Assessing the developmental and learning needs of kindergarten children: Construction, validation and impact of a reliable in-school kindergarten screening instrument

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Abstract

A continuing problem in early childhood education has been a gap between concern for the full range of individual differences among kindergarten children and equal access to suitable assessment with appropriate intervention and instruction to accommodate these differences. The focus of this inquiry is issues associated with screening kindergarten children at entry to formal schooling, validation of a multifaceted performance assessment to identify kindergarten children's developmental and learning needs, and the impact of consequential decisions.

The instrument developed in this study provides quantitative and qualitative results to guide referrals and instruction. Screening categories are: Outside Motor, Fine Motor, Language, Paper/Pencil and Reasoning, Personal Characteristics. Items are familiar criterion kindergarten tasks at which children age 4.6-6.0 would typically be expected to demonstrate success at the independent level of function or as necessary, with help. Screening sessions took place in the children's familiar school and classroom setting, and were completed for a whole class (divided into four groups), usually within two hours. Evaluation, scoring and interpretation of results were completed by teachers and the researcher. Specific scoring criteria are defined, minimal, and validated.

The instrument was longitudinally validated with different comparison samples over three years, (1993,1995,1996). The Combined Samples totalled 776 children screened early in the year and 833 children late in the year, in 15 city, suburban or rural schools. Parent surveys informed issues such as readiness, preschool experience, and sample descriptives such as developmental milestones, medication, and behaviour. Classroom teachers (year one for the 1993 and 1995 Samples and years two and three for the 1993 Sample), were surveyed regarding those students' subsequent attainments to further inform the interpretation of their original early year kindergarten screening results.

Evidence was obtained of internal consistency and the reliability of scores over time and across contexts and evaluators. Full tabulations of scores are tabled by whole samples and each school population, and by age, gender, language (English / ESL), and time of year within samples and schools. Target scores signalling specific risk are presented. Study results indicated in-school kindergarten screening can fairly evaluate and identify the developmental and learning needs of each child screened and differences among the children. School mean gains, from early to late screening results, indicated instructional interventions based upon assessed needs have positive outcomes for children.

Dedication

This work is dedicated to the kids and to my best friend.

Acknowledgements

This thesis is the result of work undertaken over a number of years with the guidance, patience and assistance of friends, colleagues and especially my family. To my supervisor Dr. Paul Whiting, I give special appreciation owing to his foresight which enabled the work to get started at the university, his thoughtful direction, and his tenacity which has helped me see it through. To my associate supervisor Dr Mike Bailey, formerly of the University of Sydney, I am particularly grateful for continuing to be a resolute mentor. I thank Dr. Elaine Chapman who became an associate supervisor and who very kindly and aptly advised the data analysis. And I most sincerely thank my colleagues who freely gave their time to review content items for the screening instrument and actively participate in schools as raters, and my friend who helped me validate information on the databases against the raw data.

However, it is the children, their teachers, school administrators and parents who were the foundation of this work, and it is for their current and future counterparts I deeply hope the work will be of assistance.

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INTRODUCTION

I.1 Research Problem

A continuing problem in early childhood education has been a gap between concern for the full range of individual differences among kindergarten children and provision of equal access to suitable assessment with subsequent intervention and instruction based upon results, to accommodate these differences. In Australia, the need for research in early childhood education is essential (Ebbeck,1992). Specific to the present study, research should have sufficient scope, flexibility and definition of standard to produce adequate evidence which identifies and clarifies the issues surrounding school-entry screening, and support its use by schools to optimise the development and learning of kindergarten children.

This inquiry examines issues associated with screening kindergarten children at entry to formal school to identify their developmental and learning needs, the validation of educational performance assessment (specifically The Kindergarten Screening, the instrument developed in this study), and the impact of decisions based on assessment results for schools, kindergarten children and their parents/carers.

The gap between theory and practice seems to exist owing to poor dissemination of knowledge about contemporary developmental and learning theory in early childhood, contemporary theory in educational measurement, and misunderstanding of the essential and cooperative relationship between assessment and instruction based on that knowledge. In practice, early childhood education should be founded upon contemporary developmental and learning theory and each child's assessed developmental and learning needs, with individually accommodated instruction which is developmentally and socially as well as academically, appropriate. Further, schools must be ready to educate all children despite the differences they bring to school. These goals can be met and still be politically and economically (cost, time and resource) effective.

Assessment of children's school entrance level function, to inform intervention and instruction, must be the initial step to optimal learning. Currently in the state of

New South Wales (NSW Australia), parents and teachers must rely on obtaining developmental and/or learning assessments, therapy and remedial help as available and affordable, from private specialists, government and university facilities, school counsellors and school specialists. Advocacy groups report that children can wait for up to eighteen months for assessments such as speech and language, from community services (personal communication, SPELD NSW & Learning Difficulties Coalition of NSW, 1998). Thus, many children arrive at school with no assessment for existing or potential risk factors.

Many children now attend pre-school, but pre-schools and care centres frequently do not have staff with the expertise to assess and remediate a child who has problems not obvious to casual observation, and most of these children would not have a manifest cause for their problems. Hence, there is no identification or recognition of their developmental and/or learning difficulties. Based upon the researcher's experience in schools, many children enter formal school with unidentified developmental, personal or experiential factors which may put them 'at-risk' for success at school despite initiatives such as the NSW Early Intervention Service System and the NSW Department of Education and Training Early Intervention Program[1 Notes]. [See **Notes**, p.299.] Therefore, in-school assessment is an essential first step to ensure appropriate intervention and accommodated instruction from the outset of children's school career.

Longitudinal studies in the motor domain (Loose,Henderson,Elliman,Hall,Knight,& Jongmans,1990), in literacy (Juel,1988), and for multiple areas of development (Drillien, Pickering, & Drummond,1988), show that children's motor, social, and learning difficulties are not alleviated over time without direct intervention and instructional accommodation of their developmental and learning needs. The plight of these children can not be over-emphasised.

A contributing factor has been lack of a sufficiently valid and reliable standardised in-school kindergarten screening instrument founded on typical early childhood development and learning and typical kindergarten curriculum. Such an instrument should assess the levels of independent function of children's abilities and skills to identify their developmental and learning needs to inform instruction. For this study,

development is taken to mean an on-going dynamic state with no specific end result intended. *Need* is taken to indicate a current assessed state of function in relation to expectations.

The following summary of recommendations by the American National Association for the Education of Young Children (NAEYC) and the National Association of Early Childhood Specialists in State Departments of Education (NACES/SDE) (1990/1991), guided the formation of the screening instrument constructed for and used in this study (hereafter called The Kindergarten Screening), and procedure for this study. According to the NAEYC and NACES/SDE, standardised kindergarten screening (initial assessment), should:

- be non-disruptive and fair to children;
- rely on objective evaluation of demonstrated performance on familiar criterion (kindergarten) tasks in the familiar (school) setting;
- consider a combination of affecting domains (motor, language and cognitive, personal characteristics) and environmental factors (eg. as identified from parent surveys);
- benefit children by identifying what they can do at their independent level of function and with help to confidently inform parents and aid teachers to adjust instruction for individuals and groups based upon assessed needs, and to refer for specific diagnostic assessment when results indicate atypical function;
- be cost and time efficient, and be easy to administer, score and interpret by teachers, for a whole class;
- be valid and reliable in relation to the children being assessed and the intended purpose of the screening.

Criticism of kindergarten screening has centred on adequate validation of measurement instruments for consequent decisions. Performance assessment is thought to more fairly evaluate achievement and individual process differences to identify current function and potential, than traditional testing. However, sufficient validation of performance assessment has been problematic owing to difficulties standardising tasks, procedure, and scoring (Stiggins, 1987; Wiggins, 1989). Therefore, research method issues relevant to this study are concerned with

sufficient and specific definition of standards to ensure appropriate measurement validation in relation to the stated purpose and actual use of educational performance assessment with "the combination of logical argument and empirical evidence" allowing confidence in the inferences, interpretations and decisions made from results, (Shepard,1993, p.406). The eclectic design of method for this study is constructed to address these issues in detail, (see Chapter Three, p.83).

The proposition of this study is that standardised in-school kindergarten screening can accurately and consistently identify children's developmental and learning needs across time, contexts, and evaluators, as children individually demonstrate abilities and skills in affecting domains which are assessed to be: expected for age; less than expected for age; better than expected for age; a concern requiring immediate intervention; or a combination of these possibilities across domains.

I.2 Intent of Screening

For this study, *assessment* is taken to mean evaluation of demonstrated performance and other relevant information, resulting in a clearly defined profile of current function. *Kindergarten screening* is taken to mean initial assessment to identify what each child can do: the strengths and weaknesses of each child's abilities and skills in affecting domains, in this case, upon school entry. The Kindergarten Screening is intended to help teachers identify levels of independent function for each child and individual differences among children to confidently guide appropriate decisions such as referral for specialist attention, accommodated instruction, and collaboration with parents, to benefit children.

Teachers use The Kindergarten Screening to observe children's demonstrated performance of familiar criterion tasks within their familiar school setting to identify what each child can do independently and as far as possible with help, to determine potential. Results are based on objective evaluation of typical responses as expected for age and attributes unique to each child, yielding information about each child's developmental and learning needs. All kindergarten children should have equal access to interventions which accommodate their assessed developmental and learning needs.

Screening does not label, determine cause or predict specific outcomes. The Kindergarten Screening provides diagnostic information to inform instruction. For example, we can identify a child's fine motor ability and related abilities and skills as being at or better than expected for age, and can therefore expect the child to be able to control a pencil and successfully learn to write accurately and efficiently, although in doing so we are not predicting that the child will have good handwriting. However, results from this study will indicate some risk factors signalled by specific target scores, should invite immediate attention.

I.3 Theoretical Frame

Typically, age-specific emergence of many aspects of early human development and learning is predictable, but the absolute uniqueness of each child must be recognised. There is an unique collection of personal, environmental and experiential factors which define each being. Aspects of biological development in early childhood are similar across cultures. Children are born with *abilities* which evolve like walking, speaking and processing information. *Skills* require the use of abilities but are learned within a context, then practised and perfected as means to an end. The degree of skill competence depends on ability as well as opportunity, practice, confidence and motivation.

During early childhood, integration of the communication system between mind and body takes place allowing typically developing children to achieve spontaneous responses in affecting domains, at the independent level of function. *Typical development* is taken as the indication of predictable specific responses within given age ranges. *Spontaneous responses* are free of hesitation, needing no external cues beyond the information given, and are we hope, appropriate. *Independent level of function* is taken to mean a level at which abilities and skills are sufficiently automatic to be generalised and transferred to new tasks - for example with motor ability, not having to think 'how to' (motor plan) when catching a ball or when holding and controlling a pencil to write, freeing a child to attend, to think and to respond.

When looking at the whole developmental process, a fundamental principle is that

although the rate of developmental progress is highly individual and dependent on the integration of multiple factors, there are typical patterns, and it is only against the typical that we can identify what may be atypical. The following outline summarises components of typical development and learning in early childhood (Twaddell,1994), the theoretical frame, or conceptual bias, upon which this study is based. While there has been and continues to be widespread consensus about the identification of these components, recent research has produced a conceptual change in early childhood developmental and learning theory regarding the process by which they contribute to behaviours (see Chapter One, 1.1, for a review of current developmental and educational theory in early childhood and Chapter Two, regarding current theory within the assessment domains of The Kindergarten Screening).

Components of Typical Human Development and Learning - Summary

The PROCESS OF LEARNING: attending to, receiving, processing, organising and storing information from the physical world, and responding

I. Process - input, organisation, output
II. Affecting Variables - inherent, environmental, personal

ABILITIES and SKILLS: practising skills using developing visual, auditory and motor abilities to receive, process and store information, easily shifting from one ability area to another, to create and to produce integrated and appropriate responses

I. Motor Ability - motor planning, body image, gross motor, fine motor; pattern, memory and sequence
II. Visual Ability - perception, discrimination, memory, sequence, visual motor integration
III. Auditory Ability - perception, discrimination, memory, sequence, auditory motor integration

COMMUNICATION: using all forms of language as a tool to receive, compare, evaluate and integrate new and stored information, and expressively convey meaning

I. Comprehension
II. Verbal Expression
III. Manual Expression

PERSONAL/SOCIAL: achieving successfully as an individual and as a member of communities

I. Personal Development - self-care, work habits, emotional development
II. Social Development

Note: For the complete outline, including examples, see Appendix A1.1, p.304.

I.4 Research Variables

The NSW school entry kindergarten population is made up of children between the chronological ages of 4.6 and 6.0. Many of these children are developing typically in conditions promoting optimal learning, while for others, atypical developmental factors and/or intervening variables may put them at risk for less than optimal learning or indicate possible giftedness. Although the identification of research variables is reminiscent of the positivistic scientific tradition, they are helpful to describe and understand the theoretical frame of this study. However, the following were never meant to be experimental variables to be verified within the parameters of positivistic method. Theoretically, then, for this study:

- The independent variable can be thought of as *Mother Nature* - the typical and usually predictable emergence of the biological aspects of abilities and skills as identified by developmental milestones expected for age. [2]

- The intervening variables are the effects of *internal personal factors* - inherent, medical, physical, neurological, and cognitive - and the effects of *external environmental factors* - home, culture, community, and experience.

- The dependent variable is the profile of the personal and experiential background each child brings to school and the actual screening responses by which we may identify the independent function of each child's abilities, skills and concepts within and across specific assessment domains.

I.5 Procedure

The instrument developed in this study provides comprehensive curriculum and developmental domain content coverage and quantitative and qualitative information to guide referrals and instruction. Screening categories are Outside Motor, Fine Motor, Language, Paper/Pencil and Reasoning, Personal Characteristics and total score, Success Rate. Assessment items are familiar criterion kindergarten tasks at which children age 4.6-6.0 would typically be expected to demonstrate success at the independent level of function or as necessary, with help. Screening sessions

were completed in school with a whole class working together (divided into four groups), mostly within two hours. Evaluation, scoring and interpretation of results were completed by teachers and the researcher. Specific scoring criteria are defined, minimal, and validated by a longitudinal scoring study for the Paper/Pencil category, and interrater agreement.

The instrument was longitudinally validated with different comparison samples over three years, (1993,1995,1996). The combined samples totalled 776 kindergarten children screened early in the year and 833 children late in the year, in 15 city, suburban or rural schools. Parent surveys informed issues such as readiness / preschool experience and expectations, and sample descriptives such as developmental milestones, medication, and behaviour. Classroom teachers (year one for the 1993 and 1995 samples and years two and three for the 1993 sample), were surveyed regarding those students' subsequent attainments to inform further interpretation of their original early year kindergarten screening results.

I.6 Research Questions

The general research question of this inquiry was two-fold:

- Can kindergarten screening based in contemporary developmental and educational theory in early childhood, and contemporary measurement theory, justifiably be used to assess the developmental and learning needs of school entry kindergarten children within affecting developmental and academic domains, to inform instruction;
- can decisions based upon screening results accommodate the diversity that kindergarten children bring to school ?

Two subsidiary questions emerged. The first is about the instrument and the second is about the use of results.

1. Can a standardised whole class in-school kindergarten screening instrument which is economical and time efficient to administer, score and interpret, with teachers and other school staff as evaluators, be considered adequately valid and reliable across contexts, evaluators and time to:

• fairly evaluate and identify kindergarten children's levels of independent function observed from demonstrated performance of familiar criterion tasks as being typical for age, accurately and consistently discriminating difference among the children ?

• generate appropriate information to confidently guide interventions such as referral for specialist attention and instructional adjustments, and which may be applicable to the population of kindergarten children ?

2. Can knowledge of children's identified individual developmental and learning needs facilitate teachers' and parents' undertakings to help kindergarten children achieve to the best of their abilities, skills, and opportunities to learn in school and in their daily lives ?

I.7 Anticipated Outcomes

Since The Kindergarten Screening looks at levels of children's independent function within a collection of affecting domains to identify each child's developmental and learning needs, and individual differences among children, anticipated outcomes of this inquiry were:

• use of a standardised whole class in-school kindergarten screening instrument will help parents, teachers, school administrators and policy-makers become more aware of the nature and range of kindergarten children's developmental and learning needs and individual differences;

• based upon screening results at school entry, parents, teachers and school administrators will become more willing to recognise and accommodate children's identified developmental and learning needs and individual differences across the kindergarten curriculum and at home by generating more appropriate intervention and instructional decisions regarding individual children and school policy.

And since The Kindergarten Screening is developmentally based, it was predicted:

• early year scores would be consistent across samples and for gender and age within samples;

• end of year scores would be less consistent even across samples, due to intervening variables such as school policies and interventions.

Chapter One - Issues Associated with Kindergarten Screening

1.1 Developmental and Learning Theories in Early Childhood

Effective education for kindergarten children depends on many factors. The most pervasive factor underpinning policies and decisions at all levels, including assessment and instruction, is stakeholders' concepts and understandings of development and learning in early childhood (Barbour, 1992). In early childhood education, developmental and learning theories are inextricably entwined.

Developmental theory is poised somewhere between a linear view of maturation based on intrinsic biological factors which necessarily unfold according to each child's timetable regardless of context, and a dynamic view which includes the significance of environmental factors as well as intrinsic factors influencing the development of each child's abilities, skills and achievements. *Educational theory* is poised somewhere between philosophies and practices which are child centred and those which are academically or skills centred; child initiated versus teacher directed; unstructured versus structured; developmentally based versus psychometrically based; constructivist versus sociocultural. Evidence along the full range of these continua could be identified among the beliefs, policies and practices within the fifteen schools and among individual participants, in this study.

In general, current educational practices for young children are still primarily founded upon the predetermined developmental stage maturation theories of Piaget, when "new knowledge was the result of creative activity in which the child built on prior mental constructions ..." (Sameroff & McDonough, 1994, p.189). "... children are required to reconstruct the realities they elaborated at the previous developmental level. In effect, the child creates reality, and recreates it, out of...experiences with the environment" (Elkind, 1991, p.6).

According to Kessler (1991a), "... justifying appropriate practices on the basis of developmental theory obscures the philosophical and political nature of all curriculum decisions (p.137). According to Bereiter (1994), constructivist and sociocultural philosophies are not "incompatible" as neither one implies rejection of the other.

According to Stone (1996), while there should be a distinction between developmentally appropriate and educationally appropriate instruction, both rely on present levels of demonstrated performance as a starting point for instruction and both seek to optimise intellectual advancement. It is the user-friendly, valid and accurate assessment of present levels of demonstrated independent performance intended to inform developmentally as well as educationally appropriate instruction for kindergarten children, which provided the impetus for the study reported in this thesis.

Educators can design kindergarten programs which help socialise children, prepare children for "school learning"- meaning the student role and the importance of academic learning - and teach significant content, helping each child become "... an independent seeker of knowledge and a creative thinker" (Spodek & Saracho, 1988, p.10). "For learning to occur there should be a balance between authoritative and facilitatory instructional practices" (Diezmann & Watters,1997). Such a viewpoint seems to render less significant the historic dichotomy of child centred versus academic centred learning environments. A perspective of developmental and learning theories in early childhood will establish a continuity in understanding of what has shaped the contemporary theories, issues and practices which affect today's kindergarten children.

1.1.1 Historical Perspective

Kohlberg and Mayer (1972) presented three ideologies of Western education, which seem also to characterise developmental theories, as both have been influenced by prevailing economic, political and social factors, policies and philosophies. The first was the romantic ideology in which children learn naturally (or authentically - a term used today), by exploring their immediate environment, spontaneously reconstructing their experiences through art and play (Jipson,1991). Caruso, Dunn and File (1992) called this maturational theory. This ideology reflects the work of Rousseau, Froebel, Gesell, Freud and others who viewed childhood development as linear, being genetically and maturationally derived (Crnic & Lamberty,1994; Meisels, Steele & Quinn-Leering,1993b), and education as the unfolding of inner virtues and abilities (Spodek & Saracho,1988).

Froebel originated the concept of kindergarten in 1837, in Germany, theorising that with appropriate care children would flourish like flowers as school encouraged the natural development of young children (Moyer, Egerston & Isenberg,1987; Spodek & Brown,1993). The children were taught at kindergarten in the morning and at home in the afternoon by their mothers who had received specific training in use of the materials, which were considered symbolic of real life. Teachers were to follow the children's lead. Direct instruction was discouraged. While a totally child centered program may seem ideal for typically developing children, the developmental and learning needs of many children require direct teaching and sometimes long-term support for successful achievement.

In Australia today, a similar approach to early childhood education is found in Reggio Emilia, the founding concepts of the Mia Mia Day Care Centre, the demonstration school and student placement centre for the Institute of Early Childhood, at Macquarie University. Children's potential is released and enhanced as they solve their life's problems, naturally. Teachers are observers, listeners, challengers, scribes and partners in learning. The curriculum is never prescribed or bounded by "the calendar or the teacher's attention span", but is actually determined by the children's interests with "no two years alike, ... the teachers (don't) know for sure what will happen next" (Fahlman,1997). Inclusion of children with special needs, "seen as special rights in Reggio", is supported with additional full-time staff as required. Fahlman cites generous government financial support for preschool and the homogeneity of the cultural context from which it comes, as two reasons for the success of Reggio. It would seem that in many countries, especially America and Australia, the current reality of socioeconomic, cultural and language diversity, inclusion, and economic rationalisation, the success of Reggio on a large scale, would be difficult.

Also of the romantic ideology was Maria Montessori. Montessori, and owners of the "slum tenements" in a district of Rome (now termed a low socioeconomic area), believed education would help prevent the vandalism and damage being caused by the "unruly children" age three to seven, left to their own devices during the day by their working parents (Montessori, 1964). The first Children's House opened in 1903.

Montessori believed that children's development was not completely predetermined, nor intelligence fixed; a departure from the strict belief in the predestination of intellect and abilities. While she believed that development emerges naturally and is dependent on each child's initial sensory experiences with the environment, she also believed that children do have the capacity to influence their own development. She theorised knowledge as being based in children's perception of the world and expanding as children pass through "sensitive stages", when they change their perceptions.

Her curriculum included sensory training, practice in daily life tasks, "manners", "muscular" education, and basic academic skills (Montessori,1964; Spodek & Brown, 1993). School-home collaboration was written into the regulations of the Children's Houses. "Once a week, at least, the mothers may talk with the Directress, giving her information concerning the home life of the child, and receiving helpful advice from her" (Montessori,1964, p.71). This position seems a precursor of the current strong, and in the opinion of this researcher necessary, parent school involvement movement (Davis,1989; Tizard, Schofoeld & Hewison, 1982; "Visit By", 1994; Williams & Chavkin,1989).

"Not only was the vandalism prevented, but these children ... became avid pupils" (Montessori, 1964, p.xi). These positive findings resulting from what would have been an original early intervention program, are confirmed by contemporary successes. Sigel (1990) speaks of early intervention as a dynamic effort to modify the "developmental trajectory" of children by "optimizing the ongoing environment", to gain more positive outcomes than might otherwise occur.

The efficacy and long term positive effects of contemporary early intervention programs have clearly been established in the areas of scholastic success, socioeconomic success, and social responsibility, by longitudinal evaluations such as those of the American Federal Head Start Program (Duncan, Brooks-Gunn & Klebanov, 1994; Schweinhart & Weikart, 1985; Schweinhart, Berrueta-Clement, Barnett, Epstein & Weikart, 1985; Woodhead, 1988). Another example is follow-up data from the Carolina Abecedarian Project (offering early preschool intervention to low income families), demonstrating positive effects on intellectual development and

academic achievements were maintained through age twelve (Campbell & Ramey, 1994). Mazzarella (1990) wrote that the American Congress has "finally" realised the major role and cost effectiveness of early intervention in solving the problems of "disadvantaged populations". Kagan (1994) reported: "there is hardly a legislator on Capitol Hill who doesn't know that for every dollar invested in early intervention, "x" times that amount is saved later on" (p.226).

The second ideology of Kohlberg and Mayer (1972) was cultural transmission, or environmental-learning theory with a stimulus-response approach (Caruso et al., 1992). The kindergarten curriculum was separated into content subjects reflecting and directly teaching the various aspects of the dominant culture (Jipson,1991). This ideology, also called a sociocultural approach, "tells us to pay close attention to the cultural practices in the learner's milieu" (Bereiter, 1994, p.21). Education is conceived "as passing knowledge, skills and values, social and moral rules from one generation to the next" (Spodek & Saracho, 1988, p.3), with an emphasis on habit training - reflecting the behaviourist theories of Thorndike and Skinner.

American educators used this ideology to socialise, or assimilate, large numbers of immigrants and their parents in the late nineteenth and early twentieth century (Spodek,1988); a form of enculturation. After the 1957 launch of Sputnik, the cultural transmission ideology was again installed to improve students' academic outcomes, especially in the fields of science and technology. In 1960, Bruner wrote that any content subject could effectively be taught "in some intellectually honest form" to any child, at any age (Elkind,1986; Webster,1984). Metz (1995) describes this form of learning as being hierarchical: step-by-step teaching of the components of processes "with each step embedding the skills of the prior steps" (p.94).

Strategies of this method, sometimes called explicit and systematic teaching (advocated within the NSW 1997 State Literacy Strategy), are summarised by Rosenshine (1986). As children had been thought to be poorly prepared for school, the kindergarten curriculum was to be more academically 'rigorous', so children would progress more rapidly in school (Webster,1984). This philosophy totally suited the academic reforms being introduced; reforms which continue from the 'excellence in education' movement begun in the mid 1980s and still being

promoted by governments today (Berliner & Biddle, 1995).

The third ideology of Kohlberg and Mayer (1972) was the progressive ideology reflecting developmental theorists such as Piaget, Inhelder and Vygotsky, in which teachers facilitate children's understanding of their experiences by providing a learning environment promoting interactive problem solving (Jipson,1991). This ideology has been called cognitive-developmental theory (Caruso et al., 1992), or a constructivist approach which "tells us to pay close attention to the mental activities of the learner" (Bereiter, 1994, p.21), as all knowledge is a construction between the mind and the environment (Elkind,1991). Individual change is attributed to multiple influences, although for Piaget, dependence on the biological inevitability of cognitive maturity remained. Education is viewed "as helping the child achieve higher levels of development (through) structured, though natural interaction with the physical and social environment" (Spodek & Saracho, 1988, p.3).

Vygotsky and Piaget, the most notable proponents of the constructivist approach, were contemporaries. They were born in 1896 and both followed career paths as developmental and educational psychologists (Berk, 1994 a & b). However, due to political circumstances in the Soviet Union, Vygotsky's homeland, his writings were banned. They were reissued in the 1950s, with English translations of his 180 works reaching the Western world from the 1960s.

In general, Piaget saw learning as a result of cognitive development, in fact development was thought to be a prerequisite for learning (Kagan,1990 & 1992). Like Gesell, he saw language and cognitive development as predetermined, sequential, and unfolding in linear stages, thus placing limits on instruction (Diezmann & Watters,1997). Children construct knowledge individually, storing coded records of perceptual experience as memory schemas as they enter each new cognitive stage (Clay,1991 b). "His image of a busy, intrinsically motivated child who discovers reality independently, by exploring and acting on the surrounding world, is well known ..." (Berk, 1994 a, p.1). Piaget was primarily interested in explaining universal developmental attributes of human intelligence, not individual differences (Butterworth, 1994).

In general, Vygotsky saw cognitive development as a result of learning (Kagan,1990 & 1992). He saw language and cognitive development as shared, associated experience (Clay,1991b). Knowledge is constructed within social contexts, stimulated and shaped by verbal exchange between the child and a more capable person, an adult or peer (Seifert,1993). "He maintained all uniquely human, higher cognitive processes grow out of language and social interaction" (Berk, 1994a, p.2). Educational practices following these concepts seem more functionally capable of recognising and accommodating individual differences.

The biological dependency of development in early childhood came from the work of Hall, who is credited, from the 1890s, with establishing the relationship between the study of child development as a scientific discipline, and early childhood education (Spodek,1988). Hall, and his student Gesell, introduced a scientific foundation to the study of children by empirically establishing age norms for expected developmental stages. Appropriate kindergarten curriculum was then meant to "... provide educational experiences that would (consistently) fit the (inherent) developing competencies of young children" (Spodek & Brown, 1993, p.95). Suitable skills and achievements would in time emerge, regardless of intervention. If indeed this were true, there would hardly be any need for early childhood education.

The human infant was believed to be perceptually and psychologically incompetent or empty, in need of "devoted parents" (Kessen,1993). Past accounts of children's capacities and cognitive development were restrictive, underestimating young children's capabilities by portraying the child as: having an egocentric view of the world, incapable of distinguishing real from pretend, or being able to manipulate symbolic or abstract information, thinking only within Piaget's stage of concrete operational thought until age eight (Diezmann & Watters, 1997), with only a disorganised, disconnected personal universe of sensory perceptions (Catherwood, 1994 a & b; Metz,1995).

> "Development has typically been defined as leading towards a biological goal of species-specific maturity. In these terms, cognitive development is simply one aspect of the way an organism's biological potential unfolds. The arrow of development moves upward in one

dimension, defined by biologically founded processes" (Bradley, 1993, p.404).

However, the "canonical" belief in science as the source of truth, and that "the individual carried his or her history and its consequences within inner hermetic seals, independent of current events and free from tangled social context, was called into question" by early childhood educators (Kessen, 1993, p.416). Alloway (1997) saw this "postmodern" stance as disrupting traditional early childhood beliefs and "casting a shadow over...'empirical truths' about child development ... (introducing) a healthy scepticism and the acceptance of a plurality of voices" (p.1). These views questioning the unitary absoluteness of scientific evidence accepted as warranting truth, were parallelled in the field of educational measurement, (see discussion Chapter Three, 3.2).

In the early 1960s, Hunt and Bloom expanded developmental theory by expounding the vital importance of the effects of environmental circumstances on even the very early development children, and the "malleability of IQ" (cited in Elkind,1986). Children age four and five in preschool are capable of making deductive inferences required in solving syllogistic problems depending upon the contextual conditions of familiarity with the subject and sequence of presentation (Hawkins, Pea, Glick and Scribner, 1984). Clay (1991b) wrote of critical evaluation of the influence of Piagetian theory to early childhood education, citing Donaldson (1979) as contributing to the concept of the competent preschooler.

Donaldson's research established a misrepresentation of children's cognitive abilities by demonstrating that children's responses were often contextually dependent, determined by what the child thinks the adult question must mean, rather than being a true representation of the child's understandings from within the child's context (Grieve & Hughes,1990). Preschoolers can demonstrate logical inference when task features are familiar and sensible to them (Donaldson,1978/1987, cited in Dyson & Genishi, 1993).

According to Seifert (1993) there were numerous studies in the 1970s and 1980s which did not support Piaget's theory of innate predetermined cognitive stages.

Kessen (1993) cited Stone and colleagues (1973) who reviewed several hundred articles they saw as justifying their book entitled, *The Competent Infant.* Further, Kessen notes that by the end of the 1980s, "the force of data, theory and cultural commitment" resulted in Bower's book *The Rational Infant.* Kessen also cited Wynn (1992) who reported evidence indicating that five month old babies have "true numerical concepts" (Kessen,1993, p.423). Sophian (1988) reported evidence that preschool children have a good understanding of one-to-one number correspondence despite poor performance on the traditional Piagetian conservation task. Sameroff and McDonough (1994) reported evidence demonstrating preschoolers and even infants can have a "complex understanding of number concepts, spatial transformations, and causality..." (p.190).

Three decades of human research in sensory and cognitive development has demonstrated well defined perceptual processes and cognitive competence in infants and young children (Catherwood, 1994a; Haith,1990; Kessen,1993). Many studies refute the traditional view that maturity of the visual and auditory perceptual systems depends upon development of the motor system and sense of touch by showing, for example, that infants (three months old or less) perceive visual objects as having a constant shape and size and that newborn babies are sensitive to visual and auditory patterns (Butterworth, 1994).

Typically developing infants have been shown to be capable of remembering "coherent" information about the attributes of their physical and personal world (Bauer & Hertsgaard,1993), and capable of the same cognitive processes as older children and adults (Catherwood,1994a). Catherwood lists these cognitive processes as attending (selective processing), encoding and representation (forming a mental impression), memory and retrieval, sorting and organising information, and "reasoning", (the combining or merging of information).

Contemporary evidence shows that the rapid growth in all affecting domains of young children's development and learning is not solely due to maturation, but in fact also significantly influenced by interaction with each child's environment - home, culture, community and experience (Crnic & Lamberty, 1994). One would

certainly have to add school environment to the foregoing list as it is in the school environment where contemporary developmental research is least acknowledged and where children are expected to successfully achieve personally and academically. These views are supported by findings that young children can benefit from and successfully cope with early education that directly promotes reading in kindergarten and specific cognitive processing skills across the curriculum (Diezmann & Watters,1997a; Hanson & Farrell, 1995; Metz, 1995; Siegel & Hanson, 1991).

