general, and imagery and inner language, in particular. The range has included listening comprehension, memory strategies, literal recall and word meaning on the one hand, as well as activities designed to illustrate reading and thinking involvement, the so called higher order skills such as analysis, synthesis, inference, and forming opinions, and judgments from print. The purpose of this intervention has been to illustrate how to help students seek meaning and understanding from print. Through imagery and inner language, the students are encouraged to take control of their reading behavior by experimenting with ways to reflect, monitor and predict, during and after the reading process. Reading for meaning could be compared to walking through a giant maze; the intervention is attempting to help the student think of ways to find the exit, rather than allowing them to wander aimlessly. The hope is that the student will learn to apply these strategies to the next maze and will constantly be evaluating newer and more efficient means of escape. First the student must recognize that they are in a maze and that they want to escape. Then they must be willing to be coached into considering strategies. They may learn these strategies from peers or adults and they may experiment with

options for themselves. When they escape they will share their strategies with others, take pleasure in doing so, and look forward to the next maze.

It is this mind-set under a mediated metacognitive pedagogy that is being presented, rather than a specific curricular focus. The notion that similar activities and similar inteventions under this mind-set can be applied across grade levels and subject levels is being presented for future inquiry. In a more general sense, what is being represented is a way to infuse children's metacognitive sophistication and critical thinking ability as a necessary and important ideal for all educators (and parents and students) within the teaching-learning process. Such a pedagogy does not distinguish reading comprehension from critical thinking or the exceptional from the regular or gifted learner. The intent and purpose is the same: reading for meaning is thinking and any increment of sophistication is appropriate for all learners. The evolution of the young reader's thinking during reading, towards reading for thinking, describes the maturing purpose of the reading process which begins initially as attempts to make sense from print and then gradually transforms print as a tool for mental development in helping mature the sophistication of thought. A similar parallel would be the change from a child's early attempts in understanding underlying concepts of numbers into using these concepts of numeracy for self-directed thought. Imagery and inner language serve as the vehicles through which cultural signs (letters and numbers) become mental tools of thought (thinking in words and numbers).

(B) QUANTITATIVE STUDY RESULTS:

Treatment Effect on Reading Comprehension

Before presenting empirical data, it is felt important to express what is hoped to be gained from this aspect of the study design. The linkage of traditional measures of reading comprehension to an exploratory mediated metacognitive intervention is being sought in general terms without seeking specific cause and effect variables within this interpretation at this time. This is considered an important premise to this study because although the predominance of focus on imagery and inner language within the intervention cannot be assumed to be directly responsible for potential gains in comprehension, the contention remains that gains may be related to this predominance. The empirical data seeks knowledge of a relationship, rather than proof of reasons for the relationship. A secondary benefit of any statistical relationship which emerges may also be the knowledge that traditional measures of reading comprehension are in some fashion also tapping in on meaning seeking behavior in general, and metacognitive behavior in particular.

Tables 1 through 4 are presented as raw score pre-post test data of four classes of Grade 4 students: three classes received the mediated metacognitive intervention and a fourth class served as a control comparison. Equivalent forms of a Grade 4 level of the Alberta Diagnostic Reading Comprehension Test and the Analytic Reading Inventory were administered as pre and post comparisons. A Cloze Test from the Alberta Diagnostic Reading Inventory was also administered to provide an alternate form of reading comprehension comparison. (Please refer to Appendix E)

As mentioned within the description of methodology (Chapter XI), these measures were chosen because of their focus on a broad variety of comprehensive abilities which range from literal recall and memory of material, to higher order analysis and synthesis of information, as well as inference. Both measures have attempted to

associate specific questions to a variety of comprehension ability and, although this study does not attempt to relate the intervention to any particular form of comprehension, it is felt important to choose measures that make these distinctions because relating the intervention to reading for meaning at a variety of representational levels is the purpose of quantitative results.

TABLE #1 Control Group RAW SCORES

Student	Alberta Diagnostic Reading Comprehension /10			Cloze /36			Analytical Reading Inventory Comprehension /8		
	Pre	Post		Pre	Post		Pre	Post	
A	8	8		29	25		6	7	
B	4	0		4	5		2	1	
B	5	5		11	19		3	4	
D	4	6		25	32		3	2	
E	8	3		31	32		5	5	
F	4	1		19	12		5	5	
G	6	6		26	28		4	4	
H	6	8		25	34		4	4	
I	10	10		33	32		7	6	
A	9	9		32	36		5	7	
K	7	6		34	29		7	7	
L	1	3		22	21		2	0	
B	10	9		35	36		8	8	
N	10	10		36	36		8	8	
O	8	8		33	32		6	6	
I	9	9		35	36		6	5	
Q	7	9		31	32		3	4	
R	5	5		22	27		3	7	
S	5	2		25	25		2	3	
T	9	8		32	32		7	4	
U	4	8		23	21		3	5	
V	7	8		33	35		7	7	
W	10	9		35	36		7	8	
X	8	10		32	31		6	6	
Y	1	2		3	6		0	2	

N = 25

TABLE #2 SCHOOL A RAW SCORES

Student	Alberta Diagnostic Reading Comprehension /10		Cloze /36		Analytical Reading Inventory Comprehension /8	
	Pre	Post	Pre	Post	Pre	Post
A	7	9	24	26	6	5
B	1	9	0	8	0	2
B	8	8	34	35	6	7
D	5	9	16	33	2	5
E	3	5	16	7	5	5
F	1	2	1	3	0	1
G	3	6	16	24	4	5
H	5	9	33	31	5	6
I	7	10	31	36	6	8
A	6	9	26	32	6	4
K	9	10	35	36	6	8
L.	3	8	30	22	7	6
B	10	10	35	36	6	8
N	7	9	29	36	7	8
O	5	7	19	25	3	6
!	5	4	23	20	4	4
Q	5	8	25	33	5	9

N = 17

TABLE #3 SCHOOL B RAW SCORES

Student	Alberta Diagnostic Reading Comprehension /10		Cloze /36		Analytical Reading Inventory Comprehension /8	
	Pre	Post	Pre	Post	Pre	Post
A	6	4	27	27	-	-
B	9	9	33	35	7	8
B	7	10	31	36	6	6
D	5	2	11	29	2	2
E	4	7	24	31	4	5
F	6	8	28	36	4	8
G	7	7	31	36	5	7
H.	6	7	26	29	6	7
I	5	7	31	30	6	7
A	9	10	34	35	6	6
K	4	9	27	32	7	8
L	4	9	27	32	7	8
B	4	6	20	36	3	4
N	6	9	25	36	4	7
O	4	4	16	9	0	1
I	9	9	35	36	8	6
Q	7	9	32	33	5	6
R	3	6	23	24	4	5
S	7	10	32	35	4	8
T	9	9	33	35	8	7

N = 20

TABLE #4 SCHOOL C RAW SCORES

Student	Alberta Diagnostic Reading Comprehension /10		Cloze /36		Analytical Reading Inventory Comprehension /8	
	Pre	Post	Pre	Post	Pre	Post
A	1	1	23	35	6	7
B	1	4	5	20	2	5
B	10	10	35	36	4	7
D	3	7	27	34	6	6
E	1	2	1	4	1	1
F	4	9	13	24	4	6
G	3	7	13	21	-	-
H	6	9	32	28	6	7
I	2	9	27	35	5	6
A	6	8	35	34	7	8
K	5	6	14	24	6	7
L	9	8	26	22	6	7
B	7	10	35	35	6	8
N	5	9	20	34	2	7
O	8	8	32	30	-	-
I	3	8	4	28	2	5
Q	2	6	8	24	2	3
R	7	10	32	36	4	7
S	6	10	30	36	2	7
T	5	9	34	32	5	8
U	6	10	28	35	4	7
V	2	0	3	7	-	-
W	5	8	19	18	2	6
X	6	10	31	35	7	7
Y	4	6	9	18	4	3
Z	6	4	8	17	5	2
AA	6	9	15	33	6	8
BB	4	10	8	36	5	7

N = 28

Table 5 presents the means and standard deviations for students in the control group and the three intervention groups.

TABLE 5 COMPARISON OF PRE-TEST RESULTS

TEST	SCHOOL	#	MEAN	S.D.
Alberta Diagnostic	Control	25	6.60	2.66
Reading Comprehension	School A	17	5.29	2.57
	School B	20	6.05	1.93
	School C	28	4.75	2.38
Alberta Diagnostic	Control	25	26.64	9.22
Cloze Procedure	School A	17	23.12	10.75
	School B	20	27.30	6.23
	School C	28	20.25	11.50
Analytic Reading	Control	25	4.76	2.18
Inventory	School A	17	4.59	2.18
	School B	19	5.05	2.07
	School C	25	4.36	1.82

An analysis of variance procedure (ANOVA) was performed for all three standardized measures to ensure that no initial statistical differences exist between the control and intervention classes. The Alberta Diagnostic Reading Comprehension measure revealed an F statistic of 2.48, (df = 3, 86; p = .0652) indicating no significant differences between groups. A second analysis on the Alberta Diagnostic Cloze Procedure resulted in an F statistic of 2.45, (df = 3, 86; p = .0683) and a third analysis for the Analytic Reading Inventory resulted in an F statistic of 0.42 (df = 3, 82; p = .6856). All three results, therefore, support the contention that the control group and intervention groups can be considered statistically equivalent prior to the intervention period.

A T-score parametric statistical procedure was employed to establish intervention affect through pre/post-test comparisons for all three measures. Table 6 presents the data

under the hypothesis that significant differences will emerge in pre/post-test comparisons for classes receiving the intervention, and that no significant difference between pre/post comparison will emerge for the control class.

TABLE 6 PRE/POST-TEST COMPARISONS

TEST	SCHOOL		#	MEAN	S.D.	t	p
Alberta Diagnostic Reading Comprehension	Control	pre	25	65.600	2.661	0.29	.6886
		post	25	6.480	3.057		
	School A	pre	17	5.294	2.568	4.79	<.001
		post	17	7.765	2.278		
	School B	pre	20	6.050	1.932	3.25	.004
		post	20	7.550	2.235		
	School C	pre	28	4.750	2.382	6.13	<.001
		post	28	7.393	2.846		
Alberta Diagnostic Cloze	Control	pre	25	26.640	9.224	1.29	.2075
		post	25	27.600	9.069		
	School A	pre	17	23.118	10.746	2.04	.0553
		post	17	26.294	11.162		
	School B	pre	20	27.300	6.233	3.36	.003
		post	20	31.600	6.369		
	School C	pre	28	20.250	11.504	4.78	<.001
		post	28	27.536	8.992		
Analytic Reading Inventory	Control	pre	25	4.760	2.185	0.84	.4118
		post	25	5.000	2.217		
	School A	pre	17	4.588	2.181	2.92	.009
		post	17	5.706	2.201		
	School B	pre	19	5.053	2.068	3.12	.006
		post	19	6.105	1.997		
	School C	pre	25	4.360	1.823	4.74	<.001
		post	25	6.080	1.913		

Results clearly support both hypotheses for all three classes undergoing intervention across all three measures of reading comprehension. Highly significant pre/post-test comparisons for intervention classes against results of the control class, which do not meet significance, strongly suggests that a positive relationship exists between the intervention and the children's ability to understand reading material as measured by these instruments. Considering the relatively short study duration (12 weeks), and the period of time between sessions (10 days), these findings are somewhat surprising in the degree of relationship obtained.

Some of this change could be attributed to the children's knowledge of their participation in the study -- the so called Hawthorn effect. It is also acknowledged that the statistical phenomenon of regression to the mean may affect this positive change between pre and post tests and may have particularly affected the measures of fewest questions. (Alberta Reading Comprehension subtest and the Analytic Reading Inventory subtest. At least part of this concern is ameliorated through the inclusion of the control class within the research design, which one could assume would experience the same regression. However, the reader is still reminded of this concern.

The degree of change certainly suggests that the focus on the understanding of their own strategies, through imagery and inner language, has affected and empowered these students to read more meaningfully. It seems reasonable, that some of this improvement can be attributed to a positive relationship between reading comprehension as measured through these instruments, and the mediated metacognitive approach. It may also be reasonable to postulate that at least some of this positive relationship can be associated with the focus on imagery and inner language because both processes received a predominate role within the intervention. The nature of this relationship remains unaddressed and is felt to be an important aspect of future inquiry. The affect also appears to have been particularly beneficial for children experiencing difficulty in reading; the so called "special education" population of young readers. Table 7 combines

students of all three intervention classes that scored fifty percent or less on pre-tests of the Alberta Diagnostic Reading Comprehension Test. Percentage comparisons to post-tests reveal startling improvement for a large majority of children experiencing initial difficulty.

TABLE 7 % PRE/POST-TEST COMPARISONS FOR CHILDREN SCORING 50% OR LESS. (Alberta Diagnostic Reading Comprehension Test)

STUDENT	PRE-TEST SCORE/10	POST-TEST/10	% GAIN OR LOSS
A	1	9	+ 80
B	5	9	+ 40
C	3	5	+ 20
D	1	2	+ 10
E	3	6	+ 30
F	5	9	+ 40
G	3	8	+ 50
H	5	7	+ 20
I	5	4	- 10
J	5	8	+ 30
K	5	2	- 30
L	4	7	+ 30
M	5	7	+ 20
N	4	9	+ 50
O	4	9	+ 50
P	4	6	+ 20
Q	3	6	+ 30
R	1	1	--
S	1	4	+ 30
T	3	7	+ 40
U	1	2	+ 10
V	4	9	+ 50
W	3	7	+ 40
X	2	9	+ 70
Y	5	6	+ 10
Z	5	9	+ 40
AA	3	8	+ 50
BB	2	6	+ 40
CC	5	9	+ 40
DD	2	0	- 20
EE	5	8	+ 30
FF	4	6	+ 20
GG	4	10	+ 60

For some children experiencing initial difficulty, the intervention appears to have "turned on" a comprehensive capacity that was not previously present. Eight of 33 students, or 24.24% of weak comprehenders, gained 50% or better on post-test results. Forty-nine percent of the students improved pre-test results by two fold or better. Indeed, four of the 33 weaker readers tripled or quadrupled initial scores. It is possible that for many of these students, the intervention represents the first opportunity that these learners have experienced to consider their own engagement and control of their reading comprehensive ability. It is also postulated that the locus of inquiry through imagery and inner language has provided many early readers with a metacognitive agenda through which an increment of learning autonomy for gaining meaning from print has been attained. These results also imply that for many children historically termed "disabled" learners or readers, at least an equal consideration should be given to the mediated opportunities that such students have experienced towards improving their metacognitive prowess. The implication is offered that the traditional paradigm of intervention has neglected the modifiability of metacognitive control within each learner and has neglected the importance of the mediated dynamics between teacher and learner in seeking this control. Indeed, it may well be that historic interventions have hindered or prevented a child from gaining control of their learning because the tutor or mediator has inadvertently provided the student with external mental cues and protocols over long periods of time, which have fostered cognitive dependency rather than autonomy.

Four of the 33 weaker readers did not make gains in comprehension. In terms of Vygotsky's (1978) conception of individual "zones" of proximal development, some children will require a great deal more mediated metacognitive experience and, even then, for a small percentage of children, their individual zone of metacognitive modifiability may be marginal at best. For the educator however, there is value in the belief that all children can learn to become more autonomous learners to varying degrees -- all children

can learn to learn better for themselves and can benefit from mediated learning environments which foster such intellectual sophistication.

(C) QUALITATIVE STUDY RESULTS:

Pre / Post Interview Analysis

Pre/post interviews of professionals, parents, and students provide a qualitative perspective of the efficacy of the mediated metacognitive intervention. The method of analysis seeks common threads of evidence from a structured interview format. Outlines of structured interviews are provided in Appendix A and full transcripts of all taped interviews appear in Appendix B. In keeping with the exploratory nature of this study, the interview format is designed to seek a sense of worth and usefulness in the eyes of professionals, parents, and students.

PROFESSIONALS:

(A) SCHOOL ADMINISTRATORS

The most obvious perception in reviewing administrators pre and post interview results is the brevity with which they responded on post interviews. A sort of detached efficacy of the importance of the study emerges which indicates that they felt removed from the actual classroom intervention, but were happy as long as the teachers were happy. Statements such as, "I intentionally stayed out of the study" (School A) and "the reality is that this research project has gone on with my full support, but no involvement on my part in terms of how it went and in terms of any conclusions to be made from it. My teachers are happy and that is all I can say" (School B), may suggest that they do not perceive their roles as being actively involved in this classroom initiative. The question has to be asked whether these administrators perceived their roles as being involved in any classroom pedagogical concerns.

A portion of this detachment could be attributed to the study design. Principals were invited to participate in all classroom sessions and were encouraged to engage in on-going dialogue with the classroom teachers and resource teachers throughout the study, however, no predetermined schedule of session days was provided and, although all administrators were informally reminded to engage in dialogue with staff and record their thoughts, no specific times were arranged to keep track of their progress. A single administrator attended two sessions throughout the intervention period--a very disappointing attendance record which may or may not be attributed to study design.

An element of job frustration and demands also surfaces within the comments of all three administrators: "I knew I wasn't going to have the time and I just said if the teachers want to do it, they are welcome to it." (School B), and "This year with 767 students, a vice-principal that was cut back to part time and an overcrowded school, the reality is that this research project has gone on with my full support, but no involvement on my part in terms of any conclusions to be made from it." (School B) and "I think you get bogged down in a school this size, I see fewer and fewer children with increase in enrollment and I become more of a building manager and not a very satisfied building manager." (School B)

There is little relevance in analyzing philosophical educational themes between individual pre and post interviews or between administrators, because no administrator really assumed the role as active participant within this study. Regardless of reasons for this lack of participation, it is most disconcerting to think of administrators so far removed from children's learning that they perceive themselves more as building managers than as teachers of students. Were these staff intimidated by the research initiative which sought their active involvement? Do most administrators share the views of those participating in this study? What job roles do administrators view as their priorities? Are these the same priorities as teaching staff? How important is the role of the administrator in helping to support a mediated metacognitive focus? How important

is their role in any change process within a school? According to Fullan and Miles (1991), Fullan (1988) and Fullan and Hargreaves (1991), the principal can be a powerful force behind educational reform and change. Future study seems warranted to discover more aboutt factors preventing some principals from participating in the change process.

(B) RESOURCE TEACHERS

Resource staff interviews were reviewed seeking support for the efficacy of the intervention, the ease of implementation, as well as the cross-over or transfer to other subject areas. It should be noted that all three resource staff bring to the study a common philosophical belief system which considers the role of the teacher as a "facilitator" of learning. Statements such as: "My role is to help children be in charge of their learning" and "I can't do the learning for the children, I have to be there to set the stage and to have all the right factors in place so that learning can happen" (School B), illustrate the importance that all three of these professionals place in empowering children to learn for themselves. All three staff have also revealed from pre-interview questions that they have changed their philosophical beliefs significantly over their careers. "Then, I thought I just had to impart knowledge, I had to impart something and they had to give it back to me and that was that." (School A).

All three resource staff also allude to the importance of the metacognitive behavior of students before the intervention period. Quotes such as, "I think that there are some common strategies that kids do almost automatically, but there are others that are more natural for some." (School B), and "I try to make them talk through everything they are doing with me." (School A), illustrate this point. Indeed, two of three resource staff allude to imagery and inner language--"That's one thing that I model in my teaching, talking out loud." (School B), and "I talk a lot to them and ask them what they are doing in their heads." (School A).

In general, resource staff pre-interviews are considered remarkable in the degree that these professionals view their roles in a Frierian sense, as one that seeks student autonomy in learning through fostering metacognitive behavior. These staff members have also obviously thought about children's learning and have had professional opportunities to work with students, individually. The feelings which emerge from all three pre-interviews are of very competent, thoughtful and experienced professionals with clear opinions of their educational roles and with a willingness to seek more knowledge and try out new approaches. During post-interviews all three resource staff members assign value and importance to a mediated metacognite approach: ". . . to me it was important because it showed children and myself a new strategy that I hadn't used, and I don't believe a lot of children actually used in reading." (School B), and "It gave us insight into the value of getting the kids to image and to ask questions to themselves." (School A), and "I think that the study has value because it's not only given the teachers a chance to see what can be done, but also has given parents some input into what is happening and maybe wanting to find out more about metacognition." (School B).

All resource staff also see potential for carryover or transfer of this approach to other subject areas: "I tried to change my practice for the better with regard to fractions with some Grade 5 students, trying to help them reach a more insightful level." (School B), and "I am doing a lot more talking with kids in all subjects, like I say talk me through it, tell me what you are thinking, tell me what you are seeing in your head." (School A). "We (teacher) talked about the carryover several times and he (teacher) thought that the children were aware of it and thinking about it. We didn't talk in specifics about whether they carried it over to another subject area other than reading." (School B).

Two of three resource staff also comment upon the application of a mediated metacognitive pedagogy for students experiencing difficulty during individual or small group intervention: "I see him seeing himself more as an inquirer of reading and he is now stopping and thinking about what he is reading, and questioning himself on what the

text is actually saying to him." (School B), and "I've changed the way I see kids and the way I deal with kids who come to the Resource Room." (School A). This last statement is considered important to this study because linking a philosophy and a psychology into pedagogy has been a main recurring theme. If experienced Resource personnel can say that they have changed the way they see kids, and the way they deal with kids, even after such a short intervention, then some confidence is gained for this approach potentially affecting the teaching-learning process and being deserving of more in-depth study.

Not all comments on the general study design were favorable. When asked by the interviewer how the study might have been improved, the time factor was mentioned: "I think a common culprit is the time factor, I wished I had more time to spend in class just literally observing." (School B). A second criticism was addressed toward the need for more parent involvement: "It's unfortunate there weren't more parents involved, if there had been a brief meeting at the beginning of the study, inviting parents, then perhaps Mr. Marsh could quite directly explain what the objectives were. I think that may have been more effective than a letter." (School B). This is a valid criticism of this study and, in hindsight, should have been applied to group meetings with administrators and resource staff, as well. To summarize what pre and post-interviews of resource staff have contributed to this study, all three of these professionals see value and importance to a mediated metacognitive approach and have used some of the strategies modeled when working with special education students and groups of children being given extra reading practice. All three staff also have indicated that this approach is new and useful for them, and has helped them understand more about how children learn in subjects other than reading. Criticisms offered have included the need for a longer intervention period and better communication with parents over the purposes and intent of the study objectives.

(B) TEACHERS

Pre-intervention interviews of the three teachers involved in the school-based study all reveal professionals that view their roles as more of a facilitator of learning,

rather than as a purveyor of knowledge. Statements such as, "Well, I decided quite a while ago that I was talking far too much" (School B), and "I view myself as a facilitator of learning as opposed to a lecture-type of teacher" (School B), indicated that these professionals (similar to resource staff) were advocates of a student-centered philosophy before the intervention period. When questions became more focused on children's learning, all three teachers acknowledge the diversity and range of student strategies and rates of learning: "It is a very individual thing, I think students learn for a variety of reasons, different things at different rates, depending on their past experiences, their background, and where they are coming from, and of course, on their abilities." (School B). One teacher alludes to learning styles and the importance of visual and verbal approaches: "Some kids are very visual learners, I'm a visual learner, I'm a visual person, so I often try to do things visually in the class. Other children are oral learners, in other words, hearing, and so I think they need to talk and hear their ideas, and so we do a lot of that type of thing." (School A). Although all three teachers bring a constructivist and holistic philosophy of learning to their practice, and also believe strongly in individual differences in rates of learning, they are not clear about what to do for children experiencing difficulty. When asked what they might do for children that are experiencing problems in learning, comments such as, "for some I think we are probably setting them up for a shortfall because we provide so many crutches and then, all of a sudden, at some point in time because of funding or whatever reason, you kick out the crutches from underneath them and then they are really stranded", (School B), and "I don't work with this particular student, she has a full-time Educational Assistant ... I think in order to understand that child you have to talk with the E.A." (School A), suggest that these teachers do not necessarily perceive their role as being active agents involved in the learning of all children.

All three teachers comment favorably on the efficacy of the mediated metacognitive intervention: "As I watched the students work on it, there was a lot of

enthusiasm . . . on the short term I think there was definite improvement for ability to comprehend" (School A). "I saw a lot of value to what he was doing; those things that we can put across with the most memorable image is the thing that is going to stay with them, word, or picture, or whatever" (School B). "I think it meant a great deal to the students. I think imagery and the language aspect was probably happening for a lot of people at a subconscious level. But to focus on it and making it come to the forefront, it was quite an eye-opener for many of them" (School B).

All three teachers also allude to the possibilities of applying this methodology beyond reading comprehension. "There was crossover to work that we did in Math; we did some visualization in Math and dealing with story problems and comprehension, trying to understand what the question means, comparing it to the kind of visualization that they were doing in the reading activity" (School A), and "Really, ultimately all teaching is imagery isn't it? It is certainly applicable in the language areas, maybe in other areas too, to explore" (School B), and "I do see it as a long term thing, but I think you would have to sort of put your mind to some degree to make it happen" (School C).

Teacher comments also suggest that a mediated metacognitive pedagogy has prompted changes in their practice; "It was very easy (to implement) and we did some activities when Don wasn't here and the kids picked up on them very quickly and enjoyed them. They responded well to them. I would say it is fairly easy to implement" (School A), and "I have attempted to bring out imagery more in the discussions we have, I mean to make it more profound or to make it deeper" (School B). Although all three teachers have attempted to apply this approach to reading comprehension and other aspects of the curriculum, they express the need for more direction: "I haven't really set my mind to it as to how I would extend the ideas, which I would have to do to carry it over a longer period of time" (School A), and "I mean, to make it profound or to make it deeper, I think it requires Don to come to us with something that, you know, we can apply easily and

incorporate into our curriculum" (School B), and "I think it won't be a resource that will probably be utilized as much as it could without some sort of direction" (School C).

In summary, all three teachers involved in the study, through observation and guided participation in presented activities, see value, importance, and generalizability of a mediated metacognitive approach to learning. However, all three teachers also allude to the need for longer term study and more guidance in this direction. Judging from pre-interviews, the teachers involved in this study had already established a degree of constructivist and student-centered philosophy over their careers; future study comparing opinions of teachers of differing philosophical outlooks would provide an interesting future research direction.

The importance of understanding the dynamics of the teaching/learning process emerge from teachers and resource teachers, alike. The mediated metacognitive model has hopefully added substance to the child-centered philosophy of these professionals. Through focusing on student usage of imagery and inner language, a dialogue between teacher and learner naturally develops which sets the stage for intellectual flexibility and fosters a metacognitive intimacy. This is felt to be a long-term process, however. Resource staff and teachers comment upon the need for more longitudinal studies to help both themselves and their students gain a richer perspective on this initiative.

The long-term expectation for metacognitive change is purported to empower the student with a new learning responsibility to demonstrate their learning control. The teacher, too, is purported to be empowered in a Freirian sense because, through classroom dialogue on a metacognitive agenda, they come to learn about student learning to a much greater degree than a methodology which demands content and normative comparisons, alone. Hopefully, the comments from these professionals will generate future inquiry into changes within professionals and students which shed more light on the affects of a mediated metacognitive pedagogy.

(D) STUDENT INTERVIEWS

Twelve pre and post-intervention interviews were completed with randomly selected students from all three classrooms. The purpose of including student interviews is to provide qualitative information regarding student awareness of their reading metacognitive behavior before and after the mediated metacognitive intervention.

The most obvious observation to be made from student pre-interviews is the degree that students tended to "mimic" the phrases of parents and teachers when questioned about how they tried to remember what they read. "Sounding out" (7/12) and "skipping the word and reading on" (7/12) were the two most common strategies mentioned; at this age level reading comprehension seems to be considered more at a level of understanding individual words rather than sentences, paragraphs, or stories.

When the students were questioned more directly towards revealing how they remember books they have read or listened to, five of the twelve interviewed allude to imagery and/or inner language. However, judging from the following exchange, it is apparent that some students have not previously been asked about their metacognitive comprehensive behavior:

Interviewer — Now what did you have to do to remember that? What are the things going on inside your head while you are remembering the last chapter?

Student — .... read it over?

I No, you were just telling me about it. What did you do, just now, to tell me about it?
S ....

I How do you remember it?
S ....

I If you close your eyes, can you tell me about it? What do you do when you close your eyes?
S .... You use your brain?

I How do you use it? What does your brain do?
S It makes you remember stuff

I What does it make up there?
S ....

I Can you see anything? Up here, when you are telling about it? Can you see the children?
S Yeah, kind of.

I You can see the children. Do you always see something up here when you are reading?
S No, not always.

This exchange certainly illustrates the difficulty that some children have considering their own mental strategies for reading. It may also suggest that parents and teachers have not provided the opportunities for some students to ponder how they might attempt to remember or understand reading material. Students may well interpret "reading" as "decoding words", rather than understanding the context and inferring meaning from print, because the mediational influences at home and in school do not give the message, either overtly or covertly, that the learner can assume control of their cognitive behavior. The question also begs to be asked--when should home and school begin to address metacognitive behavior? The belief being offered is that concern over metacognitive behavior should begin from birth, onward, and should be considered a primary parental ideal as well as an educational ideal.

When pre-interview questions were focused more directly on imagery and inner language; six of the twelve students interviewed revealed insightful comprehensive behavior:

Student 1: "I can picture myself right there in the place of the main character and stuff like that."

Student 2: "Most of my books have no pictures, so I picture them."

Student 3: "You feel like you are in the story."

Student 4: "When I read to myself, I really think about what it sounds like in my mind; it feels like it is really happening. But, when I read out loud, it's not really the same. When you are reading it inside your can look at the words and you can imagine what it is like, especially for chapter books where there are no pictures."

Student 5: "What's going on in my head? I can see the picture, sort of like watching T.V."

In summary, approximately half of the children interviewed before the intervention found it very difficult to discuss their metacognitive behavior for reading. This difficulty may be attributed to a lack of experience or opportunity to consider this behavior, or indeed, might possibly be due to their over dependence on others to guide their reading behavior to a degree which makes it difficult for them to assume responsibility and control. Some children appear to interpret reading as decoding words alone, without any consideration over gaining meaning, or knowing how to attempt to gain meaning.

The remainder of the students were able to discuss the way they employ imagery and inner language through prompted questions from the interviewer. However, it is obvious from their responses that they had not previously encountered many opportunities to do so, or considered this direction as an active part of their reading for meaning.

Post student interviews were designed to explore the efficacy of a mediated metacognitive approach through the opinions of the students. When asked what the study was about, all twelve students interviewed provided reasonable purposes. The following examples are considered very sophisticated responses for Grade 4 children.

Student 1: "Learning about how I learned to read and the ways I learned to read."

Student 2: "Reading and setting pictures in your mind."

Student 3: "pictures and voices in our mind."

Student 4: "I think it was about pictures that remind you . . . different types of pictures, like diagrams and maps and finding out what you can use in your head if you are stuck, and the voice in your head to ask questions and how you sort of read."

Although not all children responded with the same sophistication, all students did perceive that the purpose of the study was to increase their metacognitive awareness for reading meaningfully through experimenting with imagery and inner language. The following quotes from student post interviews illustrate this point:

Student 1: "I guess I learned how to use our voice in our head better and how to see my own pictures. I never seen it that way before, I just read."

Student 2: "It was about reading and getting pictures in your mind."

Nine of the twelve students interviewed indicate that they are now using some form of imagery and/or inner language to help them remember and understand what they read. Illustrative quotes would include:

Student 1: "Before Mr. Marsh came I wasn't using my voice as much. But now I'm using it all the time."

Student 2: "I can understand my books a lot better by seeing pictures."

Student 3: "I know now how to picture more things and not just read the book and have no idea what it is about. I know what the words mean now because of the pictures in my head."

Student 4: "You try and keep them (pictures) in your memory and if you really liked the book, you just can't get them out sometimes."

Virtually all of the students to varying degrees, indicate that they are now attempting to use imagery and/or inner language in other subjects or activities:

Student 1: "I used to use it (imagery) in reading, but now I'm using it in mostly everything."

Student 2: "Like in French class, I can just look up in my mind and, like, let's say we are talking about a cat, I just look up in my mind and I see a picture of a cat and right beside it says it in French."

Student 3: "If the teacher is asking you a math problem and you try and make the math problem out in your head by making pictures and using your voice."

With children of this age, it is difficult to judge whether their responses are representative of actual metacognitive change, especially over such a brief intervention. What the children say they are doing may not be what they are really doing. It is extremely encouraging, however, that all of the children interviewed have gained varying degrees of knowledge about the words, imagery and inner language, and believe they have attempted to apply both processes to reading as well as other subjects or activities.

Some of the students also indicate that they are now attempting new things from a metacognitive perspective. It is this incremental metacognitive change or modifiability which the mediator constantly seeks in order to empower the learner to behave

intellectually for themselves, by themselves. The reader is encouraged to read the interview transcripts in Appendix B with this thought in mind. It is the purpose of this study to reinforce the need to elevate this intellectual modifiability as a primary educational ideal and consequently to focus on how best to promote this behavior within students. Unless this direction is both implicitly and explicitly infused within our pedagogy, many children will continue to rely on the thoughts of others through rote memory or externally contrived responses. The student interview technique can be a very valuable formative assessment and teaching device to ensure that students are given the opportunity to assume control of their learning.

(B) PARENT INTERVIEWS

Seven of nine pre and post intervention interviews were completed from randomly selected parents expressing interest in participating in the study. The purpose of parent interviews is to provide information about how their roles as mediators of their children's learning may have changed and whether or not they perceive the "mediated metacognitive" intervention as an important and useful educational direction.

Parent interviews demonstrate an extreme range of opinions, from detached apathy to overwhelming support of the study. One parent moved during the study and a second parent did not appear for a scheduled post interview. This range is best illustrated through post interview quotations responding to the question: "What do you think the study was about?"

Parent 1: "The relationship with the parent and the school and how the parent interacts with the school."

Parent 2: "My understanding is that he wanted to find out if visualization could make better readers."

Parent 3: "I wasn't really sure myself. I know it was trying to help . . . like you said, some kids have to learn to put images in their heads . . . now he said to me yesterday that he can do his math that way too."

Parent 4: "I think they were just looking for methods that parents employ to start educating their children."

Parent 5: "O.K. it was about how we can improve our children's reading by way of teaching them how to learn how to absorb more when they are reading."

Parent 6: "Well, basically it was to me the understanding that you need to spend time with our kids to help them learn to read and to express themselves so that they can learn how to express themselves."

Parent 7: ". . . to me things kind of got lost in the wind with it, because he would bring home a paper to show me and I'd say let's do this. ('Well, we did this in class, we don't have to do it at home.') So I just kept on with him, then he would read something and I'd relate back to the paper that came home and question him."

A large part of the responsibility for parental confusion concerning the purpose of the study must be assumed by the researcher. Confusion could have been avoided, or at least ameliorated, through direct contact with parents before, during and after classroom intervention, rather than relying on information sent home through students. Even mailing information directly to parents would have assured their receiving the weekly update on classroom activities, as well as guidance for home activities. Keeping this flaw in research design in mind, parental interviews still reveal some interesting insights into their perceptions of themselves as mediators and in terms of the changes some parents comment upon concerning the learning behavior of their children.

Firstly, from pre treatment interviews, all seven parents are considered very active participants in their children's education. All spend considerable time at home helping with homework and all mention reading with their children from a very young age. A representative quote is offered from Parent 5, "We read to our children when they were babies and we continued that right up through, and we still read every night, that's part of the routine at night when they go to bed."

All of the parents interviewed also comment on close connection with the school:

Parent 5 "I keep in touch with the teachers all the time and when you speak to them they'll agree. I have always talked with them when I was home all the time."

Parent 7 "He is the oldest of four children, so I try and participate as much as I can in what's going on and I like to see what he brings home and I keep in contact with his teacher on a one to one basis to monitor his behavior and see if there is something we can do at home to encourage him to partake in something or not."

Parent 3 "I talk to the teachers quite a bit and I talk to the children a bit. Like I spend a half hour when they come home from school and that kind of thing. They let me know how they are doing and I ask them what did they do in school today. ('Oh, nothing much.') So I say did you do something in Math today or I ask for a specific thing."

Although, not surprisingly, all of the parents volunteering for the study are extremely active in their children's education, mixed opinions are expressed over how current school practices have changed from their own experience and, more specifically, what reading and learning involves. Responses for the question -- Are your children being taught the same way you were taught in school? -- ranged from a definitive YES to a definite NO.

Parent 7 "No not at all. Kids are a lot freer in school now than in my day . . ."

Parent 2 "I figure it is pretty much standard old school type instruction . . . essentially the basics are the same. There's little differences in style that you would expect from different teachers, but the basics are the same."

It is also apparent that the interpretation of "reading" for all but one parent interviewed is limited to the decoding process, rather than comprehensive ability:

Parent 5 "Sounding out words was the thing. That's the way I was taught in school, so I wanted to continue doing that. Breaking up the words and sounding."

Parent 2 "I bought workbooks for them and we would work on them."