There is broad consensus in modern child development theory regarding consideration of the 'whole child'[3] (Moyer et al., 1987). Kagan (1992) summarised aspects of the whole child as attention, motivation, health, emotional maturity, intellectual ability, developmental status and influences of the environment. The NAEYC & NACES/SDE (1991) collected these aspects into the four domains of emotional, social, cognitive, and physical. Cody, executive director of the American National Education Goals Panel wrote that any assessment of early learning and development should include: "physical well-being and motor development; social-emotional development; approaches to learning (curiosity and persistence); use of language; cognition and general knowledge" (Cody, 1993, p6).

> "The assessment of a child's ... best chances cannot be by appeal to some abstract, theoretically defined determination of their 'natural abilities' or their 'best interests'. Each case can only be judged after careful analysis of that individual's relation to its own unique circumstances..." (Bradley,1993, p.411)

Stone (1996) labels the prevailing conceptual foundation of early childhood education, resulting from a "rich" 400 year history of "developmentalism", as a form of "romantic naturalism" owing to "the uncontested assumption that the 'natural' course of development, however conceived in theory, is the optimal possibility" (Stone,1996). Stone describes developmentalism's predisposition to rely on the "sufficiency of a natural inclination to learning", seeing civilisation as being distinct from nature, the supposed "dangers of interference with native characteristics", and "the desirability of learning experiences that emulate those thought to be natural", as unwarranted.

Of principal concern to Stone (1996) is continued adoption of "innovation" while rejecting known, empirically and field tested valid and reliable interventions, teaching methods and materials, that are said to disagree with natural development and are therefore harmful to young children. He states that today, developmentalism is a deterrent to schools being held accountable for academic achievement, discourages intervention, and discourages both teachers and parents from "asserting themselves with children", affording children greater freedom with less responsibility for their own behaviour and learning. Stone also points to the often resulting need for remediation for children whose "growth of unfavourable habits" have occurred while "awaiting the emergence of behaviour". This theme reoccurs as a result of specific research within developmental domains in early childhood, and is reported in Chapter Two.

According to Kameenui (1993), in the face of children's diversity and learning difficulties, educators tend to pursue "fashionable" experimentation rather than rely on well-established documented practice. According to Stone (1996), educationally appropriate teaching (as opposed to 'developmentally appropriate practice'), does not treat current performance as being at the limit of developmental function, but rather as a guide to "academic advancement"; a concept more in keeping with the child development theories of Vygotsky.

"Although sensitive to student comfort with teaching practice, educationally appropriate practice holds achievement, not developmental suitability, to be its top priority" (Stone, 1996). For a functional example, as this researcher has observed many times in school, the achievement of classification skills across the curriculum can be just as easily practised using symbols, pictures or hands-on materials, depending upon a child's developmental level of reasoning and familiarity with content. Teaching strategies can be sensitive to individual developmental differences while presenting specific content.

1.2 The Kindergarten Curriculum - the Political Climate

Major economic and social issues since the 1960s spotlighted early childhood education (Elkind,1986; Webster,1984). The post industrial economy, emphasising

the service and technology industries, opened many job opportunities for women. Further, an active women's movement seeking equity of circumstances and choice regarding career and family, and changing social conditions, resulted in an increasing incidence of single mothers, meaning more women entering the workforce.[4] The result is that many young children experience out-of-home care and school related tasks and routines in preschool, prior to formal school (Bredekamp & Shepard,1989; Meisels et al.,1993b; Elkind,1986).

In the 1960s and 1970s, reformers and politicians, worried about "permissiveness" in the schools, sparked fears of a national literacy crisis in the United States. By the 1980s criticisms were vigorous and widespread, supported by cross-national data on academic achievement (Berliner & Biddle, 1995). Arguments for "the re-establishment of standards of academic excellence" were put forth, with some people encouraging the establishment of a "core curriculum" (Spener,1988, p.144). In April,1983, the American National Commission on Excellence in Education issued their report *A Nation at Risk*, along with "... many scholarly treatises on excellence" (Kagan,1991, p.241). A *Nation at Risk*, endorsed by the American President, made explicit charges about the decline of American education, and advised use of standardised tests at all levels of schooling to identify students in need of remedial instruction and to certify mastery of grade-level objectives for next grade promotion (Berliner & Biddle,1995; Meisels et al.,1993b; Smith & Shepard, 1988).

In 1996 another American National Educational Summit was held, attended by 41 state governors, 49 business executives from corporations such as IBM, and the American President, who all agreed that "public education is broken and woefully in need of fixing" (Gray, 1996, p.40). This summit decided setting the national standards agreed upon at the 1989 summit (attended by all 50 governors and the President), was too hard. At the 1996 summit, Gray reports the states agreed to each set their own "internationally competitive academic" standards, and the business leaders agreed to ask for academic transcripts from job applicants. With political emphasis on educational reform such as designated 'bench-mark' outcomes, governments are mandating the content of teaching by defining what students ought to learn followed by large scale 'high-stakes' testing for accountability, ostensibly to promote school reform (Dorn,1998; Jaeger,992; Linn,1994; Wolf et

al.,1991; Worthen,1993).

In 1989 the Australian Federal government published the National Profiles and the NSW State government then created new academic standards in a core curriculum with Key Areas of Learning, published in Excellence and Equity (Print, 1993). The "government argued that prescription in the overall pattern of study by students was not only necessary, but also without opposition" (Print, 1993, p.104). In 1995, the NSW Premier was still proposing even further reforms to bring back 'rigour' and 'content' into the curriculum, which seemingly placed him out of step with national and international trends as many reforms had already taken place (Scott & Garcia, 1995).

As a result of the Excellence in Education reforms, the large numbers of children entering kindergarten with preschool experience, research regarding the benefits of early intervention, and teacher expectations, the 1980s produced concerns about the way in which specific academic standards dominated the kindergarten curriculum (Bredekamp & Shepard,1989; Graue,1993; Phillips,1992; Rusher, McGrevin & Lambiotte, 1992). According to Meisels et al. (1993b) and Shepard & Smith (1989), the academic skills based curriculum pressured teachers to be accountable for children achieving stated outcomes. In Australia, the pressure of accountability could be seen in the NSW Premier's views promising: "extensive school-by-school reporting on performance, including an assessment of how each school 'adds value' to the educational outcomes achieved by those who enrol" (Scott & Garcia, 1995, p.1A). Dorn (1998) states that high-stakes testing producing statistical accountability has "taken a prominent place in political culture" due to the supposed universality and objectivity of its results.

Shepard and Smith (1989) saw the situation "... as the escalation of curriculum, or the downward shift of what were next-grade expectations into lower grades" (pp.135-136). Katz (1992), Director of the ERIC Clearing House on Elementary and Early Childhood Education, saw the downward shift of academic curriculum starting from university level and subsequently pushing the primary curriculum into the first years of formal education. "All parts of the early childhood field experience the downward pressure of curriculum reform in school education," (Ashby,1997, p.77).

Today four and five year old children are receiving more formal, whole-class academic instruction in kindergarten. For example, in a newspaper story about the redistribution of financial childcare assistance, a mother said that owing to higher fees she could no longer afford the quality care at the community-based centre which was "such a pity" as her four year old daughter was being taught how to write her name and the alphabet and how to count (Davey, 1997).

However, the academic learning environment is considered by some early childhood educators as being inappropriate and unfavourable to how young children learn best, creating demands which are incompatible with their "neurological and mental capacities" causing stress, anxiety, a real and/or perceived sense of failure, and for some children, retention (Burts et al.,1992; Charlesworth,1989; Elkind,1986; Katz, 1992; Moyer et al,1987; Tomchin & Impara, 1992; Willer & Bredekamp,1990). Although, as the discussion of early childhood developmental and educational theory points out above, this view is mostly inconsistent with a great deal of empirical research over the last few decades.

1.2.1 Developmentally Appropriate Practice (DAP) / Academic Orientation

From the early 1980s there was growing concern among early childhood educators that the predominant academic skills based kindergarten curriculum "... fails to produce students who possess the kind of higher-order thinking and problem-solving abilities that will be needed in the 21st century" (NAEYC & NAECS/SDE, 1990/1991, p22). By the late 1980s the need for kindergarten curriculum guidelines became clear to many early childhood educators. Owing to the downward shift of academic expectations into kindergarten, Willer and Bredekamp (1990) observed: "Children entering kindergarten are now expected to have already acquired the skills that used to comprise the entire year's curriculum [sic]" (p.23).

The political climate, economic and social changes, and contemporary views regarding early childhood developmental and educational theories tend to translate into learning environments dominated either by developmentally appropriate practice (DAP), or by an academic / skills based orientation. Caruso et al. (1992) say DAP is an attempt to operationalise cognitive-developmental theory. The Connecticut Early

Childhood Education Council (1990) defines DAP as the combination of age appropriateness and individual appropriateness. Age appropriate is recognition of empirically validated typical early childhood developmental milestones in affecting domains - physical, emotional, social and cognitive. Individually appropriate is recognition of each child's "pattern and timing of growth" as well as singular personal and environmental attributes.

In general, *the academically orientated kindergarten curriculum* is characterised by: whole class teacher-directed instruction; rote learning with drill and practice, reward and punishment; abstract materials; a fragmented timetable; stated instructional objectives in specified content subjects; teaching discrete skills; anticipation of achieving stated outcomes; and is thought to consign many children to failure, (Charlesworth,1989; Cosden, Zimmer & Tuss,1993; Egerston,1987; Peck et al.,1988; Webster, 1984). Jipson (1991) said the academic orientation is characterised by cultural transmission, when skills and knowledge are disseminated from teacher to child in a teacher-controlled learning environment.

By contrast, *the developmentally appropriate kindergarten curriculum* is characterised by: interactive teaching taking advantage of children's natural motivation to learn; responding to the needs of the whole child; matching the curriculum to individual ability levels; child-initiated conceptual, discovery learning; interpretive evaluation of information; basic skills acquisition across a broad range of content; activities and multisensory materials meaningful to children's daily school and personal lives; large blocks of time for language, motor activities, inquiry and play, with "intent and purpose"; small group instruction; active manipulation of the environment; acceptance and respect for linguistic and cultural diversity (Bredekamp,1993; Bredekamp & Rosegrant,1993; Burts et al.,1993; Elkind,1991; Gronlund,1995; Moyer et al.,1987; NAEYC & NAECS/SDE, 1990/1991; Peck et al.,1988).

While there has been criticism of the academically oriented kindergarten curriculum and its attendant teaching practices, there has also been criticism of DAP owing to seemingly rigid adherence to specific principles. Three main DAP principles being questioned are: the existence of universal developmental stages in all affecting domains; development and learning being individual processes irrespective of

communities and culture; exploration being the best way children learn irrespective of structured and/or "mediated" experience with adults (Fowell & Lawton,1992; Jipson, 1991; Kessler,1991a & b; Walsh,1991).

Walsh (1991) encouraged instruction which can link the ideologies by including the educational theories of Vygotsky and Donaldson: Children's current independent developmental levels of function are identified and the child is then challenged by the curriculum and instruction to where he/she will be, as opposed to limiting instruction by just developmentally meeting the child where he/she is now. Kessler (1991a&b) encouraged early childhood education to be caring and schooling for democracy, encompassing the sociocultural aspects of children's lives. Jipson (1991) called for teachers to "clarify for ourselves the nature of the connections between culture, children and the curriculum" (p.135).

By 1993, Bredekamp emphatically stated that the NAEYC, DAP guidelines should be interpreted as achieving "the appropriate balance between teacher-directed and child-initiated learning" (p.119). This position seems more moderate than the original which was interpreted as all early childhood education must be predicated on developmentally appropriate practice, which in turn was not always specifically defined. According to Ashby (1997) current reliance on psychological knowledge of child development as being representative of universal truths, is actually representative of a "cluster of beliefs and assumptions. Child development knowledge does not provide the basis for early childhood care and education" (Ashby, 1997, pp.78-79). This position agrees with Stone (1996) in that strict adherence to developmentalism rejects contemporary research and functional environmental influences.

1.2.2 Attitudes and Expectations

Depending on stakeholders' understandings of how children develop and learn, views differ on the most relevant child factors in relation to: entry to formal school; what should be emphasised in the kindergarten curriculum; when specific content should be presented; and how to instruct. Stakeholders in early childhood education are parents, teachers, administrators, counsellors, psychologists, therapists

researchers, and politicians (Doliopoulou, 1996). Depending upon their degree of influence within their communities it is their views, attitudes and expectations which create policy and learning environments.

Research has been conducted in this area of attitudes and expectations regarding the development and education of young children, indicating widespread variation in opinions about issues impacting decisions. These studies were not intended to determine best practice, but rather level of support for, and beliefs in DAP from different stakeholders, and level of actual classroom implementation of DAP. For example, Doliopoulou (1996) compared the professed beliefs and actual practices of Greek kindergarten teachers in relation to appropriate / inappropriate curriculum and instruction. Doliopoulou reported:

- No teacher rating was close to 100% on either side of the debate, in belief or practice.
- Increased parental influence produced more DAP beliefs and practices; although parental pressure on teachers to produce academic outcomes was also evident.
- Teachers reporting control of their planning and program claimed to engage in DAP beliefs and practices, but were observed to actually use more inappropriate practices.
- Teachers claiming to be strongly influenced by state regulations engaged in more inappropriate practices.
- Teachers with more years of experience and with "many" children in their class, tended to have more inappropriate beliefs.
- In general, state regulations and parents had the most influence on the these Greek kindergarten teachers' beliefs and practices, while parents and the teachers themselves had more influence on beliefs.

The Doliopoulou Study copied American research (Charlesworth et al. 1991,1993), using the same questionnaire developed for the American studies. In both countries more teachers rated appropriate practices as being important, than actually provided such practices to students, demonstrating a discrepancy between DAP beliefs and practice. The American studies showed a "stronger" relationship between

inappropriate beliefs and practices. These results are consistent with those Caruso et al. (1992) found in preschool programs in that a significant relationship was demonstrated between teachers' beliefs and practices based on environmental-learning theory, which is inconsistent with DAP.

Rusher et al. (1992) compared the beliefs of teachers and their principals regarding early childhood education, concentrating on three issues: academics; child-centeredness; activities. Those researchers reported that teachers strongly disagree with an academic orientation in the kindergarten curriculum, favouring child-centered practices emphasising expressive arts, motor activities and physical movement (as opposed to the children sitting still to complete paper and pencil tasks). Principals indicated similar beliefs, although the similarity was less strong between male principals and teachers, than with female principals; the researchers citing differences in the traditional career paths of male and female principals as a possible explanation.

The above research also reported differences between the beliefs of teachers and their principals, and the beliefs of policy makers at the level of school districts or departments of education, where beliefs tend to be far more academically oriented. Further, in general the Rusher study (1992) found educators in urban and rural areas (where children typically performed less well on minimum skills tests), to be more skills-based teacher-directed, than in suburban areas; citing less poverty in the suburbs as an explanation.

Rusher et al. (1992) said the debate is really between "behaviourist" and "phenomenological" belief systems, with teachers and principals creating the link between policy and practice. However, belief systems do not stand alone, they are usually modified by existing policy and the attitudes and expectations of the school's community of parents. In New South Wales, policy is developed from three levels: first the Board of Studies; which is then interpreted by the state Department of Education and Training, (there are no local autonomous decision-making departments of education or school boards, in NSW); which is then interpreted by principals, and translated into practice by the teachers.

The attitudes and expectations of teachers and school administrators in the research reported in this thesis regarding the appropriate / inappropriate debate were identified by observation and informal interviews, and recorded as qualitative comment. In general, the combination of links between policy, community, belief systems and practice was different from school to school depending upon how the principals were influenced by the various factors. Whether the school was city or country, or whether the principal was male or female, did not seem to make a difference. The degree of teacher autonomy to put their own beliefs into practice firstly depended upon their principal's interpretation of central policy, and then the degree of collaboration between school administration and teachers.

Teachers also feel pressure from social, political, and economic constraints. For example, some parents of children who have attended preschool feel their child has acquired all the necessary prerequisites for formal school. According to Seefeldt and Barbour (1988) and Shepard and Smith (1989), parents pressure teachers to advance literacy skills, ignoring appropriate experiences and expectancies in the physical, language / cognitive, and personal domains of the whole child. Two studies compare teacher and parent attitudes and expectations of the kindergarten curriculum.

Knudsen-Lindauer and Harris (1989) found teachers, mothers and fathers in agreement, rating listening and confidence as the two most important development areas to be emphasised in kindergarten. Teachers rated social skills as third most important, while mothers and fathers ranked intellectual skills third. Teachers rated social skills, listening, speaking and motor skills significantly higher than did mothers, and social skills and self-confidence higher than did fathers. Mothers rated listening, self-confidence, small and large muscle skills, problem solving and art appreciation higher than did fathers. The authors say teachers and parents generally agreed upon a balanced curriculum with DAP oriented teaching practices, and the needs of kindergarten children, although many teachers commented upon the prevailing role of administrators. This interpretation corresponds with this researcher's observations across the 15 schools in this study, again indicating administrative influence being the more significant determiner of practice.

Graue (1993) reported parents discussed social and academic issues as being the main purposes of kindergarten, clearly distinguishing between academic and social growth. Graue said the academic aspects were relatively general, but universal and reflective of the "escalation of the curriculum". Parents were aware of changes from their own experiences, in the curriculum and in the expectations of children. Some parents were worried about "pushing their child"; which is a major reason for parents not enrolling their child immediately upon the child reaching legal entrance age - a practice called 'holding-out', (see 1.3.5 below). However, another concern was that the kindergarten curriculum did not present sufficient challenge, essentially repeating preschool activities.

Graue (1993) surmised that a lack of daily worksheets and basal readers had led parents to believe the curriculum lacked "rigour", revealing a narrow parental view of learning which saw drill and worksheets as academic and learning, and everything else as social; hence producing conflicting expectations for the kindergarten program and teachers. This conflict in expectation has been caused by educators and the public being "encouraged to believe that if a teacher is sufficiently creative and ingenious in harnessing each individual's potentialities, expected learning outcomes will emerge in a way that the student will experience as spontaneous, natural, and comfortable" (Stone,1996).

1.3 Readiness

In 1990 the President of the United States, endorsed by the governors of all fifty states and reindorsed by President Clinton in 1994 as Public Law 103-227, proclaimed *Education 2000* (Kohler & Rusch,1995). *Education 2000* has six goals. The first goal is: "by the year 2000, all children will enter school ready to learn" (Cody,1993; Kagan,1990; Katz,1992). Cody said this goal forces society to focus on all that happens to children before entering school and the need to determine a shared and fair definition, and "measure", of readiness. Kagan (1990) said despite support for Goal One, the idea of 'readiness' poses real challenges as conceptually it has various definitions and interpretations and practically, poses problematic issues such as age for school entry, kindergarten retention, tracking, transition classes, the nature of the kindergarten curriculum and instruction.

As of 1992, Kagan wrote there is no professional or policy consensus regarding a definition of readiness, producing wide variance in practice. Graue (1992) asserted that definitions of readiness are embedded within communities. According to Katz (1992) the main debate centres on "the extent to which development and learning are determined by biological maturational processes versus experience". The maturation concept declares when children are more or less ready to benefit from formal instruction, while "interactionists" assert that it is the combination of inherent processes and experience which contribute to learning, and, that "human beings are born with a powerful, built-in disposition to learn" (Katz, 1992, p.2).

1.3.1 Child Ready / School Ready

A still broadly held concept views readiness as the "biological unfolding of psychomotor and cognitive structures" (Graue,1992). Maturation has been considered a prerequisite for learning with premature instruction thought to be possibly harmful. Willer and Bredekamp (1990) object to this view of readiness being a "single unitary condition" within every child and being primarily a function of time. These authors see readiness as multidimensional, dynamic, and enhanced by interactive challenge. Conversely, while Peterson (1994) does not see readiness as a single point in time, he does present an argument and evidence for "natural timetables for mind-brain development" which are consistent with Piaget's stages and which can be threatened or delayed.

'Readiness to learn' (Kagan,1990 &1992) considers all aspects of the domains of the whole child affecting preparedness, or capacity to learn specific material or skills, *at any age*. Readiness to learn assesses independent functioning, "... recognising the fluidity of the multiple developmental processes that influence such readiness" (Crnic & Lamberty, 1994, p95).

Another concept, 'readiness for school', is said to be characterised by inflexible standards in affecting domains which are expected to have been achieved prior to school entry. Gullo and Burton (1992) studied aspects of "academic readiness" as a single construct. Schoen and Nagle (1994) studied temperament in relation to task oriented behaviours, as a predictor of school readiness. Readiness for school "... Is

a more rigid construct, dictating the belief that a specific set of cognitive, linguistic, social, and motor skills must be attained to indicate readiness" (Crnic & Lamberty, 1994, p.95). Children who can not meet school standards are often considered 'unready'. However, Bredekamp (1990) wrote that when large numbers of children are considered unready, the problem usually lies with developmentally unsuitable curriculum and teaching practices.

In a *Readiness Issue Paper*, the Connecticut Early Childhood Education Council (1990) said that in practice, readiness criteria determine a child's behavioural and cognitive ability to "adjust and adapt" to the expectations and standards set by the school. In this definition, it appears that the child's capabilities of coping within the system are what is being assessed. Willer and Bredekamp (1990) see efforts to improve school accountability as having led to such definitions of readiness. Defining readiness in terms of specific skills expected prior to school entry, "is defining readiness as gatekeeping", rather than determining intervention and instructional needs, and is an inappropriate practice. Meisels (1992) argued that exclusion is practised to make the system work, thus avoiding modification of the system to accommodate the needs of children.

This gatekeeping interpretation is posited as a systemic attempt to reduce failure by "allowing already solid performers into the school and keeping out exactly those young children that might benefit the most from exposure to academic opportunity" (Crnic & Lamberty,1994, p.97). Another form of gatekeeping is readiness assessment to retain children in the same kindergarten or to place children in transition classes, or 'extra-year programs', prior to kindergarten or first class. These practices are all considered forms of retention. Currently, these practices are not prevalent in NSW, although retention in the same kindergarten class is fairly common.

There is a lot of literature and research regarding teachers' beliefs about retention and the various aspects and effects of all forms of kindergarten retention (Cannella & Reiff,1989; Cosden et al.,1993; Kundert et al.,1995; Niklason,1987; Mantzicopoulos et al.,1989; Phillips, 1992; Pianta, Tiebohl & Bennett,1997 [this article includes a good review of past retention research beyond those mentioned

here]; Siegel & Hanson,1991; Tomchin & Impara,1992; Zepeda,1993). Bredekamp (1990) argued that retention practices resulted from inappropriate curriculum in primary grades if a whole class of children is not considered ready.

The various concepts of retention actually place the responsibility of being ready on the child, instead of the system being ready to meet children's variant developmental and learning needs. In reality, the failure is not the child's, but the school's (Crnic & Lamberty,1994; SECA Institute Report,1993). Children may not be ready to learn what schools want them to learn (Katz,1992). Attributes said to determine that a child is 'unready' for school, are usually those best improved in school (Willer & Bredekamp,1990).

In a plenary address to the 1997 Early Years of School Conference, Katz said: "it is reasonable to assume that all children come to school with the dispositions to learn and to make the best sense they can of their experience, even though they might never have been read to, heard a story, looked at a book or held a pencil, or otherwise become 'ready' for school" (cited in Department of Employment, Education Training and Youth Affairs, 1997, p.19).

1.3.2 Child Care / Preschool

> "The care and education of children outside the school system cannot be left to chance and must become a national priority in its own right. ... It is now widely recognised by psychologists and educationalists that the experience of children in the various types of services, can have a significant impact ... on all areas of development including intellectual, language, social, emotional and perceptual-motor development" (Wangmann,1995,pp.99 & 102).

The above statement from the *Early Childhood Study Paper No.6*, the Australian Institute of Family Services (AIFS), could easily be the preamble to the American Education 2000 Goal One, (see 1.3 above). The importance of effective early intervention and preschool experience was noted previously in this Chapter (1.1), and the base of substantiating research continues to grow. For example: Gullo and Burton (1992) studied the effect of preschool on 'academic readiness' at the end of kindergarten of 4,539 children, as determined by the Metropolitan Readiness Test (MRT, Nurss & McGauvran, 1974, cited in Gullo & Burton).

They found that the children who entered (government) preschool at age three or four scored significantly higher on the MRT at the end of kindergarten, than did children who entered at age five. Further, the younger children in the age four and five cohorts scored lower than their older counterparts. However, in the age three cohort no differences were found in scores from youngest to oldest children, nor did gender contribute to difference. Results indicate that preschool for younger children can reduce their academic risk, especially for males, and that preschool is of benefit for "the general population of non-at-risk children". Similar positive results regarding the relationship of preschool experience and success in the early elementary grades, were found by Sheehan, Cryan, Wiechel & Bandy (1991). This evidence clearly signals that early intervention assists early school success.

Social factors (especially those regarding changed family groups), economic and political factors and research, have all contributed to a great demand for abundant and 'quality' child care and preschool places. For example, in Australia, Brennan (1995/6) wrote that 45% of mothers with children up to age four, were working, and also two thirds of mothers with children between the ages of five and twelve. A report in the Sydney Morning Herald stated that about half the mothers with children under five are working (Loane,1997).

Mazzarella (1990) said of 'quality' programs, they meet the assessed needs of children with a specifically defined structure of goals and individual child objectives, and careful monitoring of procedures and child progress. The AIFS Study Paper called for a national (Australian) perspective with strategies for the resolution of issues and the building of an integrated national child care industry based upon consistent and reliable government funding, to assure quality standards and accreditation (Wangmann,1995). The paper's strategies include national standards, community education, whole family approach, ongoing government influence, and development of a national children's services database. Judging from the researcher's work with advocacy groups and teaching in schools, such a database would be extremely helpful to immigrants, new parents and Australia's rural population to help children be more ready for school with information for parents and doctors regarding typical development, assessment and early intervention.

Katz (1994) said evaluating the quality of early childhood programs has been high on the research agenda since the early 1980s; theorising that less than "top quality" misses the opportunity to give children the best start to their education. Examples of this type of research are: Howes (1990) studied the quality of child care and age of entry into child care, as predictors of adjustment in kindergarten. Baydar and Brooks-Gunn (1991) studied the effects of maternal employment and child-care arrangements on preschoolers' cognitive and behavioural development.

Phillips, Voran, Kisler, Howes & Whitebook (1994) studied the quality of child care / preschool services for children in various socio-economic circumstances. These researchers found: centres in upper income areas provided the highest quality care "across multiple indices"; centres in middle income areas "almost uniformly provided the poorest quality care"; the quality of care from centres in low income areas matched that from high income areas on most indices, but these teachers "were observed to be less sensitive and more harsh" (Phillips et al., 1994, p.472). The concern is that while research and experience have identified the positive worth and significant attributes of quality child care, funding arrangements can preclude quality child care.

1.3.3 Child Care / Preschool in Australia and NSW

The Commonwealth of Australia addressed the quality issue with the Quality Improvement and Accreditation System for Centre-based long day care centres, administered by the National Childcare Accreditation Council (NCAC), (1993, revised in 1996). This non-binding policy establishes parameters of quality defined by 52 principles focusing on the "highest" standard of care and developmentally appropriate practice in education, leading to "good" outcomes of health, intellectual, physical, social, language and creative development, and emotional security.

The NSW Department of Community Services issued Regulations and Licensing Guidelines for Centre-Based Child Care Services stating minimum standards, based on 1987/89 legislation (Duffie,1991). One guideline (of eight) speaks to planning, developing and implementing appropriate programs designed to "enhance the social, emotional, intellectual, cultural and physical skills of each child". Although a licence

is required for a facility caring for six or more children under the age of six, a trained "person", "with a degree or diploma in Early Childhood from a recognised College of Advanced Education or University", is not required until a minimum of 30 children are being cared for at the facility (p.10). Two qualified persons are required when there are 40 children in attendance, and three with 50 children.

Wangmann (1995) said government withdrawal from meeting the demand for child care places led to reliance on private sector providers. 75% of long day care centres are run by private operators for profit (Loane, 1996). Across Australia commercial and employer-supported services accounted for the majority of pre-school places for children age 0-4, with NSW and Victoria leading in employer-supported care (Brennan, 1995/6). In all other states, the Northern Territory and the Australian Capital Territory, the majority of children's services are supplied by community providers; those affected most by the removal of operational funding. Brennan points out that commercial providers may set up where they please and still attract Commonwealth Government Child-care Assistance, despite such money being targeted for 'high needs areas'.

Wilkie (1997) said that the removal of Operational Subsidies would cause fee increases, undercut quality, force centres to close, creating more "backyard set-ups" and "latch key kids". In NSW, Davey (1997) reported that one local government area lost $348,000 in Commonwealth operational funding and as a result, although being an area identified as a 'high needs area' owing to services not meeting demand, there are now 500 child care vacancies in that area because services became too expensive. From a State-wide survey (N=1,300) regarding results of cuts to child care for families, 95% reported paying more for child care with a decrease in quality of care, one in six parents left their job owing to rising child care costs and one-quarter moved their children to cheaper forms of care (Loane 1997). Wilkie (1997) reported that a Commonwealth government spokesperson said that while some city OSHC services may close, the overall situation will improve when rural benefits are taken into account. Such funding arrangements are likely to result in less quality care and therefore an increased need for schools to assess all kindergarten children at school entry to identify their current levels of function.

From January 1998, the Australian government increased child care / preschool financial assistance to be paid directly to families, supposedly giving families purchasing power in an open market and thus public spending is seen to be reduced. This tactic is seen as placing children's services among the dictates of the economy; an economic policy which Tansey (1997) and Berliner and Biddle (1995) see as a form of economic rationalism. More families became eligible for financial help by concessions such as a "disadvantaged area subsidy" for rural services (Wilkie,1991). The intent was to create equity, with affordable places where they are most needed, and to meet a projected requirement for sufficient work-related child-care places by the year 2001 (Brennan,1995/6; Wilkie,1997). The rhetoric claims that affordable high quality care should be universally available with well-trained highly motivated stable staff and optimal learning environments. However, achievement of these goals means expensive operational costs (Cullen,1997; Wangmann,1995), but unfortunately the 1998 subsidies are partially funded by the removal of operational allowances to Outside School Hours Care (OSHC). Operational allowances have been crucial to initiation and maintenance of high quality care.

A recent Victorian state survey regarding the consequences of "massive" (1994) cuts of around 20% to preschools' operating budgets shows: group sizes increased with 43.9% of four year old children in groups of 25 or more; fees "soared" including penalties and exclusion for unpaid fees; teachers' hours were reduced translating to 87.5% of teachers reporting increased administrative and instruction workloads; more than 100 centres closed (Kronemann,1996). With decreased funding, the state of NSW may look forward to similar consequences. This situation may translate into more NSW children having less access to early intervention and therefore entering formal school less prepared for success within the current academically oriented curriculum. This situation makes equal access to assessment of all kindergarten children's developmental and learning needs at school entry, even more essential.

Sheehan et al. (1991) and Siegel and Hanson (1991) found full-day preschool attendance, at least the year prior to entering formal school, is significantly helpful to children's success in kindergarten and beyond. As reported in this thesis from the Parent Surveys, 92% of children in the combined 1995 and 1996 Samples did

attend preschool the year prior to enrolling in kindergarten. However, country children had less opportunity to attend preschool as there were very few places available, some of which were only one half day per week. Within the 1996 Sample, 76% of city children attended preschool 3-5 days per week compared to just 20% of the country children, (see 4.5.7 Preschool Experience, Chapter Four).

Policy-makers are aware of general descriptive statistical information which is usually insensitive to intervening variables such as actual rural access to information and services, and therefore, they are usually not aware of the enormous range and combinations of individual differences among kindergarten children. Policy-makers are also aware of research regarding early childhood development and quality preschool education and may assume children are entering formal school with similar preschool experiences, which can lead to one-size-fits-all instruction. Without centralised accreditation and quality assurance of standards for child care and preschool, readiness differences among children will continue to challenge the current centralised curriculum, impact instruction, and frustrate the expectations of teachers, further heightening the necessity of knowing the assessed developmental and learning needs of each child. In Australia, from 2000, training and credentialing standards for child care and preschool workers will be governed by the National Competency Standards, and implemented locally by registered training organisations (Burke, 1999).

> "It seems we need to re-focus our thinking in children's services so that we create a climate where the needs of children and their families are genuinely at the centre of policy and where we are not channelling children into services shaped by anachronistic assumptions about family life or economic priorities of government" (Brennan, 1995/6, p.6).