Indeed, when the interviewer specifically prompted parents to comment on the reading comprehension of their children, one of the seven parents did not perceive this direction as their function:

Parent 2 "They never got to that point at home (comprehending). Actually I always believed that if you sent them to school knowing how to read, they are going to be bored when they got there, because they weren't going to be accelerated. They would stay in Primary, so I gave them the basic phonics and that sort of stuff."

Parent pre-interviews certainly illustrate the degree that they have been excluded from the learning process of their own children, if as Bloom (1984) and Sigel (1982, 1990) suggest, they are important facilitators of the present and future learning of their children, then school institutions should recognize this importance and include parents as active agents within the teaching-learning process. In terms of a mediated metacognitive

pedagogy, early intervention from parents helping children develop their imagery and inner language confidence, practise, and prowess, is purported to provide a significant influence on future metacognitive behavior.

Parent comments on how they believed their children attempt to understand what they read reveal some references to imagery and inner language:

> Parent 5 "If the story is very descriptive, they may get a picture of that person."

> Parent 4 "So I suppose her reading, or my reading to her, is done in such a way that it gives her a very good picture in her mind and it causes her to think and feel, one way or another, about what we are reading or when she has occasion to verbalize what she is thinking about how this has made her feel. I suppose it is because it leaves an impression on her mind."

Post parent interviews on the efficacy of this approach are varied, however three of the seven parents view the intervention as important and have noticed changes within their children's learning behavior for reading:

> Parent 7 "It has made me more consciously aware of it (children's thinking). I think a lot of it is done unconsciously , whereas this is making you think. I'll be able to continue this on with my 5 year old for their learning process. It wasn't something . . . you knew it went on, but you were not working with it. It's given me, as a parent, some skills to use with my kids to help them."

> Parent 2 "Well actually the other day she was sitting at the kitchen table doing her homework and I was sitting there with her and she was yakking the whole time to herself. She said it was a little voice in her head that tells her when she is doing something wrong. It's like having me with her all the time."

> Parent 3 "but the reading, I can't believe how much difference there is from the first time I talked to you. He is so much better, I couldn't believe it. He said to me yesterday, now he is doing his math that way too. He started putting numbers in his head instead of doing it on his fingers."

These parent comments are considered revealing and important because they demonstrate that even with a very brief intervention and little information sent home, parents feel more involved and empowered to help their children in new ways. This study has argued for parental inclusion as active agents within the teaching-learning process and these comments illustrate that this direction may have merit. Future inquiries involving long-term inclusion of parents through professional development opportunities and teacher conferencing are felt warranted. These interviews also illustrate the need for

dialogue between and among professionals, parents, and students to help all concerned learn more about the teaching-learning process and to foster student control in seeking meaning.

In summary, parents involved in the study are all described as active participants in their children's learning. All spend time with their children at home and visit the school regularly. Parent opinions on whether school has changed are mixed, some believing it remains much like when they attended and others saying that their children's experience is much more relaxed. All of the parents perceived reading as basic decoding; many commented on a phonetic strategy at home and the need to read regularly with their children. The parents that continued active involvement throughout the study report changes in their children's comprehension behavior, involving the application of imagery and/or inner language; three of seven parents indicate that the intervention has improved their awareness of how their children attempt to read for meaning, and have adopted a metacognitive approach when working with their childen at home.

In general, parent post interviews were disappointing both in the number of parents following through with their home commitment and the degree in which they understood the purpose of the study. A large part of these findings can be attributed to the reliance on individual students to convey information home, as well as not meeting with parents after the study initiated to explain home strategies in more detail. The difficulty may also be due to the degree that parents have historically been removed by the school from being considered as active agents in their children's learning. The mediated metacognitive approach considers the parent as a valuable mediational influence, however, judging from post interviews, a great deal of effort and planning would be required on the school's part to empower them to become and perceive themselves as being active participants.

IMPLICATIONS OF THE SCHOOL BASED EXPLORATORY STUDY: FUTURE DIRECTIONS

It is felt important, at this time, to revisit what this study is attempting to accomplish and conversely, what it is not attempting. This is an exploratory study which has argued for a philosophical and psychological alternative perspective of the teaching-learning process for all students and special education students in particular. It is not a definitive study that attempts to prove causal relationships within this perspective. Borrowing a distinction from Vygotsky (1934), it is a "genotypic", rather than "phenotypic", study; it illustrates a need and a process rather than describing specific parameters of cause and effect within this process.

This work has attempted to link a philosophy of learning and a psychology of learning to classroom practice. It's about helping students learn to seek meaning for themselves, through learning how to represent their thinking at a variety of meaning seeking levels. Through imagery and inner language, the student is being encouraged to move beyond understandings of concrete facts, to more complex understandings, levels which permit them to make decisions, evaluate their understanding, and transfer these understandings to new or similar problem situations. They learn to find problems within their own understanding rather than solve problems through mimicking the thinking of others. The perspective offered involves a change of paradigm in how we think about children's learning and what we do with both regular and special education students in the classroom. The mediated metacognitive approach has been described as a form of cognitive coaching which continuously fosters student autonomy in thinking across the curriculum. As noted within the introduction of Chapter 9, the mediated metacognitive paradigm is being presented as an example of an applied psychological and philosophical theory of learning designed to guide interventions in development through helping to correct problems in children's functioning, or further enhance the functioning of children who have no difficulty (Resnick, 1984).

The purpose of this summary is to revisit the main themes within this research in terms of future directions. Good research is purported to be judged through importance, novelty, generalization and usefulness. The philosophical and psychological aspects of presenting the rationale for a mediated metacognitive pedagogy will be applied to regular and special education students, alike, with these criteria in mind. The writings of Freire and Vygotsky have helped define the meaning of mediated metacognition, which is offered as an alternative outlook linking a student-centered constructivist philosophy of learning with a social/cultural and institutional psychological model of learning. The symbiotic relationship which emerges between how we instruct and how children learn to learn has been offered as a primary ideal and purpose of education--essentially increasing student autonomy in thinking across the curriculum and beyond.

(A) THE PHILOSOPHICAL PERSPECTIVE: FUTURE DIRECTIONS

Freire's work is not historically related to exceptional children, it is more generally applied to "oppressed" populations in terms of socio-economic status, race, gender, or creed. Considering the sub-system of special education as a potential oppressor of special education students is considered a new and important outlook, because it encourages the professional to seek opportunities to reflect upon their practice. If, as Freire offers, oppressed populations of any sort, learn to behave as oppressed populations, then in trying to help the exceptional child, we may inadvertently be showing them how to behave abnormally--we may be teaching special education students to behave as special education students. Regardless of intervention setting, if the "sub-system" of special education assumes a mind set of deviance from product-oriented and behavioristic learning outcomes alone, rather than giving at least equal consideration to the process of learning within each learner, then we are creating feelings of inferiority and marginalization that will have negative cognitive consequences because our mind-set is one of perpetual catch-up rather than concern with the ways and means of how each individual learner deals with information.

The critical perspective of Special Education reviewed through Freire (1970, 1973, 1982, 1985), Ysseldyke (1983), Ysseldyke and Algozzine (1982, 1984, 1992) and Skrtic (1991, 1992) which described the negative aspects inherent in categorizing and labelling children against normative criteria alone, can be transformed through a focus on a mediated metacognitive paradigm. Quantitative data reviewed suggest significant improvement in children's reading comprehension employing mediated metacognitive techniques and qualitative data suggest that educators, parents and students see value and importance in this approach. Perhaps this direction can help alleviate the tendency of the institution of Special Education to diagnose and label groups of children without understanding how these children behave as learners. It may also help alter the traditional understanding of "special" education to include the learning of <u>all</u> children,

with equal consideration being given to the culture of learning within the classroom. Instead of constantly seeking student pathology, we learn to also reflect on our own relationship with the learner.

In order to accept the importance of a mediated metacognitive outlook for exceptional children, the mind-set of the teacher, resource teacher, and administrator, (along with the student and parent) must necessarily be student-centered rather than content oriented, constructivist rather than connectionist. Equal concern must b e given to understanding the depth of understanding of information so that we can help children learn to enhance their thinking power. This may help us avoid student statements such as, "No one told me I should make images when I read" that were commonplace in all classrooms participating in the study. The school based research of this study has demonstrated that resource staff and classroom teachers see value in this approach, but require more time and knowledge to learn to apply this pedagogy across the curriculum. Pre-interviews of these educators indicated that most already had adopted a more child-centered philosophy over their careers; Resource staff in particular are considered strongly constructivist within their practice. Post interviews suggest that the mediated metacognitive pedagogy has helped provide a methodology to these philosophical leanings for special education and regular education students alike, however one wonders how much more difficult it would be to infuse this pedagogy with professionals that rely heavily on content and information to impart knowledge.

Qualitative and quantitative data from this study may help illustrate the need for teacher training initiatives and professional development opportunities to encourage staff of more behavioristic and connectionist leanings to consider the benefits of focusing on a mediated metacognitive pedagogy. Such a pedagogy can begin with incremental change through encouraging classroom opportunities and discussion about learning behavior. Imagery and inner language can help students reveal their behavior in a myriad of ways across the curriculum, but the teacher must promote this direction through classroom

dialogue on a group and individual basis. Further, the teacher must learn to model metacognitive behavior (Palinscar, 1986, 1984, 1991), observe changes in such behavior (Sigel, 1990, Feuerstein et al 1980, 1987) and evaluate this change (Meltzer, 1991a, 1991b).

School administrators can have an important role in encouraging a school climate and philosophy to support a mediated metacognitive pedagogy. Pre interviews of school administrators reveal that they are far more removed from children's learning than teachers and resource staff. Post interviews indicate that, like it or not, they perceive themselves more as school managers than as educators. As Fullan and Miles (1991) offer, the principal's role is the key to school change in helping to establish a school "vision" and in preventing the "egg carton" mentality that prevails when teachers are isolated from collaboration with peers. Although some of the principal's post interview detachment from active participation in the study can be attributed to study methodology, it is reasonable to postulate that some of this detachment could be because these administrators are not involved in the curriculum or pedagogy of the classroom. One could surmise that their busy schedules keep them from a curricular focus, but the fact remains that they can be important agents of school change, and reasons for detachment from such initiatives deserve a great deal more attention and study.

Yet another philosophical consideration deals with how resource staff perceive themselves as professionals. Freire's description of "oppressed" populations, and his notion that such populations become voiceless, can be applied to the reliance on external professions which resource staff develop in order to diagnose and assess exceptional students. This oppression can often take the form of subservience through the acceptance of a plethora of medical and psychometric symptomatic labels, rather than the knowledge of how learning evolves within the learner. A mediated pedagogy may help empower the professionalism of resource staff, because they learn to seek and ask better questions of external professions which are directly linked with the learner's metacognitive behavior

and, therefore, make use of outside opinion in a truly collaborative fashion, rather than the blind acceptance or "voicelessness" which emanates from a purely behavioristic and content oriented model. This direction may also help alleviate the criticisms of Ysseldyke (1979, 1983) and Ysseldyke and Algozzine (1984, 1992) concerning too much time, effort, and money being placed on the assessment of exceptionality and for too little time, effort, and money being focused on intervention.

Pre and post interviews of Resource staff suggest that these professionals have evolved a deep constructivist understanding of the learning process and see value in pursuing a mediated metacognitive pedagogy for all students, and special education students in particular. The mediated metacognitive approach may help them extend their constructivist learning through a greater focus on the modifiability of the metacognitive behavior of their students. Through applying mediational techniques gleaned from Feuerstein (1980, 1981, 1987) and scaffolding instruction (Vygotsky, 1982, 1978) within each learner's zone of metacognitive development, the Resource teacher adopts an enriched constructivist approach which includes the students as active participants, participating fully in the development of their own knowledge, as well as the knowledge of their unique approaches to learning (Poplin, 1988). The more the Resource teacher applies a mediated metacognitive pedagogy, the more constructivist their approach becomes and the less they depend on medical labels and categories to guide their practice. They learn to ask better questions of external professionals, rather than serving as passive recipients of "expert" opinion.

For parents, a similar voicelessness exists concerning their knowledge of how their children learn and the role that they perceive themselves playing within the learning process. A mediated metacognitive pedagogy includes the parent as an active participant in children's learning, rather than passive recipients of normative marks or rankings from a content/behavioristic oriented point of view. Parent interviews from this study strongly illustrate the degree that many parents feel removed from classroom practice. What may

be misrepresented as apathy could, in fact, be the system's effective disempowerment of parents' inclusion as active mediational agents of their children's learning. This is considered an extremely important future direction for exceptional students and regular students alike--to actively include parents in the educational process of their children through helping them learn about the metacognitive behavior of their children and also to actively include them in professional development opportunities which empower them to become effective mediators. Bloom (1990) alludes to the importance of one to one instruction but, in order to make this instruction relevant, parents must be helped to educate themselves as effective mediators. Sigel (1982, 1990) also comments on the importance of including parents as active agents within the learning process through his distancing theory which involves helping children consider more expansive thinking opportunities through reciprocal dialogue. Future research could explore the long term effects of this approach on parent opinion of the schooling of their children, as well as effects upon the achievement and metacognitive sophistication of the student.

Perhaps the most significant philosophical perspective which Friere's critical perspective offers is the need to move beyond criticism of school structure and "systems of subsystems" to seek understanding of the learning process. Freire's notion of empowering oppressed populations through helping them to become aware of their oppressed state, has profound educational applications for both regular and exceptional students. Through exposing each learner to awareness of their own metacognitive prowess, the educator can apply the broader societal perspectives of Friere to each learner; learning to sophisticate the manner in which the individual deals with information brings Friere's pedagogy of "liberation" or "emancipation" to a personal level. Researcher observations and student post-interviews suggest the degree that students have been removed from many opportunities to consider their own learning behavior, or the behavior of others. The most important future direction that this work hopes to offer is the recognition that this direction is important and necessary.

A change of mind-set is, therefore, being offered not only within the "sub-system" of special education, but also for regular education. The mind-set is constructivist and values any pedagogical consideration which enhances our awareness of the learning behavior of the learner and the mediational behavior which helps facilitate student learning autonomy. The pedagogy described within Part II is not considered conclusive, but rather demonstrative of a mind-set being offered in order to promote a change of paradigm. This mind-set demands that we rethink previous givens within learning theory, instruction, assessment and practice. The acceptance that thinking is modifiable or teachable demands that we find out more about this direction and seek ways to enhance this modifiability.

(B) THE PSYCHOLOGICAL PERSPECTIVE: FUTURE DIRECTIONS

The broader societal perspective of Friere describing how oppressed populations learn to behave as oppressed populations can also be applied in a narrower psychological sense through focusing more specifically on the metacognitive development of the learner. When each individual learner is empowered through a mediated metacognitive pedagogy to constantly appraise the quality of their learning before, during and after any given learning task, they learn to sophisticate the quality of their thinking, they learn to become intellectually curious and flexible, and they learn to become confident independent thinkers. This study has applied the two mental processes of imagery and inner language as the two primary cognitive processes which help enable metacognitive potential. Paying attention to these mental processes can help us understand more about the depth of metacognitive behavior that students exhibit as they represent information across varying levels of abstraction. This is thought to be a new and important direction from a psychological point of view and should help us understand more about problem solving and critical thinking behavior. It may also help us understand more about the relationship between levels of abstraction because both processes can be applied to the process of memory, inference, forming opinions, drawing conclusions, evaluating information, or any critical thinking behavior that seeks meaning. Both processes may also provide researchers with links to affective and psychomotor learning behavior that are so often excluded from discussion of the cognitive domain.

The metacognitive model of intellectual development presented attempts to establish a pedagogical linkage through a sort of symbiotic relationship which emerges between how we instruct and how children learn to learn. From Vygotsky's social/cultural theory of development (1962, 1978, 1993), this model, which considers the metacognitive sophistication of the learner through imagery and inner language over a lifetime, extends Vygotsky's theory to include classroom instruction. An important future direction would be to further evaluate the usefulness of this paradigm for students,

parents and educators. Does it help in understanding how children develop their thinking? At what ages? For all subjects? How can such a model best be implemented in the classroom? At home? Can such a model help define what is meant by constructivism at a psychological level? Can it also provide a locus of philosophical direction within special education? Simply thinking about the metacognitive behavior of learners releases a plethora of questions seeking to expand our knowledge of how students engage in learning, how aware they are of their own learning behavior, and how we can help them to enhance their learning behavior.

The outlook presented in Part II of this paper attempts to provide an alternate view of learning through the introduction of a metacognitive developmental perspective over a lifetime. This model employs genotypic units of human action rather than phenotypic description of human mental functioning. This is considered important because this outlook permits a developmental view of learning as a dynamic life-long process rather than providing descriptive windows of development alone, without consideration of the phylogenic and ontogenic history of how learning occurs.. This also helps define this model as an applied theory of learning with direct application to the classroom and beyond; if metacognitive behavior through imagery and inner language is modifiable, then we can discover how this can best be accomplished at school and at home. We can learn how best to mediate learning using both processes as a pedagogical nucleous around which students' strategies can be discovered and explored across the curriculum. We can also learn more about how these two processes interact with dispositions and volitions to learn. School study results appear to support the need for a closer look at the nature of both processes as well as their relationship to the teacher-student learning process. Study results also suggest that those students experiencing difficulty in reading comprehension may benefit most from this direction.

Vygotsky's prophetic writings are all based on the need for genotypic, rather than phenotypic, analysis. His usage of the word "generative" throughout his work

exemplifies the importance he placed on understanding how metacognitive behavior tows development and how mediational influences of society, culture, and institutions define and shape this development. The model presented extends his theory of learning by offering imagery and inner language as the two primary processes through which we learn to behave metacognitively--learn to predict, monitor, and reflect upon our mental activity. Indeed, just prior to his unfortunate early death, his interests in inner language and school as primary mediational influences were beginning to emerge. He did not, however, treat imagery and inner language together as the two primary metacognitive processes and he did not consider their influence as a symbiotic metacognitive relationship throughout a lifetime. The usefulness of the proposed model of metacognitive development is considered an important future direction for inquiry because it may help relate the relatively new science of cognitive psychology more directly to the classroom and it may help us provide psychological reasons for a child-centered and constructivist outlook on learning; it may help bond a philosophy of learning, and a psychology of learning, into an applied theory of learning.

The school-based portion of this study has demonstrated that significant changes occur in the reading comprehension of children under a mediated metacognitive intervention. Explanation of this improvement can range from statistical regression and the simple inclusion of these students in a study, to fundamental metacognitive change in the way students approach reading for meaning. For many of these students, it is possible that this study represented their first opportunity to engage actively in classroom dialogue about how they approach their learning. Paul (1990) and Freire (1970, 1973, 1982, 1985) speak of the importance of a dialogical learning experience across the curriculum and Palinscar (1986, 1984, 1988) and Paris (1983, 1986, 1991) have successfully applied dialogue specifically to reading comprehension. Talking about children's learning as an integral aspect of classroom practice is an important aspect of a mediated metacognitive pedagogy, that deserves more attention in future research initiatives.

Certainly the notion that imagery and inner language are the two mental processes responsible for the emergence and sophistication of metacognitive behavior is also considered a new and important direction demanding more inquiry. Is this a valid contention? Are there other mental processes that have been excluded? Do both processes exert equal influence across domains? To what degree? Are both processes universal across cultures? How does their relationship differ across cultures? What is the relationship of both processes? Can we modify the learners usage of both processes? To what degree and at what ages? Can forms of exceptionality be interpreted through the sophistication of imagery and inner language? A great many questions remain to further explore the efficacy of the presented model in depth.

Both processes certainly provided the nucleous around which the intervention sessions were planned and delivered. It would seem reasonable that at least some of the improvement from the school study can be attributed to children becoming more aware of specific reading strategies that they learned to apply through imagery and inner language. The model of metacognitive development which has been offered gains credibility because these young readers may have shown that they have learned to modify their comprehension control in reading by applying imagery and inner language before, during, and/or after the reading process. Sophisticating the application of both processes over a lifetime forms the foundation of this model of cognitive development.

A large part of the usefulness of the presented perspective of metacognitive development is helping the researcher explore the relationship between "top-down" voluntary or metacognitive mental activity and "bottom-up" involuntary mental activity. This perspective also prompts the educator to ask how much their methods of instruction favor or exclude involuntary or voluntary mental development. Bottom-up involuntary learning is based on rote mental procedures which become automatic without learner awareness or intervention. Top-down voluntary learning implies a degree of thoughtfulness or mental engagement before mental procedures become automatic. A

child can learn from repetition that 2 + 2 = 4 without understanding, or even attempting to understand, what the numerals represent, what addition means, or how to use this information for future learning. If we encourage and evaluate the degree of thoughtfulness with which the learner comprehends 2 + 2 = 4, through the self-questions they pose and through the images with which they represent this understanding, then we are addressing the way the child employs top-down metacognitive mental activity. But when and how do children learn to pose self-questions? When and how do they represent information with images for themselves? How much practice does a learner require before strategic applications of imagery and inner language become automatized? Are these applications transferable to related learning tasks? Unrelated? A future direction for the researcher is to pay more attention to the top-down voluntary and metacognitive level of inquiry as well as the relationship between top-down and bottom-up mental functioning. The overwhelming portion of research from the turn of this century to the present time, has excluded the introspective metacognitive arena of inquiry. For the educator, a parallel need to pay attention to top-down metacognitive learning behavior emerges within every aspect of their practice towards mediating the metacognitive behavior of every student.

Herein lies a confluence of the ideas of Freire and Vygotsky, a merger of philosophy and psychology. The way we teach children affects the way children internalize and control their learning. To a large degree the traditional connectionist and behavioral pedagogy has promoted bottom-up rote learning and has largely ignored top-down metacognitve learning. From the point of view of the learning disabled reader, the heavy reliance has been on remediation which stresses more bottom-up involuntary learning to automatize sound and symbol relationships; the change of direction to top-down metacognitive control opens up new avenues and new hope for improvement through remedial techniques which promote more top-down strategic control on behalf of the student. Indeed, many professionals in the field of exceptionality are redefining

learning disability in terms of metacognitive control rather than against standardized differences in achievement alone. (Reid, 1988, 1991; Wong, 1991, 1992; Meltzer, 1991b)

Certainly more research is needed to explore the individual phylogenic and ontogenic development of inner language and imagery. Both mental processes have been elusive in revealing their characteristics and have historically been assigned rather elementary and precursory roles in learning theory (Bruner, 1964; Piaget, 1976, 1980). Indeed, we currently know very little about either process from a functional or morphological point of view. Two of the children from the school study did not seem to be able to image at all -- What differences in learning result for these children? Is it also possible that some children never learn to pose internal questions at any level of abstraction? What relationship might both processes have in terms of mentally challenged individuals or other forms of exceptionality? We know less, yet, about how they behave under varying forms of mediation. A future direction which this work hopes to proliferate, is elevating both processes in terms of their importance to learning and instruction. The notion that viewing intellectual development through their sophistication demands more inquiry. The view that they provide a useful pedagogical outlook similarly demands more inquiry.

School study observations of Grade 4 children's imagery and inner language in seeking meaning from text suggests a great deal of variance ranging from a seeming inability to apply either or both processes, to a rich and integrated representation that enhances recall, as well as higher order abstraction abilities, including inference, analysis, synthesis, making judgments and forming opinions. More research is necessary to associate causal relationships between similar interventions and the variety of comprehensive abilities that students employ to seek meaning. More longitudinal studies are required to evaluate the longevity and generalization of changes in metacognitive behavior. For some of these readers, improvement in reading comprehension appears to

be related to learning to apply either or both processes. The degree of improvement, particularly for those students experiencing intial difficulty on pre-tests, warrants further research to further explore the strategic dynamics of both processes.

Considering what we know and what we don't know about imagery, for example, can generate useful future directions of inquiry. We think we know it is a universal process across cultures yet individualistic in the manner it is applied by each learner. We know some learners are extremely flexible in employing imagery as a form of representation, and others are not. Recent research suggests that imagery is comprised of a number of distinct functions (Kosslyn, 1980, 1983; Pinker, 1980). Very little has been written about how imagery evolves in terms of sophistication. Making a mental picture directly from a visual referent is not the same as inventing an image without a visual referent. Imaging on a two-dimensional plane is not the same as three-dimensional. Moving images internally may be different from representing stationery images. Imaging a picture is different from imaging a diagram or graphic organizer. In short, we do not yet know the ontogeny of the capacity to image in terms of sophistication and application. We do not know exactly when a child learns to represent their reality through images or if there is an end-state to sophistication into adulthood. We do not know why some learners choose imagery as their preferred mode of representation, and others do not. We know very little about brain physiology or morphology which enables imagery to occur. We do not know when, how, and why the human engages in this activity or the degree that this activity defines our intellect.

What do we know, or don't know, about inner language? We again know it is a universal yet individualistic human mental capacity. We know the power of words in thought representation. We are not sure of the relationship between thought and language. We are not sure when social language becomes so individual that it evolves into private speech or thought language. We are not sure if, and when, there is any real difference between syntax and semantics at an internal and private level of application.

We are not sure of the relationship of culture and thought, and the degree that how we speak defines how we think, or vice versa. All of these questions require inquiry from a metacognitive perspective, as well as the culturally and socially oriented perspectives that have thus far occupied the lion's share of research. We must also seek to discover more about the ontogeny of inner language. When does it emerge? Does private speech emerge at different times for different cultures or mediational influences? To what degree is private speech or inner language still communicative or social in nature, rather than thought language? When does the meaning of a social or communicative word or phrase become so saturated with contextual semantics that it no longer requires active consideration and can serve as an element of inner language? How often do children engage in inner language? Does this vary from child to child and task to task? Is there an end-state to the sophistication of inner language? Can we teach children to employ or use this process more often? How can we evaluate its sophistication over time? Again, more questions are posed than addressed within this work. The point is stressed, however, that these questions are important to increase our knowledge of how children control their learning and how we can best foster this control as educators. The direct locus of inquiry geared towards the sophistication of inner language may help extend the ideas of Chomsky (1965, 1968) in his exploration of thought and syntax, as well as Bakhtin (1981, 1986) and Vygotsky's (1962, 1978) work considering the social and cultural relationship of thought and language.

The double helix model of the symbiotic nature of imagery and inner language is felt to provide an important conceptual linkage to previous learning theory and current cognitive learning theory. This model attempts to capture the genesis of the act of learning over a lifetime, through the metacognitive sophistication of imagery and inner language as a function of mediational influences as well as genetic factors. It attempts to trace intellectual development not through levels of informational abstraction, but rather levels of metacognitive abstraction. This is considered to be a new and important

perspective because it helps explain the act of learning, the dynamic nature of learning, the modifiable nature of learning and the mediational functions of learning. It provides a direction which does not require differential comparisons of "products" or "pieces" of information; the main concern is acknowledging mental control, modifiability and sophistication. This model may, therefore, help provide an alternative perspective on intellectual development which can shed more light on the current Neo-Piagetian learning theories of Case (1985, 1987), Das et al (1979), and Pascual-Leone (1969), as well as the cognitive learning theories of Sternberg (1984, 1985, 1990), Pavio (1969, 1976), Seigler (1991), Anderson (1983) and Gardner (1983, 1985, 1989).

This focus from the educational perspective may well be applied to other fields of inquiry in the future. The outlook which presents intellectual sophistication as more sophisticated application of imagery and inner language over a lifetime may also be useful in future anthropological and behavioral studies. Again, the relationship of automatic bottom-up mental functioning and top-down metacognitive control of mental functioning is being explored. For example, from an anthropological point of view, the focus on imagery and inner language may help us understand more about the relationship of cultural thought and language. Are the languages of eastern cultures more metaphoric because their culture favors imagery? Does the language define how a culture will think as Whorf (1956) would contend? Could this cultural preference favor imagery as the primary method of mental representation throughout a lifetime? Do Eastern cultures, therefore, attain a more sophisticated level of imagery? Conversely, are western cultures so verbally oriented that they discourage the sophistication of imagery? Are they, therefore, more sophisticated in applying inner language?

From a behavioral point of view, what is the relationship of imagery and inner language in helping or hindering self-control? Self-esteem? Abnormal behavior? The term metacognition has been applied with an academic and cognitive reference in mind, however a parallel application of the cognitive perspective offered can also be applied in

changing therapeutic directions from the behavioristic Freudian form of psychoanalysis (1910) to the humanistic call for renewed attention to the inner experience of the individual, illustrated through the works of Rogers (1969, 1980, 1983), Maslow (1962) and Miller (1990). Current humanistic oriented therapies such as the rational psychotherapy of Ellis (1962), place a great deal of attention on the individual's control of one's feelings through controlling one's thoughts; the model presented may add to our knowledge of how one attempts this control through imagery and inner language. The emotional and behavioral development of the individual could well be mediated as effectively as the intellect through fostering positive application of imagery and inner language.

(C) PEDAGOGICAL DIRECTIONS

The school based research portion of this study applied a mediated metacognitive intervention to the reading comprehension of Grade 4 students. It is about classroom experiments through dialogue about the ways students can gain control of their own meaning-seeking behavior. It is about trying things out in a classroom environment in order to evaluate the potential of this approach through discovering and discussing learning strategies. An obvious future direction would be to discover the effect of this intervention on the reading comprehension of students of all grade levels. When do children develop independent strategies employing imagery and inner language to help them read meaningfully? Is the intervention consistent at all grade levels or do children learn to apply such strategies in "spurts". Do children learn metacognitive behavior by evolving through a linear level of degrees of abstraction, or do they learn to apply comprehensive strategies in a more simultaneous fashion? What is the relationship of these two processes in terms of problem solving and problem posing? Can children seek meaning without using either process? Why do students favor either process? How teachable are they?

A second important direction for future inquiry would be to explore the efficacy of this approach across the curriculum at all grade levels. Would a similar intervention achieve similar gains in writing/spelling achievement? Mathematics? History? Can we help students become more intellectually flexible and independent across the curriculum? Can we evaluate the sophistication of student self-questions and images over time and between subjects? Because a learner employs imagery to comprehend in reading does not mean that they will automatically use imagery to seek solutions to a problem in geometry. Similarly, internal questioning that helps the learner monitor and evaluate their understanding while reading, does not necessarily mean the learner will apply inner language when building a model airplane. Dialogue between and among students,

parents and teachers may help to broaden applications over time that would not have occurred otherwise.

A third important direction would be experimenting with mediational variables. Are there limits to how much mediated metacognitive instruction students can be expected to profit from? Are there instructional techniques which benefit more than others? What is the relationship between explicit group discussion of metacognitive behavior and implicit expectations? Do certain mediational variables apply more beneficially to students of differing abilities? This work has argued for a pedagogy which infuses critical thinking across the curriculum for all children at all grade levels. The school study intervention employed an infused technique, described as mediated metacognition, which offers an alternative perspective to the more traditional cognitive-behavioral approach that moves beyond the packaged instructional programs for teaching independence in thinking, reviewed in Chapter IX, to consideration of the dynamics of the teaching-learning process itself. Further, it helps extend the approaches of those that have argued for infusion (Mulcahy, 1986, 1991; French, 1983, 1991; Swartz and Perkins, 1990; Swartz and Parks, 1992) by demonstrating the effectiveness of including a focus on imagery and inner language, and by providing a model of intellectual growth which describes their sophistication under mediational influences. The implication for educators is the contention that the more we integrate a mediated metacognitive model into the classroom, the more we may be able to anticipate student sophistication in thinking, and the more students may be able to learn to evaluate and control their own thinking behavior.

An important aspect of this change in outlook concerning students modifying their intellectual control, is the contention that mediational influences help tow or promote children's thinking into more sophisticated understandings; improving their strategic applications of imagery and inner language propels them into enriched levels of understanding which in turn eventually permits more sophisticated applications of

imagery and inner language. Acceptance of this view certainly puts in question traditional "readiness" practices based on Piaget's stage theories--the mediational influences help cause readiness to occur and the contention that we should not teach or mediate children to do certain things at certain ages does not make sense under a mediated metacognitive pedagogy. The learner is always ready to learn an increment more, but the mediator must know how to tap in with an appropriate level of mediation.

In order to move in this direction, a system-wide plan is necessary to implement the changes of paradigm towards a mediated metacognitive pedagogy. Just as the goal is to empower children through fostering intellectual sophistication, school systems must also seek their own form of empowerment to plan, monitor, and reflect upon the change process. Increments of change can, therefore, exist along a continuum ranging from a single teacher, implementing a single lesson, to school, county, province, and even national directions. What this study offers is a philosophical "why", and a psychological "how", through mediated metacognition. Explicit and implicit priority needs to be given to improving the quality of student thinking to meet the challenges of living in a technologically oriented and multi-cultural world.

Many authors have argued for similar reforms, including Barell (1991, 1995), Gardner (1991), Swartz and Parks (1994), Swartz and Perkins (1990) and Baron and Sternberg (1987). All acknowledge the need to restructure our schools towards enhancing the critical thinking process of students. All also allude to the difficulty in initiating and maintaining change. Perhaps this perspective on the importance of mediated metacognition and imagery, and inner language will help add to the will for change.

The title of this document includes the phrase "towards a mediated metacognitive resource model". The meaning behind this phrase should not be interpreted as though "resource" belongs to exceptional children, because this train of thought would fall within the traditional paradigm of beliefs which marginalizes, pigeon-holes, and differentiates

what we believe about children and children's learning. This is why the statement "for exceptional children and regular education students alike" has recurred throughout this work. A mediated metacognitive pedagogy applies to all learners; this is an important difference between this study and the lion's share of previous research in Special Education. This model transforms the belief system of practitioners, parents, and students, away from differences, towards a proactive learning agenda which is globally applied, regardless of exceptionality. This pedagogy is necessarily student-centered, and necessarily based upon how each student becomes as independent as possible in their thinking. "Resource", therefore, becomes resource for all students, parents and teachers, and the "special" in Special Education becomes a special way of thinking about children's learning.

There is danger in transforming the meaning of these words to apply to all learners, because staff and resources have historically been financially dependent on the numbers of children diagnosed within a plethora of exceptionalities. Special Education has evolved into a very expensive "sub-system" which politicians and accountants find almost irresistible in times of budget cuts and restraint. Misrepresentation of a mediated metacognitive pedagogy could imply that we no longer require special education staff or special education training. This is, of course, absolutely untrue; the resource teacher can be a key player in helping a mediated metacognitive pedagogy to evolve. A great deal of professional development and training will be required to empower resource staff to help classroom teachers infuse this pedagogy across the curriculum for all children. Pre and post-interviews with Resource staff suggest that, at least for this study, a constructivist and child-centered philosophy may emerge because these staff already have a history of opportunity working within individual or small group settings. It would provide interesting research to discover if this is so for the majority of Resource teachers. This study also provides a new aspect to the role of the resource teacher, a preventative role through modeling instructional techniques for classroom teachers, and through engaging

all students in explicit group discussions about metacognitive behavior. This new role does not mean that resource teachers are no longer working with smaller groups of children or individuals. The mediated metacognitive pedagogy can, and should, be applied to the individual with even greater opportunity to expose, encourage, enhance, and monitor metacognitive behavior.

Another new and important future direction for special education could occur in redefining and rethinking previous definitions of exceptionalities. For example, rather than defining a learning disability strictly in terms of discrepancies between achievement and cognitive potential, a mediated metacognitive definition would define in terms of inefficient strategies; a failure to appropriately predict, monitor, or reflect upon how they engage in the particular activity. Similarly, rather than defining pervasive developmental disorder or autism solely in terms of social and/or cognitive retardation, a mediated metacognitive outlook might implicate the failure of the learner to engage in appropriate inner language beyond literal mimicry; they may not be engaging in their own thoughts in words. These definitions have a pro-active learning agenda, rather than relying on prescriptive description alone. The way we define reflects and shapes the way we behave as educators, and this work can hopefully help the sub-system of Special Education and the system of regular education merge into a philosophical and psychological agenda that values the sophistication of thinking within all students.

Another perspective which this work hopes to offer is the placing of at least equal responsibility for children experiencing difficulty squarely on the shoulders of the "system". The history of the "sub-system" of special education, reviewed in Part I, directly suggests the possibility of a negative social learning culture that these students have experienced during their educational career. The notion that the sub-system may create and foster inadequate learners begs attention; if, as this study purports, the mediational influences surrounding learning directly affect a student's intellectual development, then one can only surmise that some forms of exceptionally have been

proliferated by negative mediational influences. We may create a disabled reader because we have established a culture of intellectual dependence within this learner which does not allow intellectual flexibility to attempt optional strategies to read.

SUMMARY

This exploratory study has presented a critical perspective of the traditional paradigm of special education and has argued for an alternate model based on the mediated metacognitive control of learners. A model of intellectual sophistication has been described which considers the degree of metacognitive control the learner exhibits under mediational influences, through the strategic application of imagery and inner language over a life time. This model's focus is generative in nature, revealing intellectual development in terms of the acts of knowing, and the degree that the learner achieves learning au nomy. A school study to test the efficacy of this model has resulted in improvement of the reading comprehension of Grade Four students and is considered a new and important educational direction by educators, parents and students.