1.3.4 Diversity / At-Risk

Diversity of life circumstances also contributes to the considerable variety of individual differences among kindergarten children. Children with diverse culture, ethnicity, language, socio-economic experiences as well as general readiness for formal school, present a complex mixture of factors not faced by schools years ago. Linguistic and cultural diversity have become the norm in most developed countries,

dramatically increasing the proportion of ESL students in schools. This increase is primarily due to high rates of immigration and declining native-born birth rates (Carey & Mosemak,1997; Cummins,1990; Siguan,1990). "Accommodating student diversity has placed complex demands on schools, particularly those in urban communities" (Wang & Haertel,1995), p.160).

Issues of diversity and risk factors (which are often one and the same), have been researched and deliberated by a great variety of stakeholders within the major areas of interest in early childhood. However, a misuse of risk factors is that at times, all children from backgrounds which tend to generate known risk factors have been labeled as being at risk which in turn, can create unrealistic expectations about children's competencies. 'At-risk', as a labelling concept is usually defined by the social, political and economic parameters considered acceptable to the primary group in power (Fine,1990; Flores, Cousin & Diaz,1991).

ESL speakers and other minority groups, such as those with low socioeconomic experiences, have been labelled as being at-risk. In the extreme, Fine (1990) said groups who "suffer" due to risk factors are labelled because "it satisfies both the desire to isolate these people, by the Right, and to display them, by the Left" (p.55). Flores et al. (1991) wrote that labelling children of diverse language and culture as being at-risk perpetuates a negative perception the children are starting school with a language deficit, which will probably lead to learning difficulties. Katz (1992) wrote: " 'At-risk' children are often assumed to be deficient in experience and to suffer from lack of stimulation and therefore to be intellectually unprepared for school" (p.4).

Jens and Gordon (1991) wrote of the need for prior-to-school identification of risk factors in early childhood to minimise the effect of those factors which may contribute to vulnerability. The American early intervention program Head Start is a prime example of how successful this strategy can be. The authors listed known risk factors within the areas of the child's constitutional make-up, family, and/or environment. However, Hrncir and Eisenhart (1991), and Horin (1999), warn against looking for problems everywhere and labelling young children unnecessarily as risk is not static, children develop within dynamic environments, and standardised

test scores are not effective predictors of risk for young children. Connell (1994) wrote of a changing focus from the attributes of disadvantaged children to the attributes of school systems.

Cummins (1990) wrote that in schools, minority students are "empowered" or "disabled" depending on interaction with their teachers. Cummins said when minority students feel positively oriented toward their own culture and the dominant culture, with no personal perceptions of inferiority to the dominant culture, widespread school failure does not occur. While this view was primarily directed to linguistic and/or cultural diversity, the message about perceptions and expectations toward diversity would be none the less true regarding any deviation from any supposed norm.

The combination and interaction of affecting intervening variables for each child - inherent factors (medical, physical, neurological and cognitive), and environmental factors (home, culture, communities and experience, including preschool) - are what create diversity. A positive transition from home to school with subsequent positive school experiences and learning, which can translate to positive parent / school attitudes, will depend upon the extent schools recognise and respond to the individual differences of all children (Ramey & Ramey, 1994). However, "When the resulting heterogeneity of children's characteristics and capacities is met by a uniformity of teacher expectations and behaviour, many children become cognitive and social casualties" (Sameroff & McDonough, 1994, p.193). While it was not within the scope of this thesis to elaborate upon these various diversity factors and their impact upon early childhood education, these issues must be recognised by all stakeholders as affecting kindergarten children, their families and schools.

1.3.5 Entrance Age

> "Specifically, the relationship between chronological age and school success is still open to debate in spite of the quantity of words written and the extensive controversy the problem has generated" (Miller & Norris, 1967, p.48).

Current concerns about the age children are 'ready' to enter formal school are usually based on personal knowledge and opinion preferences about early child

development and education, and in particular, the nature of kindergarten curriculum. There is actually no research base which convincingly establishes the most appropriate age for school entry (Crnic & Lamberty,1994; Miller & Norris,1967).

Miller and Norris (1967) wrote that since the first American compulsory school attendance legislation in 1852, in Massachusetts, data has been gathered and a lot has been written regarding the age when children should enter formal education "outside of their homes" (p.47). A summary of the authors' review is that in the main, the attempt was to relate chronological age at school entrance to subsequent school achievement, focusing on the aspects of either the child adapting to the current school structure [child ready], or the school structure meeting the needs of the child [school ready - see 1.3.1 above]. The authors cited a 1961 report of the Illinois Childhood Education Association which concluded that one might either adjust the entrance age policy to ensure probable school success, or adjust the school program to meet the needs of all eligible children.

There are many studies on issues surrounding entrance age to formal school. For example, Gredler (1980) took exception to the maturationist view and the expectations of many teachers, that because younger children, especially males, are the more likely to be retained, they must have maturational difficulties. Gredler argued that individualised adaptation of instruction based upon assessed need is required for the 'unready' child, not repetition of the same and assuming age alone is the problem. Langer, Kalk & Searls (1984) reported that the early significantly higher achievements of oldest students upon school entry were still evident at age nine, but decreased by age thirteen, disappearing by age seventeen.

Braymen and Piersel (1987) pointed to a general pessimism in the literature regarding the academic achievement and social / emotional adjustments of "early entrants", suggesting required screening procedures to identify and eliminate those possible early entrant children who seem more likely to have difficulties. An early entry system was introduced in NSW (Australia) in 1991 allowing children to enter kindergarten at age 4.0, with presentation of specific provisions and agreement of the school principal. De Cean (1997) reviewed for parents and teachers related issues of early entry and requirements for NSW early entry, (such as IQ assessment

and demonstrated skill levels well above average for the class they wish to enter).

It is interesting to note that recommendations to teachers for coping with these children, cited by De Cean (1997) and taken from the NSW Department of School Education guidelines for meeting the needs of gifted children, all seem equally relevant and appropriate for meeting the needs of all learners such as: evaluate which concepts children have mastered; use learning centres in the classroom; assist children to identify problem areas in their areas of special interest; organise a mentor with similar interests; stimulate learning; let the child progress through basic skills at his own pace.

Crosser (1991) analysed year five and six "academic achievement indices" of children who entered school at age five or six. In general, Crosser found greater academic advantage for the older children, despite gender, although scores on reading subscales were significantly higher for older males, than younger males. Sheehan et al. (1991) found that older children performed better than the younger children on academic tasks through third grade, and that the younger children are more likely to be retained and referred for special help. Further, the youngest eligible children who were delayed a year before enrolling performed better on kindergarten and first grade standardised tests than did those youngest children who were enrolled. However, one would need to know intervening variables such as did the children who were held out attend preschool and if so, what was the nature of that preschool program, and also, what was the nature of the kindergarten school program for those younger enrolled children.

Bellisimo, Sacks and Mergendoller (1995) studied changes in the practice of 'holding-out' age eligible children from kindergarten enrolment, citing among findings, that parents at higher SES levels and more boys are associated with holding-out. Brent, May and Kundert (1996) presented a twelve year review of the incidence of delayed school entry finding that in general, there had been a significant increase in these numbers of children from 5% to 16%, with significantly more males and youngest children most often held out. In a year three survey of parents in the Brent study who held their children out, 93% cited the academic orientation of the kindergarten curriculum as their reason. Consequences of holding-out include:

a wider range of age (and therefore also of achievements and experiences) in each class; older age kindergarten children tend to encourage expansion of the academic curriculum thought necessary to challenge these children and to meet the expectations of parents (Brent et al.,1996; Meisels,1992).

Miller and Norris (1967) studied the academic achievements of fourth and fifth grade students in relation to their initial school entrance age. The age groups of children studied were those of "normal" entrance age, those younger and those older. Results showed that standardised readiness, intelligence, and achievement scores were not significantly different at any grade level, although scores of the late group were more varied. The researchers were disturbed to find late entrants were retained more and referred more frequently for psychological study than normal or early entrants, and had sociometric ratings indicating problems with conformity to classroom behaviour, following directions, and completion of assignments.

The organisation of the "primary unit" of that school system featured eleven instructional levels based upon reading achievement and a twelfth enrichment level, with individual pacing of progress. The researchers concluded: that younger children be admitted "if the primary program is flexible enough to provide instruction at their levels of development"; that there be a determination of social and personal factors of retained students not considered academically deficient; and that local policies depending on local factors such as type of program operating, should determine entrance age (Miller & Norris, 1967, p.59). In NSW, the last of these conclusions is not possible owing to a centralised system of administration for the whole state determining policy such as entrance age.

The changing curriculum, research and changing philosophies about early childhood development and education, and social and economic changes with their attending expectations (for parents, teachers, administrators and policy makers), are all factors affecting viewpoints regarding entrance age. The Independent Teachers Association of NSW undertook a broad survey of early childhood educators as part of a state review of kindergarten entrance age (Kenny,1987). Survey respondents agreed that except for isolated incidents, children age 4.6 are too young for school entry citing many reasons, including the demands "these children make on teachers".

Respondents also called for better resourcing of early education such as early intervention and smaller class size, (which to some extent, has taken place).

Research findings reported in this thesis reflect the Miller and Norris (1967) findings in that chronological age at school entrance seemed less indicative of success than the operating systems and methods of instruction in the schools. This idea is far from new: Gredler (1980) cited Gates (1937), who showed the successes of kindergarten children of different mental ages (not chronological age) were linked to the different methods of instruction used by teachers; which introduces the ideal of accommodated instruction depending upon need.

1.4 Kindergarten Screening

In the field of early childhood, the definition of 'screening' varies. In the present study, screening is taken to mean initial assessment of kindergarten children's school-entry abilities and skills to identify their developmental and learning needs to guide referral and instruction, (not placement). This definition is broader than that often attributed to developmental screening which according to Lewis (1993) refers only to developmental and health factors.

Developmental screening has been used to determine referral, placement, and disability status only, such as has been used for Head Start (Meier,1993), not as a tool for immediate instructional planning. Lewis (1993) said that it is within this context that some misconceptions about the use of kindergarten screening instruments, have evolved. Further, it is within that context that researchers have been anxious about establishing the predictive validity of developmental screening instruments (Drillien,Pickering & Drummond, 1988).

In the 1980s and 1990s school entry screening (sometimes called readiness testing), has been criticised due to concerns about using standardised testing in early childhood, lack of appropriate empirical validity and reliability evidence for some screening instruments, and misuse of results. Policies and individual placement decisions which sort, label, track or retain children are considered inappropriate (American Academy of Pediatrics,1995; Bredekamp & Shepard,1989;

Cannella & Reiff,1989; Charlesworth,1989; Ellwein et al.1991; Meisles,1992; Meisles et al.,1993; Shepard & Graue,1993; Siegel & Hanson,1991). These practices, often referred to as 'gate keeping' and mostly seen as emerging from accountability aspects of the excellence in education reforms, are said to try and fit each child to the system; for example, trying to equalise the vast range of age, ability and skill levels, and diversities among kindergarten children.

In response, the American National Association for the Education of Young Children (NAEYC) and the National Association of Early Childhood Specialists in State Departments of Education (NACES/SDE) published guidelines for appropriate assessment and curriculum for children age three to eight (1991). [See I.1, Introduction, for a review of the guidelines.] In general, their position states that while assessment is essential for planning instruction, for communicating with parents, and identifying children who may be in need of specialised services and instruction, it must benefit children.

> "Assessment of children's development and learning is absolutely necessary if teachers are to provide curriculum and instruction that is both age-appropriate and individually appropriate. ... The appropriate use of initial assessment is to find out what children already know and are able to do and to use this information to adjust the curriculum to the individual children" (NAEYC & NACES/SDE, 1991, p32 - 33).

In Australia, the House of Representatives Standing Committee on Employment, Education and Training, Canberra (1992), issued a report which states: "It is essential that all children be screened for potential difficulties, ideally on entry to preschool, and certainly on entry to primary school ... all children need to be screened for difficulties in literacy learning ... not only by teachers, but also health professionals, such as physiotherapists, occupational therapists, speech pathologists, medical officers and social workers" (p49). While this statement only mentions literacy, the breath of screening suggested at least acknowledges the importance and influence of various affecting domains upon literacy, and also the necessity for all children to be screened.

There seems to be no argument about the capability of kindergarten screening to

validly indicate current ability and skill function, but exception is taken to the prediction of future achievements from screening (Kagan,1992). While some concerns about standardised tests (in this case kindergarten screening instruments), surround validation issues, most are about appropriate generalisations and consequential decisions made from results. Screening / readiness tests have been used for purposes for which they were not designed (May & Kundert,1992).

Barclay & Breheny (1994) seemed to dismiss all "standardised testing" as being inappropriate "in the early childhood years", but then cited only "traditional paper-pencil types" as being harmful to young children (p.215). The objection does not appear to be to standardising, but the form of test used in relation to purpose. Is the test itself harmful to the child, or generally harmful to children because of questionable validity of decisions made based on measurement results, or both? The primary question must always regard the purpose of the testing. Is the information required about outcomes (to document the achievements of a student, or of students for accountability), or is the information required diagnostic in nature and meant to inform instruction? If accountability is the answer, is the testing genuinely meant to evaluate teaching methods and interventions, or to collect evidence for ranking (at any level)?

If there are legitimate purposes for gathering data, then there can be assessment in an appropriate form and with appropriate content in relation to purpose (Shepard, 1994). Despite a negative background attached to kindergarten screening, currently in United States the screening of kindergarten children is thought to be so important that at the beginning of the 1998/99 school year, commissioned by the U.S.Department of Education, the assessment of 23,000 kindergarten children was planned. Assessment content is reflective of children's developmental and learning needs in relevant affecting domains. The Early Childhood Longitudinal Study: Kindergarten Cohort, conducted by the Goal One Technical Planning Group of the American National Education Goals Pannel, will also collect information on each child's family, community and school/programs, and will follow these children through grade five. The purpose of the then proposed study, is to inform public policy and chart progress toward the National Educational Goals (Shepard,1994). Shepard said studies of this type and size serve program evaluation and research

purposes.

Sanders and Horn (1995) said standardised tests have been able to provide comparability information of attainment levels based on stated standards, over time, whereas 'alternative assessment' has been unable to demonstrate the same qualities on a large-scale, and be cost or time efficient. By contrast the authors admitted that alternative assessment, in this case performance assessment, is more sensitive to individual differences and requires teachers to become more involved in the assessment process. Perceived disadvantages of traditional assessment created a call for assessment which is perceived to be more fair; although evaluation objectivity is an advantage of standardised tests. Sanders and Horn (1995) said current measurement methodology and computer technology have made some old concerns about standardised tests obsolete. [For a full discussion of measurement validation and of alternative/performance assessment see 3.2 and 3.3, Chapter Three.]

> "Standardised test scores, when subjected to appropriate methodologies and utilised for appropriate purposes, provide rich data for educational assessment. It would be lamentable if the perspective these data can afford were obscured by arguments no longer valid" (Sanders & Horn, 1995)

In Australia there is no existing Commonwealth or NSW State legislation comparable to the American National Education Goals, or Public Law 94-142 (which targets preschool and school children to age eight with disabilities, including learning disabilities), or Public Law 99-457, (which targets infants from birth through age two with developmental disabilities). According to Casey and Swanson (1993) the above initiatives have "forced states to identify and manage children with developmental problems" (p.210). The early identification of children with developmental and/or learning problems is essential for optimal results from intervention. However, Casey and Swanson point out that many American children do not have access to the type of "developmental surveillance" being urged. Many parents in Australia would not have access to early childhood developmental assessment or intervention. Therefore, it is crucial to the personal and academic success of their children, that all children have the opportunity to be assessed upon entry to kindergarten to identify their developmental and learning needs.

Chapter Two - Assessment Domains

Introduction

The Kindergarten Screening, the assessment instrument developed for and used in the study reported in this thesis, was designed to investigate the performance of kindergarten children in the following domains: motor ability, language and reasoning, and some personal characteristics. While Chapter One, Section 1.1, presented general discussion in reference to past and current concepts and issues of developmental and learning theory in early childhood, Chapter Two presents specific contemporary research and theoretical perspectives within the assessment domains of The Kindergarten Screening and their relation to early childhood development and significance for kindergarten children. Contemporary knowledge of typical development and affecting variables in early childhood within these assessment domains helps frame an accurate understanding of the reasons for their inclusion in the instrument.

2.1 Motor Ability - Introduction

The Kindergarten Screening directly assesses motor ability in the categories of Outside Motor (Checklist Items 1-9) and Fine Motor (Checklist Items 10-19). While aspects of motor coordination are quite biologically discrete, typical early childhood development and learning depends to a great extent upon the successful integration of motor function with other developmental domains. "Certainly the domain of motor skills represents development in its most dramatic progression from struggle to habit" (Denckla & Roeltgen, 1992, p.455). An appreciation and understanding of the interdependencies of perceptual, cognitive, experiential and environmental factors in skilled motor function, and the relationship of motor competence to the school curriculum (Bushnell & Boudreau,1993; Catherwood, 1994b; Dighe & Kettles, 1996; Henderson, 1987; Larkin & Hoare, 1992; Shephard, 1995; Smyth & Glencross, 1986; Thelen, 1985; Turvey & Fitzpatric, 1993), seems crucial to effective assessment and instruction in early childhood education.

> "When behaviour is skilled - rapid, smooth, reliable, and accurate - the coupling among the component elements is stable. When movements are unskilled, however, subsystems are more loosely assembled, more variable, and more easily disrupted" (Thelen, Corbetta, Kamm, Spencer, Schneider & Zernicke, 1993, p.1060).

Achievement of motor coordination and its relation to other perceptual domains, learning, experience, and environmental factors, and also the relationship of motor function to atypical behaviours such as dyslexia, learning disabilities, attentional, social and behavioural difficulties, have been the topic of a resurgence in early human movement and coordination research. This research was firstly motivated from the 1960s by the work of Walton and his colleagues, and of Soviet theorists such as the physiologist Nikolai Bernstein. Contemporary motor (perceptual, language and cognitive) research regarding typical development has been aided by the availability of new computer and brain imaging technologies, new methodologies and assessment techniques and resulting new theories (Bushnell & Boudreau, 1993; Catherwood, 1994a; Haith, 1990; Friel-Patti, 1994).

2.1.1 Theoretical Perspective

As discussed in Chapter One, section 1.1.1, Hall and Gesell are usually credited with initiating the scientific study of early childhood development. These researchers, along with M.Shirley and M.McGraw, spent the 1920s-1940s meticulously documenting the onset of specific behaviours and observing progress (Hopkins, Beek & Kalverboer, 1993; Thelen, 1995; Shepard, 1995). For example, Gesell described age norms for 53 stages of rattle behaviour with similar records for 40 different behavioural stages and sequences (Thelen, 1995). Their work formed what became for many years, and to a large extent still is a theoretical and textbook frame for the development of motor function in early childhood. Within this frame, motor development was thought to be inherent and universal (all same age children demonstrating same behaviours), with the inevitable and invariant sequential emergence of motor milestones being hierarchically programmed (from reflexive to voluntary behaviour), and guided by maturation, which in turn was dependent upon a timetable unique to each child (Bushnell & Boudreau, 1993; Deuel, 1992; Hopkins et al., 1993; Lockman & Thelen, 1993; Shephard, 1995; Thelen, 1995).

Until Walton's descriptive studies about 'clumsy' children appeared (Lord & Hulme, 1987) and translations of Bernstein's work in 1967 (Turvey, 1990), the above views of children's passive motor maturity remained in the background against studies regarding changes in perceptual processes, cognitive development, and social behaviour (Lockman & Thelen, 1993; also see discussion 1.1.1, Chapter One). According to Lockman and Thelen, Bernstein was the first to present the concept of 'biodynamics' in relation to human movement.

> Contemporary theories "suggest the possibility of a pattern formation or dynamics approach to child development as an alternative to the conventional approaches emphasising maturation (nativist), specific learning experiences (empiricist), cognitive stages (Piagetian), and strategies of encoding and retrieval (information processing)" (Turvey & Fitzpatrick, 1993, p.1175 - parentheses the authors').

Bernstein (1967/1993) described motor coordination in terms of the self-organisation of hundreds of 'degrees of freedom' which exist among muscles, joints, cells (the musculoskeletal system), and of the ever changing spatiotemporal / environmental conditions[5], involved in each and every human movement (Hopkins et al., 1993). The question became: How are the multitude of affecting variables reduced or limited, organised and controlled, to produce coordinated movement? The problem Bernstein posed was understanding the bringing into an appropriate and efficient coordinated relation the complex system of "multiple and different component parts ... defined over multiple scales of space and time [and] in so doing, he underscored the essential formative and steering roles of the information available to perceptual systems" (Turvey, 1990, p.938).

> "Attempting to deal with the interaction between neuromotor systems, the energetics, and the environmental constraints is awesome" (Larkin & Hoare, 1992, p.424).

In the last decade, the study of early childhood development has been enriched by multidisciplinary process-oriented studies in movement science, perceptual psychology and neuroscience resulting in new insights into the "multicausal, fluid, contextual, and self-organising [procedure] by which infants and children learn to control their bodies" (Thelen, 1995, p.79). In this case contextual means task

specific (Hopkins et al., 1993; Shephard, 1995). Individual action elements are not seen to be controlled by fixed linear cognitive development or maturation of the central nervous system "with each structure along the pathway ... assigned an invariate function" (Deuel, 1993, p.240).

Movement variations are functionally limited by their linkages among available elements in a synergistic organisation of the motor system, with the same elements able to reorganise into different performance variations depending on the task (Thelen, 1985). Hopkins et al. (1993) call these limiting factors "control parameters", writing that "different processes can act as control parameters at different ages in motor development" (p.355). According to these researchers, control parameters are the experiential factors and non-linear maturing conditions of the perceptual, cognitive and motor subsystems, allowing age-specific developmental transitions to occur. Varying conditions such as sufficient body strength to walk or degree of muscle stiffness, or even cultural expectations, can create the occurrence of individual differences.

With increased understanding of neurophysiological and biodynamic factors in human movement, there is a different view of motor development in early childhood than traditionally imagined. There are changed views about the influence upon performances of task elements, effects of learning and experience, and the environment in which the task is performed, as contributing factors to controlled human movement (Larkin & Hoare, 1992; Shephard, 1995). This view is centred on the self-organisation of unique patterns among the perceptual-action systems "in which the components relate mutually and reciprocally", mediated by growth related changes and spatiotemporal factors (Turvey & Fitzpatrick, 1993, p.1186). [For further discussion of current developmental theory in early childhood from another point of view, see 1.1 and 1.3.1, Chapter One.]

Owing to all the variables necessarily and collaboratively involved in achieving coordinated movement, modern theory teaches the seeming impossibility of action being predetermined, having just to await its time to emerge. According to Thelen, the unity of perception, action and cognition has been restored making "obsolete many old debates in developmental psychology, particularly those that pit nature

against nurture" (Thelen, 1995, p.80). The contemporary view of atypical motor function describes a heterogeneous group of children owing to various combinations of deficits and secondary effects.

2.1.2 Developmental Coordination Disorder

> "Children who have unusual difficulties with the performance of motor skills which cannot be attributed to any identifiable intellectual or physical cause ... are likely to suffer from an expectancy of failure, a poor self concept, and feelings of depression, frustration and anxiety which are detrimental to learning" (Smyth, 1993, p.12).

The term 'developmental' or 'immature' in respect to a motor (or language) delay usually refers to function considered typical at a younger age but atypical at a later age, as opposed to a deficit considered atypical at any age such as a neurological disorder like cerebral palsy, or known chromosomal or other heritable syndromes (Deuel, 1992; Fox & Polatajko, 1994; Sprinkle & Hammond, 1996). However, sometimes an unfortunate and often unwarranted assumption from the 'immaturity' concept is that if the child is given time and tries harder, the child will mature and grow out of an apparent developmental delay and eventually achieve an acceptable level of function (Denkla & Roeltgen, 1992; Dighe & Kettles, 1996; Larkin & Hoare, 1991; Deuel, 1992). While time to mature can be the answer for some children, for others, waiting for maturity can result in learning unacceptable adaptive behaviours, often creating a need for later remediation caused by inappropriate or less than effective function.

Children's motor awkwardness is a recognised, internationally identified disorder. A recent term describing the disorder is developmental dyspraxia, reflecting the concept that the cognitive objective to organise and plan movement in response to sensory input is somehow impaired (Dighe & Kettles, 1996). The diagnostic label of the World Health Organisation is Specific Motor Retardation, and from the American Psychiatric Association, Developmental Coordination Disorder (DCD) in the *Diagnostic and Statistical Manual of Mental Disorders*[6] (Denckla & Roeltgen, 1992; Deuel, 1992; Fox & Polatajko, 1994; Henderson, 1993). Sometimes the terms DCD and dyspraxia are used interchangeably (Alston, 1996).

Longitudinal studies such as Loose et al. (1990) and Hamstra-Bletz and Blote (1993), show that children's motor difficulties and resulting poor self-concept and academic problems are evident into teenage years. Reports of the incidence of children with motor dysfunction / awkwardness vary from 5% to 20% depending upon definition and the nature of the studies regarding degree and area of the dysfunction being identified (Larkin & Hoare, 1991; Schoemaker & Kalverboer, 1990; Short & Crawford, 1984; Smyth, 1993; Unwin, 1995). McGlinn and Hawke (1988) reported 6% of children aged 4-7 years screened in their study (N=159), showed marked motor immaturity or dysfunction and were referred for physiotherapy assessment.

Children with motor impairment (DCD) can usually be distinguished from those functioning at the low end of a typical distribution as they do not generalise as well from intervention and are more likely to have associated learning, attentional, social, behavioural or speech difficulties (Fox & Polatajko, 1994; Gubbay, 1989; Hoare & Larkin, 1991; Kalverboer, de Vries & van Dellen, 1990; Michelsson & Lindahl, 1993; Schoemaker & Kalverboer, 1994; Sovik & Maeland, 1986). The motor performances of DCD children are often inefficient and awkward, slow and inaccurate, especially when speed and a high degree of accuracy is required (vanDellen & Geuze, 1990). DCD children are a heterogeneous group whose difficulties with motor planning and/or mastering motor tasks are often inherited, vary in severity and range of difficulties, and have no readily explicable or obvious intellectual, sensory, neurological or physical disturbance (Gubbay,1989; Denkla & Roeltgen, 1992; Henderson, 1987; Henderson, 1993; Hoare & Larkin, 1991; Hume & Lord, 1986; Larkin & Hoare, 1991; Smyth, 1993; Sprinkle & Hammond, 1996; Stephenson & Fairgrieve, 1996; Unwin, 1995; Vaessen & Kalverboer, 1990; Wall, Reid & Paton, 1990).

The above authors and researchers also write of necessary functional understanding of the disorder and implications for children's daily life and in school. DCD children can have difficulties with general coordination (balance, timing, rhythm and sequence), sport (throwing / catching, fitness, avoidance), manipulative skills (scissors, cutting food, handwriting), self-care (tying shoelaces, pouring liquids), spatial organisation (body position in space and when writing). Associated factors

can include difficulties with spelling, reading, maths, articulation, right-left disorientation, disturbed body image, hyperactivity, short attention span, distractability, memory, and social, emotional and/or behavioural disturbances usually related to taunting, and rejection by peers and adults, low self-esteem and frustration. "Very early on...a global sense of incompetence and low self-esteem may envelope such a child; and this damaged self-image may prove difficult to redress" (Denkla & Roeltgen, 1992, p.456/7).

Motor dysfunction has been thought to be evidence of damage to a fixed hierarchical neuroanatomical pathway, with motor behaviour invariably altered by interruption to, or destruction of such a predetermined structure (Deuel, 1992). Motor difficulties have been considered 'soft signs' of minimal brain dysfunction (Watter & Bullock, 1989), or "... intrinsic impairment of central nervous system organisation" (Gubbay, 1989, p.14). According to Deuel (1992), in contemporary developmental theory the various neuroanatomical networks (subsystems - perceptual, cognitive, motor) are functionally configured depending upon task demands (such as spatiotemporal factors, and perceived and increased memory requirements). Performance represents processing interactions among these networks and task variations, and deficits may appear only under conditions of what becomes excessive processing demand.

2.1.3 Direction in Contemporary Research

Some recent research has focussed attention upon the relationship between current developmental theory and motor function with atypical learning such as dyslexia (Stephenson & Fairgrieve, 1996). An example is Nicolson and Fawcett (1995) who proposed a generalised automatisation deficit. Research considering the dynamic systems approach emphasising the self-organisation of components to produce coordinated movement, contends that motor development may be a determinant of development in other domains, as opposed to a consequence. For example, Bushnell and Boudreau (1993) suggest motor development to be integral to the development of haptic and depth perception. This type of research informs the endogenous development of human movement and its relationship to other perceptual domains.

The information-processing approach considers the key patterns of coordinated movement to be the result of a cognitive integration or filtration and effective use of external and internal sensory data (Haggard, 1992). Information processing research looks at the perceptual, cognitive and motor processing of stimulus information of the internal and external components involved in a given motor movement, to better understand motor dysfunction and to inform remediation and/or accommodation (Denkla & Roeltgen, 1992; Larkin & Hoare, 1992; Schoemaker & Kalverboer, 1990; Smyth & Glencross, 1986; Vaessen & Kalverboer, 1990; van Dellen & Geuze, 1990).

In general, research in this area for both gross and fine motor skills, presents tasks for which the content and speed of the processing load of the various movement components are adjusted, to determine their contribution to the movement and reaction time of the participant. For example, Smyth and Glencross (1986) suggested motor dysfunction is associated with a deficiency specific to the proprioceptive modality. By contrast, using a dual task experiment stressing either speed or accuracy, Vaessen and Kalverboer (1990) suggested that motor dysfunction results more from the kind and amount of information processing required by the movement, rather than the actual attributes of the movement. This approach emphasises the level or extent of active cognitive processing required by the movement (the cognitive load - having to think 'how-to'), as well as attributes of the motor load, and their effect on attention.

Larkin and Hoare (1992) used a functional approach to describe motor dysfunction by documenting the specific performance factors of the motor sequences of typically developing and clumsy children (such as the order of limb segments, timing, amplitude and speed of the movement), regardless of cause or processing ability. In this manner, typical and atypical movement can accurately be contrasted. Dewey and Kaplan (1994) investigated the possibility of subtypes of developmental motor deficits. They identified one group demonstrating difficulties with motor sequencing, another with deficits in balance, coordination and gestural performance, and a third type showing severe deficits in all motor skill areas.

Nicolson and Fawcett (1995) considered dyslexia and motor function. They

reported that dyslexic children show a collection of deficits in developmental domains not obviously related to reading or phonological skills. Dyslexic children demonstrated motor performance less adept than reading age controls for tasks such as static balance and fine motor skill for speed of bead threading and moving pegs on a pegboard. The children had difficulties with these tasks when combined with rapid processing of information (such as speed of automatic naming and for forced choice reactions), performing a dual task (such as balance while concurrently attempting a verbal task), or when "conscious compensation" (such as visual or physical strategies used to mask or minimise difficulties), was prevented. While results showed the dyslexic children certainly had significant phonological deficits, these deficits "occur in parallel with deficits in processing speed, motor skill and balance", and are age related (Nicolson & Fawcett, 1995, p.28).

An example of conscious compensation is reported by Frosstrom and von Hofsten (1992). These researchers observed that when reaching for moving targets, motor impaired children aimed ahead of the target to intercept the target, thus compensating for the inappropriate timing of their reactions. This reaction would be similar to the response of a child turning his/her head away from an on-coming ball as the child has difficulty timing the arrival of the ball for catching. "Spatial and temporal accuracy are important aspects of motor skill, both in fine motor tasks such as writing and in gross motor function like in ball games" (Geuze, 1990, p.207). In the present study, examples of conscious compensation were expected and were demonstrated in some Outside Motor and Fine Motor screening items.

As with other motor actions, handwriting involves the coordination of various components such as a well integrated finger / thumb system, wrist and elbow movement, and stable shoulder and trunk (possibly affected by low muscle tone), along with tactile-kinesthetic factors and motor planning (Tseng & Cermak, 1993; Van Galen, 1993). Van Galen reported that from his experiments and those of others cited, neurological evidence supports a modular information-processing account of the task. Van Galen wrote of the dynamic biomechanical aspects of handwriting (corresponding to Bernstein's degrees of freedom), stating that "most of this biomechanical 'problem solving' is done automatically and without effort" (Van Galen, 1993, p.220). Automaticity in this case also includes knowledge of the

sound, name and formation of each letter providing the writer with essential information to inform an appropriate and automatic motor plan for writing each letter (Alston, 1996; Berninger, 1994; Taylor, 1991). Berninger (1994) found that at all grade levels, orthographic skills (processing strings of letters in words or letter-cluster units, for reading and writing), and orthographic-motor integration were the best predictors of writing skills.

Sovik (1993) described handwriting as being "precisely coordinated under neural control in accordance with related space and time factors" (p.229), subject to visual monitoring, feedback and guidance. When children first learn to write, vision is required to define the task and monitor the hands, but once writing patterns are learned, visual analysis is free to attend to other parts of the task (Schneck, 1991). Typically, learned motor information about writing patterns is stored in long-term memory and can be automatically retrieved and reproduced independently from sensory feedback.

However, for a large percentage of children with learning disabilities, writing is not automatic; children with learning disabilities manifest an inordinate amount of mental and/or physical energy to write (Schneck, 1991). For these children, a suggestion is that "decreased tactile and proprioceptive-kinesthetic feed-back from their hands continue to need visual monitoring to perform a handwriting task (and that for these children) prepatterned movements may take longer to develop or may never develop" (Schneck, 1991, p.702). Continued visual monitoring of handwriting reflects another form of conscious compensation for difficulty with visual-motor integration.

According to Kiely (1996), reluctance in school to directly remediate subsequent "bad" handwriting stems from lack of appreciation of the "... sheer magnitude of the destruction of self-esteem that can ensue", and lack of appreciation that students with specific learning disabilities are unable to effect improvement without considerable help (p.101). Further, owing to emphasis on creative writing in recent decades, as opposed to the craft of writing, young teachers are untrained in the teaching of handwriting and have little knowledge or experience with which to help their students (Alston, 1996). For example, teachers need to know that children

with spatial and directionality difficulties find unlined paper hard to use as the relationship of letter shape and size to the writing baseline, is not understood (Alston, 1996).

According to Sovik (1993) empirical evidence shows a general correspondence between motor development and writing development with gradual age specific change seen in the early years and continued progress in speed and accuracy from age 7-15. [For a detailed review of age specific development of fine motor control, see O'Brien and Ziviani, 1984.] Handwriting is an acquired skill and proficiency is responsive to appropriate instruction which should be individualised to the readiness of the child and should continue through primary school with emphasis on good form and legibility, before speed (Hamstra-Bletz & Blote, 1993; Sovik, 1993). For example, while pencil grip is not in itself a predictor of proficient handwriting, an atypical grip may cause decreased accuracy and speed depending on the quantity of writing required (Tseng & Cermak, 1993). To help inhibit the need of remediation for often avoidable handwriting difficulties, kindergarten seems the ideal time to ensure the teaching and learning of appropriate foundation fine motor skills.

Assessment and intervention for motor dysfunction are essential to prevent the formation of inappropriate movement patterns in fundamental skills and to circumvent secondary movement and behavioural complications, or children's ability to interact with their environment is compromised (Larkin & Hoare, 1991; McGlinn & Hawke, 1988; Smyth, 1993). In the present study, early to late year screening results in the motor categories will show from school gains, that school based intervention for outside motor and fine motor skills can enhance positive outcomes (see 6.1 and 6.2, Chapter Six).

2.1.4 Screening

> "A quantitative standard for assessment is helpful, and ... developmentally appropriate normative values are important ...; if no performance is required or observed, not only will a developmental level be misassigned and severity of deficit underestimated or overestimated, but the most obvious deficit may be missed entirely" (Deuel, 1992, p.246).

The existence of motor dysfunction and attending academic, personal and social consequences have been functionally and clinically documented. Kindergarten is a suitable time to assess motor development and address difficulties to enhance foundation skills and to prevent secondary consequences, as this is when motor problems experienced by children are likely to be noticed due to the many school activities requiring motor skills (Schoemaker & Kalverboer, 1990; Smyth, 1993). "Even if no remedial action is taken, the mere recognition of a child's difficulties can help. Parent and teacher understanding can result in more realistic expectations of performance ... in games, sports, drawing, writing and other motor skills", (Smyth, Johnston, Short & Crawford, 1991, p.35).

Due to considerations for equal access to assessment, the heterogeneity of children with either gross and/or fine motor problems, and difficulty in their obvious recognition in typical school populations, in-school screening is a time-efficient first step in targeting students. Teacher evaluation of current function / screening, has been used successfully in many domains (McGlinn & Hawke, 1988; Kalverboar et al., 1990; Llewellyn & Maher, 1993; Reisman, 1991; van Dellen, Vaessen & Schoemaker, 1990; Watter & Bullock, 1989).

Parent questionnaires are also used in conjunction with screening as a way of incorporating additional information into the screening process including children's medical history, developmental milestones, and environmental circumstances such as preschool experience (Meisels, Henderson, Liaw, Browning & Have,1993a). Meisels et al. reported that use of their parent questionnaire improved the false positive rate in their work by 30%. Parent questionnaires are used in the present study.

Tasks in The Kindergarten Screening motor categories represent a comprehensive range of the tasks in the kindergarten curriculum requiring motor skills (see Summary of Screening Checklist Items, Outside Motor and Fine Motor, Appendix 1., A1.5, p.347), and also the range of developmental motor, visual and auditory abilities and skills underpinning those tasks, (as identified in the theoretical frame of this study, see I.3, Introduction). If a child demonstrates difficulties with these tasks it is important to determine which aspects of the task may be causing difficulties.

However, as screening identifies areas of concern, specific diagnostic assessment may be required to identify explicit details and advise regarding appropriate intervention, remediation, and instruction.

2.2 Language and Reasoning - Introduction

> "Inside classrooms many other factors influence and shape the outcome of learning processes, but the one that is pre-eminent is language - the medium of all educational exchange" (Cook-Gumperz, 1986, p7.)

The two screening categories which directly assess children's language and cognitive function are Language (oral language - Checklist Items 20-32), and Paper/Pencil and Reasoning (receptive language and reasoning as observed from written / drawn visual-motor responses - Checklist Items 33-46). Although aspects of language and thought can be observed separably, the synergistic nature of their collective operations seem to link them almost inseparately. It is therefore not surprising to find strong correlations between measures of language and intellectual development, and between them both and academic results (Siguan, 1990).

The sensory input, family and social conditions that children experience and their interpretations there-of from birth, shape, and are shaped by language. The use of language renders thought accessible to social influence (Au,1990). For years, researchers, linguists and theorists have been describing the relationship between language and thought.

For example: According to Bruner (cited in Dechant, 1964): "if a perceptual experience is ever had in the raw, that is, free of categorical identity, it is doomed to be a gem serene, locked in the silence of private experience" (p9). According to Langacker (1967) some kinds of thought can take place irrespective of language such as being absorbed in listening to music or when creating a sculpture, as "language is an instrument of communication, but language itself does not communicate" (p.53). According to Cazden (1988) each and every utterance unites the cognitive and the social.

According to Marzano (1991) and Seifert (1993) we use language to translate and organise the attributes of our non-linguistic sensory experiences into the cognitive structures we carry in long-term memory. According to Lahey and Bloom (1994) developmental changes in language performance hinge on the effective limits of working memory. There are implications for language assessment and instruction depending upon one's theoretical perspective about language acquisition and the relation of language to thought, between innate capacities and environmental input (Friel-Patti, 1994). Johnson (1999) said assessment of children's receptive and expressive language is essential as all other symbol systems such as reading, writing and maths, are mainly dependent upon oral language.

2.2.1 Theoretical Perspective

Bohannon (1993) wrote that despite research in the various aspects of language such as phonology, semantics, and syntax or perhaps because of all the various abilities and skills which comprise the whole concept called language, no universal comprehensive theory of language acquisition (or its relationship to thought), has emerged. To gain a perspective of contrasting views of language development, he collected diverse research approaches into three groups.

The first group of Bohannon's (1993) research approaches explaining the acquisition of language was *structuralism* (which seeks to discover invariant processes underpinning observable language behaviour that are universal across all individuals and contexts), *versus functionalism* (which looks to the relationship between language and the environment as predictor of observable language behaviour). The second group was *competence* (referring to an individual's knowledge of language such as designated grammatic structures), *versus performance* (referring to an individual's actual language use). The third group was *nativism* (expounding the innate origin of most aspects of language learning), *versus empiricism* (expounding that language is learned like any other behaviour through reacting to the environment). However, similarities among these approaches led Bohannon to classify them into theories of language acquisition and cognitive development being either behavioural, linguistic or interactionist based, with the interactionist theory divided into the connection of language development with either cognitive

development or social environment.

In general, Bohannon (1993) characterised the behaviourist view as that the acquisition of language is not dependent upon maturation, but rather a skill learned just like other skills by imitation and conditioning. This view clearly emphasises empiricism, performance and function over nativism and competence. Language is thought to be verbal behaviour (Emmitt & Pollock, 1991). Children are passive recipients of language with their early utterances considered random imitations, and successive approximations to acceptable mature performance being trained and reinforced, controlled, by stimuli from the environment. The grammatical rule system governing language and vocabulary is not discovered by children, but is directly elicited and shaped by the language models provided by children's care givers (Friel-Patti, 1994).

Of linguists, Bohannon (1993) said that central to their various theories is the assumption of an innate and universal finite structure of the grammatic rule system of language, which needs only to be mapped onto the language heard from birth, and is quite independent from language use. Linguists such as Chomsky contended that language development emanates from a physiological part of the brain (called the language acquisition device - LAD), triggered by language experience (Bohannon, 1993; Dyson & Genishi, 1993). The language environment sets parameters of maturation for native speakers, but does not shape or train verbal behaviour. Children test their language theories against their language environment (Emmitt & Pollock, 1991). Second language learning needs only to reset some parameters of the LAD (Bialystok, 1991). Within this framework individual differences were ignored as initial language acquisition was thought to be similar for all children; studies needed very few children as any child would be representative of the process of early language development (Nelson, 1981).

Chomsky's (1965) transformational or generative grammar is recognised as the exemplar of this linguistic conceptual bias; which emphasises the structural, competence and nativist approaches (cited in: Bohannon, 1993; Emmitt & Pollock, 1991; Friel-Patti, 1994; Menyuk, 1991). The developmental milestones of speech and language are taken by some as proof the universality of the process of language

acquisition (Gleitman, 1981; Siguan, 1990). Siguan (1990) wrote that when acquiring language, although modified by cultural heritage, all children follow the same stages at the same ages and therefore, linguistic development is both biological and sociocultural. While there are recognised developmental milestones in the acquisition of speech and language which are used to assess current function (Jenkins & Bowen, 1994; Lahey & Bloom, 1994; McDonagh, 1993; Twaddell, 1994), there can be adverse outcomes for young children when educators strictly adhere to an innate philosophy by deciding to wait for appropriate development to emerge rather than intervene (Bashir & Scavuzzo, 1992; Friel-Patti, 1994; Paul, 1992).

According to Bohannon (1993) interactionist theory may be considered more moderate and a compromise between the behaviourist and linguist with children taking an active part constructing their language and perceptual knowledge. The interactionist assumes: "that many factors (eg. social, linguistic, maturational / biological, cognitive, etc.) affect the course of development, and that these factors are mutually dependent upon, interact with, and modify one another" (Bohannon, 1993, p.260 - parentheses the author's). However, within interactionist theory Bohannon listed three basic research approaches to the acquisition of language and its relation to cognition.

The first, a cognitive-interactionist approach, is exemplified by the work of Piaget: while language itself is not innate, language learning, like other abilities, is completely dependent upon the biologically predetermined sequence of cognitive development which in turn, can be mediated by other factors such as the child's interaction with his/her environment. Piaget viewed children as actively, but independently, using a stable set of logical tools, cognitive operations (considered to be present from birth, universal, and invariant across differences in content) to intellectually construct ever more complex inferences about their experiences (Case, 1991).

The second interactionist approach, also cognitively based, is 'information processing' (also discussed in relation to directions in contemporary motor research, 2.1.3, this chapter). In general, the human information processing mechanism is

thought to be a linear organiser which encodes perceptual experience, operates on initial and subsequent interpretations storing representations in long term memory, and allows retrieval of stored information (Seifert, 1993). Research into children's linguistic and cognitive development shifted from defining performance as product, to analysing processes as causes of development (Bialtstok, 1991). "Neuropsychological approaches to the study of patterns of cognition and language abilities have integrated perspectives that were considered discrete and noncontinuous" (Rudel,Holmes & Pardes,1988, cited in Bashir & Scavuzzo, 1992, p.56). As information processors children are similar to adults, usually unconstrained by innate restrictions or stimulus-response associations (Catherwood, 1994a; Bohannon, 1993; Metz, 1995). Within this approach, it is suggested that individual differences in language and cognitive ability stem from the unique combinations of information processing components and interfering factors for each person (Lahey & Bloom, 1994; Thorndike, 1991).

Central to the information processing approach is the efficiency and capacity of working memory which with help from short term or episodic memory (where environmental textual attributes are stored) initially processes sensory perceptual experiences, after which, selected information is decontextually represented in long term, or semantic memory (Marzano, 1991; Seifert, 1993). *Of paramount importance to language learning for young children is:* **1.** the interrelationship of the amount of active attention called for by working memory (being influenced by auditory and visual perceptual interpretations, the extent of automaticity of abilities and skills from short term memory required for the task such as phonemic awareness, and the effect of internal and external distractions), **2.** children's use of cognitive strategies for organising and remembering information, **3.** the accuracy and invariant nature of information in long term memory (prior knowledge), and **4.** ease of accessing and retrieving information from long term memory (word-finding) (German, 1984 & 1992; Howe & Brainerd, 1988; Howe,O'Sullivan & Marche, 1992; Mann & Liberman, 1984; Nippold,1992; Lahey & Bloom, 1994; Peverly, 1991; Rosenshine, 1986; Wiig & Becker-Caplan, 1984).

> "The stored memories and information-processing strategies of our cognitive systems interact with the sensory information received from

> the environment, selectively attend to this information, relate it to memory, and actively construct meaning for it. Generation is a fundamental cognitive process in comprehension" (Wittrock, 1990, p.348).

Bohannon's third interactionist approach was social-interactionist. While this view is similar to the linguists' in that there is an assumption of an innate predisposition to grammatic structures, there must nevertheless be interaction within the environment for language to develop and mature. While the linguist generalises from an observed utterance (performance) as evidence of universal knowledge of the structure (competence) in unlimited situations despite contextual variations, the interactionists require more performance data at the independent level of function for that conclusion. Children and their language are seen as a dynamic and simultaneous development of the functions of language in social communication. "Thus, underlying structure mapping is not innate, but negotiated or conventionalised through social interaction" (Bohannon,1993, p.275). This approach to the acquisition of language and development of reasoning seems the most apt to a functional approach to early childhood education, and is embodied in the work of Vygotsky.

2.2.2 Realities of the Theoretical Perspective for Children

A major contribution of Vygotsky for early childhood education regarding the acquisition of language and cognitive development is his concept of the 'zone of proximal development' (ZPD) (Diaz, Neal & Vachio, 1991; Tudge, 1990). "Vygotsky's zone of proximal development connects a general psychological perspective on child development with a pedagogical perspective on instruction" (Hedegaard, 1990, p.349). For each child, the ZPD is dynamic and is bounded by independent function at one end and at the other, by that which the child can accomplish (and subsequently master), with collaborative help (Berk, 1994a; Diaz et al., 1991; Palincsar, Brown & Campione, 1994).

The ZPD can be assessed by identifying current levels of independent function (in any domain) to inform potential, which is then intended to be achieved by appropriate and sufficient challenge (Tudge, 1990). Beyond current function when a

problem becomes too hard for the child to solve alone, active participation with a more competent partner supplies support which is just ahead of actual achievement, facilitating the child's independent problem solving efforts (Clay, 1991; Palincsar et al., 1994; Seifert, 1993; Vukelich, 1994; Walsh, 1991). Cognitive developmental change occurs as a result of children mastering ever more challenging problems and becoming independently responsible for structuring their own performance (Berk, 1994a; Diaz et al., 1991; Plumert & Nichols-Whitehead, 1996).

This process of mediated development by supplying and/or modelling and gradually withdrawing help, giving the child more opportunity to perform responsibly and independently, is seen as the natural and systematic teaching practice of mothers (Diaz et al., 1991; McCartney, 1984; Seifert,1993). Mothers interact with their infants supporting and encouraging shared communication (sometimes called 'motherese'), and later providing opportunities for children to test speech and language structures (irrespective of the degree to which they originate from an innate predetermined source or are elicited by environmental pressures or any combination thereof), thus setting the scene for the kind of language the child will subsequently speak (Emmitt & Pollack, 1991; Menyuk, 1991). According to Tzuriel (1996) researchers have shown that parent-infant interactions are crucial for infants' cognitive development. Tzuriel reported many studies regarding traditional mother-child interaction with supporting evidence that parent-child activities relate concurrently and predictively to specific aspects of children's cognitive development.

However, Gorenflo, Gorenflo and George (1995) reported on non-traditional child rearing with predictions that by the year 2000, 82% of American women between the ages of 25 and 34 will be working out of home. This situation has prompted research into the quality of day care, and in different settings, in relation to children's optimal speech and language, and cognitive development. While many factors need to be assessed such as the quality of the day care environment, children's intellectual and language development, and family background and home environment, there are specific findings. For example, McCartney (1984) found that children's language and cognitive development do benefit from high-quality day care and that such care can effectively serve early intervention. This research confirmed the importance of child-adult verbal interaction as children from centres with high

levels of child-caregiver speech (as opposed to peer speech) performed better on tests of language development.

Baydar and Brooks-Gunn (1991) found that maternal employment during an infant's first year had detrimental effects on the cognitive and behavioural development of all children regardless of gender and SES status. Gorenflo et al. (1995) found that in general, day care workers' basic knowledge of typical speech and language milestones was minimal and that the researchers' simple inservice method could increase familiarity with language development. This is especially important since these child care workers often offer a child the first opportunity for assessment and intervention.

Kindergarten teachers should know each child's prior-to-school experiences as they may make a difference to planning instruction. For example, low scores for the Language and/or Paper/Pencil & Reasoning screening categories coupled with prior-to-school information may indicate lack of sufficient child-adult language interaction suggesting such practice to build foundation skills would be appropriate, or may indicate concern about developmental delay suggesting the appropriateness of a specific diagnostic language assessment prior to intervention and/or instruction. For a more detailed discussion of other aspects of pre-school, daycare, and quality care, see Chapter One sections 1.3.1 and 1.3.2.

'Scaffolding', a name given this Vygotskian teaching-learning process, is used by teachers as they facilitate (rather than direct), challenging, collaborating and negotiating with students to encourage and increase their metacognitive processes as well as domain-specific knowledge (Cazden, 1988; Clay, 1991; Berk, 1994a & b; Diezmann & Watters, 1997a; Mason & Sinha, 1993; Rosenshine & Meister, 1992). Teachers guide and support each child's cognitive progression in all contexts, including acceptable social competence, to help children test the hypotheses and knowledge they have constructed against the thinking of other people (Jipson, 1991; Wells, 1990). Whether at home (Diaz et al., 1991) or in day care (Baydar & Brooks-Gunn, 1991) or at school (Cazden, 1988), more frequent adult-child verbal interactions have been empirically related to positive school outcomes.

While the more competent partner, or 'significant other', is usually thought of as an adult, experience and research has shown a more competent peer can be highly effective in enhancing cognitive development (Cazden, 1988; Tudge, 1990). Tudge points out that in this kind of interaction it is necessary to consider the relationship between the partners. However, a great amount of research is available regarding the use of and effective strategies for peer-tutoring (Greenwood,Carta & Hall, 1988; Smith & Burrichter, 1993; Tudge, 1990). A form of peer-tutoring is English speaking language models for ESL speakers.

Second language learning is facilitated in social settings (including kindergarten classrooms as is relevant to the present study) when the second language learners are outnumbered by speakers of the target language and speakers and learners are free to interact with one another (Cummins, 1990; Fillmore, 1991). According to Fillmore, in classes where most children are non-English speakers, ESL children (especially the less social) interact with children speaking their own language and therefore, their learning of English is not optimal, and further, this situation is compounded if the classroom learning environment is primarily teacher directed. Although, according to Allen (1991), the children of some cultures are more adult oriented and will seek and receive English input from teachers. Success can be measured by the amount of child motivation for engagement with non-trivial classroom activities (Allen, 1991; Cummins, 1990). "Language learning requires the help and involvement of people who already speak it: their speech behaviour allows the learners to figure out how the language works ... socially ... linguistically...(and) cognitively" (Fillmore, 1991, pp.52 & 53).

2.2.3 Home / School Scripts - Play

At school entry, irrespective of background, most children are naturally proficient language learners and competent language users with knowledge of how language works (Garcia, 1993). The transition from home to school requires children to become competent in the new and different language environment of school (Pinnell & Jaggar, 1991); and sometimes in a second language. Initial language acquisition and early home language are characterised as being interactive and collaborative with negotiated shared reference and highly contextualised, with comment often

restricted to physically present objects and current events (Cazden, 1988; Snow, 1983; Wells, 1986). During home or in informal face-to-face communication comprehension is supported by the contextual features of here-and-now cues (in time), and also those of gesture, intonation and facial expression, which are not usually apparent when processing school language, or when writing (Collins & Michaels, 1986; Cummins, 1990).

School language is characterised by a lack of shared reference (as reference is often assumed by teachers), and frequency of reference in another kind of context. The shifting of context is sometimes called recontextualisation, usually meant to help students reconceptualise phenomena differently such as in a before and after temporal context, and considering the hypothetical as well as the actual (Cazden, 1988; Wells, 1986). Academic language, and all written language, tends to rely on visualisation and cognitive strategies to construct and generate meaning. Continued use of context-dependent language for strictly pragmatic purposes constrains thought processes and does not prepare a child for the more informative and discursive functions of school language or the decontextualisation and generalisation required to support abstract reasoning and knowledge (Cook-Gumperz, 1986; Christie, 1987; Grieve & Hughes, 1990; Siguan, 1990; Snow, 1991).

Children's make-believe symbolic play expands their decontextualised representational thought by gradually separating thought from action and objects, and by communicating their growing understanding of reality in preparation for the later development of abstract reasoning (Berk, 1994a,b &c; Dockett, 1994; Gowen, 1995; Johnson & Yawkey, 1988). According to Berk and Gowen, for typically developing children, pretense gestures appear at about twelve or thirteen months and by age three children can imagine, or visualise objects and events without direct real world support. Pretend sociodramatic play in a variety of situations has empirically been shown to be of central importance in the intellectual, social and emotional development of children throughout the preschool years, endorsing children's collaborative social construction of knowledge (Berk, 1994c; Dempsey & Frost, 1993; Gowen, 1995; NAEYC, 1992). The primary achievement of age five to seven is the capacity for abstraction gained by the ability to internalise language (Sameroff & McDonough, 1994).

Independent context-free visualising (as well as general knowledge) are basic ingredients for recall and for listening and reading comprehension, by providing a frame in which to organise and integrate information (Bell, 1991; Durrell, 1980; Gambrell, Kapinus & Wilson, 1987). According to Bell (1991) creating mental images is fundamental to receptive and expressive language, sense of humour, following directions and critical thinking.

Considering the above factors of language and thinking in regard to emergent literacy skills, Snow (1983) contended that early reading skills such as experience with environmental print, print and book conventions and auditory discrimination for sounds and rhyming (the "Sesame Street" skills), can be learned in school. The 1995 study of Purcell-Gates, McIntyre and Freppon agrees with Snow as their results showed that the acquisition of written language knowledge can occur after beginning school, despite entry level function or SES factors. However, these are not skills which contribute to the decontextualised use of language required for reading comprehension and school language. Home conversations which can enhance preschool children's memory and use of language as a tool of thinking, for cognitive organisation, include reading and telling stories to children, helping children construct descriptions of past events, and asking children tutorial questions (Sameroff & McDonough, 1994; Snow, 1983).

Bashir and Scavuzzo (1992) cited research of Tallal (1980 a & b) which reported association between oral language deficits, reduced language processing, and reading problems. The ability to fully process spoken language is a factor consistently associated with early reading ability, especially listening and reading comprehension (Mann, 1984). Willows and Ryan (1986) and Tunmer, Nesdale and Wright (1987) reported studies which evidence substantial correlations between syntactic awareness, or grammatic sensitivity, with early reading development. Willows and Ryan (1986) theorised that automatization of semantic and syntactic processing leaves more processing space for larger units of meaning. Yaden, Smolkin and Conlon (1989) reported findings that preschoolers' questions during reading aloud at home were in fact most frequently about story meaning, followed by questions about word meaning. "The authors hypothesize that home storybook reading may have more effect on children's development of comprehension

processes than on their print awareness" (Yaden et al., p.188).

Strickland (1990) wrote that learning to read and write are interrelated processes that develop in concert with oral language. Williams (1991) wrote that when young children are read to at home along with interactive language between adult and child, the child may be more prepared to cope with school language scripts. Martini (1994) studied differences children encountered between home and preschool language and found that children interacted with adults a greater proportion of the time at home, although most were not hesitant around teachers. Martini also reported that children tended to use objects in more complex goal-directed ways at home, and encountered and solved more problems by themselves at home.

Walker, Greenwood, Hart and Carta (1994) reported results of their study that SES, language and IQ antecedents assessed between 7-36 months of age, were predictive of these children's receptive and spoken language and reading and spelling achievements seven years later in school. While SES and IQ were factors defining the selection of children in that study, early language spoken at home was the predictor of later school achievement for these children.

In research reported by Snow (1991), while rhyming may foster phonemic awareness, it is decontextualised oral language skills which relate to reading comprehension. There seems to be abundant evidence that all children should have the opportunity to have their oral speech and language skills assessed upon school entry.

2.2.4 Language Disorders

Specific Developmental Language Disorders (SDLD), like Developmental Coordination Disorder (DCD) discussed in 2.1.2 of this Chapter, are distinct from acquired childhood aphasia in that they have no obvious point of onset or identifiable neurological basis (Paul, 1992). Also like DCD, SDLDs are diagnostically defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM IV) (American Psychiatric Association, 1994), have associated behavioural and academic deficits, and profound social consequences for children who otherwise have normal

"motivation to communicate and interact with others and the cognitive abilities to perceive their differences from peers" (Paul, 1992, p.212). Unlike DCD, there is abundant literature and research about the various aspects of speech and language receptive and expressive disorders and their relation to cognitive development. Issues which are especially relevant to the study reported in this thesis are the persistent nature of language learning disorders and concomitant difficulties, the degree of variability within language learning disorders, and the contemporary focus on the functional aspects of children's language.

Bashir and Scavuzzo (1992) contended that a reason children with language learning disorders remain academically jeopardized throughout school years is the difference between a child's actual language acquisition and the requirements of school language. According to these authors, while the learning of early language forms mirrors that of nonaffected children, acquisition occurs more slowly and an extended period of time and support are needed for mastery. The process is occurring concurrently with learning to read and write and so the child is required to understand and produce complex oral and written school language.

The above authors point to assumptions made in schools which can lead to unfortunate consequences for children. One is that (certainly native) speakers have mastered appropriate knowledge of language and its use and concepts required for successful learning, and the second, that persistent language learning problems are developmental delays and the child will "catch-up"[7]. The authors also point out that there is little evidence of academic catch-up for some children with language disorders and therefore, identifying factors which seem to perpetuate the misfit between children's developmental language and school language requirements should reduce their academic vulnerability.

Lahey and Bloom (1994) reported that because children's language performance can vary, even on similar tasks, from one context or time to another, focussing on one deficit or specific factor within the information processing process as causing learning or academic problems, is questionable. The authors acknowledge the synergistic interaction of language processes and influencing factors comprising successful language learning and use, and propose that variability occurs to the

extent that any one, or combination of these factors, may limit available processing capacity, for any given task, by competing for processing space in working memory. For example, word-finding disorders are a limiting factor for working memory indicating processing difficulties such as memory problems, or semantic difficulties such as lack of or inaccurate prior knowledge, and can cause language and learning difficulties in varying degrees (German,1984 & 1992; Nippold,1992; Wiig & Becker-Caplan,1984).

Lahey and Bloom (1994) summarise factors influencing working memory as: competence with grammatic structures, (receptive and expressive); speech production; the effectiveness and accuracy of the mental models children are able to create; familiarity and relevance with content and context; access to long term memory; social, cultural and emotional factors. Efficient and accurate auditory processing (which feeds working memory) and which is dependent upon components of auditory ability (outlined as part of the theoretical frame of this thesis - Appendix A1.1, p.304), and the effect of environmental factors, can affect receptive and/or expressive language (Friel-Patti,1994).

Articulation errors can indicate phonological processing problems and/or motor speech impairment, grammatical errors can indicate morphological and/or syntactical difficulties, and communicating in single words or phrases (not complete sentences) can indicate developmental delay (Butler,1995). Regarding the sophistication of complete and varied sentences to be expected upon kindergarten school entry, the age three norms for aspects of expressive language reported by Silva and Stanton (1996) quoted from the Dunedin Study (N=1037) are notable: 6% used single words or word combinations with only about a 20 word vocabulary (considered serious delay), 5% used sentences of four or more syllables, 43% used sentences with words other than nouns or verbs, 35% used pronouns and prepositions and asked questions appropriately with the most advanced consistently using correct word order with no words omitted and complex sentences (p.33).

2.2.5 Screening

To identify the modifiability of cognitive structures and source of learning difficulties, alternative dynamic performance assessment which focuses on learning processes,

not learned products, is recommended (Butler, 1995; Palinscar et al.,1994). [For detailed discussion of alternative performance assessment see Chapter Three, section 3.4.] Contemporary practice advocates a functional approach to language assessment by evaluating performance collected in a natural setting and analysing a sample of spontaneous and independent speech, such as competence with speech production and standard syntax, to identify the child's language strengths and needs to inform instruction (Bashir & Scavuzzo,1992; Chall & Curtis,1991; Friel-Patti,1994; Paul, 1992).

Assessment for language and comprehension function should use task analysis to identify influencing factors of the assessment setting and processing factors of the task itself (Friel-Patti,1994). Regarding setting, Friel-Patti said performance may be inconsistent from assessment in a controlled situation free from distraction. The natural classroom setting (as used in the present study) offers the opportunity to identify functional independent competence in the surroundings in which the child is expected to be successful. See Chapter Four, section 4.1 for a complete description of measurement conditions for the present study.

In the present study, screening items were task analysed beyond the familiar sense of delineating the task into its component steps, to the information processing abilities and skills, or processing factors, required for task success, and is described in Chapter Five (p.149). Beyond that explanation for individual screening items, task analysis can group Checklist Items into like processing factors to provide another source of important and functional qualitative information from the Language and Paper/Pencil & Reasoning screening categories. Patterns of children's responses can be compared within groups of items, for example:

1. Receptive language - includes the spatial and temporal concepts of top, under, beside, middle, next to, between, above and same (Checklist Items 33 - 41). Spatial and temporal relationships only have meaning within the context in which they are situated (Brown, Collins & Duguid,1989; Jenkins & Bowen,1994) and are only said to be correct depending upon shared interpretations which are in turn, based upon the mental models which children and teachers make - visualisation - and which even for young children can be directly taught, practiced and understood (Diezmann & Watters,1997; Plumert & Nichols-Whitehead,1996). These concepts make up a

large percentage of kindergarten school language. Consider these actual examples of teacher talk such as "put your finger on the next underneath", or, "what is the first / last sound you hear...", or, "you may do ... after you ... but before then...".

2. Auditory processing for the singular/plural grammatic structure (Checklist Items 39, 41 and 44). In this case the degree of innate origin of language structures is of no consequence, as current function is the only question. However, the teacher's point of view regarding development in early childhood will determine the extent of direct teaching, practice and mediated language support each child presenting with difficulties, will receive.

3. Accurate processing for auditory memory and sequencing - Checklist Items 22-27 for survival information and for rhymes.

4. Auditory processing and visual motor integration - writing name and numbers, copy forms the human figure drawing and figure size and spacing on the page (Checklist Items 33 - 42 and 46. These written responses are excellent indications of the integration of language and visualisation. Even the process of responding suggests the mental image. For example, has the child drawn letters or a shape in pieces, or as one unit. Further, the response to Checklist Item 40, "draw a cloud above the trees", can indicate a child's skill in discriminating final sounds as some children draw a clown, not a cloud. Difficulty with final consonant sounds forecast difficulty with word sound segmentation tasks (Jenkins & Bowen,1994).

5. Reasoning - 1:1 correspondence for counting, shape pattern, equality of number / "same as..", (Checklist Items 43 - 45). While these items may directly assess prior knowledge, they still indicate the receptive accuracy of standard language concepts expected of children in this age range. For example, it is very interesting to note that early in the year for Checklist Item 43 ("draw a circle around five flowers"), most children draw five circles. However, by the end of the year many children can visualise a group of five and draw all five flowers within one circle.