The simple statement that "thinking can be taught" has prompted this complex re-evaluation of how we perceive our roles as educators and special educators. We owe it to ourselves, and to our students, to discover in more depth how we can facilitate the sophistication of children's thinking processes. A mediated metacognitive pedagogy is offered as a step towards a classroom and Resource model that values the modifiability in students' thinking behavior, values the mediational influences which enhance this modifiability, and values this direction as a primary educational ideal.

APPENDICES

APPENDIX A

STRUCTURED INTERVIEW FORMAT

All pre and post interviews were recorded by an external interiewer, Mrs. P. Moore, an experienced Resource teacher knowledgeable in cognitive psychology and approved by committee chairperson, Dr. S. Sodhi.

Pre and post interview formats were discussed in detail with Mrs. Moore to ensure variables of coaching or leading responses were kept to a minimum. Mrs. Moore was also familiarized with the purposes of the study.

Resource teachers in each school were responsible for coordinating interview schedules for all triad members (including themselves), parents and students. Selection procedures for parent and student interviews were also the Resource teacher's responsibility under the guidelines that the first three parents consenting for interviews would be selected and the first five students bringing in parent permission forms would be selected.

(A) Triad Pre / Post Treatment Interview

(Entire interview to be recorded)

1. What do you think you are doing when you teach? Has it changed since you first taught?
2. How do you think children learn? Tell me what you believe about children's learning and thinking.
3. Can you give me another name for a teacher to reflect your beliefs about teaching? Have there been any professional development opportunities that have influenced your beliefs? (courses, workshops, seminars, etc.)

4. Tell me about your beliefs on the delivery of services for special education students. Are your educational beliefs different for these children? What changes might you suggest for these learners? What changes might you suggest for the system?
5. How do children know what they read? Why are some children so much better at this and others are not? Why are some children good at reading, but not "knowing"? Can we help change the reading behavior for children? How?

(B) P' . Pre / Post Treatment Interview

(Entire interview to be recorded)

1. How is your child taught? Has this changed from year to year? Was it the same as when you were in school?
2. How do you attempt to teach your childen? What do you do with your child at home? Do you do the same things at home as they do in school?
3. Do you read with your child at home? How do you know what he/she can read? How do you think they are doing it?
4. How does your child remember what he/she reads? Do you think the school or home can help them remember better?
5. Do you think you know enough about the way your child approaches their learning? Do you think this knowledge is more for the school to discover? Parents? How can we improve our knowledge of our children's learning?

(C) Student Interviews

(Entire interview to be recorded)

1. How did you learn to read? When did you know you were really reading?
2. What is your favorite book? How do you remember it?
3. Do you think all students learn to read the same way? Why hy not?
4. How do you think you could learn to read better? What ways have you tried?

5. What's the difference between students who have a hard time reading and those who have an easy time? What sorts of things do good readers do in their heads that weaker students might not do?

APPENDIX B

INTERVIEW TRANSCRIPTS

PRINCIPALS

PRE PRINCIPAL SCHOOL A

*Interviewer
*Principal School A

I What do you think you are doing when you teach ?
A I think there is a real match between teaching and learning and I think as a teacher you need to facilitate the learning of the student, so you need to be providing them with the kinds of experiences at whatever level they seem to be working through at that time so that they can have opportunities to experience and to learn as much as they can. So in a sense, maybe as a facilitator you are someone who can guide them, someone who can intervene at appropriate times.

I I take it from what you said, that you are implying that children learn differently or at different rates. Does your role as facilitator change with the rate or the style of different children's learning and what about children with special needs?
A That's an interesting one to pursue. If that 's your belief and your style, probably it's going to carry through with all children, but I think, perhaps the key is the intervention, the kinds of strategies, of communication, the relationship, the rapport, there is such a whole listing, kind of thing. Maybe it comes out there and possibly some of the strategies that you would choose to use may be more direct. So you can say, are you still facilitating. I don't know what the final end is. I think you have to use some different strategies and approaches, that's for sure.

I What do you base this feeling of being a facilitator on? Have you had anything in your past experience--courses or workshops, conferences--that brought about this realization, or was it there when you first started teaching? Was that how you perceived yourself?
A I think when I first started teaching I perceived myself as a teacher, a person with all the knowledge and I just passed it on; I opened up the top of the head and dumped it in and they regurgitated the way I wanted it. That was certainly was the way I begun teaching. I think, over time, I changed as I worked with children and realized sometimes when I set things up differently in the classroom by way of projects or whatever, that all kinds of wonderful things happened that I never thought about myself and so I started exploring from that. I think it really solidified for me at the Mount program the last five years, or so, and went through a process, myself, of not having someone there, directing me, in the way that I had been through any other courses that I had taken. For the first while it was a struggle, I was completely lost. Just couldn't get myself together, I thought I was losing it, many times. When I finally realized that I am the one who has complete control and can take the responsibility and can make use of these other resources, it was wonderful, and I just really then began to see how this can happen with other children. Same as with teachers in classrooms at that time, becoming sort of not being that main person on

the stage, controlling everything, but actually backing off, facilitating choices, and so on, I could see kids really growing from those experiences.

I Did it help you to understand how children learn in here?

A I think so, because I think you have to get inside heads a bit. You put yourself in the role of being more of a listener, than a talker, a director, and so on. If you really listen and observe, you can find out what is happening, what their reasoning is. It doesn't always have to be on paper, it can be verbally, it can be a combination, or whatever, and by attending to that task, you can then find strategies and eventually things that really work.

I Then can we direct this toward reading, in particular. How do you think a child learns to read?

A I have no idea. I am sure there must be an answer to that, but when I think of how I learned to read, and somebody else, and how children do, I don't know. It seems to be a combination of many factors and what works for one child maybe doesn't work for another child. But, I think you watch children who have had enriched talk and conversations and experiences whether it is in school or out of school and where books play a really important role. Sometimes it is the talk, it's the conversation, it's the learning about the concepts. I think there is a whole process there.

I What you have included for me then is the externals, the models that other people give, and then you have eluded to a couple of the internal things Can you develop those internal things?

A I think so. I think that's what I mean when I talk about the enriching experiences and kinds of conversations the kids have in their lives, from the time they are born until they come to school.

I Do you ever explicitly talk about those things? Should you always have a kind of peripheral thing?

A I think there are times when you actually talk through them with students. I have not had the experience of doing that. I think that the teachers I have watched and I think really do the best jobs, do those kinds of things with students.

I In your experience, had you had children that you really can't get into their heads?

A I think we often say that, the frustration sometimes is there, and maybe I have watched teachers say that, I just can't seem to find anything that works. I think that some of the special needs we have, having watched someone (like Jana Prest, for instance) deliver a really different model to students, I just think that there are other ways of doing that, other than just direct and fill in the blanks and here's a piece of paper. There was a lot of building of ideas and concepts and some of those students that we thought, "boy, there's not much happening there", really blossomed over time. I don't know, because I think there is some point at which there are certain things that some students can't work out in their heads.

I Who are the kind of people that you utilize when you hit these situations where the classroom teacher for one reason or another feels frustrated, that there is an enigma here and with the best of my intentions, I can't unlock that? What are the resources that you are able to call on?

A I think, once again, watching teachers, they have colleagues and they have other teachers and those teachers who have those contacts within a school setting really benefit. They give a lot, they share a lot, they also get a lot in return. You have your resource teachers and you hope that you have someone who is attuned to what is happening in a classroom of that nature, so there can be follow-up and sharing, you

have educational consultants, and so on. Also, you have parents, we forget that too much. Maybe forgetting too much is a way of saying it, I think parents don't often understand the involvement they can have, or they are busy, or they are working, or they have so many other responsibilities, but if you can build a nice relationship there, I think you can get a lot further than working alone on it. I know, you have other agents, you know all the answers.

I I think that you have covered all the bases; the questions that I had to ask and I do appreciate your succinct answers.
A Hopefully they make sense.

POST - PRINCIPAL SCHOOL A

I What do you think was the importance or value of this study?
A The importance or value of it, I think possibly, well related to students, but related to teachers too, I think. I think it probably initiated some discussions amongst other staff and I know at one stage, the upper level had Don come in and he talked with us about activities that those teachers could be doing that relate to it. For the students - I guess I really haven't kept that close a watch, but I think they have been introduced to it. To another way, to other strategies, perhaps of managing their own problem solving, and so on. I think that is important. Some of them maybe use it now. I think it needs a lot of reinforcement, is what I am trying to get to. This is the tip of the iceberg. It is something that needs to happen at lower grade levels to learn it as they travel through the grades, to self-talk, how am I doing this? how did I get the answer the last time I did this? what did I do? I think it needs to be a long term kind of thing.

I Have you heard any discussion that the crossover, not just in Language Arts, but in other subjects in other areas?
A I guess I haven't. Maybe its because I haven't been that close to some of the discussions. I know our teacher had said that with some of the high needs students that she works with in that class, that it didn't seem to be showing much of a carryover, but I think it is one of those things that takes time, it takes repetition, it takes modeling, coaching over and over again, especially.

I Then, because you have been a bit removed it will be difficult to ask you if you have gained any insights in particular into children's learning other than your discussions with Don.
A No, I have not been that close to talk with those individual children in the class or to see some of the things that they are doing.

I Would you suggest any changes to the study that might have involved you more? Or, do you see that that's not really necessary?
A I can almost say yes and no, that's the way I function sometimes. I think that for something to happen in a school, that a principal is a key person to facilitate and promote and so on, so I'm not saying that you don't have a role, but I guess I also believe that along with that there is often the ground roots kind of knowledge and movement that teachers can bring about and so I think things can happen at that level without me, to some extent, but I think it is more of a pocket, the classroom or couple of teachers to encompass. To include the entire staff or cross grade levels, I would need involvement that it was just really hard . . . often I didn't know when sessions were happening and a couple I did know and I was committed to other things or dealt with a crisis, or whatever.

I *I guess we are looking also if there was something you saw that could have been done another way.*

A *No, other than I guess I think about the time - the amount of time that was actually spent, though I know our teacher was probably trying to carry on some of those things when Don wasn't there. It just seemed to me that it wasn't enough to really get a true picture of what could happen.*

I *I guess those are the questions that we wanted to know and I appreciate your frank responses.*

PRE PRINCIPAL - SCHOOL B

*Interviewer
*Principal B

I What do you think you are doing when you teach?

B That is a tricky question. I have some thoughts on that because I think that sometimes when people are teaching they have an intended message, but it's not always what's being received by the learner. I think that people can have objectives that they believe that they are trying to reach with the child, but when you actually watch and observe what is happening, there's other learning taking place. They may be saying, "I hate this, this room's too hot, this room's too cold", so I believe that to a certain degree people when they are teaching can have their stated curriculum objectives, but then in addition to all of those, there's all the hidden curriculum that's being taught that they may, or may not be, aware of that's taking place. Now I'm not sure if that's a fault.

I Another facet of that would be, how would you define your role as a teacher? Or you could put a name to it.

B I think that teaching is a process that is one of guidance and is guiding children through a process and that process involves a real area I guess of different experiences of learning, so that teachers are a guidance.

I And how would you define, a little more precisely, that guidance. Can you give it a name that you might refer to yourself? How you think of yourself when you are teaching?

B Well, I think that I guess I always saw myself as one who is sometimes imparting knowledge, sometimes I'm developing skills within children, introducing strategies and so forth to help them to become an independent learner and I think that's, I dunno if that's a .....

I Did that change over time or is that how you feel you started out?

B Personally? I think when I originally started as a teacher, I saw myself in the beginning as the person in control and that I was imparting knowledge. I was a high school history teacher, so obviously I knew all of the information and I had to give it to students. Over the years, I have certainly reversed and my role changed as being one of a facilitator that brought opportunities for learning to the children and they became explorers of knowledge and information and so forth.

I How do you think children learn?

B Well. I think there's different ways. Through experience, this is likely one of the best ways children learn. I think everyone, as they involve themselves actively, is

a learner. That's when real learning takes place and I guess that that's going back to one of the first things I said, is that the intended learning on the part of the teacher is not always what's taking place. So the only way to really measure when learning has taken place is seeing the learner then do the things that you are hoping are within your expectations.

I Then do you feel that all children learn the same?

B Definitely not. They don't learn in the same way, obviously, and I think there's some children that are visual learners, some must have concrete materials to work with before learning takes place, there's others that can simply look at something and understand it, some are better abstract learners than others, so there's different learners, and as many different approaches to learning and the way that you have to teach those kids.

I You mentioned that felt that you were a facilitator. What do you base your feelings on being a facilitator on?

B As a facilitator, my definition, I think of a facilitator is one who brings the child as a learner and the curriculum together. And now you have to then understand my definition of curriculum. Curriculum is everything that takes place with the learner and the teacher and that can be not only books and other materials, but it's the classroom, it's the outdoors, it's everything that is involved in the learning process. So curriculum, to me, is a really multi-dimensional situation.

I I kind of wonder when you think of yourself as a facilitator, are you able to alter the way a child thinks, the strategies they use?

B I think that as far as altering the way that child thinks.

I How do you know how a child thinks? How do you know what's going on in their head? Their kind of learning?

B That's a difficult question. I don't know if you really ever know what's going on in a child's head and I think that you can only, sort of sometimes, measure what is going on in a child's head by either what they say or what they do and so, obviously, if you're through whatever strategies you are using as a teacher to try to elicit responses or something that's going to be indicative of what the outcome is that you are trying to achieve, the only way that you really know if you are, I guess the same difference is if you try different strategies and you start getting the responses, then I would say that, certainly, you should be able to, or you can sort of see whether the child is changing their thinking and, I guess I'm trying to think of examples, but obviously people do change their thinking.

I And you put the responsibility on you as the facilitator's change strategies. Does the child change strategies and how do they learn those?

B Oh sure, you see children, and I guess that this is one of the neat things about watching learners, is that lots of times I can remember situations where I was trying to teach a child using a certain strategy and that obviously was not, the child was not processing that the way that I was sort of looking for, and another child might have just come along and explained something in a different way and boom, they say "now I understand". And so, obviously, children certainly achieve outcomes from, not from what I do, it's obviously a lot of it is what they are doing.

I What about those children that you can't figure out? How they are learning? Where do you turn?

B Where do you in respect to assistance and that?

I In figuring out how they learn? Or how to teach them?

B I think that as an educational theme, that as many different types of children that you come across, particularly, let's say learning disabled children, who I think for many, many years were a real mystery to a lot of teachers, that through the experiences of others, whether it is the diagnosticians that work within our schools, the educational consultants or whatever you want to call them, that there are people that have devoted a lot of time to trying to determine how certain children learn. That you simply have to refer to others as a team approach.

I Who are those other people that you would feel comfortable calling on?

B Resource teachers, educational consultants, learning disability specialists. I certainly have used, like, at the I.W.K. I have used the Atlantic facility there for the hearing impaired, the visually impaired. All of those people obviously have information that we can use and certainly the Child and Adolescent Team when it comes to behavioral problems.

I What happens to students when you have called in these consultants or you have utilized them with the students? What happens to them regarding the student themselves?

B One of my, I guess immediate thoughts on that, there is a real correlation between the gains that we make in respect to the learning that we are hoping will take place and the self-esteem of the student, which again I sort of relate it to the support of the home. I think that sometimes we can gain an understanding of why the child isn't learning, but then that the impact of the home environment, the impact of the things that are traumatized in the learning, and I think, for example, of children who have blocks, that caused by emotional traumas. I think back of specific children that we had very little success, even though we understand why learning is not taking place. Until we can deal with those problems and their lives, we have very little hope of influencing learning. I have seen that with numerous children, and then I've seen the tremendous gains take place that once, either the environment they are in has changed, or the parents have overcome the difficulties that they have had. All of those situations.

I With these children that you have used these other resources, have they become dependent on this assistance, do you find them becoming more able to take on responsibility for their own learning, what's been your experience?

B That's a good question because we have, for example, here we call an "After School Club" and what that Club does is it provides support for children who we feel home does not provide the proper support in respect to homework. We see those children gradually falling behind because other children have that support network. We have found that as long as they are coming to the program, they will tend to do O.K. As soon as we take away that support network and the home does not provide it, then the child pretty well goes right back to where they were before. If we involve the parent, and the parent perhaps is a parent maybe who has the ability, but is having problems in their own lives, and they can't give that support, then the child will always need that support. If it is a parent who, maybe has come to grips with whatever the problem was, and that's why the child wasn't receiving the support, we sit down and we say here are the same strategies that we have been using with your child, trying to provide organizational skills, consistency with respect to experiences that they need at home, and that parent is ready to then provide that support, then the child normally will start making gains. So I guess that in terms of in-school support with resource personnel, again, I think much of that depends on what the reason is, or why the child has either fallen behind their peers, or is having difficulties. That's a very difficult question.

I Those are all kind of external things to the child themselves, that become internal problems. What about the extent that the child assumes the responsibility for their own learning?

B Much of that, again, I think depends on the child and the child's self-esteem and what the reason is for the child not being sort of at the level that they were. If it is a specific learning disability, my personal experience is, that depends on when that child, personally, can come to grips with the fact that they are a learning disabled student. That they are not stupid and that they do have a specific problem, the same way that someone else has a problem that you can see. My experience is that for most of those children that does not take place until Senior High School because children have a very difficult time accepting that the reason that they can't do well is a learning disabled student is because of minimal brain damage. How do you explain that to a child? And so the other thing is that 'yes' you talk about the external things, if that parent is able to instill within that child a real self-esteem sort of building process that says you have your strengths, maybe you are having problems with reading that you can do elsewhere, then we will make gains with that child in that respect.

I Specifically regarding the reading with the child, how do you think children gain meaning from reading, how they attempt to remember and think about what they read and do some children not remember?

B If you are referring to the whole comprehension aspect of reading, it's another good question. I think that for some children reading becomes a natural process for them as many other types of skill developments do for other children. In other words, some children, throw them in the water and they swim almost immediately, where there is other children it is a real skill developing process that sometimes never becomes natural and to understand why it is easy for some and not for others, I don't know if I really have the answer. For some children, I've seen Primary children that are reading like a whiz and it is because they have had tremendous exposure to reading and print, and they seem to have been able to put it all together. I don't know if I really can answer that.

I What about some of these children who are wonderful decoders, read every word on the page fluently, and sometimes with great expression. But have no understanding of what they have read.

B Good question. I don't know if I really can explain that. That's again, you're getting into the whole cognitive area.

I Do you think you can change their perception of what the reading is?

B Their perception what reading is?

I Because many of our children think reading the words out and saying the word is reading.

B Yeah, I'm sure that they do because we, as much in the same way we parcel the language into reading and writing and all of the different domains that we have, that --I'm not really sure that these children that think of the reading, we have had teachers for years and not just teachers, parents, that would also say that a child can't read because they can't read orally and yet they have good comprehension of what they have read, so I guess you'll have to put that in the relationship of what your definition of reading is. I'm not really sure. I'll have to think of that one more.

I I would gather from what you have said, that your view of reading comprehension has changed because you understood that some people think oral reading is reading.

B I can remember back to days when the teacher made everyone go around the classroom reading orally and that poor little child sat there, who either was dyslexic or simply maybe had a speech impediment and everyone judged their ability to read on the basis of how well they read orally and there's many others that are just as confused and frustrated when they know that the child came up and told them everything about what they've read and yet they can't read it orally. So there's a . . . I guess that my main concern is that, or not a concern, my feeling is that most of us in life will not put ourselves in positions where we display our weaknesses and so for example, if you are a poor writer than you, and I'm saying if you are a poor writer, penmanship and things like that, then if you had to present something you will likely have it typed, as an adult. If you are a poor speaker you will not volunteer. . . . hiding within the classroom so that they don't have to display their weaknesses as well. You watch the child, he will drop something on the floor, the teachers going around the room and doing that and hopefully not many are, so that they avoid their weakness and getting into the area of what's happening within that brain is a little bit beyond what I'm prepared to make a judgment call on.

I Did you have any particular courses or workshops or seminars that have influenced the way you think of yourself as that facilitator?

B Likely, I would say for me that I don't know if it was so much a matter of a course or anything like that, I think it was a group of us as a school staff a number of years ago. We were sort of influenced by one particular individual who was involved in a graduate study program at Dalhousie and working with Judith Newman and I think that was likely one of the first times that we really started focusing for ourselves as educators on reading and writing and particularly on language, instead of allowing others to simply to tell us, "this is how you teach children", that we examined the learner and how did children learn. Even though, I'm sure that in college courses we looked at . .. that was too early in my career to really focus on the learner. I was focused more on the teacher and I believe that, in the 70's, late 70's perhaps, I started focusing on the learner, more so, so for me personally it came as a result of being influenced by this one individual who then, through a lot of readings, and so forth, we started going to seminars and having group discussions within our staff and likely altered my thinking a great deal on who has ownership of learning. Its not really the teacher, it's the learner.

POST PRINCIPAL - SCHOOL B

I I guess I'm going to ask you what your understanding of the study was and what importance or value do you think that it had?

B What a terrible thing to ask me that stuff. I don't have any answer for that.

I I forewarned you that I would be back.

B You didn't tell me what you would be back to ask me.

I I didn't know at that time. This is Don's study. Were you very much involved?

B No, I intentionally stayed out of it.

I Did your classroom or resource teacher discuss what was going on.

B Not the resource; the classroom teacher and I basically talked a little bit about it just from the point of view. . . he made comments like it was a very impressive study, the kids found it appealing, very practical, the kids were buying into it, the

accessibility to all children, kids found it fun, reached a lot of kids, especially the unmotivated, has universal application, and stuff like that. But, other than that, I stayed really away from it.

I *Sc I can't ask you about any insights you have or criticisms that might have improved it.*
B *No. Not a bit.*

I *How do you think that Don might have informed you better about what the study was?*
B *. . . . . .*

I *Is it the kind of thing that you would have given him time or I guess it is looking at what priorities might have had*
B *I guessed that maybe this was more for me than him. I knew I wasn't going to have the time to teach and I just said, if the teachers want to do it, you are welcome to do it.*

I *O.K. that's part of what he wants to know and part of what they are looking at. So, I guess you have answered my questions.*
B *Wasn't that neat. Neat and tidy.*

I *You had your discussion with one of our teachers and I guess you pulled out from him what he thought.*
B *And that's mainly what I was, at some point, certainly would be beneficial from a . . . I would like to find more information about what they are doing, but I sort of stayed away because I have so many other things on the go that I just didn't want to get involved in it.*
The teacher felt that it was a good project and he certainly sees that there is benefit for the kids in it. So it was a worthwhile project.

I *Thank you very much for participating.*

PRE PRINCIPAL - SCHOOL C

*Interviewer
*School **C**

I What do you think you are doing when you are a teacher?
C You could only answer that in limited statements, but I think the main thing is to get children to be excited with a life-long process.

I Some people call themselves by another name as a teacher. Like might view themselves as a coach. Is there some other name that you might apply to teacher that would ?
C I view as a source of inspiration. I know you can get into a philosophical discussion about rote learning, memorization, standards. I, personally, want high standards, but high standards themselves will not excite children about education. It has to be high standards with inspiration. The inspiration and the high standards have to be modified by compassion.

I How do you think children learn? If they are inspired, then how is it that they learn?

C You can take a whole series of learning theories and you can analyze and cut it apart, but it is a bit like analyzing what makes a good teacher on the debate whether you categorize it or whether it is some total of individual parts which are more creative and defy definition and I think the whole process, to some extent, defies definition.

I By that I would take that you can't define precisely how one person learns. Do you think that there is a commonality in learning, or is it unique to each individual?

C There is not necessarily a uniqueness to each individual, but each individual has certain strengths and certain weaknesses, and there is teaching styles that should hopefully tap into those strengths. We go back to the usual labels of auditory learning, etc., but I think that a good teacher uses a variety of approaches and tries to draw out the strengths of each individual student by using a variety.

I Is there anything in your background; workshops, conferences, books, courses, that brought you to your understanding?

C I'm pausing here because while I can answer 'yes', you could not have been in Kings County for the past number of years without coming across discussions such as learning styles. I think the driving force of my philosophy was the fact that for many years I was not a successful student in school and school was not a happy place for me to be. To use the cliché term that I grew up with that I was a 'late bloomer' and I still have nightmares about school, even in my adulthood. I will sometimes, even now, wake up in a panic because I have failed a test, or something like that. It has marked me very much and I wanted to be a teacher because I felt I could make a difference. I felt I was a late lover of learning, I got hooked on learning and I felt that I wanted to do the same for other people that had been done for me at the last moment. I could sit back now and analyze. I was ambidextrous, I stuttered and it was the days of ink, left-handedness. I now realize that what I did then was that my hand went across the wet ink and I was always being kept in because my work was messy and you weren't allowed messy work. It really wasn't a happy time.

I Are you the same kind of teacher, when you started, that you are now?

C First of all as a principal, I'm not a teacher. That's a philosophical question, isn't it. I think you get bogged in a school this size I see fewer and fewer children with increase in enrollment and I become more of a building manager and not a very satisfied building manager and I get farther away from the children. If I went back into the classroom now, I would take the same philosophy that I had 20 years ago. Twenty years ago, if I heard an experienced teacher say that I would have actually died of shock. I would think what a dinosaur that person was. But I would take in the philosophy of that I wanted to excite children. I'd also take in the philosophy that I had high standards. I believe when I taught that I did excite many children -- I don't believe you can excite 100% of the children, but I believe you can get very close to it. I also believe that I had high standards that were reasonable for the children, as a whole.

I You mention that there are some children that you can't quite reach. What do you do when there is this child that's an enigma, that you don't know how it is that he learns, that you aren't able to tap into that. Who are the people that you call on?

C You basically fail. You don't give up, but you fail. First of all when you reach the high school and junior high, where most of, but not all my experience with teaching was, I used to say that you used to get one student a year who you could do a striptease in front of and they wouldn't blink. In terms of elementary students, you know the options better than I do because of a whole series of processes, calling

on support services and advise, and parent meeting after parent meeting, and you can modify sets of procedures, you can set individual programs, you can do all that, and at the end of the day, there are some children who are usually so scarred by life that you can't reach. You don't give up, but you can't reach. The student that we discussed this afternoon, that I sent home, is crying out for help, and until someone comes up with a solution to his underlying problems, I'm not so sure that we can succeed. But we don't give up.

I How do you think that children do learn? If one of the young students comes in to you and reads for you, that exciting time when they finally know, "I am a reader", and the reward is to come and read for you. And then they close the book and you ask them to tell you about the story, how is it that they can retell that story to you?

C I would reverse that question and ask you: when you have a child who can read a story, why do you get the one or two children who can't retell it to you?

I Well, if you can tell me why they can't retell it, then I will no longer have to ask people how can they.

C The interesting question is: Which question should you ask? Why they can retell it, or why they can't retell it. It's a bit like Newton and gravity: the natural thing about gravity is to assume things fall. Newton didn't assume it, he asked why did it fall. I go back to the question you asked me. Maybe it is not a question, but an assumption. What is natural, may be natural. The question, perhaps, implies that you don't think it is. When all the sum total of parts come together, maybe there is a resolve that defies analysis and when the sum total parts don't come together, you have to ask why? What is important is, is it important to know why a child speaks by the age of 5, which is an interesting exercise to find out, or is the questioning more important to find out why a specific child, by the time they are 5, does not speak.

I I don't think that, perhaps, I could understand why he doesn't unless I understood what went into what he does. That's why I pose the question. How does that child remember to tell you what he has read? What are the strategies that that child goes through to retell the story to you?

C The only thing I can apply to that is a series of clichés. You have the fact that the child obviously has understood meaning and the ability to generalize that meaning, basic understanding of maybe cause and effect.

I What is going on in his head, or maybe even in yours, when he is retelling something.

C You're looking for visual clues, you are looking for memory clues, you are looking for idea associations, and you are mentally thinking faster than you are speaking in order that your brain can process and you can get your words out in a logical order.

I Thank you very much.

POST PRINCIPAL SCHOOL C

I I'm coming back to find out your attitudes and interests regarding the importance and value of the study, ease of implementation, long-term gain of students, crossover to other subjects in their learning, and to find out your involvement.

C This year with 767 students, a vice-principal that was cut back to a part-time, and an overcrowded school; even though I strongly believe in research and trying to

improve my school, the reality is that this research project has gone on with my full support, but no involvement on my part both in terms of how it went and in terms of any conclusions to be made from it. My teachers are happy, the resource teacher was happy and that is all I can say.

I *Thank you very much.*

TEACHERS

PRE TEACHER - SCHOOL A

I What do you think you are doing when you teach?

A Anything? That's a pretty broad question. What do I think I am doing when I teach? I guess I'm, when I teach, it's an odd word -- teach. Shouldn't have come out with such a broad question, right off the bat. Let me just think. Normally, I don't think of teaching in such a broad context. I teach, I encourage, I facilitate, I work with children, all those sort of things. I'm going to look at the word 'teaching', that I might talk about imparting information. If I'm talking about facilitating, I'm talking about creating opportunities for children who learn. If I'm talking about working with the child, I'm talking about on a one to one basis, dealing with that child and dealing with that child's needs. Under the broader context of teaching, I guess you could include all of those things.

I Has that always been the way you have perceived your role, or has it changed since you first started teaching?

A I think my role has changed a lot. I suspect that, philosophically, I was in one place and in practice I was in another. Certain subjects--they were very much what we call child centered things, but note I used the word subjects. So I separated things out and I taught and I stood and delivered some things. For example, in Math, I would stand and deliver the concepts and then have the kids practise. Now I do it much differently. I think, philosophically, I was in one place and in practice I was in another.

I In your background, was there any particular experience or education or workshop or conference that brought your philosophy and your delivery together.

A Well, there are 3 or 4 different things that have really had an effect on that. Most of them professors. I would say the first one was a professor at Acadia, David Barron, a linguistic, who introduced me a lot to the concepts of psycholinguistics. David Doak, another one, very strong influence, and then probably the next one who had the biggest influence on me was Dr. Dienes, in terms of math. And I think their philosophies, although they probably wouldn't think so, are very similar. I should mention one other, I did the Mount program with a group of teachers and I think that program showed me how to teach in a collaborative style. To work with children to get children to collaborate together, to learn by talk more about their concepts.

I When you are with the children, do you see them learning in a similar manner?

A All of the children? I wouldn't say so, no. Children have different learning styles.

I Is your response to that different with the different children?

A It depends on the numbers I am working with. I mean, and that often depends on how I organize the class. Some kids are very visual learners, I'm a visual learner, I'm a visual person. So I often try to do things visually, in the class. Other childr , I think are very much aural learners, in other words, hearing and so I think they need to talk and hear their ideas, and so we do a lot of that type of thing. Other kids, dealing with tactile and concrete things, they need those and we do a lot of that in the classroom. I tend to try and use a lot of different ways to present information so that kids of different learning styles can pick up on that.

I Have you had a student that was an enigma and you really didn't understand how they learned? What do you do?

A We'l, if a child is not learning, then I look at the individual student and try to understand them. I talk to other teachers, talk to the principal, talk to my wife, she is a great sounding board (we have talked a lot about those problems) trying to get some grasp on the situation and then following up on whatever the grasp is, talk with parents, and so on. Unfortunately, I think, and kids who don't learn, often end up being behavioral problems in the classroom so that I will pick up on them on a different level. If you are going to come at me from a behavioral situation, then I'm disciplining them first before I realize this probably runs a lot deeper. Quite often, then we tend to look at the home life and talk to the parents and see. But, all the time we are looking for ways to deal with this child.

I Have you had any students that could decode beautifully .... and not understand?

A I've got one right now and I've had one other. Read, you'd think that they were understanding everything, but they don't understand a word of what they are reading.

I What do you think is going on in their head? or what is not going on?

A The child, this year, is a child who has very serious problems and has been seen by the I.W.K., and I think her problems are possibly organic. I won't say genetic because I don't know if they are genetic, but I think they are beyond learning style. The other child wasn't achieving well in school and I don't think did in the end. This was several years ago. She was an enigma, in many ways. She could read, couldn't understand it, and there didn't seem to be much that I did. I can't remember all the things that I did. There didn't seem to be much that I did that made any difference. Whether it was working with her on a one to one basis and talking a lot about what she was reading, or whether Resource people worked with her. Any which way we approached it, really didn't matter. I think she had a fairly limited home life, not an unhappy home life, fairly limited one in terms of experience and world knowledge and that sort of thing. She was a Jehovah Witness and I don't know if that had any impact on it in terms of type of stuff that she was reading, but I tended to chalk it up to that type of a thing. That there was a limitation in terms of her exposure and that was where it was coming from, but I can't say that I was successful.

I The student that you have this year, have you been able to explore with her the strategies, etc.?

A I don't work with this particular student, she has a full time EA. The times that I have sat down with her, normally what happens is that we get into a very quick conversation because she doesn't see me as anybody that should work with her, and I think in order to understand that child, you have to talk with the EA. I have had lots of conversations with the Resource teacher and with the EA about her, and there was a number of issues and one is the hearing issue, right now, a question of medication, there's a lot of different issues with this child. She is a very complex situation.

I What do you think goes on inside the children's heads when they are reading?

A Chemical reactions. I tend to still believe very strongly in the psycho linguistic concept. That children, in terms of the thinking process, they make guesses, you might say. Guesses for meaning. Play them against the rest of the world and whether it makes sense with what they are doing and what they understand of the world and if that's O.K. then they go ahead with it. Now, that's a child who is reading well. Children who are not reading well there is a number of factors that are interfering there and what they perceive me to want and what they perceive other people want. For example, a child might think that the most important thing they can do here is to read every word, when in fact, we would probably rather see a very different kind of a strategy.

I What are the strategies that you think? You mention this monitoring, the child monitoring themselves, how do they do that? What are the strategies they are using?

A Predicting, or perhaps monitoring their predictions is what we are talking about here. A lot of the stuff is textbook stuff, in a sense, but I think what they do is look for cues and in these cues they want to see if those cues that they are picking up are aligning with things that their own world view. Their own understanding of what the world is like. Phonetic cues are an excellent one. They read along, the word looks like what they think it is, they say the word and if they are reading well, then they are probably basing a lot of it on meaning. Does it still make sense, and that type of thing. The child who is not reading well, one of the first things we'll see that they will do is they'll listen, or they'll watch. Depending on how they pick up things. They will be listening or watching for my reaction and, of course, they are depending on me to cue them to whether they are getting it right or not. Which is a very poor strategy to use. So, what I want to try and do is to get them to work with other kinds of strategies in order to check those cues that they are getting and there is a number of ways to do that. I don't think a good one is to teach the cueing systems directly, I don't have a lot of faith in that, other than sound/symbol relationships. I think we can do a lot with that. They are looking at phonetic things, not so much to learn the sound/symbol relationships, because they've usually learned those by Grade 4, but they have to learn to use them. Actually listen to the word, end consonants and that sort of thing.

POST TEACHER - SCHOOL A

I What would seem of importance, or value, in this study?

A Students. As I watched them work on it there was a lot of enthusiasm. If that's of value. Motivation to be involved in a comprehension process. On the short term, I think there was definite improvement for ability to comprehend. There was crossover to work that we did in math. We did some visualization in math and dealing with story problems and comprehension, trying to understand what the question means, comparing it to the kind of visualization that they were doing in the reading activity. That sort of thing. So that was very valuable. I guess in the long term, you build away from these things, it is hard to measure in the long term, if it had any particular impact of whether it is now just a part of everything they have done. We continue to use visualization as a process in various aspects, but I daresay it has now become a part of their suitcase of strategies. I think for many of them it wasn't a new process and while we had talked a lot about working in the concrete and trying to see things in the concrete, one of the things it did was it gave us new terminology.

I Identified what they knew.

A Yes, so that if we are working with numbers, like dividing 8 by 4, to hook into that idea so that it makes sense to them and if they can see those things, if they can visualize the 8 things being divided into 2 groups, and use the concrete objects and

come back to those and visualize them that way. It gives us that kind of a hook in. So it was quite helpful that way.

I *That's encouraging. Did you see it crossing over into any other subjects like Science, etc.*

A *A lot of what we do in Science, what I've been doing involving language, writing, that type of thing, experimentation, yes, I guess because we talked a lot about some of those sort of ideas in the Science as a kind of experiment to try and have some kind of a grasp of where they are going. I guess you could say, it became a part of what we were doing.*

I *So reinforcing something that you were already aware of from earlier discussions, but perhaps brought it to the forefront.*

A *It helped me and it helped the kids because all of a sudden here was something that we were doing and we could compare into it and use it.*

I *It becomes a little more prominent in your strategies of teaching, as well. Ease of implementation.*

A *It was very easy and we did some activities when Don wasn't here and the kids picked up on them very quickly and enjoyed them. They responded well to them. I would say it is fairly easy to implement. I'm not sure because I haven't really set my mind to it as to how easy I would extend the ideas, now, which I would have to do to carry it over a longer period of time. What Don was presenting in the classroom, no problem.*

I *Such a good way for all of us to learn is to observe somebody else. When you were doing this, did you happen to observe, or were you provided with any insights into particular children's learning that you hadn't been able to observe before?*

A *Perhaps on the interest level, one is the map activity and one kid just took off with that. There's probably a lot that could be learned about that child from that and I don't mean just because he likes math, but the way he learns those sort of things. When you ask the question, I think I should have done more with that. I don't know, it wasn't something I was looking for. I guess I can't really say.*

I *Any criticisms of this study that you think might have been approached in a different way?*

A *Some of the reading was a little above some of the kid's levels. That was one thing. I think organizers would help for some of these kids, the kids who need structure. Organizers would help. What I mean by that is, obviously we couldn't be doing this every, say three times a week over 5 weeks, it lacked continuity because of that and for some of the kids I don't think they made the connections day by day and so if I were doing the classroom, I would have to structure those things in so they would make the connections.*

I *Any change in your practice or your philosophy or psychology of learning that came through?*

A *Well, like an affirmation in some ways, you know I use a fair amount of this sort of thing anyway. I daresay that I will use some of these ideas next year and hook them into the math on purpose. That will be a definite strategy. I tend, at tl grade 4 level, not to want to orchestrate the reading program. What was achieved may not have to be achieved in a fashion which teaches those strategies in reading, specifically. I find that as kids come up through, as they start to enter that old term of independent reading and just entering that phase, so what they need most is the opportunity to read.*

I How are you able to ascertain those children that haven't intuitively used this, even though they haven't had a label of imagery or inner language, how do you insure that they are using those strategies?