6. Expressive language - asking the child to tell you what he/she did after school yesterday - a personal narrative recount (Checklist Items 28-32). These items reveal a lot of information about the child's knowledge and use of language and confidence

using language. For example: Use of descriptive words can indicate degree of context-free visualisation. Articulation difficulties can indicate potential difficulties with phonological awareness skills, which are integral to reading acquisition for many children (Jenkins & Bowen, 1994). Independent understanding and use of oral grammatic structures (syntactic awareness) indicates competence in standard language forms and according to Willows and Ryan (1986) and Tunmer et al. (1987) is causally related to reading acquisition. For example, the child understands the grammatic structure 'ed' to indicate past tense when using the word "goed", the child just hasn't yet internalised the past tense form of that irregular verb. The teacher's concepts of early child development and teaching, eg. being based in the teachings of Piaget or Vygotsky, may determine how quickly the child will master the standard form.

2.3 Personal Characteristics - Introduction

The four Checklist Items of this final screening category are: Works Independently (No.47); Follows Directions (No.48); Attends Quietly (No.49); Completes Tasks (No.50). Because of the whole-class school setting administration of The Kindergarten Screening, assessment of these attributes is possible and relevant to the school experience of each child; which may not be the case from individual testing in a clinical setting. While these personal characteristics are intensely individual, contributing elements are the same for all children such as heredity, family and community experience, motor, language and reasoning skills, cultural and language diversity, familiarity with content, internal and external distractions, and preschool experience. Individual differences occur because children bring different combinations of these elements to school.

The impact of many factors influencing personal characteristics of kindergarten children has already been discussed in relation to motor and language development and learning. For example, consider having various internal motor ability and/or language processing distractions when trying to attend, follow directions and complete written tasks, especially if sitting among various external distractions, all of which could make working independently very difficult. However, aspects of temperament and resilience and the emergent self-initiated regulation of behaviour and learning are also major contributors to the personal characteristics being

evaluated by The Kindergarten Screening instrument and as such, contribute to the academic and personal success of kindergarten children, as they can affect how children learn. Kindergarten teachers can be informed about personal characteristics for each child from parent surveys and in-school whole-class screening, and can then make appropriate learning environmental and instructional accommodations for the children they teach (Klein, 1992).

2.3.1 Theoretical Perspective

Temperament and resilience (in the presence of an accumulation of known negative risk factors and misfortune), have been the topic of longitudinal studies which have followed large cohorts from birth to adult: The Australian Temperament Project (Sanson,1997), The Dunedin Multidisciplinary Health Development Study (Silva & Stanton,1996), The Kauai Study (Werner, 1989), The Christchurch Health and Development Study (Fergusson & Lynskey, 1996). Sanson (1997) defines temperament as reflecting the basic nature of a person, being 50% genetically founded and 50% influenced by environmental conditions, with differences in children evident from very early in life (Van der Kley, 1996).

While temperament contributes to psychosocial adjustment and the course of development through the effect of self-perceptions and the perceptions of self by others which emerge through continuous child environmental and personal interactions, expressions of temperament are context-dependent (Sanson, Smart, Prior, Oberklaid & Pedlow, 1994; Wang & Haertel, 1995). For example, consider the child who seems to attend and inhibit impulse in some circumstances and not in others: "... he's not that way at home / school / church / sport".

Klein and Ballantine (1991) argued that temperament describes those behavioural tendencies which are biological in origin and enduring over time, but their expression is dictated by the interaction of the child with the ideal expectancies of child development in the dominant culture. The child whose temperament matches the cultural ideal is accepted, receives positive feedback and is considered well adjusted, while the reverse is true for the child whose temperament does not match the cultural ideal. Within this concept, individual differences in temperament among

children are dependent on their match with cultural expectation regardless of context and, the authors contended, can be accommodated by systematic research and understanding of cultural differences in this regard. However, the argument could only be viable where cultural parameters are clearly distinct. The suggestion is that expressions of temperament for all children within a categorical culture are painted by the same cultural paintbrush.

Sanson (1997) argued that temperament refers to a style of behaviour, not the product of behaviour, stressing that aspects of temperament are only problematic when they are not in harmony or compliance with individual expectations such as those of parents (Oberklaid, Sanson, Pedlow,& Prior, 1993), child-care workers, teachers, or the demands of school and therefore, it is counterproductive to label a child with either general (easy / difficult) or more specific (approach / withdrawal) aspects of temperament. However, a point to be made is that characteristics of temperament are to a degree intrinsic, individually unique, and shown by research to be stable over time, especially for marked traits, although depending on factors such as parenting styles, interventions and most of all resilience, not necessarily invariant (Kazdin,1996; Oberklaid et al., 1993; Pedlow, Sanson, Prior & Oberlaid,1993; Sanson, 1997; Silva & Stanton, 1996; Van der Kley, 1996).

> "Even in the most discordant and impoverished homes, and beset by physical handicaps, some children appear to develop stable and healthy personalities, and display a remarkable degree of resilience in the face of life's adversities" (Werner, 1989, p.72).

Developmental psychopathologists have produced a rich database of research on protective factors for resilient children who, despite being vulnerable from a wide range of recognised risks (including some characteristics of temperament) and stressful circumstances in early childhood, have demonstrated positive outcomes (Kazdin, 1996; Wang & Haertel, 1995). As a result, patterns of environmental and psychological factors can be identified that contribute to successful adaptation and inform the design of family, educational and community-based interventions such as Christchurch, New Zealand's Project Early (Van der Kley, 1996; Wang & Haertel, 1995).

Functionally defined, protective factors are categorised as increasing resilience either by mitigating risks or being specifically protective (Fergusson & Lynskey, 1996). In general, protective factors include *personal characteristics* (such as sociability, at least average IQ, communication and problem solving skills, academic success, raised self-esteem, independence, self-initiated regulation / control), *parental and family attachment and bonding*, and *external support systems* (such as activities and an emotionally responsive relationship with a non-parent adult, outside the home) (Brody, Stoneman & McCoy, 1994; Fergusson & Lynskey, 1996; Kazdin, 1996; Werner, 1989). Wang and Haertel (1995) presented a comprehensive research and literature review of instructional, school wide, and family and community strategies promoting educational resilience.

A central element of resilience in young children most relevant to the present study is the development and emergence of self-initiated regulation of behaviour and learning. Subsumed under this construct are three main contributing features: 1. level of impulse control within various contexts, 2. level of receptive and expressive competence with standard language, social, and cultural forms, 3. degree of compliance (Kopp,1982). The acquisition of standard language forms and the relation between language and cognition were discussed in 2.2, this Chapter. The acquisition of impulse control, competence with standard social and cultural forms and compliance share aspects of the same theoretical and functional perspective but developmentally, have not attracted as much research. Developmentally, these constructs are more apt to be mentioned as initial and indicative causal factors within research into attentional, conduct, antisocial and related disorders (Bailey & Rice,1997; Kochenderfer & Ladd, 1996; Walker, Colvin & Ramsey,1995).

Nevertheless, an important point to remember is that the longitudinal studies have been able to demonstrate the stability of temperament characteristics over time. For example: Silva and Stanton (1996) reported that high scores for lack of control at age three and five, and preschool behaviour problems, were significantly associated with later externalising problems such as hyperactivity, inattention, antisocial behaviour and conduct disorder as reported by parents and teachers to age eleven, and by parents to age fifteen. Oberklaid et al. (1993) reported the significant relationship between preschool behaviour problems and maternal perceptions of

difficult temperament and behaviour in infancy. Silva and Stanton (1996) also reported that many changes in a child's primary caretaker, information which can be determined from parent surveys at school entry, is an important predictor of later antisocial behaviour.

Further, it is interesting to note that the current American Psychological Association's diagnostic criteria (DSM IV, 1994) considers AD/HD (to take one example) a developmental disorder of age-appropriate attention span, impulse control and activity level (Bailey & Rice, 1997). In reporting the developmental course of AD/HD children, difficulties in behaviour and toilet training at age three are reported for about half, and many are described as having been temperamentally difficult infants and as having had delays in fine and gross motor coordination (Edwards & Barkley, 1997). Early screening is advised as antisocial disruptive behaviour in preschool without remedial intervention to help children meet teacher and academic expectations can result in these children "grow(ing) *into* ... unfortunate behaviour patterns with disastrous results to themselves and to others" (Walker, et al., 1995, p.47. - emphasis the authors'). These authors emphasise the imprudence of continuing to think that young children will grow out of early indications of attentional and/or behavioural difficulties, as is still the practice of many early childhood teachers.

2.3.2 Realities of the Theoretical Perspective for Children

Developmental information about the typical acquisition of socially approved behaviours, the emergence of compliance and self-regulation has come from investigation into children's play and decontextualised representational thought (discussed in section 2.2.3, this Chapter), and self-regulation. For example, Kopp (1982) reported that the progression from external to internal regulation which is influenced by maturational and experiential processes, can initially be seen in the emergence of compliance evident in children from 9-12 months with a demonstrated bias toward social behaviour, depending upon the quality of the mother-child relationship. Developmental "... changes from externally regulated inborn processes to self-regulated capacities, can be observed in memory, attention, and problem solving" (Diaz, Neal & Amaya-Williams, 1990, p.127).

Kopp (1982) continued with a theoretical and research review of chronological factors and phases in children's development of self-regulation through preschool, when children are "capable of manifesting a set of recognizable behaviors encompassed by self-regulation constructs" (p.210). Children's behaviour becomes personally goal directed (as opposed to a compliant stimulus-response orientation), and organised as a functional system with the child taking over the caregiver's regulating role (Diaz et al., 1990). The overall picture is of children being socialised by others (theoretically either by a psychodynamic affective-motivational process or a Vygotskian process of verbal communications), and from these interactional processes self-regulation, at least in part, emerges. Kopp also said that at a certain point in this development, language and cognition have a role, but it is unclear how these processes come together.

According to Vygotsky, language forms an interactive link between social and cognitive structures (by learning to separate thought from the real world), and ultimately to self-regulation (by subordinating actions to social rules). For young children, developmental progress is displayed in make-believe representational play and in private speech (Berk, 1994c). Berk summarised the two critical features of Vygotsky's concept of make-believe play as firstly creating an imaginary situation in which children can come to terms with unrealised desires and second, make-believe play creates rules of socially cooperative and acceptable behaviour, often requiring the suppression of gratification, to successfully act out the play scene. The role-playing format of make-believe rule-based play (at home, day-care or at school) provides opportunity in any context imagined, to practise the skills and integration of more complex receptive and expressive language, social conventions, planning and sequential memory, understanding of kinship relationships, emotional understanding of self including affective nature, impulse control, and preparatory desensitising experiences where lack of prior knowledge exists (Berk, 1994c; Gowen, 1995; Johnson & Yawkey, 1988; Kopp, 1982; Morrow, 1985; Spreadbury, 1991).

The above authors generally agree that the role of others, especially adults, in children's play is facilitative through modelling and scaffolding with strategies such as setting the stage (including background knowledge for unfamiliar roles) and time table, making suggestions, and asking interpretive and open ended questions to

refine thought and encourage problem solving (Bell, 1991; Marzano, 1991). Johnson and Yawkey (1988) contended the adult role is also being spokesperson for reality, bridging gaps between play and real life. However, Gowen (1995) cautions that while adults can prompt to allow the child to embellish and extend the child's story, the adult must avoid taking over the child's story.

According to Frauenglass and Diaz (1985) "private speech ... refers to overt language directed to the self for the purpose of guiding cognitive performance and regulating social behavior" (p357). Berk (1994 a & b) described Vygotsky's conception of the contribution of the adult mentor's role to children's audible private speech, and the contribution of private speech as a tool to self-instruct thought (problem solving) and behaviour. As adults help and support children with challenging tasks by offering spoken directions and strategies "the child incorporates the language of those dialogues into his or her private speech and then uses it to guide independent efforts" (Berk, 1994b, p.62). Speech allows the child increased cognitive flexibility owing to freedom from the concrete stimulus field, with actions becoming less impulsive and more self-controlled behaviour (Diaz et al., 1990).

According to Berk (1986), children's private speech has age related developmental patterns in that as the child gains mastery, private speech becomes less audible, with only those aspects of the task stated which are still puzzling until finally, with practice, the external guidance of private speech becomes increasingly internalised with sustained attention and extraneous motor behaviour brought under the control of verbal thought. It is interesting to note, especially in light of AD/HD now being described as a developmental disorder (Bailey & Rice, 1997), that Berk and Landeau (1993) and Berk (1994b) reported that in their studies of learning disabled and AD/HD children, these children used more task-relevant private speech than controls and are often thought of as being more inattentive and impulsive. Their findings determined that the use and developmental process of private speech is the same for these children and therefore as a learning scaffold the strategy should be encouraged, but they internalise their private speech at a later age. Further, the private speech of AD/HD children taking appropriate medication was more mature, relating to improved self-control.

Private speech never disappears as it often resurfaces when we encounter unfamiliar tasks, such as driving a car on the other side of the road from which you were taught, twenty years before.

2.3.3 Screening

Research clearly indicates that personal characteristics of temperament identified in early childhood are indicative of later performance. Therefore, children assessed as possibly being at risk for attentional and/or behavioural difficulties should attract appropriate intervention and instruction to alleviate their problems and enhance self-regulation. The functional advantages of performance assessment have been discussed elsewhere in this Chapter and more specifically, in Chapter Three. Evaluating personal characteristics of children in the natural school setting, among peers, within the routine school timetable, should give the most realistic and authentic demonstration of how each child is functioning in this context. Results from anything less than assessment under these circumstances, would be of doubtful relevance to school.

The most important consideration when evaluating personal characteristics is that while quantitative scores are assigned, it is the accompanying qualitative comment which may illuminate scores to help inform decisions. For example, if the child is not attending for any reason, the child's score will be less than optimal. However, qualitative comment may explain that the child was: distracted by other children; distracting other children; daydreaming; too meticulous in task completion and missed the next direction; falling out of his/her chair; continually asking for help; repeating directions and missed the next direction. Further, parent surveys should be consulted for corroborative or possibly opposite evidence about concerns. For example where and/or when the child does or does not follow directions.

These sorts of observations, when made, are recorded for each of the four personal characteristics being evaluated as suggested in the Screening Manual (Appendix 1., A1.2, p.307). However, there will be almost as many comments that could be made, as there are children.

Chapter Three - Method

Introduction

Because of the multifaceted research problem and theoretical frame of this inquiry, its design required use of quantitative and qualitative methods to ensure an appropriate mix of evidence to support the validity and consistency of the screening instrument, which by performance assessment, must reliably identify individual differences among kindergarten children. Contemporary educational studies investigating multifaceted issues combine aspects of quantitative and qualitative methods within one research design and achieve justifiable findings. Jacob (1992) wrote that due to the appearance and current acceptance of interdisciplinary approaches in educational research there is the capability and widespread interest to explore "the influences of cultural factors and social context on student learning" (Jacob, p.294).

Distinctions between quantitative and qualitative methods and efforts to combine their techniques evolved within educational and measurement research following a gap that occurred between classical measurement theory and practice (Cronbach & Suppes, 1969; Miranda,1988; Shulman,1988; Wittrock,1973). Within the scientific experimental tradition, the restrictions of strict operational definition and compliance with its accepted concept of validity became perceived as inhibiting to the breadth of inquiries. However, a consequence was that some inquiries subsequently adopting alternative research designs produced results and interpretations which seemed to be based more on assumptions, than empirical evidence.

Subsequently, there was criticism of some research designs as lacking specific and sufficient design standards, thereby jeopardising validity in support of purpose (Finn,1988; Howe & Eisenhart,1990; Phillips,1987; Stahl,1988). Some educational and measurement research has been driven by external influences such as political pressures and the rhetoric of conflicting ideologies and publishers (Butler & Wallach,1994). For example, the promotion several years ago of whole language instruction in primary schools and the current "conservative backlash" resulting in

legislation such as the State of California not only mandating explicit strategies for teaching reading in kindergarten, but which sort of reading materials may be used in the first six months of kindergarten (TAWL Newsletter, Oct.1997, p.5).

Supposedly, public opinion regarding educational research associated it with "educational faddism", not fulfilling its role to "improve our schools" (Finn,1988, p.5). Finn's concerns were in the areas of: inadequate specification of design (operational definition); cost; ethics; irrelevant problem; weak or even non-identification of place in the field of study and/or intention for results; lack of probable and/or valid "generalisable" results. For this study, supporting information justifying use of the screening instrument will be presented, which considers:

- the theoretical frame of the instrument and safeguards to validation such as evidence and arguments to counter plausible rival hypotheses regarding generalisability (Shepard,1993);
- evidence regarding content relevance and construct meaning (Messick,1988; Shepard,1993);
- intervening variables ("antecedents and consequents") influencing scores (Cronbach,1988), and consequences of interpretations and decisions based on scores.

The design of this inquiry will be clearer when firstly viewed within an historical profile of positivistic quantitative method and interpretive qualitative method. This will allow an appreciation of the importance of the identification of individual differences and the contemporary concept of validation which has emerged in relation to performance assessment in education. These issues are discussed in sections 3.1, 3.2 and 3.3 of this chapter. Design specific standards for this inquiry are then described in sections 3.4, 3.5 and 3.6 of this chapter.

3.1 Research Design: Historical Context

In 1957, Cronbach wrote of a discipline separation between experimental and correlational psychology saying: "The job of science is to ask questions of Nature" while disciplines provide the method "of asking questions and of testing answers to

determine whether they are sound" (Cronbach, p.671). Cronbach maintained that correlational psychology, with its multivariate approach to individual differences, was a practice as old as experimentation, though slower to mature. The following summarises Cronbach's distinction between experimental and correlational psychology:

- *experimental psychology* is when the researcher creates and studies artificial variations of treatments and environments to observe the consequences of usually a single variable, bringing "situational variables under tight control, ... permitting rigorous tests of hypotheses and confident statements about causation" (Cronbach, 1957, p.672);
- *correlational psychology* looks to existing variations among individuals and social groups to "study what man has not learned to control or can never hope to control. Nature has been experimenting since the beginning of time, with a boldness and complexity far beyond the resources of science (and) the correlator's mission is to observe and organise the data from Nature's experiments", (Cronbach, 1957, p.672).

The identification of individual differences among children, a goal of this inquiry, coincides with Cronbach's concern for that always present variable of individual differences, as they occur naturally: "The correlational psychologist is in love with just those variables the experimenter left home to forget" (Cronbach,1957,p.674). He thought of variation as notable effects of biological and environmental circumstances. For example, in relation to education and learning he suggested that studies could concentrate more on the identification of test variables which define practice at different ages, such as changes in motor function as a result of practice. His theoretical plan (apropos of the theoretical variables in this study - Introduction, section 1.4), included: present situation such as medical, physical, hereditary, environmental factors; past situations such as experience; and psychometric information. "This network permits us to predict from past experience or present characteristics of the organism, or a combination of the two, depending on what is known" (Cronbach, 1957, p.683).

A more contemporary translation of this position comes from Salvia and Ysseldyke

(1991) in describing the necessity of interpretations from assessment to be attentive to current 'life circumstances'. "It is not enough to assess a student's current level of performance; those who assess must also understand what has shaped the current performance" (Salvia & Ysseldyke,1991, p.21). A more complete understanding of the individual life circumstances of children in this study was informed by qualitative comment on the screening checklists, information from the Parent Surveys, and observations from personal contact with the researcher both from teaching and informally.

Cronbach postulated that inquiry is meant to identify the existing characteristics and circumstances of an organism that will affect its mode and degree of adaptation so that organisms and environments can be successfully matched, as all organisms do not adapt equally well to variation or environments (Cronbach,1957). This theoretical position also coincides with the philosophy of this study in that learning environments and the curriculum can be adapted to accommodate the assessed needs of individual students which should in turn, contribute to the achievement of better student outcomes. However, the forty year old methodological position regarding standards in educational measurement needed to evolve to meet the current needs of performance assessment, to exploit the theory.

For example, while Cronbach believed that test interpretations necessarily assume that the test measures a construct and therefore scores are linked to the theoretical network underpinning that test instrument, his traditional scientific orientation led him to require explicit specification of the complete theoretical network with empirical verification of all relations within that network for adequate validation (Wiley,1991). This expectation would be more than difficult to accomplish and unrealistic when trying to meld the complexities of many current educational and measurement problems.

As a postscript to Cronbach's early concerns for individual differences and "... identifying just where and how a learner is having difficulty", he was still looking forward in regard to testing for educational placement in 1991 (Cronbach, p.386). Instead of psychometric information predicting outcomes, he called for psychometric

information that predicts "differentially" on the basis of intervention / "a function of treatment". This method would be personally sensitive for the children and give information of anticipated value added to the child's life circumstances.

Campbell (1969/1988) was influential in broadening the concept of operational definition, particularly in the social sciences. He disagreed with the concept of definition in science as being inclusive. "'Definition' is but description used to identify...the presence or absence of an object or process and useful in distinguishing it from similars with which it might otherwise be confused" (Campbell,1988,p.3). His reasoning revolved around the concept that there are countless attributes, known and unknown, which exert influence in any given experience, (like Cronbach's present and past situations). However, Campbell was quick to point out that it is only 'definitional' operationalism to which he took exception due to the virtually unattainable parameters which it sets, possibly resulting in unwarranted exclusions. In the present study extensive operational definition, for example regarding setting, timetable or evaluators, would unnecessarily preclude use of this screening instrument in many instances.

In reality, achieving full implementation of positivism's strict requirements for operational definition can only be approached within the rigid confines of experimental research. According to Cole (1990) experimental psychology assumes the processes it studies are not context or time dependent, but universal, whereas the sociohistorical school of psychology (associated with Vygotsky, Leontiev and Luria from the 1920s) contends that the study of human psychological processes are historically contingent and therefore, inappropriate to study using experimental methods. Campbell said that an experimental approach "... will always be incomplete (as) it is always a logical possibility, and usually a practical possibility, that some features we failed to specify will eventually turn out to be crucial to the results obtained" (Campbell, 1988, p.31). A result could even be considered in error because of a perceived misfit with predetermined definition.

Campbell promoted 'multiple operationalism', discussing the advantages of using multiple techniques and strategies to determine causal and consequential factors

(see 3.5 and 3.6 this Chapter for description of the mix of evidence and statistical procedures used in this study). Due to the influence of the heterogeneous effects of the many facets entwined in theory, Campbell said multiple operationalism increases confidence in the certainty of interpretations when there is evidence of consistent observations. For the present study, this aspect is addressed from results from the three chronologically separate comparison groups (1993,1995,1996), quantitative screening scores, qualitative comment, parent surveys and teacher surveys to collect evidence from different points of view, to fully describe the children and authenticate use of kindergarten screening.

3.1.1 Conclusion-Oriented Disciplined Inquiry

Disciplined inquiry, which characterises the design this study, offers a procedure that can rationalise both sides of the quantitative / qualitative debate by its capacity to embrace both quantitative and qualitative considerations. Cronbach and Suppes (1969) called for expansion in the design of educational research saying: "Naturalistic observation ... has tended to fall into disuse, though it is a significant form of disciplined inquiry, ... the study of education requires non-quantitative as well as quantitative techniques" (Cronbach & Suppes,pp.13 & 14).

In general, according to Cronbach and Suppes (1969), the method of disciplined inquiry includes: control for error at each step; objectivity and evidential test; internal consistency; clarity of detail, eg. in specific description of method such as data collection; and "scholarly" report which command credibility if not necessarily agreement. Clay (1991) stated that effective interdisciplinary interchange needs "to appreciate the logical linkage between theoretical issues, research designs, statistical analysis, and interpretations" (p.42).

The most important feature of disciplined inquiry is that the data and arguments can withstand exacting scrutiny from the scientific community (Shulman,1988). Shulman said that research methodology in education is "exciting" since education is not a discipline, it is a field of study, and therefore has the "raw material" for a variety of inquiries which utilise the "perspective and procedures" of various

disciplines. However, Shulman advised regardless of the discipline chosen, it is the mix of evidence to answer questions and support interpretations which is important: "... inquiries cannot involve mere recitation of facts ... inquiry demands the selection of a particular set of observations or facts from the nearly infinite universe of conceivable observations" (Shulman,1988, p.5).

Cronbach and Suppes classified disciplined inquiry as being either decision-oriented or conclusion-oriented, although adding that the line of demarcation is not rigid and that neither type is preferred. The distinction refers to conditions motivating the research in the first place, and degree of constraint. Decision-oriented research asks the researcher to provide information about a specific question, issue or evaluation, and has predetermined parameters which oblige the researcher to remain within a defined structure, constraining exploration.

Conclusion-oriented inquiry often stems from practical activities, but is theory driven and meant to produce applicable concepts and generalisations adding to the base knowledge of education. Conclusion-oriented research is motivated by self-directed conceptualising, allowing the researcher freedom to explore and redirect the inquiry depending upon emerging insights, albeit within whatever constraints are imposed. In this study constraints included ethics requirements, some school policies, time-tabling in the schools, and availability of suitable adult evaluators in schools. The present study rather straddles these orientations, being initially conclusion-oriented, but also much of its purpose is to provide data for decisions about teaching / learning for individuals.

Howe and Eisenhart (1990) referred to the debate between research methods as the "positivist alternative paradigm split". For some, positivism was rejected in the social sciences owing to the static and usually narrow confines created by strict operational definition, unitary concept of validity and quest for certainty. By contrast, qualitative research uses a variety of techniques to study phenomena as they occur naturally, rather than being manipulated or prearranged, free from possible constraints due to a priori determinations (Goetz & LeCompte,1984; Jacob,1988). In qualitative research certainty is never absolute as inquiry is an on-

going process of "interpreting the interpretations of others" (Smith & Heshusius,1986, p.9; Phillips, 1987). However, despite tolerance for qualitative inquiry, the importance of accountability to produce valid, reliable and socially significant results (consequential validity), is always the goal (Wolcott,1992).

The following summarises attributes of quantitative and qualitative methods (Goetz & LeCompte,1984; Howe & Eisenhart,1990; Lancy, 1993), with examples of their use in this study:

• Inductive / deductive - from examination and comparisons of phenomena, understandings develop to then generalise; for example, generalisations which may be made to the population of kindergarten children from consideration of results across the study's three samples such as various school interventions in light of the wide range of screening gains from early to late in the year.

• Subjective / objective - strategies used to elicit and analyse "emergent" categories directly from observations as they occur naturally; for example discovering sources of confounding influence among screening evaluators and raters and teacher expectations depending on their theoretical view of early childhood development.

• Generative / vericative - within a "fluid reality", use of data gathered from multiple sources to discover, classify and interpret significant factors, to then construct theory; for example relationships between information from the parent surveys and the children's early screening results, and between the classroom teachers' surveys and the children's late screening results as they relate to issues such as school entrance age.

Wolcott (1992) and Lancy (1993) summarise processes, basic ways of knowing, in qualitative inquiry. These processes, with examples of use in this study are:

• Watching / observing over a period of time revealing things as they are; for example in this study, for two years the researcher personally taught, at school, individual children targeted by screening results as being in need of intervention, and, worked once a week with teachers, parents and children in the school's outside

motor program.

• Asking / interviewing - when the researcher's role goes beyond an observer to gain a perception of how things are in comparison to prevailing norms and policies; for example, the researcher was able to determine the extent of teacher / administrative consensus regarding participation in this study, and had formal and informal discussions to determine school policy regarding access to Reading Recovery, (a year one remedial reading program).

• Reviewing materials prepared by others; for example parent and classroom teachers' surveys, and searching standardised developmental screening instruments to verify content (checklist items), of The Kindergarten Screening.

3.2 Standards in Educational Research and Measurement

Part of the quantitative / qualitative debate has concentrated on a long standing view that 'sound' valid educational research should be grounded in the positivistic tradition. The positivistic unitary view of validation held observations as being separate from the purpose and evaluation of inquiry. Observations were beyond question and could be verified irrespective of human judgement, because reality existed independently (of the researcher), (Smith & Heshusius,1986; Moss,1992). This was thought to be accomplished by precise and complete conceptual and procedural operational definition beyond which no options, either antecedent or consequent, would be considered. This approach restricted inquiry to that which could be proven with certainty, but which can also effectively limit the scope of inquiry beyond relevance by oversimplifying complex issues (Lancy,1993). However, "...science is no longer seen as a value-free activity" (Gipps,1994,p.61).

Howe and Eisenhart (1990) maintain that all aspects of investigation are "inherently laden with theory" which is an "outgrowth of human purposes" and are therefore, "inherently interpretive", (constructed within the mind). Consequently, since all standards are shaped by human judgements, purposes and values (Shepard,1993), there can be no stand-alone method of certification. However, "Abandoning positivism does not entail abandoning standards of objectivity and rationality ... it

entails instead the question of standards be viewed wholly within an interpretive perspective" (Howe & Eisenhart,1990, p.3).

With the acceptance of qualitative methods in educational research and measurement methodology, questions were raised challenging the appropriateness of applying traditional quantitative validation standards to alternative methods. However, according to Howe and Eisenhart, "There is no good reason for educational researchers to attempt to legitimate an alternative paradigm so that it might peacefully coexist with positivism", (Howe & Eisenhart, 1990, p.3). The ensuing debate was between those who would develop qualitative standards against a positivistic frame in an effort to legitimise qualitative studies, those who would develop qualitative standards in their own right meant to produce equally justifiable findings, and those who would use an eclectic approach - the approach taken in the present study (Smith & Heshusius,1986).

Smith and Heshusisu (1986) said, "... bypass(ing) paradigmatic questions ... leaves many crucial concepts defined in the same way for both (quantitative and qualitative) perspectives" (p.7). Shulman (1988) listed common yet distinguishing features of disciplines as the way in which they: formulate questions; define and conceptually organise domain content; organise method for the discovery, testing and verification of knowledge. deVaus (1991) said there is no ideal way to determine the validity of an instrument as the process is circumstantial to the instrument in question.

> "In our view, it is more fruitful to think in terms of one kind of validity with different design-specific instances. Such a general conception of validity helps vitiate methodological imperialism and, at the same time, is consistent with the different kinds of knowledge and technical skills that go into marshalling and evaluating research-based arguments" (Eisenhart & Howe,1992, p.13)

Eisenhart and Howe (1992) speak of general validation standards applicable to all forms of educational research, and of design-specific standards. General standards outline areas of specification and evidence required, and sit comfortably with disciplined inquiry. Design-specific standards are those which are subsumed by the

general standards, but which specifically define the unique considerations of individual studies. Standards put forward by Eisenhart and Howe, which have guided the design of this study, include:

• Suitable "fit" between research questions (I.6, Introduction), data collection procedures (3.5 and 3.6 this chapter for design specific standards of this study), and analysis (Chapters Six, Seven and Eight).

• Coherence with prior theoretical and explicit practical knowledge (including that of the researcher and also evaluators in schools, as a possible source of bias), (Chapters One and Two);

• Internal and external value constraints regarding the importance, usefulness, and risks of the study to inform and improve educational practice. External constraints pertain to "accessibility to the general education community" (Eisenhart and Howe [1992] expressing concerns similar to those of Jackson [1990]). In this study there were no external constraints on the researcher. Internal constraints concern ethics; for example deference paid to all participants in the form of confidentiality, adherence to prevailing policies and help - in this study to children, parents, teachers, school staff and administrators, the university, and the community.

• Balancing evidence from multiple sources to verify interpretations such as the attributes, and similarities and differences of task performance from: the Developmental Milestone Charts (Twaddell,1994); three comparison groups of kindergarten children; scoring study for the Paper\Pencil & Reasoning Screening Category; interrater study; and parent surveys. The object is to balance the technical issues of validity and reliability for generalisability, with concerns about actual and potential consequences (Gipps,1994; Moss, 1992).

3.3 Contemporary Concept of Validity

As the concept of measurement validation evolved to suit the needs of the educational community, it became fragmented into what are now considered "traditional" components such as content, criterion, concurrent, predictive and construct validities. According to Moss (1992) these components were "... in the

context of scientific rather than educational measurement, ... were not logically distinct, ... [and did not] reflect a more realistic and practical approach to meeting current needs" such as those presented by performance assessment (Moss, p.31 & 33).

The current expanded concept of validation views construct validity as one of two central components. Construct is the unifying element integrating the multiple evidence required to justify interpretations (Gipps,1994; Shepard,1993). Gipps considered construct validity as "patterns of relationships" among such sources as test items (construct representation - see 3.5 this Chapter), between assessment results and those of other instruments, performance differences over time and across participants and settings (in this study contrasting screening results from three chronologically separated comparison groups), and content relevance and representativeness, (see 5.1, Content Justification, Chapter Five). In this study there can be no comparison of results to those of other instruments as there is no other comparable standardised whole class in-school kindergarten screening instrument known to the researcher.