A I would say it more like this: A Grade 3/4 student, coming out of, in this school they tend to become independent readers, most of them, at least by the end of Grade 2, Grade 3, going into Grade 4, the stronger readers are going to start to develop these strategies, the weaker readers, what they need right not is an opportunity to read and I would prefer to wait a bit to develop those kinds of specific strategies, rather than to do it right at this point. Possibly, by Grade 5 they might be saying to them, let's look at this kind of a strategy. Right now, what I find and I have found this, there's only one student in my class that's not reading, and what i find is that No. 1-bring them slowly into sustained reading and No.2-making sure that the choices that they are making are choices that are suitable to their reading level and making sure that the books motivate them to read. It you operate on those levels with these kids, it will move them miles. I'm not saying that I wouldn't do those kind of things, I wouldn't want to change the way that my program is orchestrated. I would probably use it in connection with, you know, we might spend a reading session where we sometimes meet at the back of the room in a circle and do some things. That's where I would be introducing it.

I Thank you very much.

PRE RESOURCE TEACHER - SCHOOL A

I What do you think you are doing when you teach?

A Helping kids to learn. Helping kids to figure out how they are learning. Why they are not learning and how we can do it better. How they can learn better. Especially this year.

I From that, do you view yourself as a helper?

A Helper, facilitator, trying to get the kids to figure out better ways to do things. To help themselves. To be more independent, so I don't always have to be by their sides. That's what I'm trying to do.

That's how you view yourself, now. Is that how you perceived yourself when you first taught school?

A No. Definitely not. Then I thought I just had to impart knowledge, I had to impart something, they had to give it back to me, and that was it. That was the end of it. That was my job and if they didn't learn, it wasn't my fault. It was their fault. I taught everybody the same way and, no, I've changed a lot.

I How did that change come about? Was there something which you did, was there a group of people or a person, or was there a course that you took, or a workshop you went to?

A I think when I had my own child, it changed how I thought kids should be taught. It certainly changed my whole perception of learning. But we've changed from talking about things. Because I think I got tired of seeing the same kids for the same things and know we are not helping these kids. We are helping them through this test, this project, but were not showing them how to do the next one, or how to do things at a job, or weren't teaching them what they needed.

I Are you the same with all of the children? Are they learning about the same way?

A No. Some kids still need a lot of direction and need it for longer periods of time. Some of the kids I see, once you've taught them how to study, they can take it and go on and do it with the rest of their subjects, but no, I see some kids who I need to see for a month, then we'd go over how to study, how to listen better in class, how to take better notes, and do it on their own. Some kids need a lot more direction. My intensive kids need a lot more help. And we're finding this very difficult. The intensive resource kids are finding thinking for themselves very, very difficult. They are not used to doing this. They are used to someone telling them what to do, how to do it, do it and pass it in.

I If you have a student that was a total enigma to you, that you say, "I don't know what it is", would you try to get inside their head so that you can outline a program for them. Have you had any children that you just didn't know what was going on?
A Yes, I have about 2 right now.

I What do you do and who do you turn to?
A I turn to anybody and everybody -- educational consultants, my principal, the Special Education Supervisor, classroom teachers, we're all kind of putting our heads together and saying, "What can we do?" I've changed two of these kids programs since September. I think every day I sit down and say, "O.K., this isn't working" or "This is working, I'll keep this".

I How do you get inside their heads?
A Just talk to them. Make them talk through everything they are doing with me. If they are doing a math sum with me, tell me what you are thinking. If you are reading a story, tell me what runs through your head as you are reading. Did you have pictures in your head, were you thinking about something entirely different, was there words there that you didn't know, what did you do? I talk a lot more to them. Discuss how they are doing things.

I Have you had a student who could read anything and comprehend nothing?
A Yes. Definitely.

I So, when you are talking to them, do you get any of the responses that you get from other children about whether they can see those pictures going their heads?
A The kids who do that most of the time tell me they don't picture anything. They just say the words, and they can say them quite well, but they don't ask themselves questions, they don't picture things in their heads, they don't do that. They are wonderful readers, but couldn't tell you one thing that they have read. This year, I find I have three students like that. I remember at Glooscap I had a student like that and I used to say, "what can I do with this child", but now we are doing a lot more talking.

I Are you seeing anything?
A It is a slow process and for some of these kids they have always been told, "what a wonderful reader you are" and here am i questioning them and it is like, "why are you questioning me, I can read that, I'm a wonderful reader". "Yes, you are a wonderful reader, but you didn't understand a word of what you just read". Three of these kids I have seen are only in Grade 4, and this is going to hit them when they get into more content. Yes, they can read the history book, but they won't be able to understand a word of it.

I Your answers have been so comprehensive. When you defined yourself as a helper; I guess I want a broader discussion of what a helper does. Are there any other names that you might use? You mentioned facilitating?

A I see myself as somewhat of a partner in their learning, but not just myself, myself, their parents, their homeroom teachers. Helper is not really a good word.

I I appreciated that word.

A I'm trying to help them to help themselves, rather than me always doing it for them. That's why I think I said helper.

I O.K. that clarifies it for me. Thank you very much.

POST RESOURCE TEACHER - SCHOOL A

I What do you think the importance of this study was?

A I think it gave us some insight into the value of imagery, getting the kids to image, getting the kids to ask themselves questions. I think we needed to see if it really worked. If it works with all of the kids, some of the kids, etc. I think we found that out.

I What was your experience? What did you see evolving?

A I saw the kids when they were with the researcher use a lot of what he was trying to get them to use. I didn't see them using it a lot when the researcher wasn't there and when you talked to them about it, they'd say, "oh yeah, that was what the researcher was telling us to do" and they'd do it, but they weren't doing it on their own. They weren't carrying it over and maybe it's because it just wasn't done enough. It's not automatic and it needs reinforcement in the classroom every day, not just when the researcher came.

I What about ease of implementation? Is it something that was easy to do with the class and when you had children coming in, was it easy for you to involve them.

A Yes, easier for me because I only had small groups of the kids, so it was a lot easier for me to implement it. I don't think teachers found it as easy to implement in the classroom. I don't think it was carried over a whole lot, except when the researcher was there.

I What about crossover into other subjects? Were you aware of your doing it yourself when you were tutoring in another subject other than language.

A I was doing it, but not necessarily with other classes. With kids who came into the Resource Room. I have been using a lot of it this year.

I In what areas?

A In all areas, especially in Social Studies. I was trying to get my Social Studies Grade 7 group to do a lot more of it. It seemed to work with the Grade 7's. Whether they took more responsibility for it, 'cause I really noticed the Grade 7's and I'd say 'no', put Champlain up here and put this there and they'd be doing that when they were writing tests.

I You were able to present good visual images for them Any insights in the students that you didn't have before?

A I think last year and this year, I've done a lot more talking to kids. Before I wasn't good at that, but this year I do a lot more talking with them. I think I gain insights into them all just the way they learn, the way they are, because before if you do a

Math test with a child you'd just say, oh you can't do this, but now I do a lot more talking to them. Talk me through it, tell me what you are doing, tell me what you are thinking in your head, tell me what you are seeing. So that gives me more of a good insight into most of it.

I *Any criticisms of the study, itself, the way it was presented in the school, to the children?*
A *No.*

I *Was something they were replicating? Would you suggest that they do it in a different way?*
A *No, I don't think so.*

I *I guess because this has been a long term study with you and the researcher, to ask if there has been any change in practice or philosophy or psychology of learning, its probably been coming over the last few years?*
A *Yes, definitely. I've changed the way I see kids and the way I deal with kids over the last two or three years.*

I *Do you ever hear anything from the students in this class using imagery, the words, or visual imagery.*
A *Sometimes when the kids come out into the small group, but once again you have to talk about it, then they'll say the words. They won't do it on their own.*

I *Imagery and inner language?*
A *Yes, talking to yourself, it's all there. They need a lot more practice.*

PRE TEACHER - SCHOOL B

I When you are teaching, what do you think you are doing or how do you see yourself? Do you have another name for teacher?
B Well, I decided quite awhile ago that I was talking far too much. For one thing, my voice was suffering and I also at that time realized that as a teacher I was tending to see myself as sort of being the source of all information, so I became more student-centered in my approach to teaching and I saw myself more as the Montessori type of teacher where I prepared an environment and have the students move into the environment and pick out those things that they were interested in to do. Now, at the same time, realizing there is a curriculum and you have to prepare those things that are on the curriculum. Evaluation is a difficult part of that approach, first of all the preparation and then the evaluation, making sure that they are doing what they are supposed to be doing, getting through various skills, doing their reading, doing their writing, and that sort of thing. In some ways it is easier on you and in some ways more difficult. On the surface it seems to be unstructured. If you walked in there would be children doing two or three different things: somebody reading, somebody writing, somebody may be doing a project, or something, and what is really underneath that, there is quite a bit of structure, to get that sort of situation working. The child who has difficulty in an unstructured setting, like you have to be more aware of them in that setting. There are some children that I do have to be far more structured with, give them more structured activities.

I I take it you voice and probably experience has led you to change so that you haven't been the same teacher that you were when you came out. Other than your voice, has

there been anything else that caused you to rethink what you were doing. Was there a course, or an inservice, or an individual, or a conference, or a group.

B First of all, what Acadia did, especially Tom Tillemans, convinced me that the child-centered type of education was the wa That you put realistic expectations on children and you don't expect them to e through it at the same rate. In my practical, I spent some of my time wit her in a small rural school and she went through, she was pretty well locked into the Ginn type of basal type approach, and I found it extremely difficult and very frustrating. I did what she wanted, but I vowed at that point I never will do this. Because I can't do it. It was too stressful when you realized how many children weren't capable of doing this and what do you do with these children. And then I think quite a water mark in my teaching was when we did the writing project with Port Williams School, back maybe 10 years ago. We were exposed to other teachers and things they were doing and that was maybe the most educational experience I have had since Acadia, was to first of all to look at writing in terms of all that it entails with the reading and the creativity of the writing and expressing themselves, but then also what impressed me was that teachers were actually doing it. Initially I was skeptical, and then when you see ... they can do it, than I can do it. To me, I began to believe that 'yes' this was certainly the way to go and this certainly can be done, but up until then, and all the authors that we had in and everyone, that didn't convince me until I saw that it was practically (and that's the type of person that I am--pragmatic and practical) and that is what convinced me. When I saw classroom teachers actually doing it.

I Having similar experiences as yourself. From your comments, I understand that different children have different learning speeds, styles, everything else. What do you do when you hit that child who is an enigma? That even with your experience, you don't understand how they learn and don't seem to be making the progress even when you either structure it precisely for them.

B Well the only children that I have that are completely frustrated have been the ones that have had emotional problems and it is the behavior that has gotten in the way of learning. As far as the learning goes, I don't recall really coming up against a child who completely defeated me unless the child was determined to fail. I haven't met too many of those. I had one a few years ago, she was a really frustrating child. She skateboarded herself with everyone and was extremely disruptive in class and I found that to be the most frustrating experience and I realize then what I should have done and which I didn't do and I put myself through a lot of stress because I didn't. I kept trying to address the teaching aspect of it rather than the behavior aspect of it and allowed her to be far too disruptive. I should really, at that point, have put the cloth on her, really, and say, 'look this is how much time I am spending on this child and not spending the time on these children'. I think that really is the most effective thing I could have done and then the principal or whoever else would have to look at that and say that in spite of everything else, this child is demanding a lot of time. So what are we going to do about it?

I Dividing the behavior from ....

B Trying to get rid of that behavior. There are some children coming through and you don't have much impact on them, but the child I find most frustrating is not the child . . . because the child who has a real severe disability gets the focus, but the children who are very adept and very good at slipping around learning. They don't present their work to be looked at; they always seem to be busy; passive-aggressive children who are very quiet and very watchful; always want to work in a group and can we do our writing together. That type of child. I think that those are the children that .... and then you look at them at the end of the year and they haven't made the gains the others have. If you look at, say, just in terms of reading and

comprehension. They may have started at a Grade 4 level reading, but they are still at that at the end of the year. And you realize that's the child that you are liable to miss, more than any other.

I Then you are go to talk to the teacher that is receiving them for next year.

B Or make sure that they are with a teacher who is going to hold them more accountable. As I say, with my system, that child is liable to slip through there more than with a more structured teacher who is maybe more caring, but I realize that none of are going to get all the kids. There are some of us, with our styles are going to miss some. That type of child, mind you, is achieving at a fairly high level, but at some point, hopefully, will be challenged and find something that really interests them.

I I guess, moving into the reading area, when children are reading, what do you think the strategies they are using when they are retelling a story to you?

B You mean retelling it?

I What do you think the strategies are that they are using in remembering?

A ....

I I guess I am interested in, do you see all children using those strategies?

B Well I don't know if I understand your question.

I You could think about yourself when you remember something and you go to tell it to somebody else. When you have read a book and you liked it and you are describing it.

B The images, I suppose, that the book has left you with. Some children have a great deal of trouble with imagery, with seeing images. Some children who are very poor readers, perhaps, are incredibly good at imagery and recalling. In the reading groups I have had in the last two years I have been in a pretty good situation where I have been able to take a group of six students who are struggling and the Resource teacher has taken the writing with the entire class and given me this group and I have done that for the last couple of years. I am not doing it this year, because I don't have that many children who form a needy group. I guess it is just children who just don't make those connections. Usually it is the very verbal child who is having difficulty reading, can recall, can give me a nice summary of what it is they have read, and we usually find the children who are struggling with reading are usually more than likely the more non-verbal children who aren't expressing themselves. I'm just thinking how we do recall things and certainly recalling stories is from the imagery of the writer, or maybe beyond that is the ideas of the writer, certain ideas they liked. I suppose with the non-verbal child it is difficult because they may see the images and they may like the ideas, but they are so weak in expressing themselves that they can't read or call up the vocabulary.

I That's the kind of things that we are interested in exploring.

B And then there's the child who is such a poor oral reader and we are so concerned about having him read well, orally, I suppose, but get the same amount of information reading it quietly, not reading it out loud, so we shouldn't be concerned about that child. I suppose we should, to a degree, because it is helping them verbalize more and become more oral in their expression. I know what I've looked at over the years and what I have been wondering about is the children are reading and children are struggling, you look at their eyes and you look at where their eyes are going, and it's almost like they are programmed to fail. As they are reading along they have maybe 3 or 4 easy words, basic sight words, but their eyes go

immediately to that big word, four words away, and there their eyes are and they keep going back to that one and they stopped on 'but' and they are looking at that word and I realize that they are looking at that word, not looking back here. What was nice about this group that I had, was I was able to give them 3 basic strategies for finding out what a word is: use the context; read ahead; look for little words inside the big words and the other one was to give that first vowel in a word its alphabet name, because very often that's the proper sound. So I put that on the board and they'd be reading and then gradually, over the year, they would look at the board themselves, and hopefully they would get the point where they didn't have to look at the board and they'd go through these three strategies. I think it was effective because I limited it to 3 and not any more. It worked very well with them. I saw some wonderful progress in some of these readers. The other thing I did, we based it on a novel, we read a novel, and they all wanted to read orally, once they realized they were in a non-threatening group of children that would accept them regardless of their reading. Mind you, they all had words that were accessible to all of them, except for the difficult words. So they all could read, maybe say at a Grade 2 level and so once they were secure in that group, then it was pretty wonderful to see the progress and the gains they could make.

I Thank you very much.

POST TEACHER - SCHOOL B

I Now that the study has been completed in the school, did you see any value to the strategies Don was trying to make the students aware of?

B I saw a low of value to what he was doing, it's not lasting because it was such a short thing, but what I talked to him about was he should use something so that we could incorporate it into our curriculum and other areas.

I Could you see across the curriculum or was it an isolated strategy in reading?

B That's what we have to sit down and discuss. It is certainly applicable, certainly in the language areas. Maybe in other areas too, to explore.

I Did you happen to use them in any other areas with your students?

B It made me more aware of using them and that sort of thing. I can't say I have incorporated that to a great extent in what I am doing right now, but I think it requires more time and thought.

I With Don doing it with the children, did it increase your awareness of the children's learning and particularly within imagery and inner language, or is that about at the same level?

B My awareness?

I Or observations.

B I think it helped me to think about it more and to put more emphasis on it. It is an important area. Really, ultimately all teaching is imagery, isn't it? It is how well what sort of imagery can get them to see and does that image stay with them? It is a very important area. We don't use enough of it. But it is that image that we may leave them with just a very few things all year that they remember. I suppose those things that we can put across with the most memorable images is that thing that is going to stay with them. Word, or picture, or whatever.

I Do you think that it will lead you to any change in how you approach things in the future?

B *Well, as I say, I think it would require . . . . I may change what I do . . . I have changed a bit in . . I haven't changed a great deal but I am more aware of it . . . I have attempted to bring out imagery more in the discussions we have. I mean, to make it profound or to make it deeper, I think it requires Don to come to us with something that, you know, we can apply fairly easily and can incorporate into our curriculum. That's where I think Don can be the most help to us is now give us something we can use.*

I *Did you find your students any more aware, spontaneously commenting about the strategy in other situations other than when Don was right in the class? Did any of them allude to it?*

B *They never alluded back to what he had done. Kids are always pretty observant and aware of imagery and if you give them something that has a good strong image in it and then they respond to it. But as far as a change, he has his tests, before and after tests, he may see a change in that. I don't really see a change.*

I *I guess I'm thinking that some children almost need the teacher's permission to know that it is an acceptable strategy. That they think it is their secret way of doing things and I wondered by bringing it out more in the open that the students then might refer to it, not be as guarded about the technique that they were using.*

B *Well, again, I don't know what is going through their minds . . . I mean we are not . . . we don't really do reading as such. Resource teachers may have seen something. They certainly do mention the imagery something conjures up. But I couldn't say it was more now than it was before.*

I *Sometimes children will allude to it in, say, Matn or something where they let you know that they are thinking in pictures regarding quantities. I just wondered if you happened to have picked up or heard something like that.*

B *No.*

PRE RESOURCE TEACHER · SCHOOL B

I When you are teaching, what do you think it is that you are doing? What do you think of yourself, do you have another name that you think of yourself when you think of teacher?

B The first one that comes to my mind would be learner. Even though in the role of an educator you are leading others to learn, I also see that I am a learner, because in that whole process I am learning as well, not only about my particular students, but about my learning. If that doesn't sound too confusing. I see that teacher role as one of a facilitator more than anything else. I guess I don't see education, or the role of teaching, as one of dumping knowledge from my vessel into another student and another vessel. That I think is an archaic and really non-progressive way of looking at teaching and education.

I Has our vision of yourself changed from when you first started teaching?

B Yes. Definitely. Thirteen years ago when I started, I feel now in retrospect, I had a pretty narrow, naive view of teaching. I saw it as a one way street. Now I see it as more of a process that kind of plays itself out back and forth between adult learner and child learner.

I Can you look back and see anything that was particularly instrumental in causing you to change that? Either a course, or a group, or a conference?

B I would say that it's probably two things or a combination of those two things. One is the moving around that I have done. This is the 3rd different system I have taught for, second different province, so I have exposed myself to quite a variety of colleagues over that time and that, I found, has really helped me and broadened my perspective. I have been exposed to quite a wide range of philosophy, I think, and in teaching experience right from rookies like myself starting out at that point, to people I have been lucky enough to work with who are near the end of their career and certainly have a lot to teach me. So that, also, when I took a Masters Program from Mount St. Vincent, that really helped open up my views and I think a combination of those two things changed my view.

I When you are working with children, do you see them having any similarities in their learning? Or looking particularly at reading, can you see any similarities in strategies they use, either some you see with some that you don't see with others? Are there some strategies that can be taught?

B Yes. I have been asked that quite often by colleagues and parents. I think that there are some common strategies that kids almost do automatically, but there are others that are more natural for some. For instance, most kids naturally as their reading and something isn't making sense, I can certainly tell by listening to them that there is a break in their thinking. They don't always respond the same way; some don't go back and reread, some just stop momentarily and barge on, knowing it's not making sense, but I really feel that in most cases, kids know when it is not making sense to them, but where the difference comes in, some kids know what to do about that then. They know what step should happen next. I think that's really where it breaks down and I think most of the kids that I have worked with, who do end up obtaining those strategies, those have to be taught, I find, for them. They have to almost form habits. I have one girl, in particular, who is not very confident, or a risk taker, and who really has to be motivated and encouraged every time to stop if it is not making sense, let's go back and look at that, think about what you have just read, what word in there that looks like that word would make sense and for her to even take a guess at it, is a major hurtle. But, now that she is into that habit, she is just about weaned. She can almost do it on her own, almost automatically without me having to be next to her.

I When children are recounting a story to you, how do you think it is they can remember? And what strategies do you think they are using?

B I sometimes look at a child and wonder what it is that's really going on up there. How are they telling me this, with accuracy, or with a lack of accuracy. I think with some kids, they do just have this automatic kind of recall that doesn't really depend on making a whole lot of connections. I have had a few students, over the years, who I won't call them people with photographic memories, but they almost hold the information that they are reading in their heads and kind of store it in a way that makes sense, sequentially. They don't really end up making a whole lot of connections and pulling it together when they retell it as a story retold. There are some kids like that. But many other kids, I think, they actually, as they are reading, picture what is going on, form a mental picture as they are reading and that gets sort of recorded and then it gets added to or changed as they continue reading and finish the passage. I look at myself and as a learner, when I am reading something particularly that is not familiar to me, whether it is a topic that's not familiar, or something that I have never read before at all, I end up trying to make sense of it by picturing, by imaging, by trying to picture it in my own mind, especially with something fairly concrete, that's easy to picture. The real trick comes when it is something that's abstract.

I When it is, then what do you do? When it is more abstract?
B I find that difficult. When it is abstract, but I kind of hook into certain words that are easily understood by me and I don't know.

I What do you do with those words?
B That's tough because it happens so automatically, I think I probably almost store them in my head for future reference two or three lines down the road in case I need to reference back to that.

I When you relate this to the children that you work with and you say some of them seem to do it intuitively, others have to be taught, what about the child that is an enigma to you? Who do you call on?
B Usually, first I talk to that child's classroom teacher, although that's after I talk to the child, especially if it is an older kid. Usually if it is a kid who will understand what I am saying and we can have a conversation about the trouble he/she is having, I'll say, "tell me what happens when you are reading", try to get a sense from them, because I think even though they may not be able to expr ess it, coherently, at times, or in a sophisticated way, they know that either something's not clicking and why. I do a lot of talking to the classroom teacher, parents, and my resource colleague. She and I sometimes compare notes and we find kids with similar profiles, that kind of thing, but more and more I'd say in the last 5 or 6 years, I have relied more and more on talking to the child, because I feel they obviously have a stake in this, it is their future and their education that we are concerned about, and they can be pretty insightful.

I Have you had any children that are good at reading, I think you alluded to that, but not comprehending?
B I have had a couple in particular who really are the extreme of that. Who really stand out. I have had one student who, I guess if we were labeling would be labeled hyperlexic, an automatic decoder, could decode at a year and half, interestingly enough, until he really reached about the end of Grade 1, Grade 2, here he really didn't blossom in the comprehension area until then, because as I read about that time about hyperlexia, I understood that their extremely imbalanced as far as their decoding and comprehension, but with this boy his comprehension really began to catch up and that gap narrowed. I often looked back and thought what were the factors that caused that, and in this case, I think this is a child whose parents obviously took a real interest in what his challenges were and they didn't give up easily. He wasn't expressing himself very well and they really encouraged him to round out sentences, to become more sophisticated as a speaker and that really helped his comprehension, generally. I have certainly had kids who are really good word callers, but just were you able then able to talk to them about what strategies they were using.

I Inside?
B Some, although I must say I would end up focusing more on maybe trying to get at the comprehension through writing, rather than through what they saw was going on in their mind.

I Has your understanding of what reading, in particular, has it changed over time?
B Yes. I would say it has. When I went through my education program I was lucky enough to have had a professor who believed in wholistic language and wholistic learning, so I feel that I had a good basis to begin with as a teacher in that respect. I have certainly learned a whole lot more about the importance of writing and where that fits in. Although I didn't have trouble with writing in school as a student it

wasn't one of the things that I liked to do, so I've come to learn, really how it relates in the whole language a. . I think that would be the biggest change for me.

I Thank you very much.

POST RESOURCE TEACHER - SCHOOL B

I *Regarding this study, what did you see as the importance or value of it?*
B *When I think back to when it was initiated, and the discussions that we had at the time, I think the importance of it is to look at how we are helping our students be as insightful as they can about their own learning and about how we as teachers are learners, as well. That sounds muddled up, I guess what I am saying is, it is really important because it is going to give us a chance to look at how kids learn and how they learn about what they learn.*

I *I know that you have had a difficult time following this study because of your changing positions, did you think the study had any value.*
B *I haven't, as you say, because I have not been here for four months, I haven't had a lot of chance, yet, to talk to Ardith, but I do think that the study has had value because it's not only given the teachers a chance to see what can be done in a fairly controlled atmosphere, but also given parents some input into what is happening and maybe wanting to find out more about metacognition. I certainly think it is a valuable study.*

I *In talking with the classroom teacher and with your colleague, how easy it is to implement this approach with children.*
B *I would say that is relatively easy if you have a teacher who has a good understanding of what it is that they are implementing and who is committed to incorporating these philosophies or this way of working with children into the classroom on a regular basis, not just in language arts, but all. Given those two things, the commitment and some level of knowledge.*

I *So you see the ability to use these strategies across the curriculum.*
B *Yes, I do, I'm thinking in particular on terms of math, science, in terms of math I'm thinking of teaching fractions. Maybe at the Grade 4 or 5 level when you get into equivalent fractions, improper fractions, and on the surface, I'm sure to many kids, it seems to be a complicated set of steps that don't make a lot of sense, but if you draw them into looking at why we ask the questions we ask when we are doing fractions, I think it would go a long way to make more sense to them.*

I *With these students, do you see any long term gain?*
B *With these particular students, or just in general?*

I *Both. Are you expecting any?*
B *I am expecting some, certainly in some students. In talking with the teacher, he has said he is feeling like he hasn't seen a lot of major growth, at this point, but it might be too early to tell. It might be that we would need to have a look at that particular class at this point next year, or even in the fall, to see how they are approaching their work next year is reflected in what we have done with them this year. I might be too early to tell in some cases.*

I *You would also have to need to know if it is being reinforced.*
B *Right.*

I Do you think insights were gained into the way children do learn?
B I think so. I think that in this particular case the teacher certainly has a good level of insight to begin with into how kids learn, but I think it enhanced his knowledge even more. I know from my point of view, I feel that we gained even more insight.

I Can you see where this might effect your practice in your acting as a teacher, as mentor, with the students? Do you perceive any change in your role?
B Definitely. The examples that I used about fractions, I tried to change my practice for the better with regard to fractions with some Grade 5 students, trying to help them reach a more insightful level about that particular area. And also with kids as readers, I definitely think I would like to look into it more. I do regret not being able to have had the ongoing contact, as I think I would have gained even more.

I If you could have been an observer in the class and saw the sessions as they were going on.
B I haven't had the benefit of observing while the sessions were in progress.

I Or the opportunity to listen to those informal comments, spontaneous comments, by students to know whether they are in fact using some of those strategies. Do you have any suggestions, criticisms, of the study, as such?
B I wouldn't say I have any criticisms. It's unfortunate that there weren't more parents involved. Maybe one suggestion to address that concern might be, if there had been a brief meeting at the beginning of the study, inviting parents and perhaps Don could quite directly explain what the objectives were, I think that may be even more effective than a letter. The letter was certainly clearly written, but I think maybe face to face contact and opportunity for questions from parents may have been better.

I I want to thank you for your participation and I hope that you will pursue it with Don.

PRE TEACHER - SCHOOL C

*Interviewer
*Teacher - School **C**

I What do you think you are doing when you teach?
C In the area of reading?

I Or just in general.
C I guess just pass on knowledge.

I What do you think of yourself when you are teaching? Can you put another name to teacher. Different people views themselves differently.
C Facilitator.

I Facilitator. Any other term?
C Model, at certain times.

I Facilitator probably is one most of us a comfortable with. How do you come to that term in a classroom?

C To me it means instead of being leader or the boss figure head, that it is a two way street and that you are more or less guiding and setting perhaps some guidelines or boundaries where a learning environment can take place, as opposed to being a more of a dictator. Hopefully they will absorb it. Interaction as opposed to a lecture type of thing.

I Can you tell me how you view children's learning. Is it the same, is it different, is it the same with your very able children.

C No, it's different for everyone. It is a very individual thing. I think students learn for a variety of reasons different things at different rates, depending on their past experiences, depending on their environment, depending on their background, and where they are coming from, and of course, on their abilities. There is certainly a wide range, all the way across the board. It's a very individual thing. There are certain things they have in common, for sure, but there are many differences.

I What do you think these things in common are that children have in learning?

C I think the desire to learn is a common thread throughout. I think that there is a definite willingness that possibly diminishes as they get older in certain individuals. I think, originally, they are all very eager and for one reason or another the path seems to widen as they do get older and in the upper grades.

I What strategies do you see that students use in reading?

C I think it varies from a young reader to almost going by memory and recall and predicting to a word symbol relationship to actually putting meaning in the written word. Depending on their abilities are able to function as an adult by the time they are 9 or 10 years old, literally, as far as their reading ability, while others are still almost at the stage of looking at pictures and trying to put things together or some use context clues, some are phonetically very good, other can't put that together at all. Some I think visualize the word, I know I had one fellow last week and I asked him and he said I see the word. He could see the word but he was only picking up a few key symbols or letters that he was putting together, missing more or less the whole vowel and most of the rules.

I Could he see the whole word?

C No. I don't know if he could see the whole word, for sure. I think he was seeing the whole word but when he actually put it to print, that he was only including out of a 10 letter word, only 3 letters. Maybe a beginning and an end and take a stab at what might be in the middle.

I How do you think kids remember what they have read?

C I think a lot of it is depending on how meaningful it is for them.

I How do you think they get these markers so that they can remember from one sequence to the next?

C I think it varies a lot. I think it varies on their ability, their interest level.

I What strategies do you think they use to remember?

C Depending on which level it is. In very young children, my son for example, if you would try to shorten the page, he would know, even when you turn the page, he'd know everything that was on there and he is only 2 years old, but he would know that you didn't say enough words.

I How do you think children in your classroom remember what they have read so they can retell it to you?

C I think sometimes they almost retell it to themselves, kind of an inward thing. Sort of sequence it together. I think others take a stab at one particular thing that they remember even if it doesn't answer the question that you might be looking for. They might recall a specific thing from a story or something they have read. There are others that leaves me to wonder if they do have a strategy at all because they either do not recall or it is a sort of a fine line there because sometimes even its the reading ability but it is also a lot of comprehension thing that they might not be able to retell it. There is a whole thing about the sequence, getting things in order, but that doesn't necessarily, it might not be able to retell, actually they might have some idea, they sort of recall the main, some a lot of times might be a character, or something and they'll be able to tell. When you came in they were reading about "Super Fudge". They, no matter what the reading level or comprehension level, they are all very familiar with him as a character and they'll remember things that stand out. Like something that was funny. At this age level they seem to remember that.

I Do you remember having any courses or workshops or seminars or conferences that were particularly meaningful or gave you insights into how children comprehend or learn?

C I don't know, I spent some time at Acadia with Heather Hemming, kind of a Dr. Doakes, I can recall some of the things that I don't know if I agreed with all of it, but going back from Teacher's College to Eric Smith, I think he had a lot of interesting things. There probably is if I could give it a little more thought.

I But it isn't that meaningful, or else it would be right up in the forefront.

C There's lots of times that I walk away and I'm impressed with something, at that point in time, but it doesn't stay over time.

I Are you the same teacher that you were when you first started?

C No. From the whole perspective of what was happening 14 years ago, we were into the old Basil readers and workbook type thing and I guess we probably never did a great deal about, I mean the whole language thing with Doake coming on the scene and so on, was just at the time when I was graduating that the thing took a major, so yes, continually changing for the last 14 years and almost on the way back again, I think. Realistically looking at it.

I As a facilitator, do you think that you can alter the way a child thinks?

C Yes. You can open up avenues that they might not, yes I think for sure that you definitely can because you can give them things to think about that they might not have or you can broaden, a think a lot of it is based on experience and background and you have, you are in the position to broaden that, they're experiences.

I I guess I'm looking for how do you know what is going on in some child's head so that you can help them alter the strategies they are using?

C Wish I knew the answer to that one. I think it's different for different children. Like at sometimes I'm so mystified that I'll say, "what are you thinking about right now" "I mean when I ask you this question, how do you, you know to come right out and ask them, how do you sort this out. If it is a mathematical problem, you could say, "would you please show me", you can watch so you can almost relive it or go through it yourself. With reading it is more of an abstract thing and you can do your miscue and that, and all this type of thing, but still to really know what is happening in there, I don't know, it just seems easier with this level with math. You know if they didn't carry or if they didn't do this it is an easy thing, it might not be an easy thing to correct, but it is an easier thing to identify. With children

reading, it is a lot more complex. They all have different strategies and they, they're common strategies, or one would hope that there are. What actually does go on, I find that they have a harder time verbalizing themselves as to why, when you do the miscue thing and what not, I sometimes wonder if the students aren't, or just all, well, for one thing they know what is going on and they know they are in that situation, but another thing is I find a lot of times it's not the word that they seem to be stumbling over is not the word they are having trouble with, it's the one that's five words down the line and so when you are dwelling on that particular mistake, I'm not sure that that's the significant one.

I What about the children that you really can't figure out what's going on? Who can you call on, or where can you go for some kind of help.

C I guess my first response to that is I would go to a Resource teacher and then from there a specialist.

I Who are the specialists that you are aware of?

C It depends, if it is a speech thing, if you sort of determine it is a speech thing, then we have someone that comes around. Or, there is Donnie for assessments and so on, but to actually, the amount of time that they can spend with any given student, as far as I'm concerned, they can't decide what the problem is and what to do about it.

I What happens to these students? What do you think? You've been teaching long that you have seen students, 5, 10 years after you have had them. What do you think happens to the children that have had additional help from Resource or from the Educational Consultant or the Speech Pathologist, or whoever, as far as their learning, their confidence. Are they independent or do they become more dependent on outside help. What has been your experience?

C I think you just hit it both ways. I think, for a lot of them, it definitely helps. For some, I think we are probably setting them up for a shortfall because we provide so many crutches and then all of a sudden, at some point in time because of funding or whatever reason, you kick out the crutches out from underneath them and then they are really stranded. I guess there is a fine line between them becoming too dependent on someone else and the most useful thing we can do is give them the tools that they need, strategies or what not, so that they could help themselves in that situation. That's easier said than done, of course, for some individuals it is something that they can grasp at and see marvelous improvement, whereas others fall between the cracks.

POST TEACHER - SCHOOL C

I Regarding the study, did you see anything value to the study or any importance?

C I think it meant a great deal to the students. I think imagery and the language aspect was probably happening for a lot of people at a subconscious level. But to focus on it and to being it to the forefront it was quite an eye opener for many of them. Interesting, some of the students that are considered resource students, were able to tap this too and it was quite meaningful to them. It was kind of an interesting thing to observe.

I Did you see them applying those strategies outside of the reading context?

C Yes, I think it had some, I'm thinking probably Math in particular, Geometry type of thing. But I'm sure across the curriculum there was a variety of other things, as well.

I *In your teaching, did you direct them in the Math to think of, to picture the figure that they were drawing.*

C *Yes.*

I *Because that came out in their interviews, so they were aware of it, they knew they were using it. I found that interesting when I thought that perhaps you were using it.*

C *And it seemed to be quite a worthwhile procedure. I liked the whole idea when we. I guess it was Charlotte's Web, that Donnie read a bit about and then they made the transition from the fiction to a real-life scenario and that was also quite interesting that they were able to put that together.*

I *You were mentioning that with the students who are generally getting resource help, how did that manifest itself that you were aware that they were using it and were able to use.*

C *When Donnie came and asked questions, I noticed that, just from sitting back observing basically, that I can think of one little guy, in particular, that he was always the first one with his hand up and just very keen and able to put it together and at a level that was probably higher than I might have expected with him to perceive the strategies and what not.*

I *Did this student demonstrate that kind of confidence before, or do you think . . .*

C *No. I think it was out of character for him.*

I *So then from your experiences, would you expect a long term gain or do you think that I guess this is something for you to think about whether it is a one time thing, because Donnie came in and did something with them made them aware of it, or whether you are going to see any long term.*

C *I think you would have to sort of put your mind to some degree to make it happen. It will happen, but I think it is sort of going to go back on the sub-conscious level that they do ask themselves certain questions or they do conjure up certain pictures and I think that happened before, but I think unless you address the issue and you sort of give them some guidelines or facilitate in some way, that I think it won't be a resource that will probably be utilized as much as it could be without some sort of direction. But, yes, I do see it as a long term thing, other than just a short term.*

I *And from what you have said, it would seem that you are using it as a strategy, overtly, where before you presumed that people were doing it because you did it, but now you are aware that it can be taught.*

C *Yes, and the questions that they. . . . they were very interesting, because sometimes we assume that we know what is going on in a child's mind and actually what they are thinking has nothing to do . . . not that they are on the wrong track, just because they are not thinking the same thing that you are thinking, but it is sort of an eye opener when they come up with some of these questions, and so on. And I found it quite appealing that they would . . . there was one section that dealt with questioning and they were to make up questions themselves, and I felt, well that's a littler better twist or sort of a different angle that allowed them to make up the questions instead of constantly answering questions.*

I *So, then, it wasn't just stimulating for the students, it appears from your comments that it was stimulating for you. It provides you with other teaching strategies, insights to the students. This is really good because you have hit all the*

points that certainly Donnie was concerned about and from your comments I can see you doing it on a long term, being aware of it and the stimulation of having somebody else come in and actually demonstrating instead of just telling you and being able to be part of it.

C *That was nice to have the chance to sit back and observe because you are at a different light when you can sit back and think, I see something happening here. There are a few students that manipulate your time so much that it gives you a different sort of focus.*

I *A different responsibility, you are there to observe, not to be responsible for the discipline, the lesson content, and all of the other things. That in itself was valuable. I am sure you observed other things that weren't in the nature of the study. Overall, it has been a worthwhile experience.*

C *Yes.*

I *Were you able to enter into a discussion with the resource teacher, or the principal about what you were doing or what insights you saw.*

C *The Principal and I didn't get a chance to discuss it at all because he is always on the go. The Resource teacher came into the room and observed when I was going through a session with the students. I think from the conversation that followed, she found it quite interesting.*

I *That would put her in the position you had been.*

C *And she was able to sit in on most of the visits when Donnie was here, as well. The Principal, unfortunately, didn't get in as much because he had so many things that were taking his time.*

I *I do appreciate your participating in it and I appreciate your spending time with the part I am involved with and the enthusiasm that you bring to it.*

C *Thank you.*

PRE RESOURCE TEACHER - SCHOOL C

I What do you think you are doing when you teach?

C I'm hoping to be able to help children be in charge of their own learning, but I want to be able to 'facilitate', but I want to help them get a handle on what they can do and to keep growing.

I Are you teaching the same as the way you started? Has your teaching changed?

C I would say it has. It has grown. When I first started, I had gone to the Mount in the era when people were taught that there was no one method that worked best for all children. So that was my foundation. However, when I started teaching, I was in a school board that expected me to use "Ginn 360" and that was what I started with. It didn't fit for me and it didn't fit for all of my students, so I kept adding to it, but as I've grown professionally and matured as a person, as well as an educator, I think I have added to my repertoire of teaching skills and changed to really meet needs of children as I best can.

I How do you think children learn?

C I think that they have to have things brought to their attention. I don't necessarily think children learn everything by osmosis, I think they need to be exposed to a wide variety of literature and print materials, but they need a teacher, or an adult

of some sort, could be a peer, to point out to them significant details and also help them know how to get a handle on what's being presented that they can connect it to what they know and make it useful for them and build on that.

I Can you do the same for all children? Are they all learning the same way, then?
C No, I don't think that they all learn the same way. It is my job to be able to read individual children and to look at each child and say, "now this is where he is, this is his strength, how can we build on that", and present information in a way that that child can connect with it. The way that I can present it to one child could be different than the way another child will need it to be presented.

I How do you know what is going on in that child's head?
C I have to observe the children and see what they are actually doing, talk with them about what they are doing, look at the end products of what they are doing, and evaluate those products, look at it again and see how we have come this far. Now it's the next step and sometimes incidentally, and sometimes very pointedly, work with the children and let them know that this is where we were, this is where we are now and this is what we are going to work on next.

I The child reads something or you have read something and you close the book up and you ask the child to tell you what is going on. How does the child know what to tell you?
C Do you man what's gone in the story or what's gone on in their head.

I What's going on in their head?
C How did they know what to tell me?

I How do they remember?
C My understanding would be that this made sense to them. Made a connection with them. It would have to be something that they can relate to something that they already know.

I So they can tell you what they have read so you know that they have comprehended it. How do you think they remember?
C When I am remembering things, I think of like things that I already know and I also say this is similar to that, and if I can remember this portion, then this will help me remember that. I'm talking to myself, I'm organizing information for myself. I'm organizing by categorizing, by finding similarities, by the purpose, by recalling.

I What do you tell students when you want them to recall something?
C I want them to see it in their brain, I want them to put themselves back through what they did before and when I have a child with a new word, I'll say what do you know about that word that is something that you already know. What is familiar for you? What part do you know? How can we use that? So, I am asking him to look for familiar segments of information.

I The child talks to himself.
C That's one thing that I model in my teaching, talking out loud. What can you look for? I want to have the child have that modeling habit so often that it becomes natural for them to say, "I should look for the part I know", so eventually it will become internalized and they will not need me as the prompt.

I You want them to see it and place themselves in it.

C Like me going back upstairs and standing where I was before to remember something. I have to bring it back to what I am sure of.

I What do you base your feelings of being a facilitator? You use that as a name for the kind of teacher you were. What do you base that on?

C I base it on the fact that I can't do the learning for the children. I have to be there to set the stage and to have all the right factors in place so that the learning can happen. I know that I can help make that learning more purposeful and more orderly and more apt to happen, but I can't actually get inside that child's head and do that learning for them. That's were I see myself as the facilitator. I have to set the stage, put the things in motion.

I In your background, was there any conference, workshop, course, or discussion that was pivotal in this understanding?

C One of the books that I read that was very pivotal was Negotiating the Curriculum by Garth Boomer and he is from New Zealand. It very much talked about how we had to involve children in their own learning and that we had to negotiate with them what was meaningful and useful for them to learn and that we have our Departmental guides and all of those good things which give us our direction, but all of that is immaterial if we are not connecting with the children's needs and their interests, and that we have to not be afraid as professionals to really draw upon our students, their interests, their needs, their strengths, and build that curriculum with them and for them.

I If, after you have done all of this, you still find there is a child that you really don't understand how they are learning, who do you call on? What do you do?

C First thing, in my position, I would do is that I would meet with the classroom teacher and we would share observations. It depends on where I am seeing that child not learning, perhaps in the small group pull out session, that we decided is a necessity. Perhaps I need permission from that teacher to observe that child in his classroom setting with his peers and to see the interactions. I need to work with the teacher to see how she is finding him as a learner. Perhaps to previous teachers, going to the record cards to see if there any factors that I am unaware of that might be hindering that. Calling parents to find out what they have noticed about their child's learning and then in my current role I would decide upon certain informal assessment strategies to see what is happening. The things that he is able to do and see if I can determine where he is of need. If I'm not sure from what I do then I would call upon an Educational Consultant who might do more formalized tests, but the testing would not be my first resort. It would be something that I want to see that child functioning by observing him.

I Who else might you call on?

C I might call upon speech-language pathologists, someone connected with the visual area, or the family doctor. Sometimes when there are family problems, Social Services issues, that's not something that I directly contact, but through parents I might need to tap into Child and Adolescent Team. The child. Sometimes I'll sit with the child and say, "why do you think this is happening, when you are reading what do you notice, what parts of it are you finding easy, what parts are difficult for you? What can we do?" In some cases, it might be peers. I do, in some cases, go to the principal. He might know of factors that I am not aware of.

I Thank you very much.

POST RESOURCE TEACHER - SCHOOL C

I *What do you think is the importance or value of this study?*
C *To me it was important because it showed children and myself a new strategy that I hadn't used, and I don't believe a lot of children actually used in reading.*

I *How did you see this developing?*
C *In the first sessions that I went in, I saw children that were giving answers that they were expecting Mr. Marsh to want and then as the sessions progressed, I could see children that the light bulbs were coming on and they were really answering and not just saying what they thought the answers should be and there were children that . . . I think of one little girl I thought was just giving all the right answers and then when I would walk around and see what she had written and the excitement and the description and her responses, then I knew it was genuine and there was a lot of her coming through it and the depth of what she was giving was sincere, so I think I saw what I think was a very superficial thing at first, would blossom into something that was real for her.*

I *So you are commenting that you felt that the importance was it exposed them to a new strategy and you saw them able to express it and use it. Did you see these strategies of imagery, of inner language, showing up in other areas, other than when Mr. Marsh came in?*
C *I have two boys that I work with intensively from the class and both of those boys in their reading would stop and talk about things that they were thinking about or seeing which they would never have done prior to being exposed to it. One of the boys, at the beginning of the study, was very disinterested because he is very turned off by reading and really didn't appear to take much in, but now I think with the combination of the year's work, as well, that I see him seeing himself more as a inquirer of reading and that he is stopping and thinking about what he is reading and questioning himself on what the text is acutally saying to him.*

I *Do you think he is able to tell you what these strategies he is using? Is he aware that he is doing this? Does he know that he is stopping? Does he know he is looking at a moving picture or whatever in his head?*
C *I asked him, one time, how he got a particular word that he never would have attempted before and he said, "well I saw that picture of that sentence in my mind and it seemed to make sense". And he would be someone that I would never have expected to have said that to me prior to this study.*

I *Does he give any indication of talking through a new situation?*
C *Yes, he'll stop and say . . . he overuses, because last year his one only success he had was using word families and so this year in the study he'll stop and talk himself through a word family and then come out with the right word, so much so that that was hindering his reading strategies, so in fact . . . Mr. Marsh. . . in frustration one time I invited Mr. Marsh to come and visit as we read together and Mr. Marsh talked about using other strategies such as scanning the whole word and reading on and that kind of thing, but ian certainly was talking to himself with that one secure strategy.*

I *Did you feel that it was difficult to implement these strategies? In the classroom?*
C *I think that it is an awareness level and it is one that you have to use it or lose it, you have to keep it in the forefront of your mind and I do feel that sometimes you get pressured to get so much done, that sometimes we don't give children enough time and I think we have to be conscious of that because it is something that could easily slip.*

I *Do you think about crossover to other subjects? Are you aware, did you see any evidence through talking to the classroom teacher where these strategies appeared or that you realized that the student was using this strategy?*

C *I can't say that I personally saw that because I have been so focused with the language development of these two boys that the bulk of my time has been with those boys and I must confess that I had not discussed with their teacher whether it carried over.*

I *Long term gain. It is difficult to assess this because it has been a short term project. I guess that, wondering if students refer to it, you have mentioned these two boys where you have seen a difference. I guess you would have had to talk to their techer about it in order to see where this might occur.*

C *We did talk about it several times and he thought that children were aware of it and thinking about it. We didn't talk in specifics about whether they carried it over to another subject area other than their reading. He felt that certain children were definitiely thinking about it.*

I *Now that the study is over, did you have any insights during the time or do you have any thoughts on how it might have been a smoother running project or did it raise other questions for you?*

C *Smoother running, I think a common culprit is the time factor, I wished I had more time to spend in the teacher's class just literally observing. I went in a couple of times when the teacher was doing story time and just to see the kind of discussion that would be happening between him and his students, but I think that that would be the one area I don't think I had enough time to be in the classroom and seeing it function. I find, in my role, I am in the classroom, I'd like to say 50% but it is only about 40%. I have a lot of occasions to take children out and do direct instruction with and so I feel that I would see a better application of it if I spend more time in that particular classroom.*

I *After particpating in this study, do you feel any change in your understanding of the children's learning?*

C *I think what it has told me is that we have to involve children in their own children, make them aware of themselves, about how they go about learning and to self-talk the imagery, the thinking about what's happening behind the scenes. I think we have to make them a party in that, it's not just teachers that know about reading development, the children can recongize themselves developing.*

I *Any changes in your practice? I think you alluded to this, that you hadn't been as aware?*

C *Stopping and questioning children more often about what they are doing when they are reading rather than just simply stopping and talking about the comprehension questins or the prediction of what is going to happen next or why do you think he did that, so I find I'm not just thinking about those types of comprehension quetions, I'm asking them to look at and think about how they figured that out, what was it that made this easy to do, what did you see and I think I have broadened my questioning, actually.*

PARENTS

PRE PARENT 1

I Do you know how your child is taught in school?
P1 To a certain degree.

I How are you made aware of how she is taught in school?
P1 Basically through the parent teacher meeting and interviews and a lot of the time I have come in to sit in her class.

I Is it the same way as when you went to school?
P1 Basically no, I don't believe there was much emphasis on reading and math and class readings and stuff like that. I don't think it was made as much fun as teachers try to emphasize today. I think that makes a big difference and I hear now that there is a lot of parent involvement which really makes a big difference. When I was growing up, my parents took very little part in my education.

I When your child is reading, do you see the same skills that you were taught in reading or do you see anything different.
P1 I see a higher level of skill from when I was taught. My instructor, even through my high school years in reading . . . my reading was great but I didn't do much of it and I wasn't encouraged to do much, like to pick up and read a book was not on my agenda at all. But, today, the students go through a book in a week and it is encouraging and they want to read which is even more encouraging. So there is a big difference.

I Did you read with your child when she was little?
P1 Yes. Even when she couldn't read, she thought she was.

I When she started reading and then she wanted to tell what she had read with you or her Mom, she wanted to tell somebody else about that story, how do you think she remembered it?
P1 Probably for the most part if there were pictures involved or if it was something that related to her, then she did very well. If there was some emphasis put on particular parts of the story, she could tell it back.

I One of the things I am interested in, and you mentioned if there were pictures, how do you think those pictures helped her with her remembering?
P1 Probably through being able to capture what the story was all about and she sees a picture and she can relate, depending on the story, she can relate, the picture stays with her.

I So, you think that she is able to see that picture?
P1 Yes.

I When she has read something, or when you have read it, how did you know that she understood what she has read?
P1 For the most part, we would go back and ask her certain parts of the story and that's how we could tell whether or not she knew the story.

I Do you think there is any other way, you mentioned about the pictures and you feel that she can see pictures about the story, is there any other thing that you think is

going on in her head when she is doing that, besides the pictures? You can relate it to you own remembering. Do you remember just the pictures or is there something else in there?

P1 There could be more than the picture. I would tell her if you could relate it to something you might have done then the story is related to you in that sense. The picture is fine, but you have something other than the picture so you can say, "yeah, I know I have done this" or even to the fact it is something that you would like to do.

I When you or your chld are thinking about what you have read and you think about that picture, do you ever put words to it? I think that's what you were kind of mentioning when you related it to something you know. But, do you ever use words with those.

P1 The pictures? You probably come up with your own words, other than the words that are in the story that relate to the pictures. Try to word the picture to what you would think. It would be in your own words.

I Are you actively involved with your child's learning, now?

P1 Yes. Very much so.

I And how is that?

P1 For the most part I try to spend at least once a week in the school. I usually come in for lunch with them and I also come in every Wednesday. And usually I get invited to stay.

I Well, I think we have covered all the questions and I do thank you very much.

POST PARENT 1

I Parent 1, what do you think the study was all about?

P1 Yeah, which one was that?

I The one my daughter participated in?

P1 It's been awhile.

I You have had a lot going on, with the new baby, and . . .

P1 I thought you were just trying to find out the relationship with the parent and the school and how the parent interacts with the school and how that develops between the three.

I And did she bring any of the activities home and share them with you at all?

P1 Which ones were they?

I The ones that she did in school with Mr. Marsh. He was in the school. I guess she didn't.

P1 She usually brings home a few things, I'm trying to remember what they were.

I Not particular ones?

P1 No - I... trying to remember.

I Did you discover anything about her reading, did she bring up words that 'imagery' at all?

P1 Not 'imagery' . . . no.

I *And talk about what the pictures going on in her head were doing, or how she used them?*
P1 *Uh. No, she didn't discuss a whole lot. Not with me, anyway, she might with her Mom, but she mentioned it to me that she had.*

I *Did you have a log . . . a little book . . . that you were to write in about her reading and that? It didn't come home?*
P1 *No. Was I supposed to get one?*

I *Yes, you were supposed to have one.*
P1 *No she didn't. Was she supposed to bring one home?*

I *Well, I'm not sure where it given out at this school, but they were given to the parents and it was to keep a record of what was going on.*
P1 *No I didn't see one.*

I *All right, that's a part of the study that we don't have to do. In any way, has your role in the education of your child changed at all?*
P1 *No, I wouldn't say it has. I'm still involved and monitor how well she is doing. The basics.*

I *What will be interesting is with your new little girl to see how you read with her and if it is different and what you have learned from reading with your daughter all these years and see if it will change.*
P1 *That will be a neat experience.*

I *All the things that you are aware of now, more aware, that she has made you aware of, or that you have seen. You will be ready to see more.*
P1 *Yeah, I'll be more equipped.*

PRE - PARENT 2

I How is your child taught?
P2 At school? I figure it is pretty much standard old school type instruction, because I know the teacher has been here awhile and he is more traditional, I think.

I Has it changed from year to year, or has it been the same?
P2 I think essentially the basics are the same. There's little differences in style that you would expect from different teachers, but it suits me. I'm an older style teacher, a little more traditional.

I So then, do you feel that your children are being taught in a similar manner to what you were taught when you were in school?
P2 Similar, yes, but not the same. We had a lot of nuns and, of course, it was much stricter. It is a more open atmosphere now, there's more group learning. It's kind of a mix of old ways and new ways. We always sat in straight lines and you lined up for this and you lined up for that. I think it's just a little looser, a little more comfortable for them now.

I And how did you teach your children, yourself?
P2 Before they came to school?

I And since they have been in school?

P2 They all knew their alphabet before school started, knew their numbers, recognition and counting, they could spell basic words, their own name, family name, maybe words that were important to them (like the dog next door), things like that.

I How did you do that?

P2 I think I'm teacher from the soul outward. We would have sit down time with books and when their motor skills were developed enough, I'd give them pencils and crayons. They were always accessible to them. I'm more formal. It wasn't actual a classroom setting or any set time that was put aside, but we did, maybe 3 or 4 times a week that we'd sit down. I bought workbooks for them (those little Fisher Price workbooks) and we would work on them. They were sent to Nursery School (the 3 younger ones).

I At the present time, do you read with your children? Read with them?

P2 Not really, my 16 year old daughter would come and dig into my books, or if I might find something that I think appeals to her, I'd bring it and say try this, you might like this. The same with the littler ones, but I don't sit down and actually read to them because the youngest one is 9 and I don't have time or patience with that any more.

I How do you know what your child is doing in school?

P2 Well, I don't always. It differs with the children, my oldest is at Acadia and I just have to assume he is doing what he should be. My 16 year old who is in Grade 11 is very open and she has always come complaining about this teacher or saying what they did. My 15 year old is in Grade 9, he is harder to get to because he is very bright; he gets 95's and 100's without studying, which drives me nuts. He leaves everything to the night before and still will get a 10 on the project. I keep tabs on him, I'm forever saying, "have you got this", "have you got that" and once in awhile I'll spot-check him. O.K. bring me your Math binder, I want to see it. Just to keep on top of him. The one that is in Grade 7 is at the Middle School and I'm there; I volunteer there on Thursdays and Fridays and she is a lot like her older sister, she is very open. The little one is a lot like the one in Grade 9; you have to bring it to me, show it to me, let me sign it.

I So what you know about your children then, is because of your relationship with your child, as opposed to being informed by the school?

P2 Yes. I have more contact with the kids than I have with the school. The report cards are good. I like the new report card with the write up, because I know what they know, essentially. I know that they are good in Math, I know that they can spell, I want to know, is she getting along, does she have friends, because for so many years, this one that you are going to be working with, was sort of a recluse, but she is very quiet and wasn't outgoing when she is out, but she is a hell raiser when she is home. That's what I'm interested in. That is starting to wane now because I know that she has friends and they are calling on the phone, so I know she is coming out of it.

I So you felt that the school is keeping you informed of the things that you were concerned about?

P2 I can come down here anytime, I know everybody here.

I And the school is open to you, then?

P2 Oh yes.

I In talking about specifically about the reading and you mentioned how you worked with your children to help them read when they were little, how were you aware when they passed the point of being able to read the words and to understand what they were reading?
P2 Do you want to reword that one?

I You know when they were just reading the words?
P2 Like sight reading.

I When it changes from that to being able to understand what they are reading?
P2 They never got to that point at home. Actually I always believe that if you sent them to school knowing how to read, they are going to be bored when they got there, because they weren't going to be accelerated. They would have to stay in Grade Primary, so I gave them the basic phonics and that sort of stuff. What I found you could tell is they could put a sentence together, but what I would listen for is the tone of voice and they're not just reading in a monotone and they are anticipating a little, like you get that raising of the voice for a question mark, etc. They were all good readers.

I Did they ever talk to you about what they were doing when they were reading? Like what was going on in their heads?
P2 Not really. They do that with Math, like I had several kids that visualized Math, like if they are adding they sort of visualize. Reading just seemed to be like it was natural and they didn't really know why or how they were doing it.

I Thank you very much.

POST PARENT 2

I What was your understanding of what the study was about?
P2 My understanding is that he wanted to find out if visualization could make better readers.

I Did you discover anything about your child's learning by participating?
P2 I don't think so because she always said that she pictured things in her head, anyway, so it didn't seem to make a lot of difference. When I asked her about it she would say we just did work sheets or actually the other day she was kind of peeved off because she said I thought we were supposed to be doing the study and he came in and did it with the whole class. She didn't understand control group, I guess.

I You have talked about the visualization, the imagery, did she talk at all about inner language and talking herself through or, ?
P2 Well actually the other day she was sitting at the kitchen table doing her homework and I was sitting there with her and she is yakking the whole time to herself. Now, she always talks to herself anyway, but this was really quite a conversation that was going on and I said, "Do you realize you are talking to yourself?" "Yep, I always do that" she said. So I said, "Well why, what are saying?" She said, "it's a little voice in my head that tells me when I am doing something wrong. It's like having you with me all the time."

I Helping direct her? Helping her get through a new task.
P2 It stops her from doing something wrong.

I She is using and more consciously using that technique.
P2 Yes.

I I think one of the things the study does is legitimize for this student that "yes" that's a good thing to do.
P2 She always did talk to herself, but I have noticed that she does it more.

I You'll have to listen in to see what she is doing.
P2 She gets out of the shower and she makes up 'blues' songs when she gets out of the tub because she is chilly, but she does things like that all the time.

I This probably legitimizes it. This is a good strategy and this is how people learn new things and this is how people clarify things for themselves. Was this study difficult for you, the writing log or to find out what was going on?
P2 Well, it was difficult in the sense that it is hard to get anything out of her about these things. She says, we just did work sheets and she wouldn't go into detail.

I Was there some part in the study where you thought to yourself, "this could have been done better" or "I would have done this"?
P2 Well, talking to her to write in the log was kind of, it just seemed like, well I really didn't do that much of it because it was the same thing all the time. Every time I asked her something, nothing seemed to be changed, its only now in the last couple of weeks that I have been noticing, like I said the talking to herself and I also noticed her writing, I don't know if it has anything to do with it, but her writing has become more prolific. She is really into it. My older son was on the computer the other day and he found a whole file that she has, that we didn't know about. She has a series of stories.

I Isn't that exciting.
P2 It was funny too.

I Your role then continues as it has been because you have been so actively involved in her education and being aware of what is going on and has that changed at all, or is it about the same?
P2 No, I don't think it has changed. If anything, she is a little bit more independent because she has this little voice that is telling her she doesn't need me as much.

I As you used to guide her in her thinking. She has not incorporated that into her own. Is there anything different in your reading with your child?
P2 I really don't read with her. She has been an independent reader for years now, so she doesn't want the interference.

I Thank you very much for participating in the this study.

PRE PARENT 3

I How do you think your child is taught in school? And we could use reading because that seems to be the one we focus on.
P3 In this school here it's all right, but he just came from Kentville and it was harder there because I asked the teachers about his reading and his writing and they said that he was doing fine because he was doing fine on other subjects. So he didn't need help. Then when I got here, Mrs. Dunham picked it right up and she put him

right into Resource. Now him and his Resource teacher didn't get along last year. So this year he seems to be doing fine.

I What things was he picking up on and what things were you doing with him? What things does he know about reading?
P3 He just can't seem to comprehend what's on the paper.

I Did he read the words?
P3 He can read the words if he tries, but sometimes he has to go back and repeat them.

I Is he taught the way you were taught?
P3 No. It's a little of both. What the teachers will send home and what I was taught. But, more or less is what's taught here.

I You can think about what you taught and how you were taught.
P3 I learned to read before I went to school. I learned how to read when I was 3. I had such older brothers and sisters that read to me a lot and then I picked it up myself. So I don't remember being taught to read at school. It was just something that I could do.

I So, that would have it a little more difficult for you to understand?
P3 I always read to them right from infancy up, and they would read back to me when I thought that they could know the word. He learned how to read from memory.

I By sight words.
P3 Right. When he sees a word that, like take the word 'what'. If he sees it in another sentence without the same things around it, he doesn't know it.

I But he has learned how to sound out words?
P3 Yeah.

I And how to guess or predict what it might be? And things like that. Think about when you are reading, how you know what something is or if you read something and you are going to tell somebody else about it, what are the things that you do? If you have read a really good book, what goes on in your head when you want to tell him or somebody else about that book?
P3 How do I relate to them?

I How do you remember it?
P3 I just remember it.

I Now you have to start thinking. What is it that I can remember? O.K. If it is a Stephen King and you want to tell me about a particular place or feeling, what is it that you do?
P3 The metaphors that he uses.

I O.K., but the metaphors make what in your head?
P3 They'd make it come alive, to me.

I How does it come alive in your head? What we are getting at is what is the difference between those people that reading comes very easy for them and those for whom it is difficult and so what we are trying to do is see. What is it that you know about

reading that perhaps he hasn't considered yet? And so when you start analyzing, how do I remember, how do I tell somebody else about it? What do I have to do?

P3 Recall it.

I And how do you recall it? Do you recall it in words?

P3 Association with something else.

I How do you perceive those associations? Are they pictures in your head?

P3 Yes. More or less, yes.

I Do you think he sees pictures?

P3 I don't know, I never really sit down and ask him. I guess that's something I've missed myself.

I I guess this is going to be a really worth while exercise for you because when reading has been something that came to you and it is important to you.

P3 It came easy to my oldest son, too.

I So I guess one of the things you are going to do and really a very good part of participation is for you to start thinking about why is it that .....

P3 He is not comprehending it.

I Do you think that all children learn alike?

P3 No. I don't think they do.

I And you have perceived that with your two children.

P3 They are as different as night and day.

I But are there some skills that everybody uses in reading?

P3 I don't know. I never thought about it. It just came so easy to me and you don't really think about it. It's like you should be able to do that.

I So you will appreciate very much participation.

P3 That's why I wanted to do it so if there is anyway that I could help him at home. I've done everything that I know.

I So now you are willing to try new things and to consider new ways of thinking about it.

P3 We even tried the "Hooked on Phonics" and I didn't find that really helped him.

I That's that decoding part where he can say the word.

P3 Like sounding them out. When he sounds them out and he doesn't understand the words.

I What you really want to work on with him is comprehension.

P3 He's one of these children who can read, but may not understand what he is reading.

I So he has what they call decoding skills, knowing how to name the word.

P3 But not associating it with anything.

I How do you know how your children are doing in school?

P3 I talk to the teachers quite a bit and I talk to the children a bit. Like I spend a half hour when they come home and that kind of thing. They let me know how they are

doing and I ask them what did they do in school today -- "Oh, nothing much". I say what did you do in Math today or I ask for a specific thing.

I So you don't get vague answers.
P3 Right.

I You had the regular report cards and the interviews, but obviously have made an effort to talk to the teachers aside from that and so you feel you have a pretty good handle on what they are doing.
P3 I sometimes think I come to school more often that my kids do.

I Well, good. Another thing that you might want to consider, like you realize that you see pictures when you read. Do you do anything else with those pictures? Like when you were thinking about Stephen King, obviously a particular book jumped to your mind when I said he is so descriptive of any situation and you said feelings and metaphors because that's obviously what stands out. Do you know what you are doing when that came to mind. What goes through your head -- was it just pictures?
P3 It's like watching TV in your head.

I So that's more than pictures. What else is involved in it?
P3 You could feel everything that your characters feel. Your heart starts beating faster. Like in that Pet Cemetery, when the little boy came back from the grave and you opened the door, you could just feel everything that the father was feeling. It scared the father and the little boy ..... you have to be Stephen King to understand, I think.

I You could tell I have never read one of those.
P3 I like Stephen King and Danielle Steel. Those are my two favorites. He and I read books too, like all of us together. When they were little, it was picture books. They just made the story up in their heads. As they got older, I tried to get them to put words to the pictures, but he can do that and it is his own story, but to read a story and get the words down right or understand them, it is different. I don't understand why, but it is for him. Reading is a problem in my family. I have two sisters that can't read or write real well. It's not like they haven't been taught. He has an uncle on his father's side . . .

I So you are really looking at it and saying, "we really brought together . . . ." I really appreciate your coming in to talk about this and thank you very much.

POST PARENT 3

I Did you happen to bring a log with you?
P3 I didn't. I'll tell you why. I didn't fill it out because I'm not very good at that. What I did with him was I would make up stories myself, like that game you play, we made up different monsters or different types of people and he would draw them on paper so that is what we did. So then what I'd do is get him to read to the baby and I'd tell him to describe things to the baby and he say he can see it in his head. But his reading, I can't believe how much difference there is from the first time I talked to you. He is so much better, I couldn't believe it.

I Oh good. What did you think this study was about?

P3 I wasn't really sure, myself. I know it was trying to help . . . like you said, some kids have to learn to put images in their heads . . . now, he said to me yesterday, "I do my math that way too".
Now I'm better at my math.

I Did he tell you what he did during math?
P3 He just started using it, like putting numbers in his head and then he would mix the numbers up and instead of doing it on his fingers, he put it in his head.

I Now, is he seeing numbers or is he seeing numbers of objects for that number?
P3 Number of objects. Because I asked him the same thing.

I Good, you are asking all the right questions.
P3 I was surprised and when he sits down and does his homework now, he'll do it right away and he does it quicker. I asked him if he used a calculator and he said he did it himself because he could see it in his head. And I told him that's how Mommy does it, when she makes a pattern for things because I make my own doll clothes and stuff, I do them at night time when I am laying down.

I So that's what you understood the study to be about.
P3 Yes, to do imagery in his head and I find it makes them learn quicker.

I What did you use with that imagery. Didn't he, indeed, end up talking to himself?
P3 Out loud. Like a mumble to himself. I keep asking what he is talking about.

I Is that more now than before?
P3 Yeah, a lot better. I can't believe the difference in the child. He is more competent too. I was talking to the teacher at the last teacher's meeting and he said he was a lot more open and he'll join in the class discussions. I was really please because he was having a problem with that.

I Was this study hard for you, in any way?
P3 No. I find time, where I am the mother of 5. I'm not a writer. I am, because my sons and I , like I have tons of books that we have made up together, and I should send them off but I don't have the confidence to do it.

I Did you have any criticisms of the study; while you were doing did you think to yourself, I wish they had . . .?
P3 No.

I If somebody wanted to replicate something like this, we want to know from parents what should have been done differently?
P3 I think you did a good job. He told me about Mr. Marsh explaining about naming the animals, and he went through the motions, and then he said, "He's nuts".

I Did he mention any of the other activities besides the one where they named the monster?
P3 No, just that one.

I I liked that one too.
P3 He came home and did the motions.

I Do you see that your role has changed at all in your son's learning.
P3 Yes, it is a lot more fun for me, too.

I Are you more directly involved?
P3 Yes.

I Did it help you having specific questions to ask him? In particular, things that you were looking for?
P3 Yes, I had more patience with him also. Once I knew what he was doing, and he can tell me, then I'll ask for that particular thing.

I Do you think you understand his learning a little bit better now.
P3 Yes, because it now comes naturally and didn't before. Things came naturally to me and I think everybody should be able to do that. And it kind of like made me stop and think.

I Be specific and ask specific questions about how a child learns and the best person to tell you is going to be that child.
I do appreciate your coming in and participating in the study.

PRE PARENT 4

I How is your child taught? I'd like you to consider how he is taught in school, how he has been taught, and how you know how he has been taught?
P4 Well, my husband and I feel that we are both very open with our children and I can remember as long as back as when he was a baby, we were always very interested in teaching them early, trying to get them to sit up early. Always pushing them to do things a little earlier than the norm, I guess. So, we either read to the children when they were babies and we continued that right up through and we still read every night, we read them a story every night, that's part of the routine at night when they go to bed. As far as the learning process, they learn by their mistakes, when they make a mistake we tell them about it. We sit down and find out what went wrong and what did they learn from the mistake and they seem to learn that way. That's part of the learning process, I think. We have always read to the children, we do homework with them every night.

I Are you aware of how the teachers are teaching them from Primary through Grade 4?
P4 Myself, I keep in touch with the teachers all the time and when you speak to them they'll agree I have always talked with them when I was home all the time. I'm working more now, but when I was home we picked the children up every day and I always had contact with the teachers. And always, from day to day, if there is ever a problem, we've talked about it right then.

I And the methods that were being used?
P4 We've discussed those too. I used to always ask, "how can I help Ian read?". He was having difficulties in reading. I'd always say to his teacher, what can I do to help him along. A lot of teachers were saying, well allow him to go at his own pace, but work with him every night. Perhaps even if I would read to him and just exposure would help.

I Were you given any specific strategies to try? Whether it was decoding, different ways of sounding out words or were they giving you strategies about how he thinks about reading? Were those discussed at all.

P54 It's been a while ago. Sounding out words was another thing. That's the way I was taught in school, so I wanted to continue doing that. Breaking the words up and sounding. Working on sounding. Things like that. Also, just exposure, having him always being exposed to the books and read to him and have him try to read to me. Sitting with him and helping him along. So all of a sudden, one year, he just started on his own.

I You mentioned the way you were taught and you wanted that. Are the other situations where you feel he should be taught more the way you were taught, or do you think things are moving along?

P4 I think they are moving in a much better way, because when I was in elementary school, we had the Little Red Reader, we had one story that we had to read every day. The Tom, Betty, Susan series. That's all we ever had to read and we had to underline the words and study those words but we weren't asked, like the children are now. They have to know a certain amount of words, which I think is great. As long as we could read this reader, that we read every day, that's all they seemed to be concerned about. But, no, I think it's great now because the children are encouraged to read a book every day. A different book every day. And to really try to read as many books as they can in a month. And I think the more you read the better you get at it. I was never a reader, myself, and I think that's because I was never encouraged to read in school and expand. I still don't like to read, myself, but I know the children have to read every day. My husband is a reader. I don't even like reading newspapers. When he does, I make myself do that every day because you have to have something to talk about.

I When the children were reading or when they come home from school and you ask them, "what did you read in school today?" How do you think they remember to tell you, or if one of their favorite books, how is it that they can tell you about those characters? Or how can you remember, what are those things that are going on that you remember what a character is?

P4 I think it is the action, especially a story that a child likes to read, the interest. If it is a story that they have an interest in, I think that will help them to remember.

I The interest grabs them but then how do you think that they remember? How do they remember what that character looked like? How do they remember what the action was in the story.

P4 If the story is very descriptive, in the books today they describe everything about that character.

I They describe it so that what?

P4 They get a picture of that p son.

I Do you think that happens with all kids? Everybody sees that picture?

P4 No, I don't think so and that's probably why a lot of children don't grasp the story or absorb anything because they can't see it.

I What else do you think they are doing when they see that, is there anything else going on?

P4 They may be imagining what that person is like, what type of personality that person may be. That's what I think, anyway.

I Those are the things that we have been interested in hearing from parents. How it is that their children learn, what their feelings are about how the child is being taught.

P4 They think that they are actually in stories, too, that they are right there with the characters and that they become very involved with the character.

I Thank you very much.

POST PARENT 4

I What was this study about?
P4 O.K., it was about how we can improve our children's reading by way of teaching them how to learn how to absorb more when they are reading. Basically I think it was a success because I have actually seen quite a difference in Ian. Actually he was always good about asking questions, anyway, when he read, but I think it made him think that much more about what he was reading.