Wiley (1991) contends construct evidence must "... be specific to the network as well as the intent of the measure" (Wiley, p.104). Wiley was not only referring to the theoretical network underpinning the measurement but to necessary specification of the abilities and skills involved in tasks intended to be measured, in relation to the network. This position coincides with the process of task analysis used in this study to identify the abilities and skills of required to complete the tasks on The Kindergarten Screening instrument. Task analysis is meant to identify and help ensure equivalence between the abilities and skills within affecting domains in early childhood, the tasks of each assessment domain, and of those required within the kindergarten curriculum (see 5.2.1, Chapter Five for further discussion). The purpose of this procedure was twofold:

- to justify a valid relationship between assessment content and theoretical frame thereby tying scores and interpretations to the theoretical frame;

- to avoid the validation threats of "construct underrepresentation and construct-irrelevant variance" (Messick,1994, p.13). See measurement construct, 3.5.

The second component central to the contemporary view of validation is that validity is also the responsibility of the test user in regard to decisions based on test results, as well as the tester and author(s) - consequential validity (Angoff,1988; Messick 1975,1988; Moss,1992). Interpretations and inferences made from assessment results in comparison to intended purposes are considered integral components of validation. As well as uses, considerations necessarily include concerns regarding the "generalizability of assessment-based interpretations" (referring to groups of scores across samples, time and settings), and "other information on the context and on the experience and behaviours of the individuals involved" (referring to individual results), (Moss,1992, pp.36-37).

Throughout this evolution of the concept of validity, a fundamental concern has always been the identification of sources and then control of threats to warranted results and consequential decisions. The concept of validity is an issue of definition of truth in reality. The two major methodological approaches to research support different assumptions about reality (Lancy,1993). Within the traditional quantitative perspective "A judgement of validity ... is conferred only when proper methods or sets of techniques are employed" (Smith & Heshusius,1986, p.9), thereby certifying results as uniquely reflective and completely descriptive of the reality in question. Within the qualitative perspective, Moss describes the validation process as being continuous, justifying interpretations by agreement, describing reality using a hermeneutical approach:

> "...which seeks to understand the whole in light of its parts, repeatedly testing interpretations against available evidence until each of the parts can be accounted for in a coherent interpretation of the whole" (Moss,1994, p.7)

The expanded view of validation "... is an overall evaluative (and integrated) judgement, founded on empirical evidence and theoretical rationales ... of both the adequacy of existing evidence and the appropriateness of potential consequences of test interpretation and use" (Messick,1988, pp.33-34; Linn,1994). This current view of validation enjoys considerable consensus among educational researchers and measurement specialists. Validation is again seen as unitary, but, rather than

singular certification, as a singular on-going process and a matter of degree, although still being supported by empirical evidence.

The issue of standards for validation boils down to what evidence will count as valid "warrant for truth claims". Phillips (1987) wrote of truth as a "regulative ideal" (equating it with John Dewey's term "warranted assertibility"), which can only be achieved if "... there are criteria for judging the warrants that are advanced on behalf of claims" (p.14). Phillips contended it is the strength of supporting evidence and arguments that allows truth to be recognised and so labelled. Therefore, to maximise the credibility of an inquiry, the pragmatic goal must be sufficient and clearly stated theoretical, structural and procedural definition, use of standards pertinent to intended use, control for confounding influence, and multiple evidence to support inferences and actions.

Personal investigation of this issue is essential for the creator, interpreter and consumer of assessment results to determine which information will be accepted as valid, confidently leading to reliable interpretations and consequent decisions. In this case such decisions would be: reports to parents; referral for specialist attention in domain of concern; appropriate intervention and instructional accommodation(s); teacher, school and/or government policies which may be amended.

3.4 Performance assessment: Definition and validation

The Kindergarten Screening, the instrument developed in this study, is performance assessment by observation of each child's demonstrated performance of familiar criterion tasks in the familiar context of the child's classroom and school, among the child's peers and evaluated by their teachers.

Assessment using only standardised fixed answer tests has come under criticism in recent years as traditional forms of testing are not thought to thoroughly evaluate what a student can accomplish or fairly account for individual differences, with some critics going so far as to call for their complete elimination (Sanders & Horn,1995). According to Sanders and Horn, proponents of 'alternative

assessment' methods have become increasingly outspoken in trying to establish exclusive rights of these methods as the legitimate assessment paradigm. Even the term 'assessment' is thought to connote a distinct purpose which effectively separates this form of testing from that which ranks, labels, or determines placement such as for special education or retention:

"...assessment might be standardized, involve paper-and-pencil responses, and so on, but in contrast to traditional testing, 'assessment' implies a substantive focus on student learning for the purpose of effective intervention" (Shepard,1994, p.206).

As an alternative to traditional fixed answer testing, performance assessment: is thought to be a more valid form of evaluation because students can personally demonstrate their individual abilities, skills and achievements; is evaluation by direct and systematic observation of "real-life" tasks within a specific content domain and context (time and place); is judged by teachers and trained or professional raters; looks at actual performance or product, or both; is process oriented; is intended to motivate better teaching; supports teaching and learning; is potentially challenging and beneficial for students (Dorn,1998; Gipps,1994; Glaser,1973; Linn, Baker & Dunbar.,1991; Messick,1994; Safrit & Wood,1995; Shavelson, Baxter & Gao,1993; Shepard,1995; Stiggins, 1987; Wiggins,1989; Worthen,1993). Wolf, Bixby, Glen and Gardner (1991) wrote of hope that alternative assessment "...will provide means for exposing the abilities of less traditionally skilled students by giving place to world knowledge, social progress, and a great variety of excellence" (p.60).

The term 'authentic' sometimes attached as a descriptor to performance assessment is meant to indicate demonstrated direct performance within actual classroom conditions (Gipps,1994). An Australian example of performance assessment is the school-based teacher-evaluated written component of the NSW State-wide English Language Literacy Assessment (ELLA) for all Year 7 students launched in 1997, intending to identify the specific instructional needs of individual students.

The design of performance assessment must make clear what is being evaluated and by what criteria (Messick,1994), for example, in some cases the performance itself is the product being evaluated. The Kindergarten Screening looks at motor, oral language and behavioural performance as product but also, written performance as

product from the paper and pencil worksheet. There are performance attributes specified as scoring criteria, and qualitative individual process attributes which further and uniquely define each child's performance. Understanding the difference between specified response attributes (quantitative information) and individual process attributes (qualitative information) is especially important when screening kindergarten children because information about both is essential to a complete profile of each child's developmental and learning needs.

Scoring should concentrate on those aspects or components of the performance / product, which are most important (Safrit & Wood,1995; Stiggins,1987). While for each item on The Kindergarten Screening there are specified scoring criteria which must be adhered to, to validate results, scoring criteria are minimal compared to the individual processing differences in these young children. Individual process information is found in the qualitative comments written on the screening checklists of each screening category, for each child.

For example, frequently, qualitative comment in the Outside Motor Screening Category informed whether a weak response seemed more due to lack of practice, or concern indicating referral for specialist diagnostic attention, (see The Kindergarten Screening Manual, Appendix A1.2, p.307). If the quality of performance attributes is consistent with scoring criteria for success, the assumption can be made that the child's response is appropriate and expected, or better than expected, for age. When performance attributes negatively vary from specified scoring criteria, qualitative comment about process helps provide information regarding the relative competencies of the child (the performer). Process information provides a link from "observed behaviour to constructs ... underlying that behaviour" (Messick, 1994, p.14). And, according to Messick, "the meaning of the construct is tied to the range of tasks and situations that it generalises and transfers to" (p.15).

Shavelson et al. (1993) explained the issue of reliable generalisability in performance assessment, an issue of consistency and variability, by seeing the sample of student performance as drawn from "a complex universe" consisting of the combination of four integral components, or facets:

- all possible *tasks* representative of the content or behaviour domain in question;
- all possible *occasions* when a decision-maker is "equally willing to accept the score";
- all possible individuals (*evaluators / raters*), "who could be trained to score reliably";
- measurement *methods*.

Factors within any one of these four facets can present a source of measurement error depending on the magnitude of sampling variability. In this instance sampling variability refers to a far broader scope of factors than in the traditional sense when the term seemed only to refer to selection of participants. However, "Once (the performance is) conceived as a sample from a complex universe, the statistical framework of generalisability ... can be brought to bear on the technical quality of performance-assessment scores" (Shavelson et al., 1993 ,p.217). Design-specific considerations addressing these issues for this study, identifying and countering possible sources of error which could produce variability, are discussed in Chapters Four and Five.

The primary goal of performance assessment is the expectation that interpretations of results and subsequent decisions based on those interpretations will enhance the successes of students in school and in their daily lives. This position coincides with the expanded concept of validity, legitimatising its use. However, along with conceptual enthusiasm for the use of performance assessment, there is concern with respect to over-reliance on consequential evidence being proffered as sufficient validation. Measurement specialists write about the need for implementation of consistent technical measurement standards to ensure validity.

> "...performance assessments must be evaluated by the same validity criteria, both evidential and consequential, as are other assessments. Indeed, such basic assessment issues as validity, reliability, comparability and fairness need to be uniformly addressed for all assessments because they are not just measurement principles, they are *social values* that have meaning and force outside of measurement wherever evaluative judgements and decisions are made" (Messick,1994, p.13 - emphasis the author's).

3.5 Measurement Construct

According to Gipps (1994), the measurement construct "... is the underlying (explanatory) skill being assessed" (Gipps, p.58-parentheses the author's). For The Kindergarten Screening, the *measurement construct* being evaluated is the level of children's independent function within affecting domains (see the proposition within the Research Problem, I.1, Introduction). *Function* is taken to mean demonstrated and observable abilities, skills and concepts; in this case in performance of screening tasks. *Affecting domain* is taken to mean an area of concern in early childhood which influences developmental change as identified in the Factors of Typical Development and Learning (I.3, Introduction), and manifest in the five screening categories (Outside Motor, Fine Motor, Language, Paper/Pencil & Reasoning, Personal Characteristics).

The Kindergarten Screening instrument comprises tasks representing affective domains in early childhood and those typical of the kindergarten curriculum, and the measurement construct is fully represented in every screening item, (eliminating the possibility of confounding from construct underrepresentation). While the abilities and skills of some tasks are more indicative of a single domain and category, others have cross-representation of components. For example, in the Paper/Pencil & Reasoning category (PP&R), for Checklist Items 41 and 44, the components of auditory discrimination and accurate reception for the grammatic structures of singular / plural are required for success as well as, motor control and spatial organisation factors. It is for this reason that qualitative 'process' information is so important as well as quantifiable scores, to a complete student's profile of independent function and assessed needs.

Definition of construct alone is insufficient for reliable evaluation. Some attributes of task performance are referred to as being construct-irrelevant. While these attributes may affect the quality of performance / response, they are not defined as part of scoring criteria and do not affect scoring. A clearly defined construct in combination with clearly defined scoring criteria are required to restrict subjective interpretations of responses. [For an example of construct-irrelevance see Interrater

Agreement, Chapter Five, 5.3.] As evaluators understand and abide by scoring rubrics, construct-irrelevance should not confound the standardised results.

The theoretical frame, discussed in section I.3, Introduction, identifies the factors of typical ability and skill development and learning in early childhood within affecting domains. The same abilities and skills are identified in the screening categories, which also reflect change in development and learning. The identified abilities, skills and concepts of each screening task are among those that school entry kindergarten children are expected to be able to use spontaneously, at the independent level of function, within the existing kindergarten curriculum. Thus, the connection between the measurement construct, measurement content and the kindergarten curriculum is established. The measurement construct links the theoretical frame to the screening categories and screening items, to the kindergarten curriculum, through children's responses through each child's demonstrated performance of screening tasks, and thus, to interpretation of results and consequent instructional decisions.

3.6 Mix of Evidence

Campbell advocated using multiple and independent measures sharing theoretically relevant components to collect evidence, to increase the certainty of valid and reliable interpretations. "When multiple operations provide consistent results, the possibility of slippage between conceptual definition and operational specification is diminished greatly" (Campbell,1988, p.64). For this inquiry, multiple measures designed to collect evidence over time were:

- Quantitative and qualitative screening results for three separate yearly samples established the base of comparative evidence for substantiation of similarities between the different samples, subgroups, and individual children, by assessing all the children in each kindergarten, both early and late in the year;

- An interrater agreement study over two years to establish the nature and degree of training required for consistent and objective performance evaluation and determined the most definitive wording for scoring directives in the screening manual, thereby reducing subjective evaluation decisions (Chapter Five, 5.3);

• A Paper/Pencil & Reasoning scoring study over two years to verify and clarify specific scoring criteria, thereby reducing subjective evaluation decisions, (Chapter Five, 5.4);

• Parent Surveys to credit the independent variable with details of the children's developmental milestones, helping to establish reliable generalisability by more fully describing the sample, (Appendix 1., A1.9, p.354). The surveys also collected information about the children prior to school, medication and activities after school, and parents' occupation and concerns about their child and school, (Chapter Four,4.5);

• Classroom Teacher Surveys established their evaluation of (some) children's subsequent attainments, contributing to the picture of the impact of screening by comparing survey information with screening results, (Chapter Six, 6.6, and Appendix 1., A1.10, p.356);

• Video recording of actual screening sessions during trialing, to verify age specific responses of many children informed scoring criteria and enabled preparation of an inservice resource video illustrating the process and standard features of screening administration for evaluators. However, equally important, it promoted an objective understanding of the range of individual differences in these young children, both male and female.

The researcher collected data informally by working as collaborative teacher on-site, in three schools. This role has been described as "a legitimate role within the setting ... (and therefore information) should correspond much more closely to the lived reality of the individuals the research is designed to portray" (Lancy,1993,p.14 & p.26). This opportunity further bridged the gap between quantitative information and qualitative information. Qualitative information was collected in the form of: comment on the screening checklists as appropriate for each child; running records for each school and for the individual children taught by the researcher in 1995 and 1996; further video filming, of country screening in 1996; parent and teacher comments; conversations and observations.

Other qualitative information was obtained from implementation of a developmental

programme running two afternoons a week in collaboration with teachers and parents to enhance oral language, cognitive and motor skills; organisation materials in classrooms to be more developmentally appropriate; organising, teaching and reviewing an outside motor programme; organising and teaching an after school motor programme to which parents subscribed privately. Through these activities the researcher gained insights about the conceptual understandings, biases, and relationships between teachers, parents and school administrators. Information gained from these activities, such as the Outside School Motor Program (see Appendix 1., A1.8, p.350), was shared with other schools, but implementation remained the schools' prerogative.

Qualitative assessment information was also gathered from the comment sections of the screening checklists and from child background and comment sections of the parent surveys. One example will emphasise the importance of obtaining and coupling these sources of information. The early year screening results for one English speaking child showed the child to be in the lower Outside Motor ranks and in the lowest Language ranks. Information from the developmental milestones section of the child's parent survey showed the child to be exceptionally language delayed, (first words at sixty months). The parent comment section shared information that a family friend had abused the child for a period of time. This bridging of quantitative and qualitative information was essential to an accurate identification of this child's profile of developmental and learning needs as the child's language difficulties were considered a factor of intervening variables rather than an inherent factor; information which should influence the choice of intervention strategies.

3.7 Statistical Procedures

Quantitative statistical analyses were performed (1) to evaluate internal consistency of the scores obtained across samples and subgroups over time, and (2) to compare outcomes across samples and subgroups. The purpose of statistical analysis was to analyse and describe results, to identify aspects of the impact of screening such as comparison of school mean gains achieved from early to late in the year, and to

correlate teacher survey results with screening information. The following statistical procedures frames the collection of quantitative evidence in this study.

All three samples were screened early and late in the year. In all cases statistics were calculated from early and late scores for Success Rate (total score) and for each of the five Screening Categories. Results were tabled by each yearly sample and for each school population within the sample and then, by age, gender, time of year and in some cases by language (English / ESL), within each sample and school population.

Early and late screening means were established for each whole sample and for each whole school population within samples. School screening results were scored and recorded by the researcher, copied, and then given to each school within a week of screening, so results would be timely for the schools. Decisions about informing parents of results and programming and/or instructional accommodations made based on results, were the prerogative of each school.

Comparison of the difference between early and end year means illustrated gains for each school. The purpose of this process was to find the range of gain across the schools, and to then look for factors in the schools which were unusually successful in accommodating the children's identified needs. Such information may help inform future school based planning of instructional interventions and policies.

Mean confidence intervals for all three samples and the subgroups of gender and age within each sample were calculated to establish the similarity of obtained results over time; see 5.6, Chapter Five. Internal consistency was demonstrated by Cronbach Alpha coefficients; see 5.6.1, Chapter Five.

Percentile bands and quartiles were calculated as measures of dispersion to look at the extent to which values were spread from central tendency toward the extremes to what is atypical. This information can show patterns for subgroups to isolate possible risk factors, or establish valid target scores. Percentile bands evenly divide the whole distribution of values in exactly the same increments providing direct

comparison, in this case comparison of early and late year screening results across each sample and same subgroups within samples.

To facilitate percentile comparisons, children were grouped by their early and late screening scores into highest and lowest ranges of percentile bands. The purpose of this process was to generate information about subgroups of children. For example percentile cut-scores could be used for general grouping of children placing in the highest and lowest sections. Subgroup percentile information also allows answers to such questions as:

- to what extent are males and females consistently represented at both high and low ends of the percentile range, early and late in the year ?

- where did subgroups in specific early percentile bands end up late in the year, relative to interventions and/or accommodating instructional strategies received ?

All children were also grouped from early year scores only, into high and low quartile groups for Success Rate and each screening category. The purpose of this process was not only to determine placement of groups of children, but most important to identify each child within each quartile. Knowing exactly where individual children placed at the beginning of the year made possible accurate tracking of each child's progress to the end of kindergarten and beyond.

Based on the known distribution of early year scores, linear regression was used to predict end of year scores and thus, the difference between predicted and actual scores. Each child who achieved more or less than his/her end of year predicted score was identified. Previously, all children in each sample had been individually listed according to their early year high or low quartile placement. Within those quartile placements, children were then regrouped according to positive or negative achievement of predicted scores. The purpose of this process was:

- to identify common child age, gender, developmental milestones, preschool experience, and subsequent school attainment factors for children initially in the high or low quartile groups with residual gains or losses;

• to identify common screening factors within these groups - such as consistent initial screening scores which could be identified as target scores; derived target scores.

Beyond kindergarten, as available, academic, motor and personal progress of the 1993 Sample was tracked at the end of their year one, two and three with Classroom Teacher Surveys. Progress of 1995 Sample was tracked in this same way at the end of their year one. The purpose of this process was to identify the direction of achievement for groups of children, to identify common factors such as same / similar initial screening scores or personal factors for those children identified as receiving or not receiving special help in year one and to identify specific correlations between screening categories and items, and survey categories and items (Chapter Seven).

Conclusion

Jackson (1990), promoted conclusion-oriented research as a necessary function in educational research, owing to its ability to ultimately alter / change prevailing views. However, he pointed to the numerous ways in which educational research is viewed by or impresses, the community. Jackson cautioned researchers to be aware of what amounts to any hidden agenda that might be construed due to the manner in which research design and results are reported. To increase credibility, researchers should become more "self-reflective about our research goals and methods and what they mutely and perhaps inadvertently communicate..." (Jackson,1990, p.9); a caution echoed by Lancy (1993). The American Educational Research Association (AERA) (1997) set policy encouraging the communication of research that will be relevant to, and actively influence, policy and practice (cited in Wallat & Piazza,1997).

To ensure implementation of the above for the present study, this chapter has argued that contemporary designs in educational research can successfully combine attributes of both quantitative and qualitative method with sufficient definition of standard to lead to adequate validation of performance assessment. The contemporary concept of validity in measurement research has evolved into an

expanded view which considers construct validity and consequential validity as two central components. Construct is the measurement's unifying and integrating facet from the theoretical frame of the instrument to test results, and ultimately to the kindergarten curriculum and instruction. Consequential validity considers the responsibility of the test user in regard to decisions based upon test results, as well as that of the tester / evaluator and author. Validation boils down to the mix of evidence accepted as warrant for truth to justify interpretations in relation to purpose.

The intent of performance assessment, thought to more fairly account for students individual differences owing to direct and systematic evaluation of what each student can accomplish, is to focus on student learning for the purpose of effective intervention. Because of the social value of consequential decisions made on the basis of test results, measurement specialists write that validation of performance assessment, like all assessment, must include the implementation of consistent technical measurement standards.

Measurement specialists also contend that there are general validation standards applicable to all forms of educational research as well as design specific standards unique to each inquiry, which are described in detail in relation to this inquiry. Design-specific considerations addressing these issues for this study such as identifying and countering possible sources of error which could produce variance, are discussed in Chapters Four (p.108) and Five (p.144).

Chapter Four - Measurement Conditions: Procedures and Description of Sample

Introduction

This inquiry concerns issues surrounding screening kindergarten children at school entry to identify their developmental and learning needs, validating a reliable kindergarten screening instrument, and the potential impact of kindergarten screening for schools, children and their parents. Use of screening results involves inference and generalisation. Confidence in generalisability depends upon control for confounding influences.

According to Campbell (1988), common threats to valid interpretations and therefore to generalisability, can be traced to: participants - those being studied, (the children) and those responding (teachers and parents to surveys); the investigator; sampling, (choice of participants); and stability of content over time. Regarding performance assessment, Shavelson et al. (1993) identified all possible tasks, occasions, evaluators and measurement methods as four facets of a complex universe which can present sources of error. The current expanded view of validity considers construct and consequential validity as the two main components of validation (Angoff,1988; Gipps,1994; Shepard,1993; Moss, 1992). Some of these areas of concern, which have been discussed in Chapter Three, have to do with either the inquiry, or assessment variability, while some are common to both.

Operational definition is used to control variation and increase consistency by limiting subjective interpretations, giving confidence to reliable generalisability; although definition beyond relevance can be restrictive. For example: the only definite setting specification for The Kindergarten Screening is the availability of a set of stairs with at least four treads and a hand rail (Checklist Item 1). Stairs with a hand rail are necessary as the scoring criteria states that age four children may need to hold the rail, (see the Screening Manual, Appendix 1., A1.2, p.307, for complete description of all Checklist items and scoring criteria). However, results are not affected if the stairs are inside (in case of rain) or outside, or even off school grounds.

Clearly stated structural definition such as the study of interrater agreement and statistical processes (the inquiry) and scoring (the screening instrument), and procedural definition such as access to schools (the inquiry) and screening administration (the screening instrument), are essential to support generalisability. Specific definition of a variable implies that the variable is relevant to the purpose of the research or measurement. Cronbach (1988) pointed out, procedures, or variables which are not defined can signify that change in those variables would not alter results or interpretations. To instil confidence in the reliability of interpretations and generalisability of results from this study, comprehensive documentation and definition of relevant affecting variables are provided. This chapter and the next one present the design-specific structural and procedural methods used to standardise measurement conditions and the screening instrument.

4.1 Site (The Schools) and Procedures

The potential success of this inquiry firstly rested upon access to kindergarten children in schools and then, upon continued contact with those children in collaboration with their teachers, parents, school administrators and other school staff. Collaboration was a key because this study needed an extended period of time with active participation in schools, beyond just observation. Schools had to agree to be partners in this research, providing their natural context, to justify findings.

4.1.1 Schools - Sampling

Choosing schools was not done by random selection due to the improbability of a researcher outside the Department of School Education / Department of Education and Training (DET) [8], negotiating a statewide process of selection and then gaining compliance from schools chosen. However, care was taken to include representative geographic, cultural, and ethnic diversity, and diversity in type of school. There were eleven government schools and four independent schools of which two were Christian schools, one Catholic and one Seventh Day Adventist. Participating schools were those most likely to yield the maximum information; a technique of qualitative research Lancy (1993) calls "purposive sampling", when the

research bias becomes the purpose for site selection. According to Campbell (1988), sampling can threaten generalisability when attributes of excluded groups within the population differ from those included in the sample. Sampling variation can also occur depending on what portion of the population is actually availably for inclusion, and the stability of the population over time. Sampling variation can also occur unintentionally depending upon circumstances, in this study depending upon a school's decision to participate.

However, for this study, population sampling should not threaten generalisability because of the inclusion of all children in each school and the diversity of geographic sites and associated socio-economic attributes. The only criteria for selection were age and attendance at school on the day. A school's decision to participate automatically selected all their kindergarten children between the ages of 4.6 and through 5.11, who were at school. Socio-economic attributes were not considered in school selection for two reasons. The first was the research bias that all kindergarten children should have access to appropriate assessment, hence the inclusion of all kindergarten children regardless of possible 'risk factors'. The second reason is that within the actual geographic representation (inner city, affluent and less affluent city suburbs, country city and town, country rural), a wide range of the socio-economic spectrum was also represented, (professionals, self-employed, unemployed, pensioners - see Parent Surveys, 4.4.10, this Chapter).

4.1.2 Initial access

Initial access to schools came from two sources. The first through introduction by colleagues and the second through inservice workshops. In every school, first there was a discussion with the school principal to explain the study and give assurances that the school had no financial, clerical, or extended out of school-time obligations. The explanation also outlined what was expected at school but most important, on-going assistance the researcher was willing to give the school during participation. The researcher's early childhood teaching experience, State certifications in early childhood, reading and special education, and tertiary degrees, seemed to add credibility to the offer of help. It was made clear from the beginning that the researcher would work with the school beyond all screening requirements, as

requested, within the existing school time table and with complete acceptance of school policies. It was also made clear that the work had University ethics approval.

The first school was small, with a closely knit staff (six teachers and one office manager), and were happy to have the help of an experienced early childhood teacher. Help included screening their kindergarten children (with the classroom teacher and itinerant language teacher), and working in the kindergarten classroom with the classroom teacher, at least one full day per week. During this year the inservice workshop was written and presented at another school and by invitation, at a regional resource centre of the Department of Education and Training (DET), from which another school became interested. From that time, for three years, DET was kept informed of the study's progress, for example, by a presentation to a regional director and the Special Education Directorate, and subsequent update letters to the Special Education Directorate.

The 1993 and 1995 Samples were composed of inner-city children (some schools with a large proportion of ethnic language diversity), and suburban children (some schools with no language diversity). The 1996 Sample included some of the above children and also children in five country schools. Initial access to the country schools was gained by an arrangement with one school for the researcher to give an afternoon workshop which was given free. The sponsoring independent school invited other schools. The workshop was planned and presented in term four so that if schools decided to participate, they could be organised for screening when school started again in February. The event attracted thirty teachers and administrators. (Teachers from one school drove for five hours to attend [9].) From that afternoon, five country schools chose to participate in the study.

The purpose of the workshops was to introduce the theoretical frame of the study and to define the expectations. Taking part in research can be threatening because no matter how carefully the inquiry is presented, research is often equated with evaluation and accountability (Lancy,1993; Deyhle, Hess & LeCompte,1992). Therefore, for the study to succeed, the schools needed to choose to participate with full understanding of the researcher's conceptual biases and expectations. Within the schools, the decision to participate was made either unilaterally by the

administration or cooperatively among the teachers and other staff most likely to be involved.

Workshop content included outlines of typical development, appropriate assessment, accommodated instruction in early childhood, and an explanation of the study. A ten minute demonstration video of actual screening sessions (part of the inservice video), was shown to illustrate the screening process and to show that the children enjoy themselves. Participants were given a set of notes which presented the theoretical frame establishing the conceptual foundation within the field of early childhood upon which this inquiry is based, (Appendix 1., A1.3, p.339). The extent of teacher / administrator agreement with this theoretical frame, especially regarding implementation when translating assessment results into instructional practice, is a matter for discussion. Once a school decided to participate, organisation for screening day was immediately begun.

4.1.3 Screening Day

The success of screening day at school depended upon the degree of prior organisation by the classroom teacher and the researcher of inservice, evaluators, materials and paperwork, (such as photocopying the checklists and sending permission letters home). In general, disruption to school time and staff was minimal. For a whole class, the screening can be completed within about two-thirds of one usual morning classroom routine, (although it need not be done in one session). Additional staff used as evaluators (such as a language teacher or school counsellor), may need to reschedule their obligations for most of one morning. However, there is no need for major rescheduling or alternative teaching for children not being assessed. Further, there is no need for reallocation of space or resources, or additional outside staff, and no withdrawal of students. These issues created problems in the UK with their performance-based 'Standard Assessment Tasks', (Gipps,1994; Madaus & Kellaghan,1993). Administrative procedure for The Kindergarten Screening can be found in the Screening Manual, Appendix 1., A1.2, p.307.

There are observations to be made regarding generalisability. The assumption could

be made that the uniqueness of each school community actually threatens reliability owing to confounding influences of those variables which in fact, make each school community unique. To counter this threat, care was taken to identify and take advantage of patterns common to site and procedure found in NSW primary schools, to standardise administration.

On screening day great care was taken to ensure a practical and consistent routine at every school. For example: the timetable in NSW schools is sufficiently uniform to virtually guarantee dependable timing in every school. At 'news time', first every morning, the children were grouped and given their nametags. The children had received no prior preparation for the day's activities. Parents may have mentioned the screening in one way or another to their child, (as prior to the assessment permission letters were sent to parents). However, there was no evidence of children feeling threatened except for a handful of isolated cases.

After the children were grouped, the Outside Motor, Fine Motor and Language Screening Categories were completed for the whole class by morning tea / recess. After recess the children all sat in their own table groups to do the paper and pencil worksheets. At this time the children are settled and usually at their best, prepared to listen and attend, follow directions and respond. The worksheets take about ten to fifteen minutes and were completed well before lunch at 1:00. Between the worksheets and lunch, there was always enough time to finish what sometimes was not quite completed earlier for a few children, such as the Outside Motor ball toss. The same reliable procedure was followed at every school.

However, over time, more user-friendly procedures did emerge. For example: for each class, four sets of four checklists are required, photocopied from masters provided, each with the children's names and age. To save time writing and rewriting the children's names, a master page was created upon which the children's names and ages were written once. This page was copied, cut into strips, and pasted onto each checklist. Another efficiency, since group composition did not matter, was to group the children according to their table settings in the class so they could quickly sit at their own place to do the pencil and paper worksheet.

Another user-friendly procedure was for the evaluators. A single master page of scoring criteria for Outside Motor, Fine Motor and Language was created for the evaluators to keep with them for reference during screening sessions. The evaluators did not then have to refer to the manual or memorise scoring criteria, and could mark or highlight their scoring reference page in whatever way helpful to them.

These procedures were incorporated not only because they were practical but because they continued to build consistent screening administration and scoring, and therefore further ensure fairness. Because administration, setting, tasks and materials for The Kindergarten Screening are defined and standardised, and familiar to the children, the caution of Shavelson et al. (1993) regarding variance owing to different tasks and methods of administering a performance assessment, is not of great concern.

4.1.4 Scoring and Recording

All scoring (not evaluation) and recording was done by the researcher to further reduce disruption to staff and the school timetable, and to safeguard the consistency and accuracy of quantitative and qualitative information. The researcher tabulated checklist scores and recorded results on the class record, giving the original sets to the school and copying a set for the researcher. Each school then decided how they would use their screening results, which protected end of year results (used to inform the impact of this screening) from possible prejudice by the researcher if some schools had followed the researcher's advice and some did not.

Evaluation of responses is marked directly on the screening checklists according to a ticking key with just three possible marks: a slashed tick (✗) indicating the response is spontaneous and age-appropriate or better, scoring two points; a plain tick (✓) indicating the response is fair / good, scoring one point; a dot (•) indicating a weak response and the need of further investigation, scoring zero. After the screening session, scoring can be done as time permits. Only these three marks score, but varying degrees of competence could be indicated by attaching a plus or minus to the mark. The plus or minus is treated as qualitative information to further indicate the quality of the response to the children's teacher and is included only as the

evaluator thinks appropriate. This information can help inform decisions such as the need for referral for specialist diagnostic assessment or when grouping children in class for individualised instruction.

Scoring the first four screening categories does not involve making decisions as the scoring marks indicated on those checklists are ready to be added and then recorded on the class record form (master provided). Therefore no training is required other than being familiar with the format. Also, there is space on the record form to record qualitative comments for each child. This job could be done by volunteers assuming ethical propriety regarding confidentiality is established and maintained.

Scoring the paper and pencil worksheet firstly requires evaluation decisions regarding marking the children's papers according to the scoring criteria, and should be done by the class teacher; although for this study, was done by the researcher. Scores can then be added and recorded along with qualitative remarks. While scoring the worksheets can be done by someone else, the classroom teacher will gain a more comprehensive picture of the children's strengths and weaknesses by evaluating and marking the worksheets. Scoring and recording the whole screening, for a whole class (twenty-five to thirty children), may take three to four hours. The class record form is designed for the scores and qualitative remarks for ten children.