I Did he bring any of his activities home or talk about them at all?
P4 Yes he did, but actually I am a working mother, I'm a nurse, and we are under a great deal of stress, my husband and I both work and my husband is not the one that usually does the reading with the children, I always did the reading and all the homework and so, therefore, with me working outside the home there was less in the evenings. Especially over the study period.

I Did he happen to mention anything to do with imagery? or pictures in his head?
P4 Oh yes, he often mentioned that. Actually he never mentioned it on his own, but if I took the time to ask him, I'd have to bring it out and if I asked him he would say, "oh yes". He could imagine, sometimes himself being there, and imagine himself doing these things. He always used to do that even when he was little.

I Is he doing it in other places other than in books?
P4 In T.V., if there is a program like a child's program, like an adventure program, he has never actually said, but I am sure that he does.

I I guess one of the things that we are looking for is--Is this a strategy that children will use in different circumstances, will they use it in math, will they do it when they are learning a new skill, doing a new craft, or something like that?
P4 Imagery in math - I don't know.

I Or to himself when he is learning something new?
P4 No I have never . . .

I So you don't know if he is talking with these pictures?
P4 I have seen him and when we talk about it he says he is. He says he imagines himself doing these things.

I Next time ask him "what do you say?" Like provide another insight into what it is he is doing. Did you happen to keep a log?
P4 We did some.

I Are you going to bring it back?
P4 There is not very much there.

I That's fine. What's important for the study is to have that come back because this is one of the realities of life that we are working parents. I guess this is quite a foolish question; Was this study hard for you?

P4 Yes, because I found I had to . . . our homework period . . . is structured so at night, but always it is not the same person doing it with the child, so I only did it when I was available to do it. Our life . . . it's difficult. It was difficult some evenings, actually, to do that, because I'm working around shift work and fatigue and what not, so when we did it we actually did write in the log. So we do have a log at home and I'll bring it in to you.

I Was there anything different from before when we talked that you are able to observe, having participated in the study or is it the same?

P4 I say probably, to be honest with you, I found it the same. Because Ian always sort of imagining pictures when he read. He doesn't enjoy math and he does have quite a vivid imagination. He always did imagine himself doing these things. Dragons. . .like fighting with a dragon or whatever he was reading. . . experiencing all things that the person was going through.

PRE PARENT 5

I How is your child taught in school? How is he taught reading?

P5 Basically, I don't know how he is taught, but any teachers that our kids have ever had, have been very good teachers. I relate back to one teacher who used to have student's mothers come in and do reading with the kids, and one said that my child wasn't a very good reader. When I heard that, I said that's not right because she is a real good reader. What happened was she tends to skip the 'and's' and the 'the's' because it already registers and the teacher told the parent that she was an advanced reader and I thought that was very good of the teacher because it gave her more self-confidence.

I Do you think they have been taught the same way from year to year?

P5 Now they try to program and I thought since she was in this program with her Primary teacher and then she was going up into Grade 1, but I don't know what happened there because he ended up with a different teacher. She is very well adjusted and she is in a class now and she didn't mind that. What really upset her this year was that she didn't know who her teacher was when she was coming to school and she didn't find out until a couple of days before and she didn't like that. She said it wasn't fair because my son knew who his teacher was going to be and she didn't.

I Do you think your children are being taught the way you were taught in school?

P5 I think it is probably a bit more advanced teaching than it was when I went to school. We were in from Grade 1 to 6, I was in a one room school so it was quite a bit different and I had one teacher from Grade 2 to 6 and I felt that didn't really work that good, for me, personally. It was rather difficult when you're... Now I think the school system is much better. I found that teaching 25 years ago, maybe even more than that, when I started school, we were in that one room classroom and there was several different grades in it and I found that was probably a bit more disruptive than it is today. You used to hear the Grade 3 lessons, you had work to do, but you were still distracted. Whereas the kids today are not near as distracted in a classroom. One thing I will say about the teachers that my kids had, seemed to have good control of their classrooms. I have come and listened and set in with them a couple times and my wife did the same thing. We come in for reading and my wife comes in for reading and I'm going to have to come in for reading because she is working right now and I'm going to have to come in for reading a couple times a week, I guess.

I How do you teach your children?
P5 Well, we talk a lot for one thing and we have regular study periods like I read a book to my child and he gets a book read to him that I read to him and he has a choice of a story that he can have read to him and we spend quite a bit of time on one.

I And when he is reading with you?
P5 I let him .. he's got a new book now and it's called the *Flintstones*, its a chapter book that he got through the school and he spells the word out and says what's that, so I tell him what the word is and so he got so now he is only 6 and he can read pretty near two pages of the book and he keeps spelling the word out and trying to sound it out which is pretty good for a six year old and he gets some quite big words and I notice that he watches *Jurassic Park* but he sees the dinosaurs then he has the book on the movie *Jurrasic Park*, that we got through the service station, and he, it's kinda funny, he knows some quite big words and I was surprised, he'd see the word and he knew those soon as he seen them, surprised me. I'm quite pleased with that.

I So you read with your child? Do you know what he or she can read?
P5 Well he can read, like now he takes when I'm reading and I say, "what's the title of the story I'm reading tonight" and he'll try and read it out and we go ahead two or three stories in the book and we'll do that and come back the next night and he'll come in and he'll say this is what it is called tonight and he'll read it and most times it's memory reading and he gets it right or if it is a word and we've had it before, say two or three stories back, I" take it back and say member what we read about that and he'll look at me and I'll say same word as what's here.

I How do you think he remembers those stories?
P5 Pretty good. I think he associates them with our religious beliefs. Cause we attend three religious meetings a week, we attend a meeting on Tues. night and we don't just put him down the basement and say you set down here in the basement and play with the kids, he sets with us and he is part of the meeting. I always found that a lot times you'd think that they weren't listening and then you'd be going home in the car and he'd say such and such happened, or he'd say, "they mentioned my name in the meeting tonight".

I How do you think he remembers that? What do you think is going on up there?
P5 I think he is not totally paying attention to what's going on because sometimes we'll give him a notepad and he can draw some pictures, or whatever, but he'll hear something and it seems to click in 'cause you think a lot of times that kids are not paying attention, but they are actually paying a lot more attention than what you think 'cause you are distracted 'cause you're trying to listen to what's going on, as well.

I What do you think makes that click in with him?
P5 He's quite in to artistic stuff and so when he is doing things, like he's a pretty good drawer, and he likes to, like for instance when he was little, 3 or 4, he used to watch *Mr. DressUp*, and I found that he learned a lot from that Mr. DressUp, and not only that, he learned a lot from his sister. His sister is 2 1/2 years older so he seemed to pick up so much faster than she did 'cause she wasn't interested but she didn't have an older brother or sister. So he picked up real fast and then he would watch something on Mr. DressUp and then you'd see him with his scissors and his tape and stuff like that and he would make things that he seen on T.V., from seeing them and then he's say, "now how do you make that" and sometimes he didn't have it exactly the way it was made, but he did nice jobs on some things that he did.

I When your children got to the point when they were readers, how do you think they knew that they were readers? When your little boy says, "I can read that"?

P5 I have to relate back to my daughter. She is a bookworm. She's always had a book or a Barbie story or something like that or trying to read something off a box or something like that and her mother's an avid reader, so her mother reads stories to her and it all seems to click in, plus she really is interested in books, reading, that kind of thing. I'm not the reader in the family, although I do read quite a lot. I have to read to my son -- that's my job, to read to him and my wife studies with my daughter. She is getting to be an excellent reader, she not only, as one teacher said, knows a lot of big words, she knows how to use them properly in sentences, which we were quite pleased about 'cause we were wondering if she was understanding what she was reading. Her previous teacher said that she understood a lot of the big words, ot always she said, but most of the time.

I When you are asking them to tell you about something you have read to together, or if her mother is asking her to retell a story, or retell a Bible story, what do you think your son or your daughter does when they are trying to remember that story to tell you?

P5 In a story that I read to my son, not so much to my daughter, the story that I am reading with my son, there is pictures, right, as well as the story, and instead of reading the whole story, I read a paragraph. Then ask him a couple questions, right pointed questions. Something like the age of somebody or what were they talking about that's usually in the picture. Something that they can see, not a difficult question. I find a six year old attention span is not that long, so you do it a paragraph at a time and if they don't get the question that you're asking, you go over it again. I say, "now listen for the key word" and they pick it up 'cause, like I told me son last night, he didn't know the answer cause he wasn't paying attention. So I read it again and he picked right up on the answer. You have to read, not too much at one time, is what I think. I came in to the school yesterday to pick my son up and the kids were all in a circle, and the teacher was reading to them and I was standing out in the hallway and they're all in a circle and you could have heard a pin drop they were so intently listening to the teacher reading the story, and so you know they're all there in a circle, they're quiet and paying attention. I was quite impressed with the teachers 'cause how do you control 23 or 24 little kids. I have trouble with two.

POST PARENT 5

I What was your understanding of what the study was about?

P5 Well, basically it was to me the understanding was that you need to spend time with your kids to help them to learn to read and to express themselves so that they can learn how to express themselves and if they have a difficulty in some area if you stay close to them and you are on top of it you can help them.

I Did your daughter bring any of the materials home that she, like something on a kayak, or a map, or where they dre a picture, and another with some words?

P5 She brought some of that stuff home and other times she would just say, "I brought this home" and we would just look at it. We didn't spend a lot of time on that.

I Did she talk to you anything about using words like 'imagery', like seeing pictures in her head. Did she talk about that?

P5 She talked about imagery. I felt that was funny because it's not a word that a child would use, but she did sort of mention it in passing. She also mentioned 'inner

language' and how she would be talking and use some kind of a big word and I asked where did you learn that and I asked her did she know what it means and she said, 'yeah', it means this. Then I noticed my son, he, we were out in the field one day and he used this big word, and I forgot the word now, and I said do you know what that means, and he said 'no', but it sounded good. O.K., but the way he used the word, he used it in the right context. I said that the word means difficult. Well that is what he meant and so he had the right idea because he had heard it used before.

I *Part of the study was to help the child become aware of other strategies that they can use and one of them was 'imagery', having a picture in your mind and then the 'inner language' of talking yourself through it so they can either understand it or tell somebody else about it and part of that was to find out if, indeed, the child was using it and to see if the parents were picking up on the using of other strategies. Where you were moving, it was probably right in the middle of this study. Have you had any time to see that or has anything risen that would consider your role in the education of the child. I know that when we met before, because of your religious beliefs, put an obligation on you to be more directly involved with your child's education and you discussed that and I wondered if anything has happened since I first interviewed you that gives you other insights into your role.*

P5 *Not a lot, mainly we try to keep on top of our child's education, both my wife and myself, and spend time in what we call family study, and then we also have, and we don't always get it done every day, that's more my fault than the kids, we have a text that we go over in the morning. My daughter is an excellent reader and she usually reads the quotation and then sometimes she reads the sentences that we need to have read, and she is such an excellent little reader that when she is reading it and she comes to a word that she doesn't know, then her mother or myself will ask her if she understands the word and if she doesn't understand it we look it up in a dictionary and so she has quite a large vocabulary, so a lot of times we take things for granted with her, more so than with my son, because he is only 7. He sometimes uses a word and he doesn't use it right, so we have to correct him and he is, how would I say, he is easier to mold than she is. She is a good reader and sometimes she reads too fast, because what happens is she will skip words, she will say the sentence but she will skip the 'a' and the 'the'. She knows it is there, but she sort of goes right along. The way we would skip if we were reading a paragraph for ourselves. Our eyes just go right through it. Anyway, with her we kind of have to say if you are going to read that out loud, you have to read the whole thing, so every one can follow along. But other than that, I have noticed that Jshe is a bit of a perfectionist and we are trying to take that out of her. Not that we don't want her to excel and do well, but we don't want her to think that she has to be perfect. So many parents put so much pressure on their children to do well. I want her to do well, but I want her to enjoy it. She has found this year, I have noticed especially in the last two months, that, she does well in her class, but she is often a bit of a defeatist person, like she says, "I don't do as good as so and so" and she is very competitive that way. I keep saying is your teacher unhappy with what you are doing and she said the other day, "I want to get a log for this", and I asked her why do you want to get a log for this. And she said, "it's homework, homework, homework and it's Tuesday night and we have to go to the meeting, therefore I'm not going to get my homework all done". I said that, "Well, you know that the meetings come first". Not that school work isn't important, but maybe I'll have to speak to your teacher to see if the bulk of this homework couldn't be done on Monday night and Wednesday night and maybe if you have to stay in and do it on Friday night. We don't mind, I was looking at it and it had to do with Health, anyway, and I said well you do what you can do before supper. We have our supper and then we are going to*

the meeting. We did this one night and I felt it was really wrong of me. We came home from the meeting and it was 9:30 at night and I should have made her go to bed, but instead she had a Math problem and she wanted to do it. So come 11:00 she finally got it done. It didn't serve the purpose that it should have served, because the next day she was tired and irritable and of course that made me irritable because . . . and me being the parent . . . a friend of mine once said that his little girl said you are the parent, I'm not and that kind of stuck with me and I did the same thing with her last night that he was talking about that and I shouldn't have done that. Then I talked to the teacher about that and said shewanted to do this and he said that was just an extra. She really didn't have to do that, but she felt because it was a little block at the end of her Math book and it said 'try this' and so she saw it and thought that she should do it. I said I was glad you wanted to do it, but from now on when there is a 'try this' if we have time we will try it but we are not going to stay up till 9 or 10:00 at night.

I *It is hard to understand the pressure that children will put on themselves. I think that with Mr. Marsh and this study was trying to give the students as many different strategies so that they know that they are in control of their learning and that they can be their teacher in many situations and perhaps that they can relax with it.*

P5 *Be more or less their own guide, then.*

I *To know that these strategies are all right, because very often children will do things, but they don't think that it is the way other people learn the way the teacher approves of, or their parents approve, because we haven't known what they are doing, having talked about it, it was the kind of thing that, "well because I learned this way, I presume this is the way my child is learning" and so what we are trying to do is open up that discussion about how you learn so that they can use it in Math, Science, no matter what they do, that there are the basic skills or when you learn a new skill you talk to yourself. Some people talk out loud, some people talk to themselves, that you make up your own series of directions with pictures, so that you have in mind of when you do this, this and this, that type of thing, and that's what the exercises that she was doing in the classroom were designed to do. It helped them look at a problem, see how they might solve it, something entirely different that they hadn't been exposed to before. How would you go about it, what do you know about it, already, what do you need to know, what are the questions that you have to ask. So maybe when you are already through moving and unpacking, you may come across these papers and you can ask Jennifer, what was this for?*

P5 *I know they are there somewheres.*

I *I know you like to be involved in her learning and it is just unfortunate that the move came right in the middle of this. That's the reality of being a family and being a parent and that we all have our own priorities for our family and I guess our children learn to . . . such as Tuesday night is meeting night and that at some point she has to learn to speak up to the teacher and say can we make an accommodation. You do that now, but at some point she will. We all have our own family priorities and that's how our children learn to live in the world, but still maintain them.*

P5 *Like a structure, more or less and you have . . . like we try not to have it too . . . other than our Tuesday and our Thursday and then Sunday, but we try not to make it too structured that there isn't room for a little leeway. Sometimes we have teachers meetings where we have to go on Thursday nights and I have always told Jennifer and like Jennifer is a bit of a bookworm and so she'll be reading and I'll say Jennifer you have to do this and if she is really engrossed in what she is reading, forget about talking to her, and you'll hear her laugh in the background*

and I'll ask what she is laughing and she'll say it is something she read in the book. She is getting a bit of a sense of humor, I've noticed in the last two years, that she'll be killing herself laughing and I'll say, "you sound like your mother" what is so funny. "Oh, just something I read in the book", she'll say.

I *I want to thank you for coming in and participating in the study.*

PRE PARENT 6

I How is your child being taught in school?
P6 Pretty good. I find he needs challenging and I don't know if he has that available to him.

I How do you know how your child is being taught?
P6 He talks about it

I Do you visit the classrooms?
P6 As I can. He is the oldest of four children, so I try and participate as much as I can in what's going on and I like to see what he brings home and I keep in contact with his teacher (speaking one on one with the teacher), monitor behavior and if there is something we can do at home to encourage him to partake in something he is not. This is just our second year at this school. There will be report cards come out in another few weeks and the teacher said that he prefers to do the three-type of interview, which is all right providing I don't have any further questions that I want to ask the teacher directly without my son being there. I know in Adam's notebook there are notes about how things are going, so I review his notebook at least once a week so I can what's going on and pick up any problems that I think there might be with regard to any of his work.

I Do you read with your children? Did you read with Adam when he was younger?
P6 Oh yes.

I So, you were his first teacher. How did you teach him?
P6 I don't know, I think it is more of a bonding thing. With me it was always cuddle up with a good book and making it a very cozy, positive experience reading with him and teaching him about things and "this is a table". Like when he first started it was, "t, t, table. Tree sounds the same, doesn't it"

I Were there other things that you used to do with him when you were reading?
P6 We always talk about the book, or I'd get him to interact with me if it was a repetitive thing, I'd point to the picture of the word. Today, with my youngest one, we were at the doctor's and we were reading Cat in the Hat. So when it came to the cat and the hat, I'd just point and she'd say, "cat in the hat". so I knew that she was paying attention. So I wasn't just reading to myself.

I If you close the book and ask your child to tell you about the book, how do you think they would remember?
P6 I think something that caught their attention or that really interested them. I might not be what I was reading, but they might have seen in the picture. "Did you know Mom, that mouse was on that page, and it went over to the next page, and every turn that mouse was on the same page". Something that I didn't pick up, but they picked up. A noticed that a lot of the children's books are like that.

I What do you think is going on in their head, that they have remembered this to tell you?
P6 Just that Mommy was probably reading. They hear me reading and they'll hear the words coming in but they are absorbing the picture rather than hearing my words and they are associating more with the picture and bits and snippets from what they pick up from my reading.

I So when they close the book and tell you about it, how is it that they can tell you about it without seeing it on that page?
P6 Memory.

I And what do you think is in that?
P6 How I think they are thinking?

I And what is it that they are doing up in that head?
P6 Reconstructing it, I think, in their terms without the and's and the's and all the big words, or the filler words. They are picking out the nouns and verbs, so to speak.

I Are your children being taught the same way you were taught in school?
P6 No. Not at all.

I What is different?
P6 Kids are a lot freer in school now than in my day. I remember, as a child, sitting there trying to figure our the word "here" and it was on the chalkboard. I was only in Kindergarten and I couldn't figure it out -- "I used to get here and there confused" -- and I remember just sitting and watching it on the board. One day it was 'here comes', and even to this day that sticks with me.

I How can you remember that?
P6 It was just something. I think because as a small child I knew I couldn't read without knowing that word.

I What are you doing right now?
P6 I'm sitting back in the classroom in Kindergarten remembering how I felt.

I But, what else are you doing? How is it that you know? What is it that you do right now, remembering? What is remembering?
P6 Drawing up your thoughts that you have stored.

I Is there anything else that is up here, right now, when you are telling me about it?
P6 Feelings. Memories. History.

I If you close your eyes, what can you do right now?
P6 Be back in that classroom. Remembering.

I Makes it very vivid, doesn't it?
P6 The focusing in on it.

I Then there came the point that you knew?
P6 I find I read with my 6 1/2 year old class and they are learning more sight reading and memory reading and than when I was a child. It wasn't taught that way. Everything was phonetics and now phonetics are still involved because they are the basics, but there is a lot of other different things that come into it.

I You sound very comfortable with that, having all of these other ways?
P6 I think it gives them options, whereas if you sit down with a book and say you are going to read this and if a child has difficulty, giving them other ways of learning to read makes it more enjoyable for them.

I When your child is reading, what strategies do they use to try to understand it, you have touched on this with the phonetics, what else do you think is involved?
P6 Their comprehension. I don't know if it is because I started reading with them when they were very young, or what in our family has worked, but they all have a very high level of comprehension.

I How do you know?
P6 One of our children had to be tested for it. When a four year old takes a test and she is told that she has a seven year old comprehension, and she can use these words and understand the meaning of the words, then I know that she really does comprehend.

I If someone hadn't told you that you that, how do you know that your child understand or comprehends?
P6 When they are little and you say, "please go get Mommy's slippers", and they go get a shoe or something, I know they understand my instructions to go do something and bring it back. That lets me know they are comprehending.

I Now, when they are getting older?
P6 I think it is still the same thing. If they can follow or if they can, I know with my son and his reading, he'll read something and then he'll come to us and say, "what does this word mean, I don't understand it". I'll say use it in a sentence so I know the meaning and together we can work out the meaning of the word, even if you don't understand the printed word, we can work out what the meaning could be. Then he fits it into the sentence as to what it means.

I Thank you very much.

POST Parent 6

I You have returned your log.
P6 I didn't get all the pages full.

I What did you think the study was about?
P6 To me things kind of got lost in the wind with it. Because he would being home a paper to show me and I'd say lets do this. "Well, we did that in class, we don't have to do it at home'. So I just kept on with him, "Well, O.K., that's fine". Then he would read something and I'd relate back to the paper that came home and question him. They did one exercise with a bunch of Latin-type prefixes and they created a creature out of it and so he was quite interested in that. We got into quite a talk about that.

I But, you had to work on it, just like everything else at school.
P6 It was quite an effort. If he didn't see me looking at the sheet and we just casually started up a conversation, it went a lot better.

I But, that's like everything he brings home, isn't it?
P6 Pretty well.

I *Did you ever discover anything about his learning.*

P6 *Imaging, it made me become more aware of how it is done and how they internalize things and I particularly noticed with my 6 1/2 year old, who is reading, and some of the things that my son had mentioned about how he thinks of things when he is reading them, I was able to apply to her. She is beginning to learn how to read and how to comprehend and understand things.*

I *Could you the younger one tell you about that when you kind of triggered the right words.*

P6 *Yeah. She would tell me about what she saw in her mind and over the few months of the course I noticed with her. I made a note on one of the papers about my 6 1/2 year old and in the beginning when we first started doing this, she was like, well that word is 'cat' and when I see that word I think of a cat. But now she is to the point that she can read a whole sentence and she says when I'm done that sentence I get the whole picture of what is going on. She says it is not just one thing that is happening.*

I *So, then has this given you greater insight into knowing what the right questions to ask. Now, what about your own thinking about your own learning. Has it made you more aware.*

P6 *It has made me more consciously aware of it. I think a lot of it is done unconsciously and whereas this is making you think. Like some of the strategies he is working with, like the graphing and one of the assignments was how to remember all these words and how they were categorized and I find myself, especially when I meet new people. I'll put that under the educational area of my brain for remembering that.*

I *So it has had an impact on you as well as your 6 year old.*

P6 *I'll be able to continue that on with my 5 year old and her, for their learning process. It wasn't something. . . you knew it went on, but your were not working with it.*

I *Part of it is having the vocabulary and the right questions to ask. Did you find this exercise difficult?*

P6 *No, not really. I found I had to make the effort, because we have 4 kids.*

I *Your found it time consuming.*

P6 *No, not really. I found you would do it and then I'd think I'll go write that down and then I'd get busy doing something else.*

I *Was it worth while to you?*

P6 *I think it was.*

I *And the writing part was worth while?*

P6 *It's given me, as a parent, some skills to use with my kids and to help them. I wrote it down in the journal -- something he was doing in Math, and he was having a problem with this. Just think of it in your mind, break it down in the components you understand. And he said that makes it a lot easier, rather than just trying to remember the numbers. He was able to associate something with it. Whether he put beans in his head, or what, I don't know, but that helped him in a difficult Math problem he was having.*

I *Do you see your role any different than what it was before.*

P6 No. We are very involved in the kids and their education and learning all we can, so this has given us another tool and another aspect.

I A little different understanding?
P6 Yes.

I Is there anything different now? Is it going to be different when you read with the younger children?
P6 I think I'll be able to help them with the word association and comprehension side of things. If I can get them to verbalize what they are thinking or seeing in their mind's eye as they are reading. With Adam one day I just picked up the word 'space' and I said what do you think of when I say 'space'. And he said, outer space. O.K., the word 'space' in association with outer space and the description he gave me of what came to his mind, I said O.K. what is the other space, the different space. Then he thought of outdoor space and all the things that came to his mind rather than just the word. He is very descriptive with his writings and things like that. When I said outer space he even started describing the Martians he saw and everything.

I So this was an enjoyable experience for you?
P6 Yeah.

I I'm so pleased to hear that and I thank you for fully participating and I will pass that on to Mr. Marsh.

STUDENTS:

PRE STUDENT 1

I Keera, tell me how did you learn to read?
S1 When I was in Kindergarten in Germany, I was given middle books and some of them were quite hard and some of them were easy. We had levels. He taught me to read and we had teachers come and they helped us to read.

I How did they help you? How did you learn?
S1 They told us to read the sentence and we read it and whenever we made a mistake, then they'd say something like, "What word is that?", then we'd say it and if we got it wrong again, then they'd correct it.

I How did you know you were reading? How did you just finally know, 'I am reading'?
S1 When they told me that I was doing really good and I was finally reading.

I But then how did you know you were?
S1 When I opened the book and I read the sentence I just felt something.

I What was that something?
S1 It's sort of like excitement -- you do something that you've never done before.

I And did that happen specially when you got a new book?
S1 Yeah. Specially when I started reading harder books.

I How do you learn to read better?
S1 I learned by reading harder books.

I How did you know those new words, and that?
S1 Well, I'd go over to my Mom, or who ever was helping me, and ask them what word it was, or I'd try to sound it out. Once I sounded it out, then I'd go up to the teacher, or who ever was helping me and ask them if that was the word.

I Is there any other way?
S1 I sounded it out and then I kept saying it and later on I kept getting better and better at it.

I Did you do anything else, besides sounding words out?
S1 I looked at the word and I looked at another word and I said another word in the book like 'what' and 'was not' and 'wasn't', if they were almost the same, and then I knew that word, then I'd look at the other word.

I That's good, that's another way. Is there another way?
S1 Not that I can think of.

I Do you do any other things? Do you always read every single word? Do you read different when you read to yourself. or when you read out loud?
S1 When I read out loud I don't read as good as I read to myself.

I Why? What do you do when you read to yourself that's different?
S1 When I read to myself, I really think what it sounds like in my mind, it feels like it's really happening. But, when I read out loud, it's not really the same.

I When you read it to yourself, why does it seem more real?
S1 It seems real because you're not reading it out loud and when you are reading it out loud it's harder to concentrate. When you are reading it inside, you can look at the word and you can imagine what it is like. Especially chapter books where there are no pictures.

I Were you imagining?
S1 I'm reading the whole book right now. Like say, they are going on their adventure and you can imagine what the mountain or something looks like.

I Is there anything else?
S1 When I read to myself, it's easier for me to read because when I read to myself from reading out loud. It's hard for me to concentrate and I can't really read aloud and I've been reading to myself for so long, I'm just used to it.

I Can you think other students learn to read the same way you did?
S1 I was advanced when I started to read.

I How do you think other kids learn?
S1 Well, they probably start the same way I did, by learning with the teachers, or with their parents. Some people are more advanced than me, but some are not. Some teachers aren't the same, they don't help the kids read as much.

I How do you think these others kids learned to read? If it's not the way you did.

S1 I don't really know. My brother learned to read by asking my Mom the words. Mom didn't help me as much as she helped him.

I Do you think that your brother learned to read the same way you did?
S1 No. His teacher didn't urge him to read as much as we were. His teacher didn't do very much to help him.

I Do you ever try any new ways? When you are reading to yourself, you told me that you imagined things. Do you do anything else when you are reading to yourself?
S1 They give us pieces of what you should imagine and when I read to myself, I just take the stuff that they tell us and like a puzzle, I just put it together. They say that, as of the goblin, he is really evil, so you imagine him being evil.

I Do you think that when other students in the class are reading, that they imagine things the same way that you do?
S1 No.

I You don't think so.
S1 Some of them do, but others don't because I doubt they read Hobbit or the books that I read.

I When you were younger in reading easier books, did you still imagine things?
S1 Yes. I just looked at the pictures and they tell us different things than. I just put pieces together.

I What's the difference between students who have a hard time reading and those who have an easier time?
S1 People that have a harder time reading, I think, the difference is that they didn't get taught as well as the people that know how to read. They probably aren't the top reader or their teacher didn't care if they knew how to read or not. That's what happened to my brother. The teacher didn't care. Or, they didn't want to learn how to read.

I Do you know any children in your class that work really hard, but still aren't very good readers?
S1 Nathan, he doesn't really know how to read that well, but he would really try.

I What do you think that he could learn to do to make reading easier?
S1 He could learn to, if his Mom doesn't work with him, or if he has any free time, he could get together with his Mom and read for her.

I What are the things he would do? You told me how you learned to sound out words and you learned how to look for different words in the same story that might be kind of the same and you told me that when you read to yourself, you kind of imagine what is going on.
S1 He could start reading harder books because if he keeps reading the same normal books then he'll never learn any of the bigger words.

I O.K., thank you very much.

POST STUDENT 1

I Tell me, what was this study all about?

S1 *It was about learning how to use your imagination and learning to picture things and learning how to make pictures in your mind by just reading a book, not by looking at any pictures.*

I *What do you know about your learning, now, that you didn't know before?*
S1 *I know that how to picture more things and not just read the book and have no idea what it is, if I can read before then I picture and know what the words are even if I don't know what they mean, at least I know what they mean because of the pictures in my head.*

I *How do you remember things now?*
S1 *I remember them by, I make a picture in my head and I keep the picture in a corner of my head and when I, like yesterday my Mom told me to tell her to write a note to Mr. Balsor and I usually forget things so I just said write a note to Mr. Balsor and I pictured it in my head and then I went in today and said, Mom you have to write a note to Mr. Balsor, so I remembered it.*

I *Anything else besides pictures that you use to help you remember?*
S1 *I use maps.*

I *How do you use that picture; you see it and what do you do with it?*
S1 *I remember what it was and then I use it, I just, like say I put a picture in my head from my house all the way up to the school and I remembered what I had to take so I did that.*

I *Mr. Marsh used some words, one of them was 'imagery'. What does that mean?*
S1 *To image up things in your mind.*

I *Can you use another word beside image and imagery so that I would understand what you were talking about? Can you describe it a different way?*
S1 *Picturing.*

I *Do you use this imagery, this picturing, with things other than reading?*
S1 *Yes.*

I *You mentioned about remembering about writing that note for Mr. Balsor, is there anything in school that you might use it for?*
S1 *Remembering words.*

I *Words for what?*
S1 *French words are really hard. Like peoples' names.*

I *Is there some other class that any other subject or scribbler that you are working on that you might use it for?*
S1 *We just use pieces of paper.*

I *I was thinking about, could you use it in a Science class?*
S1 *If we had to remember rocks and minerals and we have to remember it for Health tests.*

I *How would you use it with these rocks and minerals?*
S1 *You need to remember the type of rock they are and the data that you had on them.*

I *How would you do that?*

S1 *I have scribbler and I have written something in it and then I read it and read it and read it and I can remember it for my Science test I had to do it.*

I *How was that using this imagery? What did the imagery do?*
S1 *It helps me remember things.*

I *What is it, you told me there is another word besides imagery?*
S1 *Picturing.*

I *How would you do that with the rocks?*
S1 *Like a sedimentary rock, I remember that it was found in the sea and other stuff and I picture a rock in the sea and then I say that's sedimentary rock and then I'd picture a lava rock.*

I *How would you see that?*
S1 *I'd see it as under the ground in the volcano.*

I *Can you see that volcano right now?*
S1 *Yes.*

I *There was another idea that Mr. Marsh talked to you about and it was called "inner language". What do you do with inner language.*
S1 *Well, like I said if you remember something then you can talk to yourself in your head, like inner language, like my Mom had reminded me to tell my Mom, it's like you gotta remind your Mom to.*

I *Yes, but what about the rocks?*
S1 *I'd remember the picture and I'd say that's sedimentary rock and that is lava rock.*

I *But, you don't say it out loud?*
S1 *No.*

I *Do you do anything now that you didn't do before?*
S1 *No.*

I *Did you used to do those things?*
S1 *Except for the map.*

I *This has been so interesting and I am so pleased that you participated with Mr. Marsh and I thank you very much for coming, Keera. Did you enjoy yourself?*
S1 *Yes.*

I *When Mr. Marsh would come, w ere those enjoyable activities?*
S1 *Some of them were enjoyable.*

I *What one was the most difficult?*
S1 *The one had a whole bunch of words. I don't remember the exact words, but we had to figure out what it was and it was doing the laundry.*

PRE STUDENT 2

I What I want to know is, how did you learn to read?
S2 At the beginning I started sounding words. First my teachers told me to sound out words in Grade Primary, then it went on to in Grade 3 we had to find the letters that don't speak out, and stuff like that.

I How did you know you were a reader?
S2 Mainly because in Grade 2 and 3 my teachers were complimenting on how good I was reading.

I So other people told you? But, when did you know that you could pick up a book and read it?
S2 In Grade 2.

I How did you learn to read better?
S2 Practice.

I Do you read to yourself, or always read out loud?
S2 Most of the time I read to myself.

I And how is that different from when you read out loud?
S2 Reading out loud you get sort of nervous and it takes a bit longer to get the sounds of the words together, like you have to read them then say them out loud.

I When you read to yourself, what goes on?
S2 I'd say it's a bit easier than reading out loud because I just have to read, I don't worry about how to talk.

I You don't worry what it sounds like. What else do you do when you are reading it to yourself? What's going on in your head when you are reading?
S2 If I close my eyes and I'm thinking about a horror book I just read, I can picture myself right there in the place of the main character, and stuff like that.

I How do you think other students read? How do they learn to read? The same you did?
S2 Yeah, pretty well.

I What about the children in your class that reading is hard for them? Did they learn the same way?
S2 No. They probably learned how to sound out words, they didn't really learn how to listen to the letters that don't make a sound and stuff like that.

I Do you think they can read good to themselves?
S2 Yeah, probably.

I Do you ever hear them talk about how they read?
S2 Well, I did a couple of times in Grade 3. I accidentally heard a bit of what the teacher was talking about to a boy about his reading skills and how he should practice more often.

I Were they the same kind of skills that you already knew?
S2 Yeah.

I Pretty much the same ones?
S2 Basically.

I Do the children who don't read as well as, do they work as hard as you do?
S2 I'd say they work harder in getting to learn to read.

I Do they really do the same thing you do when they read? You said that they sound words out, but that they don't know those other trickier things like letters that are silent, or letters that do different things some times.
S2 Letters like 'ph' making the 'f' sound.

I Do you think they do the other things, do you think that when they read that they see themselves right in the action?
S2 Yeah, probably.

I When you are inside that action do you say the same kind of words that are in the book or do you have your own dialogue? Do you say different things, or do you say the same?
S2 When the action is going on, I'd say I have about the same dialogue as in the action.

I Thank you very much Adam, I appreciate that.

POST STUDENT 2

I What was this study all about?
S2 Well it was like finding out how kids read and stuff and he was giving us little things to do, like how to make pictures in our head and if they were color or black and white and he showed this map and told us what it made us think of and stuff like that.

I And what do you know about your learning, now, that you didn't know before?
S2 I know that learning is a lot more than I used to think it was.

I Did you do all these things before?
S2 No.

I So, how do you remember things that you read?
S2 I just, like, remember them and nothing really special that I do.

I If I gave you something new to learn, like I gather you have been learning about rocks and minerals, and what if I gave you a new mineral. I gave you something like "barrel", something that usually isn't in the school tray of rocks and minerals, how would you remember it? What are the things that you do?
S2 Well if it is something I don't usually see often, it usually stands out in my memory, like let's say I saw a wild raccoon jumping through the trees, like I'd remember that for a long time.

I Why?
S2 Probably because that was areally excited time for me.

I How would you remember it? By the smell of the raccoon? Or, how?
S2 What the raccoon was doing because it isn't every day that you see a wild animal.

I *O.K., you come to school the next day and you want to tell Mr. Balsor about it, what would you be thinking about, what would be giving you clues that you would remember to tell him about the raccoon, what kind of trees they were, where it was, what time of day it was, what would you use to remind you of all those things?*
S2 *What time of day it was, I could see the sun high in the sky.*

I *But this is the next morning when you go to school.*
S2 *I probably know how I remember things like that.*

I *O.K. You remember a word called 'imagery'. What did imagery mean?*
S2 *Like, making pictures in your head.*

I *This raccoon, jumping through the trees if you were talking to Mr. Balsor about it, would you have an image in your head that you could draw on, that you could look up in your head so that you could describe it?*
S2 *Yeah.*

I *So you do that?*
S2 *Yeah.*

I *When I ask you, you don't readily say, "Oh, I use imagery", or "I'd have a picture in my head", so you don't really think very often about how you learn.*
S2 *No, not very often.*

I *But you use this imagery? And you used it before Mr. Marsh was here.*
Are you aware, do you know that you use this in other subjects like Science or Math or French class.
S2 *Yeah.*

I *Do you see pictures in those classes?*
S2 *Like in French class, I can just look up in my mind and, like, let's say we are talking about a cat, I just look up in my mind and I see a picture of a cat and right beside it says it in French.*

I *And you label it with the words. Do you say that word up in your head, too?*
S2 *Yeah.*

I *O.K., so you know about inner language and what is inner language, then?*
S2 *It's like asking yourself questions in your mind and stuff like that.*

I *Do you do anything differently now then you did before Mr. Marsh came in?*
S2 *I use the imagery a bit more.*

I *What activity did you like best that you did with Mr. Marsh?*
S2 *I liked the one where he said the kayaker is going straight and then he turns and I also liked the one with math, cause you could see sea monsters and that.*

I *Where did that kayaker end up?*
S2 *Well, he went in a square.*

I *Thank you very much, I really appreciate your participating and I'm happy to hear about what went on because I was away and I am pleased to come back to find out. Thank you very much Shawn.*

PRE STUDENT 3

I How did you learn to read?
S3 Mom would read a story sometimes, and she let us pick one I knew, mostly in school.

I How was that?
S3 Mom would get me to read some paragraphs and then the other one she would read. She would read it and then she would read it over again until I could read most of the words.

I How did you know you were a reader?
S3 Well I like reading a lot. I enjoy it.

I But, how did you know you were a reader? How did you know when you picked up a book, "I am a reader"?
S3 I am not sure.

I If I hand you a book, how do you know if you can read it?
S3 Usually, some of them look easy and some of them don't look easy.

I How do you tell the difference?
S3 Some books you read, you know, parent's books.

I Why are they harder?
S3 Bigger words in them. Some of the words I don't understand.

I What happens when you get a word that you don't know?
S3 You sound it out.

I What else do you do?
S3 Mom says look at the syllables.

I If you are reading it to yourself, what do you do?
S3 Try to read it over in my mind, over again until I think I got it.

I Is there anything else you do?
S3 Not usually. Last year I looked for littler words and that I know.

I How do you learn to read better?
S3 Read more.

I Anything else that you do?
S3 Not that I know of.

I How do you think other students in your class learn?
S3 Same way as I read.

I When you read to yourself, is there anything different that when you read out loud?
S3 Sometimes I only want to read by myself. I really like to read fast and other kids can't understand me if I read to them.

I What else is different? You don't have to pronounce the words is what you are saying because you go so fast that sometimes words go right together. But if you

are reading to yourself, what is different besides that? What's going on when you are reading?

S3 You feel that you are in it because you are the one that's reading it.

I What does that mean? You are in the story.

S3 You feel like you are in the story.

I How do you know you are in the story? When you are reading to yourself and you are in the story, how do you get into it?

S3 Like, if you know you are inside it? So you can read it sometimes?

I You said that you felt that other kids learn the way you do, and read the way you do, what about some of the children that reading is very hard for them, do you know any children that reading is really hard? And other people, it seems so easy. Are there some children that don't read as well as you do?

S3 Yeah.

I What do you think is the difference between those children that aren't good a reader as you?

S3 I think it's just the way; it's just a little bit hard for them.

I Why do you think it is? Do they do the same things that you do when you read?

S3 No. Sometimes it may be a little bit harder.

I What do you think they do?

S3 I know a girl in my class, she will just go over a word, she'll know it. She will try to say the word and then she'll go, "I can't do it", and then she will go, "I've seen that before, but I don't know what it is. I'm not sure what it means."

I She can't remember what it was.

S3 She'll see the same word and can't say it, then she'll come to the same word a little bit later and then she will just read it out.

I What do you think she could do to be a better reader?

S3 She could see the word more often. Learn to sound the words.

I Thank you very much.

POST STUDENT 3

I What was this study all about?

S3 The study, I guess it was about what he was teaching.

I What were you doing and what did you learn and what was the whole thing?

S3 I guess I learned how to use your voice in your head better and how to see pictures. I never seen it that way before. I just read.

I So this was something new.

S3 Yeah.

I Is it something that you would use again?

S3 Oh, yeah.

I Do you use it now?

S3 *Yes. After he left. When I'm at home, I like to read a lot.*

I *Do you use it in Science class?*
S3 *Oh, yeah. Well, when she asked us a question or she reads something, you picture it in your mind.*

I *You are doing rocks and minerals?*
S3 *Yeah.*

I *If I said sedimentary rock, would you have a picture about that?*
S3 *I don't know. Yeah I have a picture of a rock.*

I *O.K. if I say sedimentary, can you picture that rock as opposed to an igneous one?*
S3 *Yeah.*

I *O.K., what do you see?*
S3 *Well, I'm not really sure, I guess, because I wasn't in school and I missed a lot. I did a little bit of work.*

I *Do you know what the igneous rock is?*
S3 *Not really.*

I *Can you see the volcano up there in your head?*
S3 *Yeah.*

I *Then, can you see that rock. Does it look different.*
S3 *Not sure.*

I *When Mr. Marsh said 'imagery', what did that mean?*
S3 *Something in your head? Pictures or something?*

I *And then you told me that there was something else that you did, inner language. What did you tell me that was?*
S3 *Like, hear a voice in your head while you are reading.*

I *Do you do that?*
S3 *Not as much as I see the pictures, but I still do that.*

I *Did you used to talk to yourself in your head, before?*
S3 *Not very much. I don't know.*

I *Do you do any crafts?*
S3 *Sometimes, yeah.*

I *If you were learning a new craft, do you make bracelets out of braiding, laces or embroidery thread. Did you make those little friendship bracelets?*
S3 *Not me.*

I *If I were going to teach you how to do that and I would tell you that you go left over right, left over right, how would you remember that? I'm going to show you, I'm going to take the braid, left over the right one and over the right one again.*
S3 *I guess I'd think of a road, I guess, first you turn left and then you turn right.*

I *O.K. Fine. But you could see that in your head?*

S3 *Yes.*

I *Good, so you use those pictures and you use those words because you told yourself to turn left and to turn right. Have you changed in the way you learn new things. Do you use any of these.*

S3 *I guess I use my inner voice sometimes in asking questions. Like we were making a weird shape, I guess I ask myself quite a few questions because it was really hard. I had to make it until I got it right.*

I *So that was something new and something a little hard. So you are using that inner language. That's good. Then could you picture those shapes in your head?*

S3 *Yeah.*

I *Which one of the activities did you like that Mr. Marsh did.*

S3 *I liked the one with the ancient map.*

I *Are you the map reader in your car?*

S3 *Sometimes. Those ones are harder to follow.*

I *I bet you learned some skills with Mr. Marsh. Thank you very much Jasmine.*

PRE STUDENT 4

I Tell me, how did you learn to read?

S4 I learned to read when I was in Grade 1, my teacher helped me with some of the easier books and my Mom helped with me with reading at home.

I How did you learn to do that?

S4 My Mom would help me sound out words, so I could become a better reader.

I What else do you do besides sound out words when you read?

S4 Mostly when I read, when I'm in bed and I can't really read that much.

I That's when you are reading out loud?

S4 Yeah.

I How about when you read to yourself?

S4 I read to myself, I think I can go a bit faster because I'm not having to stop at some words because I am having trouble with them.

I What about those words you have trouble with?

S4 I sometimes sound them out. If I can't, then I just go on to the next word and try to figure it out after the sentence.

I That works too, doesn't it? What else do you do?

S4 I like to read other books and play games with my family.

I When you are reading, and you are just reading to yourself, what do you do besides sounding out, skipping over, and figuring out what it is? Do you do anything else?

S4 Sometimes if it is just a big word and I can't figure it out, I just guess what it is and keep going.

I You like to read to yourself? Why do you think that is?

S4 Because if there is a phone call for someone, and someone tries to talk to them, then I wouldn't be interrupted.

I Now you are getting to be a better reader. How do you learn to be a better reader?
S4 I try to choose harder books, because I think I can be better all the time.

I How do other kids learn to read?
S4 I'd say their Moms help them, and their teachers and friends. They could try to sound out words or figure them out by looking at them, or skipping them and going on to the next word.

I Do you think they learned to read the same way you did?
S4 I think most people would.

I Are there other ways that you could use if you read something and you didn't quite know what it was?
S4 I'd ask some people if I can't figure it out, or I might just skip it and go on. I just like to get most words right, but I can't always do that. It might be pretty tough, but I like harder books to read.

I In your class, there are probably some kids who are maybe better readers than you are, and there are some other children in that class that have a harder time when reading.
S4 Yeah, I'd say that there are some better people in my class. And there are some that have a harder time.

I What do you think the difference is between those who have a harder time than those that it easier in learning to read?
S4 I think those who have a harder time should choose probably easier books than the ones who have an easier time.

I Why do you think it is harder for them to learn to read?
S4 Maybe people don't help them as much.

I That is really kind of you to come and thank you very much.

POST STUDENT 4

I What was the study all about?
S4 I think it was about pictures that remind you . . . . different types of pictures, like diagrams and maps and finding out what you can use with your head if you are stuck and the voice in your head to ask questions and how you sort of read.

I So, what do you know about your reading and learning now that you didn't before?
S4 Before I just didn't really use my voice, I just continued reading to find out what that word is later.

I But now you are able to. What is it that you do when you are reading and you are at a part where you are not quite sure.
S4 I'll ask myself what the word is, I'll sound it out, if I can't get that, I'll read on.

I While you are reading, what is going on up in your head.
S4 I form pictures.

I *Sometimes does that word come through, knowing what the picture is?*
S4 *Yeah.*

I *When you have read something and then you go home because you really liked what you read, how do you remember it to tell somebody at home.*
S4 *I normally just, if it is something I really liked, then it would probably stay in my head and I'd think about it once I was ready to tell about it.*

I *So you are standing there and you want to tell them, what do you use? What do you have inside your head that helps you remember?*
S4 *My brain. It help me remember things.*

I *How can you describe what went on in the book? What do you have to be able to do in your head first, before you can tell somebody else about it?*
S4 *I have to read it and be able to know what it is about.*

I *And you are ready to tell them about something funny that happened, or exciting that happened, where do you have to be able to see that first?*
S4 *I see it in my mind. I'd say about it.*

I *Do you talk to yourself in that picture before you say the words to somebody else.*
S4 *Yeah.*

I *Mr. Marsh talked about different words. One of them was 'imagery'. What did that mean?*
S4 *I think imagery is different types of pictures or different views of pictures.*

I *What did 'inner language' mean?*
S4 *The voice in your head.*

I *Do you use that very often?*
S4 *Yeah. I use it all the time.*

I *You do. Do you use the pictures very often?*
S4 *I use it all the time.*

I *Do you use it in other classes, in Math class?*
S4 *Yeah.*

I *Tell me about it.*
S4 *Well, my inner voice in math class I'd ask myself the question a few times and I'd figure that in my head.*

I *Do you use the imagery in Math class, at all?*
S4 *I'd see numbers.*

I *What else would you see?*
S4 *I'm not sure.*

I *Would you see numb ers, like if it is a number 7, do you see the number 7, or do you see seven apples or seven oranges.*
S4 *I see the number 7.*

I *Anything change in the way you read, now, as compared with before Mr. Marsh came?*
S4 *Before Mr. Marsh came, I wasn't using voice as much. But now I'm using it all the time.*

I *That's really good. Do you think you could teach yourself something, now? Or, do you always need a teacher?*
S4 *I think I'd still like the teacher better because if I was going to teach myself something, I'm not really sure how I'd do it.*

I *Do you teach yourself anything at home? Do you figure out how to do something?*
S4 *Yeah. I figure out big words.*

I *If there was something you wanted to make, do you always ask somebody to show you how to do it or do you sometimes do it yourself?*
S4 *I normally try by myself.*

I *So you teach yourself, don't you.*
S4 *Yeah.*

I *Do you think you teach yourself other things?*
S4 *I like to try.*

I *Well, Shane, thank your very much for coming in.*

PRE STUDENT 5

I How did you learn to read?
S5 Well, I sat down with the teacher, sometimes she helped me, sometimes Mom would.

I What did they help you do?
S5 I would read a word and when I came to one I didn't know, I asked them.

I You'd ask them, sometimes they'd tell you, sometimes they'd tell you to do something else. What was that?
S5 Sound it out. Or break it up.

I Or sometimes, did you skip that word.
S5 Yeah and go on and then go back to it.

I See if you could figure it out. While you were reading those things, and you could sound out the words and sometimes you didn't read to your parents or your teacher, you read it to yourself. Then would you tell them about the story. Would they ask you questions? About what you read?
How did you remember that? How could you tell them about something you had read?
S5 Well normally I'd remember the book and think about it.

I But, if you went home and your Mom said, "What book did you read in school today?" and you said, ... Have you read Super Fudge.
S5 Yes.

I Do you remember who Fudge was?
S5 He is a little boy.

I How do you know that right now?
S5 Because it was read to us and they used the name a lot in the book.

I How did you remember it?
S5 .....

I Can you tell me what Fudge looked like?
S5 He had brown hair and he was short.

I And what are you doing right now while you are trying to tell me about him? How can you tell me that he had brown hair? And that he was short?
S5 Because I remembered it.

I How do you remember it?
S5 ....

I Where do you see it?
S5 In a book we have in the class.

I Yes. But where do you see Fudge, right now?
S5 ..... Standing at a table.

I Where is that picture of Fudge standing at a table?
S5 In a book.

I If you close your eyes can you see it?
S5 .... In Coldbrook School.

I Can you see it in here? Where do you see it?
S5 A teacher showing us.

I And can you see all of that? You can. You stored that all up in your head. You can see all of it. Good. O.K. Do you think other children can see that up in their head?
S5 ... I don't know.

I You don't know. Do you think when other children are reading, they do it the same way you do?
S5 Probably.

I Reading, that means saying the words out loud?
S5 Yeah.

I What other ways do you think children know, like you know by seeing these pictures up in your head, what else do you do up in your head to remember to tell somebody about a story?
S5 .....

I I think these are hard questions. Have you thought about these things before?
S5 No.

I Do you talk about them in class?
S5 After we read a book, yes, sometimes other people would tell us about what the story was we read at reading period.

I But when you are talking about it, do you talk about how you remember? Because you know some kids will remember everything about a story, other children might remember only one or two things. Does that happen when the teacher asks about a story?
S5 Yeah, if is an exciting one I know all about it.

I Do you think everybody remembers the same?
S5 No.

I Do you ever try new ways when you are reading or you are trying to remember?
S5 Yes. Sometimes.

I What are the things that you do to remember things?
S5 Well, I remember the first word, then when I get back home I would tell Mom about it and I just remember that first word and then I go on.

I Good, good. What do you think is the difference between children who have a hard time reading and others for whom it is very easy?
S5 .....

I Do you know someone in your class who is a really good reader?
S5 .... Not really.

I You don't. Are you new in this school?
S5 This is my second year.

POST STUDENT 5

I What was this study all about?
S5 Reading comprehension.

I What else?
S5 ...

I What did you learn about? What do you know now that you didn't know before?
S5 Make pictures in your head to understand the story more.

I What is that called?
S5 . . .

I Do you remember what Mr. Marsh called it?
S5 Imagery?

I What else, so you make pictures in your head, what else do you do?
S5 . . .

I How do you know what those pictures are?
S5 Story tells it.

I When you read a book, how can you remember what you read?
S5 I make the pictures in my head.

I You are going home, you are going to tell someone at home about whatever you read at school and so you have a picture in your head and then what do you do?
S5 Well, sometimes you remember what page it is on.

I Can you see the page that it is on in your head.
S5 Yes.

I That's really a good strategy, you remember the page that it is on, and then what do you do?
S5 Then I remember one word on the page, like a word that describes the whole sentence and I just remember the sentence.

I Before you say it to that person, do you ever say it to yourself inside your head?
S5 Yeah.

I And did you put that talking to yourself inside your head with Mr. Marsh, about those pictures.
S5 Yes.

I Do you remember what you called that when you talk to yourself inside your head?
S5 Interference. No. Inner conscience.

I You are getting close -- inner language.
S5 Yeah.

I Does that sound familiar?
S5 Yeah.

I What does imagery mean?
S5 . . .

I Is that a familiar word?
S5 . . .

I From Mr. Marsh -- imagery?
S5 Yeah, I remember the word.

I And what do you think imagery is?
S5 A picture.

I So what would he be talking about?
S5 Pictures in your head.

I Good, Jennie. When do you use this imagery?
S5 When I'm listening to a tape or when I am reading.

I Any other subject in class?
S5 When somebody is reading a story.

I That is in language arts. Do you use it in any other subject?
S5 . . .

I Do you ever use it in science. Do you ever use it in math.
S5 No.

I *Do you use these pictures more than you used to?*
S5 *Yes.*

I *You do. Do you use this talking to yourself in your head more?*
S5 *Yeah.*

I *Do you think you can teach yourself to do things? Are you always going to need somebody else?*
S5 *I can teach myself.*

I *If you want to learn something new -- do you do crafts?*
S5 *Yes.*

I *You see one in a book and you look at it and what do you do? You read the directions, but what else is going on in your head?*
S5 *I look at how it is put together and I think of other ways that I could put it together that it will look just the same.*

I *Good. Do you do any talking to yourself when you are thinking about the other ways?*
S5 *Yeah.*

I *Have you thought about that very much?*
S5 *No.*

I *But, you know that you do it. This was really good of you to come and good of you to have participated in the study. Can you tell me which of the activities you liked when Mr. Marsh came.*
S5 *Drawing the dinosaurs.*

I *Do you remember the name of the one that you drew?*
S5 *No.*

I *Do you still remember what some of those words were?*
S5 *A few of them.*

I *Did you use those when you drew the one of your own?*
S5 *Yeah.*

I *Can you remember the name of the one that you drew?*
S5 *No.*

I *How many heads did it have?*
S5 *One.*

I *So what is the first part of the word? Can you remember what one meant? Or two?*
S5 *Tri.*

I *Tri was how many heads?*
S5 *Three.*

I *Good for you.*
S5 *Pedi?*

I And what were pedi?
S5 Feet?

I You really liked that activity. I'm so glad. That's something you could do this summer, you know. You could make up all kinds of activities. Do you play school at home at all? Do you have anybody that you can teach drawing an animal like that?
S5 Yeah. Two brothers.

I Well you have an activity that will keep them busy on a rainy day. Jenny thank you very much.

ZACH HILL - STUDENT 6

I Think a long way back. Do you remember when you started learning to read?
S6 It was down in Bridgewater.

I And what did you do when you learned to read?
S6 Read the papers to the teacher about stories.

I And when you are reading and you go home from school and your Mother would say, "what did you read in school today?"
S6 Usually I read farming books.

I Do you remember reading Charlotte's Web, or your teacher reading Charlotte's Web to you?
S6 Yes.

I And can you remember what it was about?
S6 It was about pig and he was too small and they were going to get rid of him and a girl stopped him and he was put in to her pen and this spider made all kinds of webs and stuff.

I You really remember that story. Now when you were telling me about it, how could you remember that? What do you do when you are telling me about that?
S6 Remember. Thinking.

I What were you doing thinking up here?
S6 .....

I You started remembering, you said and you got all the important things? You could probably describe some of those spider webs, couldn't you?
S6 Yup. One said, I think, stunning, I think it said.

I You are looking up. Can you see it somewhere?
S6 Yup.

I Where can you see that?
S6 In my memory.

I In your memory? Where is that memory?
S6 In my head.

I You can see pictures in your head. Do you think everybody can do that? When children are reading, do you think they all see pictures in your head?
S6 Yup.

I Do you always see pictures?
S6 Yup.

I All the time.
S6 Yup.

I That's very good. And you think that all children see pictures?
S6 Yup.

I Now, in your class are there any very good readers?
S6 Probably.

I Are there some children who have a really hard time reading?
S6 Yes.

I Do you think they all see pictures? Whether they are good readers or not very good readers?
S6 Yeah.

I Is reading just saying the words on the page?
S6 No.

I Is it different when you read to yourself from when you read to the teacher?
S6 Yeah.

I What is different?
S6 A lot of different things go through your mind.

I They c When you are reading to the teacher, what things go through your mind?
S6 Nothir

I But when you read to yourself what happens?
S6 A lot of things go through my mind.

I What kind of things?
S6 Concentrating how to read and stuff. If there is a word you don't know, just skip it and go back and try later.

I Those are all the things that you can do when you are reading to yourself.
S6 Yeah.

I Well, did you ever try any other ways. Do you ever kind of talk to yourself in your head about what you are reading?
S6 Yeah.

I I'll bet you are a good reader, are you?
S6 Yes.

I Do you like to read?

S6 Yeah.

I Do you like to read to yourself or do you like to read to other people?
S6 I like to read to myself and sometimes I like to read to the teacher.

I Thank you, Zach, for talking with me.

POST STUDENT 6

I What was the study all about?
S6 About reading comprehension.

I And what did Mr. Marsh talk about and what did he have you do?
S6 Pictures and voices in your mind.

I And do you remember what he called them? When you talk to yourself?
S6 No.

I Do you remember what he called the pictures in your mind?
S6 No.

I But you know they are pictures and you know its that voice, and do you know anything about the way you learn now that you didn't know before?
S6 I can understand my books a lot better.

I How is that?
S6 By seeing pictures.

I You make better pictures now. Did you make pictures before?
S6 No.

I But now you do it quite often. Do you make pictures for anything else besides reading?
S6 Math.

I How do you make pictures in math. That's really interesting.
S6 I see a math problem and then I try to think it as a play.

I Do you talk to yourself when you are doing it?
S6 Sometimes.

I Does your teacher suggest that to you, in Math, to make pictures sometimes?
S6 Yes.

I What does imagery mean?
S6 Pictures.

I That was the word that Mr. Marsh used, imagery, do you remember it now?
S6 Yeah.

I What about this one -- inner language?
S6 That's the voice in your head.

I Sounds familiar, doesn't it? When do you use this inner language?

S6 When you are reading a math problem and you hear several voices all at once, if there is a fight in the book and they are shouting and there are several voices all at once and they are all different.

I Do you use this inner language any other time?
S6 Math and reading.

I Do you use it outside of school -- do you build things?
S6 I like to when I am making sand castles.

I Before you ever start the sand castle, do you know what it is going to look like? Do you have a plan inside your head.
S6 Yes.

I And you can see it before you ever start?
S6 Yep.

I Do you talk to yourself about that sand castle?
S6 Sometimes.

I You have told me that you see pictures more often than you used to, so that's something that is different and you do talk to yourself when you are reading, when you told me about the different characters if there was a fight that you could see that. You tell me that you can see it in math, you make pictures out of the story of the math problem, and we talked about your sand castles. Do you think that you can teach yourself to do something by yourself, now?
S6 Yeah.

I How would you do that?
S6 Think of something and sometimes your inner voice tells you some ideas and go to a library and try to find stuff there.

I Very good Zachary, very good. Thank you for participating in this study.

PRE STUDENT 7

I How did you learn to read?
S7 I just started, like small words, like 'of' and 'the' and in higher grades the teachers taught me.

I What were you doing when you were reading?
S7 If I didn't know a word, I just skipped it and went on, then I'd go back.

I How did you know, finally, "I am a reader"? How did you know that you really and truly a reader?
S7 When I read to my parents, they said that I was really catching on.

I That's when your parents knew you were a reader, but when did you know, inside your own head, "I am a reader"? Can you remember?
S7 .....

I What's it like to be a reader? What do you know that makes you a reader?

S7 The words.

I O.K., you know the words, what else do you know? What do you have to know to be a reader?
S7 .....

I One of the things is you have to know words, don't you? What else do you have to know?
S7 .....

I When you see new words, what do you have to know?
S7 Meaning.

I Yes. You have to find meaning in the words, that's exactly right. What else?
S7 Vowel sounds.

I O.K. You have to know things like that. Don't you. And what else do you have to know when you are reading? And what do you do when you look down at new book, new sounds?
S7 ..... Sometimes I think about, I keep on reading it over.

I You've said to me that you look at words and you try and think about meaning and you look at it all over and you think about things like, vowel sounds. What else do you do? After you have read it and you close the book up and you go and tell your mother about it, how do you remember what you have read?
S7 ..... Well, ... Probably before I, like tell, if it was a long , I'd read it again.

I And then, what would you have to do to remember what you had read?
S7 .....

I Have you read, "Super Fudge"?
S7 No.

I What book did you read, recently?
S7 Well, I'm reading, I think ... "Kid Power".

I Tell me, think about how you would tell me about what you read last. What was that book about?
S7 ..... I just started it.

I What book did you read before that?
S7 .....

I What book is your teacher reading to you?
S7 .... Reading it to the class?

I What did you last read about in that. How could you tell me about it? What do you have to think about?
S7 There's children, he's going, like, they think there is a crook around the town.

I Now, what did you have to do to remember that? What are the things that are going on inside your head while you are remembering that last chapter? How could you think about the children, what did you do?
S7 ..... Read it over.

I No, you are just telling me about it. What did you do, just now, to tell me about that?
S7 ....

I How do you remember it?
S7 .....

I If you close your eyes, can you tell me about it? What do you do when you close your eyes?
And you start telling me about the children.
S7 ..... You use your brain?

I How do you use it? What does your brain do?
S7 ... It makes you remember stuff.

I What does it make up there?
S7 .....

I Can you see anything? Up here when you are telling about it. Can you see the children?
S7 Yeah, kind of.

I You can see the children. Do you always see something up here when you are reading?
S7 No, not always.

I Are there some children in your class that are better readers than others? How come they are better? And how come it's harder for some children to read?
S7 A lot of words they may not know.

I Why do you think they might not know those words?
S7 Maybe because they have never seen them before.

I Have they been in your class for a long time?
S7 .....

I Have you gone to school here for a couple of years?
S7 Just from Grade 1 till here.

I So you have been here for three years. Have some of the same children been in class with you?
Do some of them have a harder time learning to read?
S7 .....

I Is there something you do that they don't do?
S7 ..... I'm not sure.

POST STUDENT 7

I What was the study all about?
S7 The study was about image in the stories he read and picturing stuff.

I *So you know what imagery means. That is the word he used, wasn't it? What did imagery mean?*
S7 *Seeing stuff in your mind.*

I *When would you use that, seeing those pictures in your mind?*
S7 *When I read chapter books.*

I *When you read books? Do you use it anywhere else?*
S7 *No.*

I *There was something else that he did besides seeing pictures. There was something that he called inner language? Do you remember what that was? What did you do with those pictures that are up in your head?*
S7 . . . .

I *You saw those pictures, what did you do?*
S7 . . .

I *And when you did activities with Mr. Marsh, he would have you look up in your head to see if you could see that map and what did you have to do in order to work out where that man in the kayak was going? Do you remember that activity? Can you see the man in the kayak right now?*
S7 *Yeah.*

I *And it said he went down the stream and then he turned right, can you see him turning right?*
S7 *Yeah.*

I *Are you saying any words to yourself, up there?*
S7 . . .

I *Do you talk to yourself in your head?*
S7 *Sometimes.*

I *Sometimes. And that's what Mr. Marsh was talking about when he said inner language, when you tell the man in the kayak to turn right. Is there anything different in the way you read, now?*
S7 . . .

I *Do you see pictures any more than you used to?*
S7 . . .

I *Because, you used to see pictures before, didn't you?*
S7 *Yep.*

I *And do you see pictures any more now, or about the same?*
S7 *About the same.*

I *Do you talk to yourself in your head any more?*
S7 *Yeah.*

I *How do you remember things that you read?*
S7 . . .

I *If you read something and you think, that would make me laugh, and you go home and at supper you want to tell them. How do you remember it?*
S7 *I just remember all the good parts.*

I *How do you remember good parts? Do you write them on a little piece of paper, do you write them on your hand so you won't forget, where do you find that remember part?*
S7 *Write them down.*

I *Can you ever tell them about it without writing it down? Can you just go home and tell them?*
S7 *Yeah.*

I *And what do you do? What helps you to remember?*
S7 *Up in my brain.*

I *What's up there?*
S7 *. . . knowledge?*

I *Can you see in a book up there what went on when you go home? Can you see pictures of what went on in the book?*
S7 *Sometimes.*

I *Thank you very much for coming in.*

PRE STUDENT 8

I How did you learn to read?
S8 By using my head.

I And how did you use your head?
S8 By thinking.

I How did your teachers teach you how to read?
S8 They helped me.

I What were the things they taught how to do?
S8 Look at the words and try to sound them out.

I Good. What else? That's one way, you sound out the words. What else do you do? When you see a new word, what do you do?
S8 Sound it out.

I That's what you told me first. You sound it out and then what else, if you don't know and you are reading along and you don't that word? Do you just stop there?
S8 Ask the teacher?

I Ask the teacher? Good. If the teacher was busy; Mr. Martin was with some other students, what else could you do?
S8 Ask other people.

I Yes you could, you could ask other people. But if they were busy and it was just this one word, and you read along and there's a word you don't know, what would you do?

S8 Skip it.

I Skip it. You have been taught very well, haven't you? Do you work hard at reading? Are there some other children in the class who learn to read really well and it was very easy for them?
S8 Yeah.

I Why do you think it was easier for them to learn to read?
S8 Because they are smarter.

I I wonder what it means to be smarter, what is that they can do that you can't. You do the right things.
S8 They can do a headstand.

I Well, does that have anything to do with reading?
S8 No.

I No. But they sound out words, they ask other people, they skip it and try and understand what it means. Those are all the things you do. What book do you like best? What is your favorite story?
S8 The Wizard of Oz.

I The Wizard of Oz. Can you tell me whose your favorite character in The Wizard of Oz. Is it the wizard, or Dorothy, or the witch, or Toto. Dorothy. Can you tell me what Dorothy looked like?
S8 She has black hair. She has a white stripe right there and a white dress.

I How do you know that to tell me?
S8 I have the movie.

I You have the movie. But the movie is not in front of us now, is it? How is it that you can describe it so well. Her black hair, her striped dress. What is going on in your head, right now?
S8 I'm thinking.

I You are not just thinking, what can you do up here? Is Dorothy up there? So you can, what?
If you close your eyes, ...
S8 I can see her.

I Any other books can you see pictures up there?
S8 ....

I You can. That's very good. And you know Melissa, that's what good readers do. Just what you do, they see pictures. They do something else, when those pictures are going on, do you know what else they do in that head?
S8 They think about them.

I How do you think about them? How do you know you are thinking about something? What's going on inside your head, like you told me about the pictures in your head.
S8 I can see them.

I And what else?

S8 You go picture them.

I How do you know, what do you do with yourself when you're thinking about those pictures up in your head?
S8 I'm trying to keep them there.

I How do you keep them there?
S8 I keep on thinking and thinking.

I Do you put any words to it? Do you use words up in your head?
S8 .....

I You do. We call that talking to ourselves. Talking to ourselves, and that's what you are doing and that's exactly right. You have been so well taught. That's really good that you know what you are doing when you are reading. How do you think you might learn to read better?
S8 By thinking and getting the pictures in my head and the words. Skip the words.

I And what do you have to do to read better? What do you have to keep doing?
S8 To keep on trying and trying and trying harder.

I So you have to keep reading and reading and reading. Yes. Is reading just saying the words? Is reading just reading the words that are in front of me? If I get a storybook and I read the words, is it enough that I just say the words? What do you have to do?
S8 Think about them in your head.

I You have to think about them. That is just wonderful, Melissa. You have been such a good person to interview and thank you for helping me understand how you read.

POST STUDENT 8

I What was the study all about?
S8 Reading.

I And what about reading? What did Mr. Marsh talk to you about?
S8 He talked to me about the pictures up in your head.

I What did you do about those pictures?
S8 Imagine them.

I You imagined those pictures up there and what were the pictures for?
S8 A story that he was reading.

I Could you see that picture? What else was going on up there about those pictures? Did you do anything else with them? Did you just leave them up in your head?
S8 Yep.

I Did you do any talking with them? Do you remember what the work imagery meant?
S8 No.

I Did Mr. Marsh use that word, imagery?
S8 I can't remember.

I *What about inner language? Did Mr. Marsh talk to you about inner language?*
S8 *I think so.*

I *Can you remember what that was about? Where was the inner part?*
S8 *In your head.*

I *Up in your head. And language means . . . talking?*
S8 *Talking.*

I *So you are talking in your head. So did you talk about, to yourself, what was going on? Did you talk about those pictures up there?*
S8 *Yes.*

I *How do you remember things now? If you read a story and you want to go home and tell them about it, how do you remember it?*
S8 *By putting the pictures up in my mind and keeping them there.*

I *And then can you go home and tell them about it?*
S8 *Yes.*

I *Do you use those pictures anywhere else?*
S8 *I use them outside.*

I *Where do you use them?*
S8 *On the playground.*

I *What kind of pictures are you putting in your head on the playground?*
S8 *Playing with my friends.*

I *And you see pictures up in your head? What are those pictures going to be of? You are on the playground and you have these pictures in your head and the pictures are of .....?*
S8 *My puppy surprise and me.*

I *That's what you see when you are on the playground?*
S8 *Yes.*

I *And then do you tell something about them or is it just a picture for you?*
S8 *No, I keep them a secret.*

I *Pictures are for secrets too?*
S8 *Yes.*

I *When you are reading, do you use pictures, anymore? Do you use them more?*
S8 *Sometimes.*

I *Just sometimes. Do you talk to yourself in your head very much?*
S8 *Nope.*

I *When Mr. Marsh did some of the activities, did you talk to yourself in your head then?*
S8 *Yes.*

I When you did that, could you do the exercise and activities that he asked you to do?
S8 A little bit.

I Which one did you like?
S8 Stories. The dragon one.

I Do you remember what you made?
S8 I made a dragon with two heads.

I Did you give it a name?
S8 Yes.

I Thank you for coming in to talk to me Melissa.

PRE STUDENT 9

I How did you learn to read?
S9 I don't know.

I Well, think about it. What were the things you learned to do so that you could pick up a book and read it?
S9 I sound the words out.

I O.K. You sounded the words out. What else did you do?
S9 ...

I Sounding words out, is that all there is to reading?
S9 No.

I What's another part of reading?
S9 ....

I Is just saying the words reading?
S9 No.

I No. What else is there?
S9 Expression.

I Expression, O.K. What else?
S9 ....

I What if you read it to yourself? Is that still reading?
S9 Sort of.

I Reading isn't just out loud and it's not just saying the words. So what else is it? How do you know what's going on in the story?
S9 ....

I Do you know what's going on when you read a story or your teacher reads a story to you?
S9 Sort of, yeah.

I How can you tell? How do you know what they are talking about? When Mr. Martin reads a book and he is reading it to everybody in the class and you are sitting there listening, what are you doing when he is reading? What's going on in your head so that you know what he is talking about?
S9 .... I listen.

I O.K. you listen for the words, and what do the words make you think about?
S9 Ideas. What the people look like.

I What the people look like -- really. So where do you see these people?
S9 In my mind.

I In your mind. Oh, good. So you see them up here while he is reading. What else do you think you might be doing when you see those pictures?
S9 .....

I If you were going to tell me about the book that Mr. Martin was reading to you, you can see the picture in your head, you know the book he is reading right now? How could you tell me about a book. What would you have to do in your head besides see those pictures?
S9 .... I can't think of things.

I Well, tell me about the book that Mr. Martin is reading to you right now. What's the name of it?
S9 Matilda.

I What's it about?
S9 ..... There's not really much about it yet.

I But you know who Matilda is?
S9 Matilda is a little girl in the story. Her parents don't like her.

I So what do you are you seeing in your head?
S9 Parents being mean to her.

I Then you are good at remembering things and knowing what is going on in the books that are being read. Are you a good reader?
S9 I don't know.

I Do you like to read?
S9 Yeah.

I Do you read a lot?
S9 Sometimes I do.

I Do you think there are some children that have a harder time learning to read in your class?
S9 Yeah.

I Do you think that they do the same things you do, like sounding out words.
S9 Maybe.

I Seeing pictures in their head. Telling the story back. Do you think they can do all those things?
S9 Maybe.

I But you don't know. Do you read with anyone in your class?
S9 Sometimes.

I I want to thank you very much for talking to me.

POST STUDENT 9

I What was the study all about?
S9 Reading and getting pictures in your mind.

I Do you know anything about your learning now that you didn't know before?
S9 A little bit.

I What things? Did you know that other people saw pictures in their head when they are reading or doing things?
S9 . . . .

I Did you know that other people talked to themselves in their head.
S9 Yeah.

I How do you remember things that you read?
S9 I don't know. I just remember them.

I Do you remember Mr. Marsh talked to you about imagery and what did imagery mean?
S9 Getting a picture in your mind.

I And then he spoke about inner language. Do you remember what that was about?
S9 Sometimes when you read you get little voices in your head saying things.

I Do you have that voice in your head at any other time? Or just when you are reading?
S9 Maybe some other times.

I When are those other times?
S9 I don't know. When I see something.

I When you do something new?
S9 Yeah.

I Do you do crafts at all?
S9 I do sometimes.

I O.K., when you are learning to do a new craft, do you have that voice in your head when you are learning something new?
S9 Sometimes.

I Is there anything that you think is different in the way you read now, or the way you do something new?
S9 I don't really know. I get more pictures.

I When you are writing your own stories, do you see more pictures now?
S9 Yeah.

I When you are writing stories, do you hear a voice inside your head that talks about what is going on in the story?
S9 Sometimes.