4.2 Participants

Campbell's list of common threats to validity include those which can stem from participants - those being studied, respondents, and the investigator (Campbell, 1988). Evaluators are about the most essential component to valid performance assessment (Shavelson et al., 1993). The following identifies roles and common attributes of participants in this study, giving strategies applied to control error.

4.2.1 The Researcher

When the researcher is an active on-site participant, initially and over time - an outsider developing an insider perspective (Deyhle et al., 1992) - familiarity can create biases for the researcher which could influence results. The researcher establishes relationships with school staff and administration, children and their

families, and can be the recipient of confidences and information which must responsibly and ethically be restricted. To counter possible threats from these circumstances, the researcher abided by a personal goal to: always ensure each child and family's privacy; never ask favours; work within school policy; do more work rather than less to ensure the project did not become intrusive to the school's routine or staff; never ask for or convey either formally or informally, information which might be perceived as being sensitive.

Specific strategies to accomplish this goal included meticulous coding of all information about children and their families before any data entry; names never went beyond the researcher. Each child in the study had a unique number identification which was carried from early to late screening results, and onto parent surveys and teacher surveys. Further, all coding on the various databases was read back in its entirety against the raw data to ensure accuracy, before any data entry for computer analysis.

Examples of working within school policy included: accepting the decision of the one principal who did not to send a letter home to parents regarding the screening as this principal saw kindergarten screening as part of the regular kindergarten curriculum of that school and therefore did not need parental permission. The researcher also accepted school decisions such as the amount of information parents were given about their child's screening results and instructional accommodations for individual differences. As a result some children may have suffered needlessly due to lack of intervention. However, at no time did working within school policy jeopardise validation procedures. It did make a difference to the potential impact of screening such as the extent to which schools accommodated individual differences and this could be a limiting factor to future research.

Campbell's concern about the researcher posing a threat to validity (in this case as evaluator of the children, and the same for all evaluators), had to do with openly or inadvertently influencing (the children's) responses. This is a real concern for performance assessment because cues can be given to the performer which can put, in this case, the spontaneity and independent function of the child's response at risk[10]. For example, allowing extra practice or giving excessive praise to a child can

cue others that that child's response is what the evaluator wants; a lesson learned by the researcher during trialing. Evaluators want the child to be successful, especially the younger children, which can be and was on some occasions (especially for Fine Motor), a limitation requiring a few sets of scores to be omitted. Evaluators may show a degree of concern at clumsy responses, especially from older children. Tone of voice can also make a difference.

Strategies to counter these threats included: as far as possible the researcher re-evaluated some children's Fine Motor responses owing to doubt regarding scores. The researcher gave all directions and evaluated, with help, all the Outside Motor screening category, and all the paper and pencil worksheets. The researcher frequently emphasised caution to evaluators during inservice sessions and sometimes during screening, to accept all responses with equal enthusiasm. In two country schools where inservice was minimal, the presentation of evaluators was checked by use of a hand-held video camera, and corrections made. In one case even after corrections, the presentation of task demonstration to each child was still not as had been modelled or directed and therefore, those scores were not included. In another (city) school where the kindergartens had 42% ESL speakers, the entire language session was taped so the researcher could discuss and compare scores with the evaluator, (this exercise also helped clarify the wording of directions for the Language Category, in the manual).

Regarding the Parent and Classroom Teacher Surveys, variance can occur because respondents may give answers they think they ought to, or that they think the researcher wants to see. Variance of this sort would mean results were not typical and/or accurately reflective of the sample. This did seem to happen for one question on the parent survey about the amount of time the child "played outside each week". In general, there are just not enough hours in the day for the children to have spent the amount of time reported, playing outside (although this was summer and the children had just returned to school). However, this circumstance did not seem to affect how parents answered other survey questions.

4.2.2 The Children

While the children in each sample were different children and came from varied life

experiences, living in different geographical areas, they all shared common attributes. The most common is the independent variable. They also shared the same reason for being in the study. Children were not selected because of ethnic, socioeconomic, language, experiential background, or for any reason other than being a child in kindergarten, at that school. Selection by definition always runs the risk of exclusion and therefore of skewed or at the least, unrealistic results. Therefore, because all kindergarten children in the schools were assessed, there is less threat of variation between children in the samples and those in the population of kindergarten children, so results are more likely to be generalised with confidence.

Regarding threats to assessment validation from the children, a concern is atypical responses resulting from being in a 'test' situation. Hence the reason for screening in the familiar school setting, with familiar adults and assessment activities / tasks, within the usual familiar school routine (timetable), and with peers, as school is where the children must succeed (Friel-Patti,1994). Key advantages of this approach are that all aspects of the screening process are natural (not contrived), can be completed for a whole class during one morning session, and the children enjoy themselves. The children are with their friends and do not feel singled-out, and they seemed to respond confidently, with enthusiasm. The situation is not perceived as demanding or as expecting any different role or behaviour other than being a child in kindergarten, because the whole screening session is just part of 'today's activities at school'. This approach is common to all children assessed with this instrument, so results are more likely to be generalised with confidence.

Another benefit from screening the whole class at the same time is that children can gain understanding of what to do from watching other children. While this may seem to advantage some children, the fact is that a child can only skip or hop, draw a diamond, tell what happened yesterday, sing a song or articulate as well as he or she can do at the time. If a child can improve performance by copying, then that child is indeed very clever and was probably only lacking practice and/or opportunity. The one limiting factor was the exceptionally rare occasion when one child's intentional or unintentional response got a laugh, and another child copied that response in hopes of the same attention. That item was repeated for both children at another time (such as after the pencil and paper worksheet), and the

session moved on quickly.

4.2.3 The Teachers / Evaluators

Confounding influences upon surveys can occur when respondents answer questions either according to what they think the researcher wants or to intentionally bias results. However, as teacher judgement has been considered appropriate for evaluation of students' achievements, as for report cards and school based assessment, there was no reason to question the general accuracy of information on these surveys. Dunbar, Koretz & Hoover (1992) wrote, "good teachers have an intuitive appreciation for variability in their students' performances and for their own potential errors in judgement" (p.290).

The purpose of the classroom teacher surveys was to gain information about the children's subsequent school attainments and match such information to screening scores, (see Chapter Six, section 6.6). Completing these surveys was entirely at the discretion of the schools in that they were not outlined as part of original expectations. Only one (independent) school declined to do so citing an already full schedule. An administrator of that school would not ask the teachers to take on any further work. The 1993 Year One Surveys were unavoidably sent too near the end of the school year owing to delay by the University Ethics Committee, so variance may have occurred because of teachers being pressed for time. This situation was corrected for the other teacher surveys by sending them several weeks earlier.

The main idea was to look for trends emerging in result patterns as there were differences in school interventions with varying results. The intent was not to specifically establish quantitative evidence of predictive validity. Future achievement really depends upon subsequent interventions and intervening variables, including developmental changes, which would be uniquely distinctive across contexts and for individual children.

Success for the inquiry and validation of the screening instrument also rested upon being able to prepare evaluators, in this case teachers, with sufficient skill to accurately and reliably evaluate children's independent function of performance of screening tasks. For performance assessment, evaluation is in fact, subjective, and:

"Even though students are typically tested on one occasion, educators, policymakers, and parents generalise performance scores across occasions" (Ruiz-Prima, Baxter & Shavelson,1993). However, as Stiggins pointed out (1987), results can be dependable when judgement is based upon a process that is "systematic and objective", and when focus is placed upon the most important aspects of the performance. It is for these reasons that care was taken to standardise the administration and scoring of the instrument.

Another source of variation that could come from teachers was the degree of commitment to the research. All teachers in this inquiry had been exposed to its theoretical frame, and it seemed to the researcher from subsequent on-site conversations with the teachers, that most understood. In general, they were genuinely interested in discovering the individual differences and strengths and weaknesses of the children in their class in order to accommodate instruction as early in the school year as possible. This seems to be a sincere concern common to most teachers.

However, there were a (very) few teachers who obviously felt obliged to participate and who did not enjoy the perceived effort required to become familiar with scoring criteria or who had no intention of making subsequent changes to their teaching routines. For example, one teacher's attitude seemed to be that owing to the young age of the kindergarten children assessed, adherence to scoring criteria was really not necessary. This case was verified by the teacher's presentation of specific Fine Motor screening tasks on Video camera operated by a school staff member, and certified by the researcher. To ensure the integrity of quantitative results, teachers' scoring was checked by the researcher. As far as possible the researcher re-evaluated the children whose scores were in question, (a validity check). In some cases scores were revised. In one case a set of scores was discarded since they appeared to be skewed and re-evaluation was impossible.

4.3 Sample Demographics - Selection and Valid Numbers

There were two criteria for sample selection: being the kindergarten age range of 4.6 (minimum entry age), through 5.11, and being present at school on screening day. All children (except from one school), had written permission from

parents/carers to participate in the screening; there were no refusals. The Principal of that school said kindergarten screening was an integral part of the school curriculum and therefore did not need permission. The Principal wrote a letter of explanation to the researcher, to ensure the inquiry complied with University ethics approval.

The three samples (1993,1995 1996) comprised ten schools in and around Sydney, (city and suburban schools in a forty kilometre north / south range). The 1996 Sample also included five schools in and around Dubbo, (country NSW in a fifty kilometre radius from Dubbo). The children were screened early in the year, mostly in February, and again near the end of the year, mostly in November. Early year screening scores were recorded for those children from age 4.6, through age 5.11: N=776 (403 males / 373 females). Table 4.1 shows the number of children screened early in the year for each sample, and their percentage by gender and age within each early year sample. Table 4.2 shows the valid cases for each sample in more detail.

For each screening sample, the total sample number (N) was taken from the screening category with the most children, as valid numbers per screening category varied. The number of children per screening category differed within samples for various reasons:

- children got to school late and missed the Outside Motor activities;
- one child had a broken leg and could not participate in the outside activities;
- some English as a Second Language (ESL) speakers were not scored for Language;
- scores of a whole screening category were not reported due to inappropriate administration possibly skewing results;
- a screening category could not be given due to lack of adult help to evaluate on the day. If scores of a category were missing or excluded, the number of children for Success Rate was also affected as only those children with scores for all five screening categories would also have a score for Success Rate.

Children were never pressured to participate. The children enjoyed all the activities (as can be seen in the inservice Video), being in their familiar school setting and in

groups with their friends. Young children being threatened by assessment is usually an adult fear. There were a few cases of a child's score not being recorded because of extenuating circumstances. For example, one female created a fuss regarding her participation in the outside activities. Just after being released from these activities she was happily swinging and chatting. It is interesting to note that on her Year Three Classroom Teacher Survey, her teacher indicates her sport and social skills at lowest levels. Another example was a female twin age 4.6, who collapsed into tears before being asked to do anything, presumably because she had been separated from her brother and was not ready to participate on her own. Exclusions were intended to maintain consistency in recording typical responses and to not disadvantage any child.

In 1993 two schools asked to participate late in the year, which augmented the number of late year children assessed : N=833, (451 males / 382 females). Due to criteria for sample selection and theoretical orientation of this inquiry the addition of children only swelled the numbers within that sample. Children were not individually compared to each other. The results of children with common attributes were compared (eg. ESL speakers) to identify patterns of responses and conversely, similar results were compared to identify any common attributes of the children achieving those results.

Table 4.1

Children Screened Early in the Year

Children	1993	1995	1996	1996 Syd.	1996 Dub.
N	268	190	318	172	146
male	51%	52%	52.5%	57%	47%
female	49%	48%	47.5%	43%	53%
Age1	23%	29%	34%	37%	31%
Age2	51%	56%	41%	41%	42%
Age3	26%	15%	24%	22%	27%

Note. Age1=CA4.6-4.11; Age2=CA5.0-5.5; Age3=CA5.6-5.11.

Syd. = (Sydney) city / Dub. = (Dubbo) country.

4.3.1 Children's Age and Gender

Across samples, the mean school entry age was CA 5.22, with a low of 5.15 in 1996. Increased numbers of Age1 and Age3 children balanced the mean age, with the decrease in Age2 children. The percentage of Age1 country children was some what lower because one independent school only accepted children for kindergarten school entry when they were five years old at the opening of school, the end of January. However, it did not seem to greatly affect the 1996 Age1 factor which had increased by ten percent, from 1993. The Dubbo (country), percentage of Age2 children at 42% is almost identical to Sydney's at 41%, although the percentage of Age3 children is higher.

This independent school's policy of delaying school entry until children are five years old seemed an attempt to create an older kindergarten population often considered more capable of succeeding academically. However, their school entry mean age at 5.4, was just three months older than the sample mean at 5.1. The early year Success Rate mean for this school was just 1.2 points higher than that of the sample mean, with their Outside Motor and Fine Motor means being below sample means for those screening categories. It is an example of using age as a 'gatekeeper', to create a more mature population, (see 1.3, Chapter One for discussion of this issue).

Table 4.1 shows that gender percentages remained almost unchanged across the three samples, although the 1996 city / country gender mix shows 10% fewer country males, than city males, with the reverse for females. Table 4.2 shows that in 1996 there were more city males in every age group, with interesting gender differences in age groups 1 and 3. Within Age1, sample percentages of males varied from 54% (1993), to 62% (1995), to 47% (1996). The percentage of Age1 males in 1996 was affected by the country children, as 58% of country Age1 were female. However, the 1996 city Age1 percentage of males had dropped to 51%.

Within Age3, sample percentages of males varied from 54% (1993), to 36% (1995), back to 55% (1996). However, the total percentage of males in 1996

Age3 is again modified by the city / country differences where 63% of Age3 were city males. These figures suggest increasing numbers of city males were being held back from school entry by their parents, until they were older. It is also interesting to note that the 1995 Sample had almost 20% more Age3 females and less Age1 females, which seemed a possible explanatory factor for some 1995 screening results, (reported in Chapter Six).

Across the study, there were just nine children CA6, enrolled in January at the beginning of the school year, (three males in 1993 and six females in 1996 - one city and five country). Although these children were assessed with the other children, their scores were not recorded as part of the early year results to avoid the risk of variant scores. However, their scores are recorded in Appendix 2.,Table A2.1.

Table 4.2 compares total valid cases for each yearly sample both early (E) and late (L) in the year and by city (Syd = Sydney) and country (Dub = Dubbo). N = total number of children for each sample (N); and number of male / female within each total sample. n = number of children by age group within sample. % of N = percent of children for that age group, by each sample. m = male. f = female.

Age Groups: Age1 = 4.6 - 4.11; Age 2 = 5.0-5.5; Age 3 = 5.6 - 5.11; Age 4 = 6.0+

Table 4.2

Valid Cases for each Yearly Sample

	EARLY Year Children					LATE Year Children				
Children	E93	E95	E96	Syd	Dub	L93	L95	L96	Syd	Dub
N	268	190	318	172	146	321	182	330	181	149
male	137	99	167	98	69	174	102	175	100	75
female	131	91	151	74	77	147	80	155	81	74
Age 1 n	61	55	108	63	45					
% of N	23%	29%	34%	37%	31%					
Age 2 n	137	107	132	71	61	41	19	43	20	23
% of N	51%	56%	41%	41%	42%	13%	10%	13%	11%	15%
Age 3 n	70	28	78	38	40	137	87	127	76	51
% of N	26%	15%	24%	22%	27%	43%	48%	38%	42%	34%
Age 4 n						143	76	160	85	75
% of N						44%	42%	48%	47%	50%
Age 1M	54%	62%	47%	51%	42%					
F	46%	38%	53%	49%	58%					
Age 2M	48%	51%	55%	59%	51%	51%	42%	46%	55%	39%
F	52%	48%	45%	41%	49%	49%	58%	53%	45%	61%
Age 3M	54%	36%	55%	63%	47%	59%	62%	50%	47%	53%
F	46%	64%	45%	37%	52%	41%	38%	50%	53%	47%
Age 4M						50%	53%	57%	52%	52%
F						50%	47%	42%	38%	48%

Note. N = total number of children. n = age or gender subgroup by sample.

4.3.2 Children's Language and Indigenous Culture

For this inquiry ESL was defined as any language other than English spoken at home. Some children were classified Non English Speaking Background (NESB), regardless of actual language spoken at home, and were not classified ESL for this study. Even though a parent may be of non-Australian origin, English was spoken at home and was usually the child's first language. This issue is the focus of a parent comment from the Parent Surveys (see 5.1.13), stating 42% of the school population to be NESB and therefore schools should maximise advantages for diverse ethnic cultures. The ESL classification was identified from school records or teachers. According to Brennan (1995/6) information from the 1991 Census said 40% of the Australian population were either born overseas or had a parent who was born overseas, and "approximately" 17% of Australians speak a language other than English, at home.

20% of the 1993 Sample were identified as ESL speakers, increasing to 22% in 1995. However the ESL percentage in the 1996 City Sample declined considerably. This decline may in part have been due to schools classifying children differently within ESL and NESB labels. Table 4.3 below shows the language mix of each Yearly Sample. The last two columns show the 1996 City percentage (Syd = Sydney), and Country percentage (Dubbo).

Table 4.3

Yearly Language Mix

Language	1993	1995	1996	Syd.	Dubbo
English	80%	78%	94%	90%	98%
ESL	20%	22%	6 %	10%	2%

The percentage of ESL speakers in the 1993 Sample is somewhat misleading. Two of the seven schools had no ESL children enrolled. Of the five schools with mixed languages, 31% of all children were ESL speakers.

In the 1996 Sample, Aboriginality was identified from school records as indicated by parents. Of the 146 children in the 1996 Country Sample, 38 (26%) were identified as Aboriginal, thirteen male (34%) and twenty-five female, (66%). A country school administrator said the actual number of Aboriginal children may have been higher but the school can only confirm Aboriginality from parent information.

4.4 Parent Surveys

Information about the children was collected from Parent Surveys in 1995 and 1996, (Appendix 1., A1.9, p.354). The purpose of this process was to gain a more detailed description of the children by identifying factors of the independent variable (typical developmental attributes such as birth weight and developmental milestones) and intervening variables (environmental and experiential factors such as continuing problems and preschool experience). Recent research has shown that due to children being exposed to multiple risk factors, early childhood assessment that focuses on identifying risk from multiple sources (eg. administration of a developmental screening instrument in conjunction with a parent questionnaire), is most effective when ascertaining need, (Meisles, Henderson, Liaw, Browing & Have, 1993).

There were a total 239 parent surveys returned for the Combined Samples: 61 in 1995 (25%); 178 in 1996 (75%). However, since respondents did not answer all questions the number of valid cases per question, varies. A possible limiting factor to the number of city surveys returned, and therefore to the study, was that the survey was only circulated in English. Therefore the total responding ESL percentage (15%) may be lower than might have been if there had been language help for families, or if there had been an oral interview option. In 1996, 85 country surveys were returned (48% of total), representing 62% of the Country Sample.

4.4.1 Birth Weight

228 families answered this question. The mean birth weight of the Combined Samples was 3.37 kilograms. The mean birth weight of the1996 Sample was 3.36 kilograms, with the mean weight of the city children slightly less, at 3.32 kilograms.

The full range of birth weights, in kilograms, placed in the following quartiles: low quartile = 1.24-3.07; middle half = 3.08-3.66; high quartile = 3.71-4.95. Only two premature babies were reported.

Prechtl (1993) reported 3.40 kilograms to be an average newborn weight for babies born to Western mothers who themselves, weigh about 60 kilograms. Certainly general birth weight statistics would depend on many variables such as common physical stature of mothers, economic factors (Duncan et al., 1994), and access to prenatal medical attention.

Studies have looked at low birth weight as a risk factor in motor development (Michellson & Lindahl, 1993) and cognitive / behavioural development (Brooks-Gunn, Klebanov, Liaw & Spiker, 1993). Within these studies, low birth weight was set at two kilograms or less. The Brooks-Gunn et al. study concentrated on premature births. Michellson and Lindahl found low birth weight to be associated with gross motor delays. Table 4.4 shows birth weight details by quartiles, of those children in the present study identified from Parent Surveys as having a motor and/or language delay, (see Developmental Milestones below).

Table 4.4
Birth Weight of Children with Developmental Delays

Children with delay	Mean	Range	Low Weight 1/4	High Weight 1/4
Crawl	3.00	1.40-3.57	38%	0%
Walk	3.38	2.53-4.20	21%	28%
Language	3.44	1.81-4.64	26%	31%

4.4.2 Developmental Milestones

There were two motor and three language questions concerning typical developmental milestones asking, "at what age did your child": **a.** crawl on hands and knees; **b.** walk with no help; **c.** start using words correctly; **d.** use 3-5 words together; **e.** ask questions. When recording ages for the milestones from the

Parent Surveys: if a range was given the middle value was recorded; if half a month was given, the lower full month was recorded.

The five milestones chosen are those for which age of typical development seems most common and those which parents may be most likely to remember. To place this information into a perspective, the following will first briefly present what is usually considered typical development, then present general survey details, and then details regarding those children identified as being delayed. Description of typical development for each milestone are from The Learning Place Developmental Milestone Charts (Twaddell,1994).

a. **Crawl on Hands and Knees** - Typical Development: 8 months = crawl on hands and knees but may rock back and forth at first; 9-10 months = crawl and pull self up; 10-11 months crawl/creep forward with leg arm opposition.

PARENT SURVEY DETAILS: Valid Cases = 207; Mean = 7.7 months; Mode = 8.0 months; Range = 4-14 months; 58% from 7-9 months; ages for 1996 city / country and gender were virtually the same. Of the 239 Parent Surveys, 23 (10%) reported some sort of circumstance regarding the motor developmental milestones. Of those 23 children, 11 (48%), were about crawling: six never crawled; three 'tummy' crawled, (commando style); two were bottom shufflers, (or as one parent wrote, the child "bummed everywhere").

Motor Delay for crawling was identified from 11 months: n = 13 or 6%; 6 of these 13 children (46%) were in the low Outside Motor Screening Quartile (for information about screening quartiles see Chapter Three, Statistical Procedures); a further 17 children were reported at 10 months.

b. **Walk with No Help** - Typical Development: 12 months = some walking mostly one hand holding on; 18 months = independent walking with controlled start and stop.

PARENT SURVEY DETAILS: Valid Cases = 228; Mean = 12.1 months; Mode = 12.0 months; Range = 7-20 months; 74% from 11-15 months; 1996 country children walked half a month earlier at 11.6 months with gender ages virtually the same.

Motor Delay for walking was identified from 16 months: n=14 (6%); 5 of the same children (36%) also had crawl delay, while five others had no response re crawl; 7 of these 14 children (50%) were in the low Outside Motor Screening Quartile; a further 32 children were reported from 14-15 months.

c. - e. Language - Typical Development: 12 months=five meaningful words real or invented; 18 months=ten spoken words / using one word plus intonation to convey thought or express need; 24 months=two-three word sentences using pronouns 'me' and 'you', with rising intonation to ask a question; 36 months=three-four word sentences using pronouns 'they', 'he', she', 'his', 'my', and also 'who' and 'what', with correct verb order asking yes/no questions. Of children reported with an exceptional developmental milestone circumstance, generally one child's language was early and four were late, (although one of the late children was exceptionally late due to circumstances of abuse, as reported by her parents).

PARENT SURVEY DETAILS: **c.** Start Using Words Correctly - Valid Cases=192; Mean=17.4 months; Mode=18.0 months; Range=5-36 months, (1995 range=7-30, 1996 range=5-36 with one at 60 months); 52% from 12-18 months / 24% from 19-24 months; ages for 1996 city / country and gender were virtually the same.

d. Use Three to Five Words Together - Valid Cases=185; Mean=23.2 months; Mode=24.0 months; Range=10-48 months, (1995 range=10-36, 1996 range=10-48 with one at 56 months); 55% from 18-24 months; 1996 city exactly one month earlier and females 1.7 months earlier than males.

e. Ask Questions - Valid Cases=158; Mean=28.2 months; Mode=24.0 months; Range=8-60 months, (1995 range=8-42, 1996 range=10-54 with two at 60); 59% between 18-30 months; 1996 city / country the same age and females 1.3 months earlier than males.

Language Delay: Language was considered to be delayed when occurring: **c.** First Words later than 25 months, n=18 (9%); **d.** Three to Five Words Together later than 37 months, n=19 (10%); **e.** Ask Questions later than 37 months, n=19

(12%). Of the 239 Parent Surveys, 36 children (15%) had identified language delay for at least one language question; 16 of these 36 children (44%) were in the Low Language Screening Quartile. In 1995 of 61 Parent Surveys, 8 children (13%) had identified language delay and in 1996, of 178 Parent Surveys, 28 children (16%) had identified language delay.

Of all 36 children with language delay: 89% were English Speakers; 15 (42%), had delays in two or three language milestones; 12 (33%), also had identified motor delay or motor slowness, (eg. crawl at 10 months or walk at 15 months); four were ESL Speakers and one an Aboriginal child. Note. the percentage of English Speakers may be inflated owing to the Survey only being circulated in English.

4.4.3 Reading

The question asked about time spent reading to children. The intent was to determine the extent to which parents / carers are heeding educators' advice by reading to their young children. A popular opinion is that young children are not being read to as much as they ought to be, because parents are working and do not spend much time with their children. Some educators point to this situation as a possible source of children's subsequent literacy problems. However, from the combined responses, 67% reported reading daily to their children. 73% of 1995 parents read to their children daily and 65% in 1996.

The second most frequent response category was parents reading to children 'as time allows': 1995=10%; 1996=16% (14% city / 19% country). The category 'sometimes' had many fewer responses, although the frequency rose from 2% in 1995, to 6% in 1996 (5% city / 7% country). The rise in seemingly less home reading time in 1996 is despite a much higher percentage of English speakers in the sample (see Table 4.3, p.126), and primarily English speaking families responding to the survey. The category 'no' remained steady at 2%, but with 1% city and 3% country in the 1996 Sample.

Reading time was less for the children identified with developmental delays. For children with motor delay, 55% were read to daily. For children with language delay

61% were read to daily.

4.4.4 Continuing Problems

Parents were asked to give some details about continuing problems their child might have in ten areas of concern, (eating, sleeping, behaviour, co-ordination, following directions, attention, speech, vision, hearing, allergies). The intent was to identify any attributes, possible risk factors, that may be common to a subgroup of children. Of the 239 Surveys, 210 parents responded to this section. Of the 210 parents responding regarding problems, 73 (35%) reported no problems. Of the 29 families who did not respond to this section it would be impossible to know the percentage of those who did not want to report problems. In other sections there were several instances where these respondents were willing to answer questions even if "no". Some drew a line through the 'problems' section and marked with "nil", rather than leave it blank.

The assumption was made that if a parent / carer identified an area of concern with a comment, that area was causing some recognisable difficulty; although there were certainly degrees of severity reported. The list of problems with accompanying details may have looked different if areas of concern had not been specified. However, the primary goal was to be non-threatening, brief, and to gain as much and varied information as possible. Areas of concern chosen were those the researcher had commonly heard discussed by teachers and parents.

Table 4.5 below lists these areas of concern in order of response frequency from causing the most problems to the least, first for the Combined Samples and then separately for 1995 and 1996. Table 4.6 shows 1996 Survey information regarding city / country and gender differences by degree of problem in areas of concern; 'higher' indicates more problems. The number of children within each year varies due to respondents not answering all questions.

Table 4.5

Problem Areas of Continuing Concern to Parents of Kindergarten Children

Combined Samples		1995 - N=59-60		1996 - N=148-150	
1. behaviour	23%	1. eating	30%	1. behaviour	22%
2. speech	21%	2. behaviour	25%	2. speech	21%
3a. eating	17%	3a. speech	20%	3. sleeping	18%
3b. allergies	17%	3b. allergies	20%	4. allergies	15%
4. sleeping	16%	4. sleeping	14%	5. eating	13%
5a. co-ordin.	10%	5a. co-ordin.	12%	6a. attention	10%
5b. attention	10%	5b. attention	12%	6b. co-ordin.	10%
6. foll. direct.s	8%	6. foll. direct.s	5%	7a. foll. direct.s	9%
7a. hearing	3%	7. hearing	3%	7b. hearing	9%
7b. vision	3%	8. vision	2%	8. vision	3%

Table 4.6

City / Country & Gender Comparison of Child Problems Reported in 1996

- eating - city and males slightly higher
- sleeping - city/country about the same; females higher
- behaviour - city/country about the same; males higher
- co-ordination - city/country almost exactly the same; males higher
- foll. directions - city and males higher
- attention - city higher; genders about the same
- speech - country slightly higher; males higher
- vision - both almost the same
- hearing - country and females slightly higher
- allergies - country and males higher

The percentage of children in the Combined Samples reporting no problems was 35%. The percentage of *children identified with developmental delays* reported with no problems was: 30% of motor delay children had no problems; 32% of language delay children had no problems. Two reasons may have contributed to these lower figures.

The first possibility is that parents were reluctant to give details of their child's problem. The second reason is that parents were not aware their child had a problem. An extreme case of lacking awareness is a boy who was declared "just shy" by his parents, and which was initially accepted by his teacher despite screening scores. His motor deficit especially regarding balance, and probable problems with processing visual information were so severe that, for example, he could not begin to catch a ball standing up as he could not watch the ball and still remain steady on his feet. This boy's screening scores, both early and late in the year, placed him the lowest quartile for every screening category and Success Rate. However, he did not appear to the researcher (who individually taught him at school), to be intellectually impaired.

Some percentages of continuing problems for the *motor delayed children* were above the Combined Samples (as seen in Table 4.5), with co-ordination at 25% and allergies at 25%. Areas where percentages were some what above the Combined Samples were following directions (11%) and sleeping (20%). None of these motor delay children had 'attention' identified as a problem, or even mentioned. Only one parent made any reference to seeming hyperactivity, reporting the child to be "constantly on the move, jumps, runs, skips, hops more than his brother did".

Some percentages of continuing problems for the *language delayed children* were well above the Combined Samples (as seen in Table 4.5), with following directions at 20%, and vision and hearing each at 9%. Areas where percentages were some what above the Combined Samples were sleeping (20%), co-ordination (15%), and attention (15%). Speech was one percent below and behaviour three percent below.

A speculation regarding 'following directions' is that the higher percentage for this concern among language delay children may at least partially be the product of undetected, unassessed speech and/or hearing problems, (which may in turn, along with potential visual problems, have been due to lack of access to required assessment and information services). In addition, the higher incidence of attention problems (realised or undetected), could also be a factor in weaker ability to follow directions. Some parent comments regarding attention were:

- "short attention span for things she doesn't like";
- "must be interested to hold his attention";
- "hard concentrating on one thing for long period of time";
- "sometimes needs too much attention";
- "not very long attention span".

4.4.5 Accidents

The survey question asked if "your child had any accidents which required medical attention". The intent was to determine if less successful children and/or those with developmental delays had a higher percentage of accidents. For the Combined Samples, 28% reported a notable accident. 33% of the *motor delayed children* were reported as having had an accident, compared to 26% of the *language delayed children* . Males had more accidents than females while the city / country incidence was almost even with city only a fraction higher.

The higher percentage for the motor delay group seems logical, although there was no indication of these children having more remarkable accidents than other children. One isolated case was a child reported to have had multiple accidents and liked to strike matches, and his only delay was in language. The only continuing problem his parents reported for behaviour was becoming "aggressive when tired", and although both parents worked (one by day and one by night), the child was "always" read to daily.

Parent comments regarding co-ordination went from indicating being left handed presenting a problem with scissors, to one child (with both motor and language delay) who "walks into doors, walls and trips over". However, that child was not reported as having had any accidents. Certainly the teacher of a child with these parental observations should look very closely at this child's screening results for complimentary observations to then possibly refer the child for specialist diagnostic assessment prior to planning instruction.

4.4.6 Medication

The intent of this survey question regarding "regular" medication, was to determine any pattern of incidence. In all cases save one, on-going medication was for asthma. One child's medication was for "ADD" plus medication to help him sleep at night. 16% of children in the Combined Samples had regular medication. In 1996, more females had medication and the city incidence was 1% higher. The 1995 surveys reported 10% with regular medication while in 1996 the percentage was 21%; probably due to random variation.

For *children in the delayed groups*, 28% of the motor group had regular medication with 27% for the language group. These percentages are considerably higher than for the Combined Samples (16%). One child in the language delay group was mentioned as having ADHD, but there was no actual mention of medication.

4.4.7 Preschool Experience

The survey question about preschool was poorly constructed, and therefore limiting, in that it did not clearly define difference between preschool attendance the year immediately prior to formal school kindergarten entrance, and all preschool experience. Many parents spontaneously gave a full accounting of all preschool experience. However, because of the way the question was worded parents could have decided to only include information about the year prior to school entrance. Therefore, while information of preschool experience for the year directly prior to formal school entry can confidently be considered as complete, similar information for two and three years before formal school entry is probably incomplete.