I I guess that's some of the things that we wanted you to do is to listen to that voice and to know when that voice is speaking. Thank you very much for coming.

PRE STUDENT 10

I Do you remember how you learned to read?
S10 Not really.

I What were the things that the teacher taught you or your mother taught you?
S10 Well, I'm not really sure, that was so long ago.

I What did they do with you to help you learn to read?
S10 First they'd speak a word then I'd speak a word and then I keep going through, like we had this book that we kept reading and every time I got something right, I'd get a little treat.

I You said that you used to look at a word.
S10 Then my parents would read it to me and then they'd tell me to try to sound it out and read it and then after I used it in a sentence, I wouldn't look at the book and my parents would read the sentence and then if I read the whole sentence through all correct, they'd give me a little treat.

I Was that looking at the book the whole sentence through?
S10 The whole sentence.

I Very good, very good. So that was one way, was by sounding it out. Another way was by looking at the word. When you read, do you do anything else besides sound out, or remember what the whole word looks like. Do you do anything else?
S10 No, not really.

I If you are reading a new book and you are reading along and you don't know a word, what do you do? You could try to sound it out.
S10 Yeah, that's what I usually do.

I You could try and remember. What else can you do?
S10 Well, I usually go ask someone who knows.

I O.K. Ask somebody else. What else can you do?
S10 Well, ...

I Do you have to know that word?
S10 I don't have to know it.

I What do you do?
S10 Well, ...

I I'm reading along, I don't know that word.
S10 You just skip it.

I Right. And go on and sometimes you know what that sentence means.
S10 Yeah. And sometimes when you read the whole sentence and there is a word you don't know and you skip it and read the rest, that will tell what the word means.

I Good. Now you have told me all the things that I would need to know in order to read that sentence, is that all that reading is? Or is reading something more than just reading the words?
S10 Well, ...

I Why do you read the words?
S10 Because I want to.

I But do you read just to read words, or do you read for something else?
S10 I read for fun.

I O.K. You read for fun. In your Science book, what do you read for?
S10 I read to learn.

I You read to learn. O.K. So there is something in there isn't there. Now, if you read a book at when you go home, because your Mom and Dad are interested in you reading, aren't they? And you mother says, what did you read in school today? How do you remember?
S10 Well, I usually just remember them all in my brain.

I O.K. Good. That's exactly where it is. Up in your brain. What do you do when you are telling your Mom about the story. Is Mr. Martin reading Matilda? What do you do when you go home to try and remember about Matilda if your mother says, "I hear Mr. Martin is reading a new book to you". What's it about?
S10 Well, I'd say it was about a little girl, very smart, and a principal whose always mean to the kids.

I All right. Now how do you know that? That's exactly right. One of the things that you did was, you didn't look at me when you were trying to remember, you were looking over there. What were you doing up here?
S10 I was trying to remember.

I You were trying to remember, but what were you doing? What was going on in your head when you were looking over there?
S10 Well.

I Do you know what that little girl looked like?
S10 Well, she had dark hair.

I How do you know that?
S10 I saw the cover.

I You saw the cover, but what's going on in your head when you tell me she has dark hair?
S10 What's going on in my head? I can see the picture.

I You can see it! Does that happen when you read other books?
S10 Yeah, I get little pictures. Sort of like watching T.V.

I Good. Then you can really tell people what's going on. How do you know what to tell me? You see the picture.
S10 And I remember the picture.

I O.K., you've got the picture, but how can you tell me about it? What else do you have to do up there in your head with that picture?
S10 .....

I Before you even told me that she had dark hair, what did you do, when you saw the picture up in your head?
S10 I remembered it.

I But, how did you know what to say to me?
S10 That's a hard one.

I That's when you should think about it, then Matthew.
S10 ....

I Does everybody in your class read about the same?
S10 I don't think.

I Do you think they all do the same thing you do, like sounding out and skipping words and looking at the whole word to see if they know what it is? Do you think they all do that? Do you think they all see pictures, the way you do?
S10 I don't think.

I I really thank you for talking to me about this.

POST STUDENT 10

I What was this study all about?
S10 Learning about how I learned to read and the ways I learned to read.

I What did you learn that was different?
S10 I learned .....

I What did you talk about with Mr. Marsh?
S10 Imagery and pictures in your mind and how you can get a picture in your mind.

I And what else? What did you do with that picture, then?
S10 We used it to help us imagine what the characters in the story are like.

I Did you talk about inner language? And what was that?
S10 Yes. That was a little voice in your head that tells you . . . if you are trying to figure out a word it helps you. If you are trying to figure it out it tells you what it might be.

I Do you ever do this talking in your head for anything else, other than words?
S10 No.

I When you are in Science class? Do you ever have pictures in your head?
S10 Yep.

I When?
S10 When, if we are doing a subject, you try to imagine what the subject is going to be like, so I'll know ahead of time. When he is telling us I can just image it in my head.

I Do you put any words with those pictures?
S10 Yep. It's sort of like a voice that is telling me what we are going to be doing, what is doing to look like and everything like that. Sort of tells the picture what it is going to look like.

I Do you use this very often in reading, now. This imagery.
S10 Yep. I use it every time. I was using it even way back.

I But do you use it any more in other subjects than you used to? Or did you used to just use it in reading or did you always use it in everything?
S10 I used to just use it in reading, but now I'm using it in mostly everything.

I When you are in class and you have an assignment whose responsible for that? Is it Mr. Martin, is it you, is it your mother.
S10 Responsible for a subject? Partly us, partly Mr. Martin.

I Are there things that you do just because you want to know?
S10 Yes.

I Does that happen in school, too?
S10 Outside school mostly.

I Is there anything you know about your learning now that you didn't know before?
S10 To tell you the truth, not really.

I Did you know that other people saw pictures in their heads when they were reading or doing something?
S10 Well, I didn't think everybody had pictures in their head. I thought most of the people did.

I Did most people talk to themselves in their head?
S10 Probably.

I Do some people talk out loud when they are learning to do something?
S10 Yeah. Only a couple of them.

I Do you ever do that?
S10 Yep.

I Thank you very much for coming in.

APPENDIX C ETHICAL CONSIDERATIONS / FORMS

1. Superintendent form:

KINGS COUNTY DISTRICT SCHOOL BOARD

Teachers' Centre (902) 681-8522 | 1042 Highbury Road B4N 3P7 | New Minas, NS FAX (902) 681-3766

SPECIAL EDUCATION

Dr. Jim Gunn
Superintendent of Schools
Kings County District School Board
I. O. Box 220
Kentville, NS B4N 3W8

Dear Dr. Gunn:

This letter is a request to engage in a research study to complete my Ph P8. requirements in Educational Psychology at Dalhousie University in Halifax, P3. 6.

The purpose of this study is to raise the metacognitive sophistication of children as a primary educational ideal, through both an explicit and implicit focus on the two mental processes of imagery and inner languag across the curriculum. Reading Comprehension has been selected as the curricular aspect through which this study hopes to demonstrate the generalization of this approach to learning and instruction The study employs what is termed a "mediated metacognitive" pedagogy to foster student self-control in learning through increased awareness and sophistication of a child's mental potential to apply imagery and inner language before, during, and/or following any given learning task.

The study would involve three classrooms of students, three administrators, three resource teachers, three classroom teachers and all parents of children participating in three different elementary schools of Kings County. Permission forms will be requested from all schools and parents wishing to participate in the study The confidentiality of all subjects will be rigidly protected; names of students, parents, and professionals will <u>not</u> be recorded and <u>no</u> individual information will be released without written consent Results of the study will be conveyed to all participants in general terms, but anonymity on a professional, student, and parent level will be rigidly preserved

Sincerely,

Donald G Marsh, M1.Ed
Educational Consultant

2. School form:

SCHOOL LETTERHEAD

Dear Parent:

This letter is written to request your permission for your child to participate in a school research study, and to also request that you volunteer to participate with your child at home. Parents influence on their children's learning is a very important aspect of what we are trying to prove.

The study is exploring better ways to help children understand reading material. It is initiated by Mr. Donald Marsh, an Educational Consultant in Kings County, as a thesis proposal for his Ph.P8. program in Educational Psychology at Dalhousie University. The study involves trying to make children (and teachers and parents) more aware of different mental ways of remembering and understanding reading material. These mental strategies are being talked about and encouraged during this study to see if children can learn to learn more efficiently for themselves.

The study will require group tests of Reading Comprehension for all students before and after a 12-week training period. No names will be associated with test results to protect the confidentiality of all participants. Parents will be asked to try out some of these new strategies with their children at home; directions and material will be sent home with students on a regular basis. Five parents out of about 75 will be asked to volunteer for interviews before and after the training period. Parents will be selected randomly from all those kind enough to volunteer their time.

We feel that this study is important because it is trying out new ways of instruction that may help children not only read more meaningfully, but learn to control their mental strategies before, during, and after any learning task. We also feel that your involvement in this study is absolutely necessary because the more aware you are of how your child learns, the better your can help them at home.

Please sign in the spaces below as indicated. We hope to start the study in early Fall. Thank you in advance for your cooperation.

Sincerely,

Principal.

I give my permission for my child to participate in the study.

Signature:_____Date: _____

_____

I would like to participate with my child at home.

Signature:_____Date: _____

_____

I am willing to volunteer for a pre-treatment and post-treatment interview.

Signature:_____Date: _____

_____

3. Parent form:

KINGS COUNTY DISTRICT SCHOOL BOARD

Teachers' Centre (902) 681-8522 | 1042 Highbury Road B4N 3P7 | New Minas, NS FAX (902) 681-3766

SPECIAL EDUCATION

Name of School
Address of School

ATTENTION: School Administrator

Dear_____:

This letter is written to request that you and randomly selected members of your staff (Grades 4, 5, or 6) volunteer to participate in an educational doctoral study during the Fall of 1994. The study is focused on the metacognitive strategies that students employ (or fail to employ) to help them remember and understand a variety of reading material. The treatment period will be of 12 weeks duration and will require the active involvement of the classroom teacher, resource teacher, and administrator. Parents will also be requested with written permission, to reinforce classroom activities at home; details of instructional techniques will be sent home on a regular basis.

On purpose of the study is to link student metacognitive behavior to reading comprehension before, during, and after a variety of narrative and expository material. Pre and post group tests will be administered to all students participating in the study from three different schools. Confidentiality of results is guaranteed to parents; no scores will be associated to individual student names.

A second purpose of this study is to evaluate the opinions of professionals, parents, and students on the efficacy of the treatment approach. Pre and post treatment interviews will be given to all professionals involved (3 per school) as well as five randomly selected parents from each classroom (1 per school) and five randomly selected students from each class (1 per school).

The treatment employs a methodology that is termed mediated metacognitive instruction. The purpose of this approach is to first directly encourage students to become aware of

their own thinking as well as the thinking of others, then to gradually apply these mental strategies to help them read more meaningfully. Imagery and inner language will provide the metacognitive nucleus around which student autonomy in learning is fostered.

The treatment period would involve approximately 1 hour per week for 12 weeks in the classroom. Over the 12 week period, the classroom teacher and resource teacher are expected to gradually assume more and more control of the research initiative. The role of the researcher will change from a director to mediator to facilitator as professional staff gain more experience and confidence in this methodology. The school administrator is encouraged to attend as many classroom sessions as possible in order to adequately form an opinion on the value of this approach.

I am very excited about this project because I feel it will eventually apply equally to all aspects of curriculum for all learners. It essentially deals directly with student self-control in learning, and will, hopefully, help all students to learn to learn for themselves. It values the ways students engage in learning, as much as net gains in information. I look forward to working with you and ask for your written permission below.

Thank you.,

Sincerely,

Donald G. Marsh, P1.Ed.
Educational Consultant

Ph.P8. Candidate Study
Dalhousie University

I have discussed this study with interested staff (Grades 4, 5, or 6) and wish my school to be considered as a possible participant.

Signature:_____Date: _____

_____

* Three schools will be randomly selected.

APPENDIX D DESCRIPTION OF INTERVENTION SESSIONS

The following information describes the six one hour sessions spent in three Grade 4 classes, and includes parent information sent home to help guide parent interventions between sessions.

KINGS COUNTY DISTRICT SCHOOL BOARD

Teachers' Centre (902) 681-8522 | 1042 Highbury Road B4N 3P7 | New Minas, NS FAX (902) 681-3766

SPECIAL EDUCATION

December 1994

Dear Colleague:

Thank you for participating in this study. I realize how busy we all are in these difficult times and I greatly appreciate your cooperation. I would like to explain the purpose of the research in general terms, then gradually work in more detail throughout the study period.

In a nutshell, I am exploring the use of imagery and inner language as mental tools through which children can learn to read more meaningfully. Imagery refers to the ability to conjure "pictures" in the mind before, during, or after any given learning task. Inner language refers to the "private voice" that helps students monitor the effectiveness of their reading. Both mental processes help students behave metacognitively; the students engage in both to either regulate or control their reading behavior.

We are not born with either learning process; they are learned through our culture and experience. Very little research has been reported on either process within a classroom setting. I believe we can help children sophisticate both processes to levels of application that they would not otherwise gain for themselves. Essentially, through fostering imagery and inner language development, we are teaching children to think better for themselves.

During the classroom intervention, I will be trying to raise the awareness of students about how they use, or could use, imagery and inner language to help them remember and understand what they read. First I will discuss both processes directly and, through reading a book to the class, I hope to help the students understand that they can learn to control and apply both processes before during and after any given learning task. I will then gradually apply both processes to the children's own reading material. Over the course of the study a variety of techniques will be explored to reinforce student metacognitive behavior. I am hoping each teacher in the study will experiment with their own applications throughout the study.

I am asking each professional to record their thoughts on the value of this approach in a "study log" (green). The entries could include your observations in class, your thoughts

from provided readings, or simply questions you may have about some aspect of the study. The "study logs" will be collected from students, parents, and professionals following the study to help me evaluate the efficacy of imagery and inner language as an instructional method. (Along with pre and post study interviews.)

Please do not hesitate to call me at the Teachers' Centre (681-8522) at any time throughout the study. I look forward to working with you.

Donald G. Marsh, B.Ed.
Educational Consultant
Ph.D. Candidate Register
Dalhousie University

INTERVENTION DESCRIPTION

SESSION 1

A book will be read to the children to introduce the concepts of imagery and inner language.

The importance of "metacognitive" control in learning will be discussed. Considerable time will be spent talking with individual children about the "pictures" they conjure when listening to the story, as well as the "private voice" they use to tell them how well they are understanding.

While reading the book, pictures will not be shown to the children until they have been given the opportunity to make their own images. This is a relatively new idea, more in line with story telling rather than reading to students. However, if children are always shown the pictures before being given the opportunity to make them for themselves, we may be hindering their future imaging development that they could have applied to their own reading. A parallel argument to this point would be the effect of television at home; if the images are always passively provided, the learner may not be encouraged to sophisticate the imaging process as a learning tool for themselves.

A similar perspective is offered concerning the development of children's "private voices". If the children are never given the opportunity to question for themselves, then they are not likely to use their private voice as an active learning tool. Their voices can be fostered by pausing throughout the story (before, during, and after reading) and posing questions to the students so that they reveal how active their own inner voices are engaged in the learning. *Did your voice tell you that you didn't understand any words you heard? Did your voice tell you what you thought might be happening next? What part of the story did your voice tell you you enjoyed the best?* These, and similar questions enable the listener to practice inner language for future reading comprehension.

SESSION 2 APPLYING IMAGERY AND INNER LANGUAGE TO READING COMPREHENSION

Imagery and Inner Language will be reviewed and discussed with the class.

(A) The students will then be asked to think of their favorite book and think about the following questions:

IMAGERY

1. Like a snapshot or a movie?
2. Make pictures at the same time as you read? Before? After?
3. In color?
4. Can you also give your images voices or hear background sounds?
5. Do some kinds of words make you image more than others? Can you think of any?
6. Could you do even more images if you wanted to?

INNER LANGUAGE

1. Can you remember phrases, words or voices from books you have read before?
2. Do you talk to yourself at the same time that you read the words?
3. Is this voice usually asking questions? What kinds of questions?
4. Do you also usually use this voice when you finish reading?
5. Can you make different characters in a book have different voices?
6. Do you think this voice helps you remember what you read?

(B) A reading sample will be reviewed with the class. The students will be asked to place a "I" for picture above every word or group of words that makes them image. They will reread the passage and place a "Q" for question above every word or words that makes them use their inner voice.

Following the reading passage, the students will be asked to draw the most vivid images and write down any questions that they thought to themselves.

MESSAGE FOR PARENTS: When you are reading with your child, discuss your child's "images" and "questions" as often as possible. Many young readers have difficulty with either or both mental processes--they become locked into just sounding out words without even trying to remember or to understand the meaning of the material.

Try to explore how your child attempts to understand **before**, **during**, and **after** reading. What questions or images can they produce from just the title or first sentence? How does this change during reading? What images or questions do they remember after reading?

Students develop very important mental habits that they will later use for studying more detailed information. Without this early practice, many students have difficulty forming their own opinions of materials. Even very good readers may fail to develop understanding; they can read the words, but cannot make any use of the information for themselves.

SESSION 3 IMAGERY AND INNER LANGUAGE TO HELP STUDENTS DECODE MORE DIFFICULT WORDS

ACTIVITY

The word "Lineatus bicephalotriped" will be written on the board along with the following scientific word chart.

mono - one	pedi - foot	melano - black
bi - two	cornis - horn	leluco - white
tri - three	cephalus - head	erythro - red
quadro - four	punctata - dotted	bruno - brown
pento - five	lineatus - lined	

- - The children will be asked to try to read the word and picture the animal in their heads. They will be reminded that parts of scientific words have special meanings, and that many names of animals and plants can tell us a lot about what they can do and what they look like.

- - The children will then be asked to make up their own name for an imaginary monster and then draw it. Monster names and pictures will be shared with the whole class. Names must have meaning and tell the reader something about the monster. The students will be encouraged to imagine other children's monsters just from the names, then each author's picture will be shown.

MESSAGE FOR PARENTS: This activity will hopefully encourage children to look for sequences of letters that have meaning within words. Through helping the student to ask themselves what each part of a word might mean, we help them make their images more accurate. This approach will not work for all difficult words. however, scientific words in particular usually describe properties of the animal or object, or the function of the animal or object.

Parents can really help their children develop more and more appropriate questions. "Have I seen this word before?" "Do I recognize any group of letters from other words?" The parent can model questions such as these and encourage their children to attempt to use similar questions for themselves.

Sometimes children will remember difficult words better if they are also encouraged to make up their own "picture" of the meaning of the word. For example, if the new word is gigantic, the student may picture a very large man or woman, or monster, saying "I'm a gigantic giant." Discussing these images with your child is fun, and should teach your child to practice mental strategies that can later be applied to more difficult work. When studying for high school exams, many students try to make a diagram of the material in their heads to help them remember facts and concepts. Perhaps if we encourage this mental habit earlier, students will be able to represent information better in later years.

Please keep recording your thoughts in the study log. Try to describe conversations with the children. Do they seem to be trying to ask themselves more questions? What is the quality or appropriateness of their questions? Can they easily apply images or mental pictures? Do they do this automatically for themselves, or do they rely on you to cue

them? The more we discover about how your child attempts to learn, the better we can be at coaching better strategies.

If you have any questions, please don't hesitate to call. (681-8522 work; 538-9785 home)

SESSION 4 ADAPTING IMAGERY AND INNER LANGUAGE TO DIFFERENT LEVELS OF ABSTRACTION

ACTIVITY (A) IMAGING: concrete to abstract

1. Try to make a picture of your house in your head. What does it look like?

2. Pretend you are flying straight up into the air and you are now looking down on your house. What do you see in your head now?

3. Pretend you are now watching a bus travel from your house to the school from up in the air. Can you see a whole map in your head?

ACTIVITY (B) INNER LANGUAGE: concrete to abstract questions

1. Read the passage provided. Make up as many who, what, where questions as you can from the information given.

2. Make as many how and why questions as you can from the information given.

3. Make as many who, what, where questions as you can from what you don't know about the passage.

4. Make as many how and why questions as you can from what you don't know from the passage.

MESSAGE FOR PARENTS AND TEACHERS: We are not born with the ability to image or talk for ourselves; they are learned through experience. Both mental "tools" gradually become more and more abstract. Very young children can image concrete objects, but cannot represent concepts easily with diagrams or other more abstract symbols. Similarly, very young children use concrete questions to help them organize and classify objects, but cannot yet easily use more abstract "how" and "why" questions to help them analyze, synthesize, or evaluate information.

An important aspect of this study is the idea that we can help children use imagery and inner language at more and more abstract levels. We are actually trying to help children deal with information more intelligently than they would have without our help. This is a fairly new way of looking at intelligence because it means we can provide children with life long learning tools that they can apply throughout their lives; essentially thinking can be taught.

It is very important that we provide the right kind of coaching or guidance. If we are too quick to give answers to children's questions for example, we may be robbing them of the chances to learn to question for themselves. Similarly, if we provide images and pictures for children all of the time through books, T.V., videos, or computers, we may not be giving children enough chance to learn to image for themselves.

We can model for children how to ask higher level abstract questions by responding to their questions with more questions. For example, if a child asks "What's this?", instead of answering the question directly, try saying, "What do you think this is?" "Why do you think this is important?" "How do we make use of this?", etc. An open-ended questioning dialogue helps children to begin to ask themselves more questions.

We can also model for children how we use images to help us solve problems, remember, or understand reading material. "Can you see ..." or "What does your picture look like?" are questions that encourage children to develop more abstract abilities later on. Asking children to draw the most vivid images they saw during reading, or playing imaginary games which demand mental pictures, helps children begin to use imagery for their own learning by themselves.

Please keep making entries in your study journals. What are you discovering about the way your child learns? How important do you feel this direction is? Do you feel the study is helping you to help your child learn better for themselves?

If you have any questions, please don't hesitate to call. (681-8522 work; 538-9785 home)

MESSAGE FOR PARENTS AND TEACHERS: Imagery and Inner Language help all of us remember narrative or story-like information, but both mental processes can also help students study more factual texts. Many children will use both processes without our help, but some do not. I believe that all students can learn to experiment with strategies that work best for them, and by doing this, they are learning how to learn better for themselves.

Imagery can help students organize information. If students are encouraged to make "mental diagrams" or "mental "maps" as they read information, they learn to group and classify information, and they learn to form concepts or relationships between groups of related information. Sometimes students will image diagrams from their notes to help them remember. Gradually they can also be encouraged to make up their own diagrams in their heads as they read information and study information. The more they learn to use images and words for themselves, the better they will become in being able to understand and remember facts and concepts.

Making diagrams in the mind is not the same thing as making movie-like pictures. This is a more abstract level of imagery that young children will find more difficult. For example, seeing an image of a "cat" is less abstract than imaging the word "cat". Seeing the word "cat" is less abstract that relating all of the kinds of cats with what they look like, eat, or do. Each level requires more abstract images to represent more information. No matter how difficult the information is, or how much information there is, imagery can be used to help us remember.

The same thinking can be applied to inner language. There are different levels of self-questions that children can learn to ask themselves. Young children usually ask themselves "what", "who", or "where" questions that can be answered directly from the reading material. Older students begin to ask themselves more "how" and "why" questions. These questions are more abstract and allow the learner to classify and relate concepts together rather than simply remembering facts. If we encourage young children to ask themselves "how" and "why" questions, they will learn to ask these questions for themselves. The more they learn to ask more abstract questions, the better their understanding will be.

If we do not pay attention, as teachers and parents, to the ways our children are dealing with their learning, many students will fail to understand information as well as they could have with our help. Many students become locked into simple memory without understanding. These students do not easily learn to think for themselves and will have more and more difficulty in school because they learn only unrelated facts, not concepts. Through understanding the control that students demonstrate by paying attention to imagery and inner language, we are learning about how well our children are learning to learn, just as much as what they learn.

Try experimenting with your child's ability to image and to ask themselves appropriate questions. Can they make mental diagrams of factual reading material? Can they remember these diagrams the next day? Can they ask themselves more abstract "how" and "why" questions before, during, and/or after reading factual information? Do these questions help them remember the facts? Please record your observations in the parent study log.

If you have any questions, please don't hesitate to call. (681-8522)

Donald G. Marsh, B.Ed., Ph.D. Candidate Register, Dalhousie University

ACTIVITY (B)

An historical map of the Maritimes will be presented to the class. Children will be encouraged to make questions and tell about their images as they attempt to gain meaning from the map. Self-questions and images will be brainstormed under the following headings:

1. What do I think I know about the map? What are my reasons for thinking this?

2. What don't I know about the map? Can I give reasonable guesses? What parts am I wondering about?

3. What can this map tell us about history and the people that record history?

This activity involves reading of a different kind; reading maps and graphs meaningfully is as important as reading words meaningfully. Reading of anything without meaning is not real reading. We have to watch that children don't just look at words or pictures on the surface.

ACTIVITY (C)

Various paragraphs will be read to the students, and they will be asked to make their own notes through imagery and inner language. Students will compare their "mental diagrams" and "mental words" that helped them group, organize, and categorize information.

> The way to do it is actually very simple. First, you put all the things into different groups. Of course, one pile may be enough depending on how much there is to do. If you have to go somewhere else because of a lack of facilities, that is the next step. Otherwise, you are pretty well set. It is important not to overdue things; that is, it is better to do too few things at once than too many. In the short run, this may not seem important, but problems could easily happen. A mistake can be expensive, as well. At first, the whole way of doing this will seem hard. Soon, however, it will become just another thing to do. It is difficult to tell whether people will have to do this job in the future.
>
> After you are finished, you sort everything into different groups again, so that they can be put into their proper places. Soon, they will be used again and the whole cycle will have to be repeated. However, that is part of life.

1. Tell me what could be happening in this paragraph. What reasons do you have for your choices?

SESSION 5 CATEGORIZING AND CLASSIFYING INFORMATION THROUGH IMAGERY AND INNER LANGUAGE

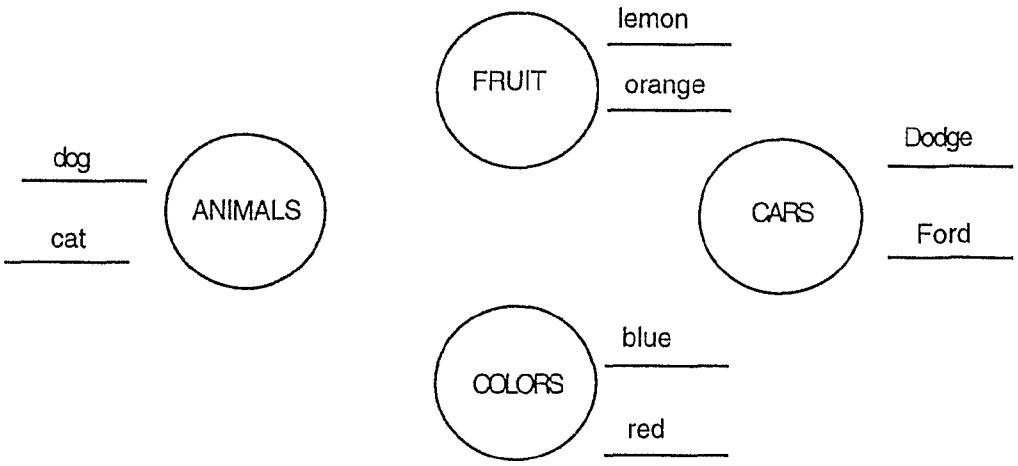
ACTIVITY (A)

1. A list of words will be presented to the students and they will be asked to try to remember as many words as possible in a 30 second time period.

2. Students will be asked to record all of the words they remember.

3. Students will be taught how to group words into meaningful categories through imagery and inner language.

IMAGERY: Making Mental Diagrams to Organize Information



Inner Language (Repeating words in concepts to themselves)

ANIMALS	COLORS	CARS	FRUIT
dog	blue	Dodge	lemon
cat	red	Ford	orange
etc.	etc.	etc.	etc.

learns to rely on other people's thinking and may never develop their own strategies. Children can just as easily learn not to think independently. Negative learning habits can form just as easily as good mental habits.

In school and at home, I believe we place too much emphasis on answers and not enough emphasis on mental strategies and procedures. Teachers often give tests that do not tell us anything about a child's thinking. These tests tell us only answers and may encourage children to rely on just memory without understanding. Parents often think they are helping their children at home by providing all of the thinking cues that we want children to learn for themselves, but over time, the child learns to rely on these cues rather than developing their own. If we learn to focus on the images and inner language of our children, I think we will learn how to help children learn better for themselves, to control their learning before, during, and after a wide variety of learning tasks.

How do we do this? We keep asking questions rather than providing answers. We find out what mental habits or procedures our children are using or not using and we show them how to approach their learning. We observe how well the child takes control from one day to the next, and we keep asking questions that promote higher levels of critical thinking. We evaluate our progress by the degree that the learner shows us they are using more efficient mental habits. We continue talking with our children, not just to our children, and we expect and encourage intellectual change.

I would like to take this opportunity to thank parents and school staff for participating in this study. I have enjoyed working with the children very much and I hope we have all learned something about helping students read and think more meaningfully. I wish I had more time to work with the students; six sessions over three months is certainly not even close to being enough when we are dealing with intellectual change. I hope that this study will, however, generate more studies for all children across all subjects. I hope that school staff and parents think that this approach is important and I hope you have a better understanding of how children learn to learn for themselves, and how we can help children become intellectually flexible, curious and independent.

Please fill in your final journal entry in your study logs. I would appreciate your comments on the importance of the study, what you have discovered about how children learn, and any suggestions you might have to promote this direction in the classroom and at home. Please send in your journals with your children; I will put the information together to help us in future studies. Again, my sincere thanks.

If you have any questions, please don't hesitate to call. (681-8522 work; 538-9785 home)

SESSION 6 IMAGERY, INNER LANGUAGE, AND CRITICAL THINKING

ACTIVITY #1

A passage entitled "Charlotte's Web" will be read by all the students. Students will brainstorm as many options as possible to help Fern and her father make reasonable decisions. What are the consequences of different options? Which options are the most likely to happen?

Each student will be given an opportunity to respond individually, followed by small group discussions to build a list of as many options as possible. Parents and teachers are invited to participate!

ACTIVITY #2

A second story entitled "Franklin in the Dark" will be read by all students. Again, students will be given the opportunity to brainstorm individually, then within small groups, followed by a whole class discussion. The question is -- How can we help Franklin?

MESSAGE FOR PARENTS AND TEACHERS We have talked about how children develop imagery and inner language to help them control their learning. For very young children, this control is usually locked into the present; they rely heavily on what they see in front of them at that time, and on other peoples verbal directions to help them gain meaning. As children mature, they begin to use their own images and inner language to guide their thinking. They begin to be able to reflect on past learning, and they begin to predict and puzzle about future learning. I believe the quality of reflection and prediction is largely a degree of the quality and variety of their images and inner language.

The two reading passages presented to the children will encourage them to think beyond the actual material. We want students to go beyond literal recall and memory to prediction and reflection. We want them to be able to consider options and consequences to form their own opinions of the material. This is a higher level of critical thinking that involves evaluating information, analyzing and synthesizing different points of view, and considering reasonable options. Children who demonstrate these reading and thinking abilities also demonstrate high levels of control of their own thinking and high levels of sophistication in how they apply imagery and inner language to the learning task. Many children never reach higher levels of thinking because they have not learned this control and they continue to rely heavily on other people's thinking. They do not easily generate their own images or ask themselves appropriate questions.

Parents and teachers play an extremely important role in helping children become independent thinkers. We can shape the learner's thinking by modeling and encouraging more sophisticated internal images and questions. We have to be very careful, however, that we are mediating or coaching the child to engage in these behaviors for themselves. If we always provide the answers without probing the student's thinking, the student

APPENDIX E SAMPLES OF READING COMPREHENSION INSTRUMENTS USED FOR QUANTITATIVE DATA

THE DARK TENT

Mike was excited? Last Week, he and his friends had persuaded their parents to let them camp out alone at Floating Stone Campground To his surprise, Mike's mom and dad had bought him a pup tent. Each boy now had his own tent. Since everything was packed and ready, they would leave early in the morning.

As Mike was getting ready for bed, he suddenly realized he'd have to spend the next night alone in a dark tent. He would be afraid, but he certainly did not want his friends to find out No matter what happened, he would just have to hide his fear.

Early next morning, the boys hiked to the campground. They pitched their tents and then went fishing

After supper, they sat around the campfire and tried to scare each other with ghost stories. Each boy tried to tell the scariest story

At midnight, they slowly crawled into their sleeping bags, but Mike couldn't fall asleep. He kept hearing strange noises. Was something outside? He lay there petrified. Should he take a look?

Mike lifted the tent flap finally and peered out A deer was nosing around the picnic table! How foolish Mike felt! He was glad he had been brave enough to look

Alberta Diagnostic Reading Program (1986)

COMPREHENSION QUESTIONS

1 Attending/Analysing WHY WAS THIS CAMPING TRIP IMPORTANT TO THE BOYS? (They were going to camp out alone)

2 Synthesizing HOW DID MIKE FEEL BEFORE THE TRIP? (excited but frightened at being alone in the dark tent) etc

3 Synthesizing WHY WAS IT IMPORTANT FOR MIKE TO HIDE HIS FEAR? (He didn't want his friends to find out he was afraid)

4 Inferring. DID MIKE LIVE FAR FROM THE CAMPGROUND? (No) HOW DO YOU KNOW? (They hiked to the campground)

5 Synthesizing AFTER THE BOYS HIKED TO THE CAMPGROUND, WHAT DID THEY DO FIRST? (They pitched their tents)

6 Attending/Analysing WHAT DID THE BOYS DO AFTER SUPPER? (sat around the campground) or (tried to scare each other) etc.

7 Synthesizing WHY COULDN'T MIKE FALL ASLEEP? (He was afraid) or (He heard noises)

8 Inferring WHAT CAUSED THE STRANGE NOISES? (a deer)

9 Attending/Analysing HOW DID MIKE FEEL WHEN HE SAW IT WAS ONLY A DEER NOSING AROUND? (foolish) or (relieved) or (brave) etc

10 Associating FIND THE WORD *PERSUADED* IN THE STORY After 20 seconds, point out the word READ THAT SENTENCE WHAT DOES THE WORD *PERSUADED* MEAN IN THAT SENTENCE? (talked into) or (convinced) etc

THE DARK TENT

Mike was excited! Last week, he and _____(1)_____friends had persuaded their _____(2)_____to let them camp _____(3)_____alone at Floating Stone Campground. To his _____(4)_____, Mike's mom and dad had_____(5)_____him a pup tent. _____(6)_____boy now had his_____(7)_____ tent. Since everything was _____(8)_____and ready, they would _____(9)_____early in the morning.

_____(10)_____Mike was getting ready for _____(11)_____, he suddenly realized he'd _____(12)_____to spend the next_____(13)_____ alone in the dark _____(14)_____. He would be afraid, _____(15)_____ he certainly did not _____(16)_____his friends to find _____(17)_____. No matter what happened_____(18)_____ he would just have to _____(19)_____his fear.

Early next _____(20)_____, the boys hiked to _____(21)_____ campground. They pitched their _____(22)_____and then went fishing.

_____(23)_____supper, they sat around _____(24)_____campfire and tried to _____(25)_____each other with ghost _____(26)_____. Each boy tried to _____(27)_____ the scariest ghost story.

_____(28)_____midnight, they slowly crawled _____(29)_____ their sleeping bags, but Mike _____(30)_____fall asleep. He kept _____(31)_____ strange noises. Was something_____(32)_____? He lay there petrified. _____(33)_____he take a look?

Mike _____(34)_____the tent flap finally _____(35)_____peered out. A deer_____(36)_____ nosing around the picnic _____(37)_____! How foolish Mike felt! He was glad he had been brave enough to look.

Alberta Diagnostic Reading Program (1986)

PASSAGE

The three were growing tired from their long journey, and now they had to cross a river. It was wide and deep, so they would have to swim across.

The younger dog plunged into the icy water barking for the others to follow him. He was weak and suffering from pain, but somehow he managed to struggle to the opposite bank.

The poor cat was left all alone. He was so afraid that he ran up and down the bank wailing with fear. The younger dog swam back and forth trying to help. Finally, the cat jumped and began swimming near his friend.

At that moment something bad happened. An old beaver dam from upstream broke. The water came rushing downstream hurling a large log toward the animals. It struck the cat and swept him helplessly away.

COMPREHENSION QUESTIONS

1. In this passage what was the difficult thing the animals had to do? (cross a river)

2. How would the animals get across the river? (They would have to swim.)

3. What is the meaning of *plunged*? (to jump in quickly)

4. Why did the younger dog bark at the other animals? (to try to get them to follow him)

5. What is meant by the phrase, "wailing with fear"? (to be so scared that one cries out)

6. After the cat jumped in, what bad thing happened? (an old beaver dam broke.)

7. Why did the log come hurling down stream? (the rushing water brought it.)

8. What is said in the story that makes you think the animals were run down and in poor health from their long trip? (Stated: They were tired; the old dog was weak and suffering from pain.)

Analytical Reading Inventory (1995)

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