Further, the question did not inquire about the quality or content of the preschool experience. Therefore there is no indication regarding developmentally appropriate activities and/or academic content, if any, of these preschool experiences. While legislated guidelines for preschool care and education do exist, there is no way of knowing the extent to which these children's preschools were able to maintain the guidelines, (see 1.3, Chapter One for discussion regarding preschool guidelines).

There were 237 responses to the preschool question. The percentages of children with preschool experience the year prior to entering formal school were as follows:

- for the Combined Samples 93% of children attended (N=220);
- in 1995, 88% of children attended (n =53);
- in 1996, 95% of children attended (n=167);
- in 1996, 96% of city children attended and 94% for country children.

17 children (7%) had no preschool experience: 8 were 1995 children (15%) and 9 were 1996 children (5%). Of the 9, 1996 children, 4 were city children and 5 were country children.

The major difference in city / country comparisons for preschool attendance is days per week. Country children had less opportunity to attend preschool as there were very few preschool places available and some were only one half day per week. The number of half day sessions, 2 or 4 mornings, were recorded as one or two days.

Of the 176 responses to the preschool question in 1996, 40% of city children attended 3-5 days per week compared to just 10% of country children. To look at this observation another way, of 92 city responses 76% of city children attended 3-5 days per week compared to 20% of the 84 country children.

Of *children in the delayed groups* having no preschool experience, 5% of typically developing children did not attend preschool while 13% of children in the delayed groups did not attend preschool. This situation again highlights the need and equity of assessing all kindergarten children at school entry.

4.4.8 TV Shows and Outside Play

The intent of these questions was again, to gain a more complete profile of these children. By asking for specific TV shows and then matching them to the TV schedules, it was hoped to get an accurate idea not only of what the children were watching, but of how much time they were watching television. In general, they were watching designated children's shows both before and after school. Nature shows, as well as cooking shows and videos were mentioned. One ESL child was

taking advantage of an English language show, to learn English. Information from the outside play question was meant to be correlated with Outside Motor screening information. Respondents seemed to be more detailed with the TV question than the outside play question.

In general, by counting the hours in the day spent at school, eating, sleeping, travelling, etc., the number of hours spent playing outside seemed exaggerated. However, in one instance careful reading of the Parent Survey for these questions coupled with screening information may have given a reason for the child's continuing motor problems, and should guide a teacher's decisions. This child was in both the crawl and walk motor delay groups and also in the early and (it turned out) late low Outside Motor Screening quartile, although he did well in the other screening categories. From the Parent Survey the child: had no outstanding problems except being "silly at times and defiant"; his speech was "advanced"; never says no to being read to whenever asked; watches all the afternoon children's TV shows; plays outdoors "very little - weekends maybe 2 hours"; had no regular after school activities. In this family the father had a skilled job (see 4.4.10), and the mother was self-employed with "home duties". This is an example of the usefulness of having multiple sources of evidence for each child's profile of function, to inform instruction.

4.4.9 After School Activities

The intent of this survey question regarding "regular after school activities / which ones / and how often", was to further understand what happens in the life of a kindergarten child. In other words, to understand more about the nature of intervening variables. A popular opinion is that young children's lives are too busy and they have no time to just be children. While this notion may be true for many children, 51% of the Combined Samples had no regular after school activities or child care. 20% had an activity once a week. 17% had an activity twice a week. Nine children (4%) had activities daily or four times a week, which included child care. Six children had three different activities. One with quite severe motor difficulties was having computer lessons.

There was quite a variety of activities. Table 4.7 lists the activities in order of their popularity (and/or because of availability) for first, second and third choice. Swimming was always first choice as this survey was taken in the summer term when school opens, usually about the first of February. Activities in the category 'other' included: nine children in Little Athletics; one child in Royal Rangers; two children for horse riding; after school care / homework centre; occupational and speech therapy (same child); one child in voice production and speech class; bicycling. Some country comments were: "waiting for gym to start" and "as activities are on".

Table 4.7

After School Activities

First choice	Second Choice	Third Choice
1. swim	1. swim	1. swim
2. other	2. music	2. other
3. jazz / dance	3. football / soccer	3. music
4. football / soccer / ballet	4. jazz / dance	4. gym
	5. ballet	5. football / soccer
5. gym	6. other & gym	6. ballet
6. music / tennis	7. tennis	7. tennis
		8. scouts (one child)

For *children in the delayed groups:* 58% from the motor group and 59% from the language delay group had no after school activities.

4.4.10 Parents Occupation

Again, in deference to brevity and a desire not to be intrusive, occupation was the only question asked about parents / carers. While additional information may have been interesting, the researcher felt other questions may reduce return rate. The survey question simply asked for "parent(s) occupation"[11].

Occupations were then classified as: 1. PROFESSIONAL = needing specific academic experience eg. surveyor, doctor, nurse, teacher - accounting for most country professionals, accountant, barrister, civil engineer, lecturer, dentist, graphic

artist, optometrist; 2. SELF-EMPLOYED = eg. home duties - one "domestic engineer", student, small business, restaurateur, opal miner; 3. SKILLED = learned by apprentice and/or experience and training eg. data entry clerk, butcher, metal worker, manager - unspecified, flight attendant, travel manager, hairdresser, shearer, pharmacist technician.

Remaining categories were: 4. UNEMPLOYED; 5. NOT AT HOME; 6. NA meaning no information given; 7. OTHER included: pensions / pensioner and 'lives with grandparents'. For the categories 'no information given' or 'not at home', a person may have been mentioned but still no information offered, suggesting unemployment, but not actually said. 'Not at home' or 'unemployed' was only counted if specifically mentioned. There were two surveys with no name.

Tables 4.8 and 4.9 summarise occupation information for those parents / carers who chose to answer this question. M = male and F = female.

Table 4.8

Parent(s) Occupation

Occupations	95 & 96		1995		1996	
	M	F	M	F	M	F
1. professional	31%	29%	40%	30%	27%	29%
2. self-employ.	12%	36%	7%	30%	14%	39%
3. skilled	37%	29%	40%	32%	37%	28%
4. unemployed	2%	.4%	3%	2%	1%	-
5. not at home	3%	.9%	5%	3%	3%	-
6. NA	14%	3%	3%	2%	18%	2%
7. other	.4%	2%	2%	2%	-	2%

Table 4.9

1996 Parent(s) Occupation by City/Country

Occupations	City		Country	
	M	F	M	F
1. professional	36%	38%	18%	19%
2. self-employ.	16%	32%	12%	45%
3. skilled	37%	26%	36%	30%
4. unemployed	1%	-	1%	-
5. not at home	2%	-	4%	-
6. NA	8%	3%	29%	2%
7. other	-	-	-	4%

It is interesting to note from Tables 4.8 and 4.9: an 8% increase in the city female professional category from 1995 to 1996 with a 4% drop for males, (remembering that the 1995 Sample is a city sample only with the same city schools as in the 1996 Sample; the 29% NA for 1996 country males could in part be unreported, unemployed.

4.4.11 Parent Comments

At the end of the parent questionnaire respondents were invited to "write additional comments about your child's developmental or learning needs ... (and about) more, or different help (which) could be provided at school". Schools were supplied with a master copy of the survey with a suggested explanatory note at the top. Most of the schools chose to send the survey home with no change. The administration of two schools included additional explanations. The Principal of a city school sent a cover letter home on school stationery. A large country school added half a page of their own message onto the survey which resulted in no space left at the end to write comment after the invitation to do so. Written comment would need to have been written on a separate page (an option not taken), or squeezed onto space elsewhere, (an option taken by three families). This circumstance may have limited

the number of country parent comments.

Of the 239 Parent Surveys returned (Combined Samples), 44 parents / carers (18%) who had concerns to share, took the time to write their comments. Each comment speaks to individual differences and would assist a teacher to better understand and help that family and child. Of these 44, 30 were in 1996. Of the 1996 respondents writing comment, 19 (63%) were city, and 11 (37%), were country. Two main categories and two less prominent categories emerged from the various comments. The most significant concern (55%), was about help provided at school, or standards of education. The second prominent category (30%), was about the developmental and learning needs of the child. Only two other categories could be distinctly identified: family matters at 7%; cultural, or ethnic matters at 7%. One response thought the survey questions considering "what went on in the past" (birth weight, developmental milestones), irrelevant.

Of the twenty-four comments regarding standard of education, eight (33%) praised the school, being happy with progress. Other comments included the usual about smaller classes, more individual attention / monitoring / supervision / encouragement. One response asked for the addition of computer studies. However, an interesting theme which appeared in three responses requested a (curriculum) balance between physical education (including dance), with "academic prowess".

Of the thirteen comments about each child's needs, the theme of three was 'great kids'. A parent's comment being the child was "well balanced, happy, relaxed ... right on schedule for age", (a parent). Other comments were varied, for example:

- language difficulties with autistic tendencies / waiting for a language assessment;
- serious medical problems first year of life / still monitoring development;
- starting school at age four very tiring, but generally all is well;
- "not a particularly good drawer but notices patterns and detail very well";
- "prefers to write left-handed".

Comments about family matters included separation of parents, adoption, and child living with grandparents. Each comment about ethnic matters highlighted different issues in this area of concern, facing schools. They included:

- "encouragement for the child to feel secure ... protect kids from racial harassment ... more education in this area";
- a plea for kindness to son from war zone ... is distressed ... only speaks Serbian;
- asking the school to exploit the potential of "cultural richness and heritage" to strengthen the child's "self-respect" and appreciation of own ethnic community.

In NSW there is no state legislated policy supporting parents regarding the readiness of children for school; although the Department of Education and Training does offer the Early Intervention Program which is being expanded in scope and access [1]. In The united States, the second objective of Goal One, Education 2000, specifies that parents will be their child's first teacher, devoting time daily to help their child learn, and receiving training and support (Stief, 1993). Stief reviewed exemplar American initiatives to support parents in compliance with Goal One, noting the attributes of several effective state and federal parent education programs.

According to Mazzarella (1990) parents are very closely involved in planning and implementing intervention for their children citing more than 50 intervention programs in Oregon. This author described use of a parent questionnaire as an economical and efficient way to identify developmental problems early in childhood saying: "data we have collected over the past ten years strongly suggests that the vast majority of parents are very capable of monitoring their own children" (p.7.), including culturally different and low SES parents (Mazzarella, 1990).

Chapter Five - Validation of the Instrument

5.1 Screening Instrument: Content Justification

An important concept within the current expanded view of measurement validity, as discussed in Chapter 3 (section 3.4), is the convergence of measurement construct and content (Shepard,1993; Wiley,1991). This blend came about due to an abandoning of a traditional concept of construct as referring "... to a hidden psychological trait" (Shepard, p.413), which could not be directly measured. The measurement construct for The Kindergarten Screening is: the level of independent behaviour function within affecting domains, which can be directly assessed by evaluating demonstrated performance of criterion tasks, and which integrates the construct with content. However, according to Messick (1975), justification of content has to do with task inclusion, which is a different issue from justification of procedure or measurement conditions.

The content of an assessment instrument should link the theoretical frame of the measurement to interpretations and subsequent decisions via the children's responses. In this case the decisions are regarding interventions and instruction based on each child's identified abilities, skills and concepts compared with those required for success within the kindergarten curriculum.

Content justification for The Kindergarten Screening included confirmation of: 1. consensus about specific typical developmental milestones expected for age in early childhood and their use for screening; 2. corroboration of The Kindergarten Screening tasks (not administration) with same and similar tasks on standardised published screening instruments using typical developmental milestones and tasks typical of the kindergarten curriculum to assess degree of function.

1. Developmental Milestones: The existence of many age-associated developmental milestones in early childhood is mostly not in question. There is broad consensus regarding the predictability of a range of ages at which many of children's distinct developmental milestones appear. Age norms are important in helping to identify age-specific expected behaviours (Von Hofsten, 1993). For a summary description

of the typical developmental milestones for the children in this study, see Chapter Four, 4.5.

There are well documented compilations of developmental milestones from a variety of sources chronologically charted in developmental domains such as auditory, visual, tactile and motor processing, receptive and expressive language, cognition, and personal/social attributes. The Learning Place Developmental Milestone Charts (Twaddell,1994), from which many of The Kindergarten Screening items were chosen, are chronologically organised from newborn to age 6/7, in the areas of sensory motor (receptive and expressive), adaptive / cognitive, language (receptive and expressive), and personal / social. They were originally generated from a wide range of existing checklists, specialist opinion, and from experience in raising and teaching children. Attributes from the charts are organised into assessment checklists by domain and age, with record forms to record level of function, by age. The intent is to enable teachers to assess and monitor attributes of typical human development and learning in early childhood to identify baseline function and evaluate progress.

For the purpose of this study the work of Banus (1979), Boulton-Lewis and Catherwood (1994), Gallahue (1993), Johnson (1993), Meaney (1991), O'Brien (1982 & 1991), O'Brien and Ziviani (1984), Paynter (1994), Seymour-Smith (1990), and Shepard (1980 & 1995), were chosen for further detailed investigation to document and support consensus for specific developmental milestones expected for age. The investigation compared identification of expected ages of milestones on the Learning Place charts with the above sources, and they were found to be consistent. The cited authors have specific expertise in different areas of early childhood development such as physiotherapy, behavioural optometry and fine motor skills, and as well as general expertise in the child development field.

For example: A most comprehensive and well documented source of developmental milestones in early childhood is in the *"identification and early intervention" Does This Child Need Help* training package, produced by the Australian Early Intervention Association (NSW Chapter) Inc., with twenty one specialist contributors, (Johnson,1993). Chapter Five, Identification, has eleven checklists from birth to age

five years, in eight "major areas of development": cognition, fine motor, gross motor, social interaction, behaviour, communication and hearing, vision, and self help skills. Items on these checklists, developmental milestones expected for age, coincide with those on the Learning Place charts (Twaddell,1994).

Current evidence outside the education community of confidence in the validity of developmental milestones and their use as screening items to determine level of function expected for age, is provided by the Commonwealth Government of Australia. In an effort to construct a more objective method of assessing child disability to determine Child Disability Allowance (CDA), parts of the new CDA Assessment Tool are based on child function expected for age (Child,1998). Function areas "based in standard developmental milestones" (CDA Assessment Tool), which coincide with The Kindergarten Screening are in the domains of receptive and expressive communication (talking and writing) and mobility (fine and gross motor).

2. Content equivalence with published standardised screening instruments: Over the years, several standardised screening instruments to assess function in early childhood within four domains (motor, language, cognitive, personal), have been developed. Owing to the wide range of children's individual differences in development and learning, these screening instruments have used developmental milestones and age appropriate criterion curriculum tasks to determine a profile of baseline function to inform intervention and instruction. Australian concern for accommodating this baseline information within the existing kindergarten curriculum is illustrated by remarks in the Administrator's Guide to the Neale Scales of Early Childhood Development (Neale,1976).

> "... in teaching five and six year old children to use paper and pencil, the frequent disparity between mature language abilities and immature hand-eye co-ordination demonstrated to me the awesome variations in physical traits with which children and their teachers begin the race to academic skills ... it was therefore clear that there existed in the first year of school an enormous range of differences in readiness and aptitude for [formal] learning that could not be dismissed ..." (Neale, 1976, p.41 - parentheses the researcher's).

Appendix 1., A1.4 gives a reference sample of twelve standardised educational screening instruments dating from 1938 - 1991, chosen to illustrate consistency over time of rationale and specifically identified checklist items corresponding to The Kindergarten Screening. While these screening instruments are individually administered and often in a clinical or therapy setting, it is their content and intended purpose to identify baseline function (not procedure), for which criterion content agreement with The Kindergarten Screening is demonstrated. Assessment items are criterion tasks typical of the kindergarten curriculum and familiar to kindergarten children such as skipping, hopping, recounting events of yesterday, rhythm clapping, writing name and numbers, recognising and completing a visual shape pattern.

An example of one screening instrument is the Early Year Easy Screen (EYES), (1991), standardised over seven years. To illustrate compatibility of rationale to The Kindergarten Screening regarding content, the three main criteria used to choose the activities of this instrument were: "relevance of information resulting from the observation, ease of administration as a group activity, and the appropriateness of each activity" (EYES Manual, 1991, p.11).

EYES has six screening categories. *EYES* categories are similar to The Kindergarten Screening although some are more academically oriented such as visual and auditory reading skills. Those categories have several items such as word, letter and picture matching and sequencing, which are beyond the scope of The Kindergarten Screening. However, to illustrate compatible checklist items, *EYES* has twenty-two checklist items in common with The Kindergarten Screening looking at the same attributes. Other *EYES* items look at the same information processing components such as understanding of position in space, but the children manipulate objects to demonstrate understanding instead of drawing, as on The Kindergarten Screening.

The span of 53 years covered by these assessments demonstrates: consistency of concern; consistency of belief in the concept of age predictable abilities and skills in early childhood; consistency in understanding the benefits of screening school entry children to inform referral and instruction. There is concordance over time regarding the relevance of using these tasks to assess and identify the strengths and

weaknesses of current levels of independent function within specified affecting developmental and academic domains, for kindergarten children.

5.2 Screening Instrument - Construction

Assessment domains of The Kindergarten Screening represent affecting developmental domains and those within the kindergarten curriculum. Affecting developmental domains are identified within the Factors of Typical Development and Learning in early childhood (Chapter One, 1.4). Criterion assessment tasks within each screening category (content domain), are representative of tasks across the kindergarten curriculum. The tasks were designed to be functional and meaningful to students, and non-threatening.

5.2.1 Task / Item Selection

According to Linn et al. (1991), screening tasks should be functional and meaningful (to the children), "... worthy of the time and efforts of students and raters" (p.19). For this study, *functional* was taken to mean having intrinsic value in that use of the abilities, skills and concepts identified from performance of these tasks can be generalised and transferred to other school tasks and those in the daily lives of these young children. For this study, *meaningful* was taken to mean within the children's immediate experience.

Children are only asked to perform what is familiar to them and therefore seem naturally inclined to perform at their best. These concepts help support the measurement's purpose of benefiting children by giving evidence of the construct for each child, (looking at what each child can do).

When choosing the instrument's tasks the functionality and meaningfulness of materials was also considered. Materials required are few and familiar to young children, for example: scissors, tennis ball, plastic bottle with handle and screw-on cap, (such as a two litre milk container). Materials are common, inexpensive, specified (such as size, shape, weight and fill for the bean bag), and are readily available (such as tennis ball, scissors, writing pencil). Masters sheets are supplied

for the pencil and paper worksheet and the cutting paper (for use in the Fine Motor Category), so they are exactly the same for each child assessed. All children screened with this instrument use the same materials and are evaluated on performance of the same tasks, virtually negating variance from these sources and permitting valid comparability and generalisability of quantitative and qualitative results. Appendix 1., A1.5 (p.347) and A1.6 (p.348) show a complete listing of The Kindergarten Screening Items and materials.

Part of the rationale for item selection was to choose tasks for which children age 4.6 - 6.0 would typically be expected to spontaneously and appropriately respond at the level of independent function. Items needed to have functional value within the kindergarten curriculum and the children's environment, with implications for instruction. This synthesis of developmental domains, screening tasks and the kindergarten curriculum creates "practical validity" in that results have implication "for the types of decision making that go on daily in normal instructional settings" (Pellegrino,1988, p.56). Duran (1988) points out that tests with practical validity provide "diagnostic information about students'... skill development which can be linked to instruction enhancing the development of target skills" (p.106). In this sense, "diagnostic" pertains to identification of current function to inform immediate decisions, rather than determination of cause.

The process of *task analysis* was used to help ensure the linking of screening tasks from developmental domains identified in the theoretical frame, to the kindergarten curriculum. Task analysis identifies the most relevant abilities, skills and concepts required to successfully complete a task, (either screening or instructional). Used in this way, task analysis looks beyond product, such as the steps required to complete a task, to the information processing components of the task (Friel-Patti,1994; Twaddell, Workshop Notes, Appendix 1., A1.3, p.339).

While the abilities, skills or concepts of some tasks are more indicative of a single domain, others have cross-representation. The matching of abilities, skills and concepts from the theoretical frame to the curriculum, with their implications for instruction, is essential for successful use of The Kindergarten Screening to help facilitate optimal achievement at this foundation phase of each child's school career.

Further, the identification of relevant abilities, skills and concepts helps ensure the stability of assessment content over time owing to identification and understanding task processing demands, as these will remain a constant.

The following are examples of the task analysis of some screening items: tossing a tennis ball, (Outside Motor, Checklist Item 9); unison and single copy rhythm clapping, and reciting a rhyme or song, (Language, Checklist Items 20 and 21, and 25-27); drawing "a cloud above the trees", (Pencil/Paper & Reasoning, Checklist Item 41). The Outside Motor Screening Category is so named, as opposed to the traditional 'gross motor' label for such activities, specifically because of the mix of abilities and skills involved. Successfully tossing a ball does require the integration and effective use of large muscles for balance (postural stability), but success also hinges upon eye-hand co-ordination, fine motor control, visual tracking, as well as experience and environmental factors; an example of the interdependence among perceptual-action systems and spatiotemporal details (Turvey & Fitzpatrick,1993; see 2.1 and 2.1.1, Chapter Two for discussion).

The first two Language items mentioned involve rhythm clapping, (Checklist Items 20 and 21). These items require ability to discriminate and isolate segments of sound, remember the sequence of sound segments (auditory discrimination, memory and sequencing), and then repeat the sequence, (auditory-motor integration). For Checklist Item 20, the sequence and rhythm must be sustained. These auditory processing skills are a foundation of phonological processing, or phonemic awareness. Phonemic awareness skills are foundation decoding skills for reading and encoding for spelling for many children; as substantiated by authors / researchers such as Adams (1990), Bashia and Scavozzo (1992), Tunmer and Nesdale (1985) and Byrne and Fielding-Barnsley, (1991).

The abilities and skills being assessed in the other Language items (Checklist Items 25-27) are accurate auditory memory, sequence, articulation and speech rhythm. Therefore, which rhyme or song is recited doesn't matter because evaluation is more concerned with the processing components of the task, rather than the task itself. In fact diversity is encouraged so that the last child in the group hasn't heard the same rhyme several times, possibly giving that child extra practice. One child sang

an African song (in English), because she said other songs were boring.

'Drawing a cloud above the trees' (Checklist Item 41) requires: attention; listening comprehension for receptive understanding of the spatial concept 'above' and of the grammatic singular/plural structure; auditory memory and sequencing; eye-hand co-ordination; fine motor control; accurate placing and spacing of the cloud on the paper; completing the task. While total task performance requires integration of all the above components (auditory processing and visual motor integration), each component can be observed separately. While total task performance is scored according to specified criteria, qualitative comment can further inform the degree or quality of function beyond scoring criteria, with regard to the contributing components.

5.2.2 Scoring

Tasks chosen were supported by general consensus from a reference sample of other screening instruments, from consultation with domain specialists known to the researcher such as physiotherapists, speech pathologists and remedial teachers, and from classroom kindergarten teachers, (see 5.1, p.147). The researcher constructed the assessment's categories and selection of items within the categories, for deliberation. While agreement was easily reached regarding the inclusion of specific screening items, there were some differences of opinion regarding refined aspects of response attributes for scoring. Some specialists and remedial teachers wanted to include scoring attributes which may be significant for their specific diagnostic assessments, but were beyond the intent of screening, and impractical for efficient scoring.

For example, some remedial teachers contended that circles (Checklist Item 35) being drawn clockwise by school-age children are indicative of immaturity. While the researcher attempted to confirm this consideration, this attribute was difficult to monitor accurately due to group administration of this instrument and therefore judgement almost completely depended upon a subjective decision. However, information that was collected indicated that anti-clockwise circles were drawn by the end of the kindergarten year; which may be more a result of instruction (in

preparation for cursive writing), than development. [From this point of view, the obvious production of circles drawn clockwise at the end of the year should warrant a qualitative comment and possible further investigation.] This attribute did not become part of the screening scoring criteria.

Scoring criteria recognises three levels of independent function: that which is appropriate and expected, or better than expected for age; that which is good or fair, (but may need practice); that which is inappropriate and in need of direct intervention. In this way the measurement construct is represented in every assessment item, avoiding a threat to validation from construct underrepresentation. However, a threat to validity can come from construct-irrelevant variance which happens when evaluators' decisions consider response attributes beyond those defined in the scoring criteria.

This possibility can arise if evaluators deviate from defined scoring criteria, (see 5.3, p.154, for an example). This can happen if evaluators are not completely familiar with scoring criteria and/or allow personal bias to influence evaluation decisions. To avoid this potential problem within this study, prevention strategies included inservice sessions, the researcher reviewing relevant scoring criteria with each evaluator prior to screening sessions, and distribution to evaluators of the one page summary of scoring criteria per screening category for reference during screening sessions.

Specific scoring criteria for The Kindergarten Screening are few and must be adhered to, to protect and maintain the integrity of scoring for each child. For example, a paper and pencil item directs the children to "draw two trees next to each other". Scoring criteria simply states "placement of figures must be as directed and in their correct number". Degree of detail on the trees does not affect scoring. However, the inclusion of fine detail for the trees, and also for the human figure, should be noted in the comment space as qualitative evidence of excellence.

5.2.2 Trialing

The Kindergarten Screening was trialed in 1992 early and late in the year in two

schools, (three kindergartens). The principals of these schools, and especially the assistant principal of one school who was also the kindergarten teacher, were very supportive of this work. They were interested in a measure which might enable them to accurately assess the developmental and learning needs of the children as early in the year as possible, to adjust instruction accordingly. They made support staff time, staff development time and school photocopier available as required. They also gave time for presentation of the project to the whole school staff. The researcher worked weekly at both schools for most of the school year to help with children and to learn more about teachers' beliefs and concerns, as well as school resources. The goal was to make the screening instrument and procedure as user-friendly as possible.

During this time screening sessions were video recorded, both early and late in the year. The purpose of the video was to record actual responses of many children to compare with scoring criteria and to help viewers (including parents) become more aware of the range of individual differences in kindergarten children. From the many hours of tape, an inservice video was produced and used in this study. Parental permission for their child's participation was obtained. Parents from one school requested to see a draft version of the video before giving full authorisation for production. Viewing was arranged out-of-school hours, with the researcher. Questions were answered and permission given. Parents in the other school in which sessions were filmed were shown the draft version at a P&C meeting and indicated that they were happy with the production.

The original screening format, items and scoring procedures were not changed as a result of the trial and video. However, preparation of the video enabled refinement of scoring criteria for some items. For example, observation of responses to the finger-thumb circles (Fine Motor Checklist items 15 and 16), clarified degrees of competence. While looking straight ahead, the children hold both hands up at about ear level, out of sight, but move only one hand at a time. It became clear that if children had a mild problem with this task they tended to move their hands slightly forward, bringing them into their peripheral vision for help. When a child found this task to be almost impossible, hands were brought completely forward in front of the child and turned around to face the child, so the child could visually monitor

movement of each finger. These details were written into the scoring criteria of the manual.

The video produced during this time also showed that the administration of some motor items needed more precise description (such as the Outside Motor balancing items), and some materials needed to be more explicitly specified. For example the video shows the wrong size ball. The manual now states a tennis ball is to be used (for Checklist Item 9), and a tennis ball was used during the study. The most obvious problem was with the Fine Motor finger-thumb circles. To be valid, these circles must be made by touching finger-tip to thumb-tip. Unfortunately flat circles touching finger and thumb pads together were shown in the video. To counter this problem a printed annexure was fastened inside each video cover describing the correct action, and very specific wording added to the manual.[12] Further, for the study, special emphasis was made about this item at all inservice meetings and before every screening session.

5.3 Interrater Agreement - Procedure

Of paramount importance to the reliability and generalisability of performance assessment is the degree of objectivity and consistency in evaluation decisions achieved among different raters, in different contexts, and across time. As noted by Linn (1994) "Several studies have demonstrated that error due to raters can be kept relatively small when the same tasks are taken by students in an on-demand administration and care is taken in training raters on well-defined scoring rubrics", (p.10). Thus, the purpose of using multiple raters in this study was to: determine the clarity of scoring criteria as stated; determine the nature and extent of rater training required to achieve objectivity and consistency; identify and counter sources of error which could produce variance.

Goetz and LeCompte (1984) refer to interrater reliability as "... the extent to which the sets of meanings held by multiple observers are sufficiently congruent that they describe and arrive at inferences about phenomena in the same way" (p.218). As applied to The Kindergarten Screening, rater agreement refers to the percentage of congruence between sets of marks recorded by evaluators during actual screening

sessions and those from different raters made during the same session. Data were collected during actual screening sessions for the Outside Motor, Fine Motor and Language screening categories when the actual evaluators were the kindergarten classroom teachers and other school staff, and the researcher.

The interrater study ran for two years in 1995 and 1996, with fourteen different raters. Five raters were private professional specialist practitioners involved with early childhood development and education, while the rest were some of the children's kindergarten teachers. The primary advantage of using several raters was the chance to identify sources of error from a wider range of views. Some 1995 results were treated as preliminary owing to identified difficulties that were adjusted for 1996, resulting in increased interrater agreement.

Two of the five 1995 non-school raters were developmental physiotherapists, one a remedial teacher, one an occupational therapist and one a former teacher, primary school principal, lecturer and administrator of an association helping children with learning disabilities. Using non-school raters was less disruptive for the schools and helped clarify definition of scoring criteria and adequate initial inservice education re procedure, but also produced some limitations. The non-school raters all had copies of the scoring criteria weeks before screening sessions and two also had the inservice Screening Video. Questions were answered and criteria reviewed in school by the researcher just prior to screening sessions with raters and the evaluators (those teachers or other school staff doing the actual child evaluations), together. This strategy meant that both raters and evaluators heard the same explanations of scoring criteria. Despite this, some raters did not seem to have a common understanding of priorities for screening and of some scoring criteria.

The percentage of rater agreement was determined by calculating the percent of raters' marks which agreed with actual evaluators' marks, for the same observations. Scoring consists of only three possible marks: a slashed tick (✗) indicating the response is spontaneous and age-appropriate or better, a plain tick (✓) indicating the response is fair / good, or a dot (•) indicating a weak response and the need of direct intervention. Only these three marks were scored, but varying degrees of competence could be indicated by attaching a plus or minus to the mark.

However, the plus or minus is treated as qualitative information to further indicate the quality of the response to the children's teacher and is included only as the evaluator (and in this case also the rater), considers this to be appropriate. This information can help inform decisions such as when to refer for specialist diagnostic assessment or when grouping children for individualised instruction.

To account for variance in the quality of response, calculation of agreement was done in two ways. 1. The first was rater and evaluator agreement with exactly the same mark (a slashed tick, plain tick or dot), disregarding any plus or minus, (which is usually less than one scorable point). 2. The second was agreement with a difference of just one plus or minus. For example, a dot plus agreed with a plain tick (•+, ✓) and a plain tick minus agreed with a dot (✓-, •). A dot plus and a plain tick minus were even closer. However, combinations such as a dot and plain tick plus or a plain tick minus and slashed tick were not counted, as these were considered too disparate.

Table 5.1 shows the highest individual percentage of rater agreement achieved for each screening category for exact rater agreement with actual mark, and adjusted agreement, (with the exception of Personal Characteristics). For example, of 213 Outside Motor observations, there was exact agreement for 169 (79%), and adjusted agreement for 180 (84%).

Table 5.1

Highest Percentage of Individual Rater Agreement with Actual

Outside Motor		Language		Fine Motor		PP&R	
213 observations		94 observations		35 observations		88 observations	
1.	2.	1.	2.	1.	2.	1.	2.
n=169	n=180	n=79	n=80	n=30	n=31	n=74	NA
79%	84%	84%	85%	86%	88%	84%	

NOTE. 1. = exact rater / evaluator agreement, same mark.

2. = adjusted rater / evaluator agreement, within one plus or minus

For all screening sessions with raters (in three different schools), two conditions took precedence, the best interests of each child and the least disruption for

teachers and the school. For these reasons there was only one rater per screening session and no rater results for the Personal Characteristics screening category. The Personal Category is marked when the children are all sitting in class attending, listening and working on their pencil and paper worksheets. Their class teacher and usually two other school evaluators were watching and marking checklists (two fine motor items and the four Personal Characteristics) at the different table groups, while the researcher was directing the children. The researcher considered another person in the room might have been disruptive for children and teachers.

Although rating information from more than one rater per session may have been preferable in terms of more extensive comparisons, it would have been too distracting for the children. However, gathering rater information in authentic situations certainly added face validity to conclusions.

Raters marked children concurrently with the actual evaluators (the children's teachers, other school staff or the researcher). There were no preset criteria for selection of screening sessions with raters other than convenience for rater and school. Evaluators and raters had identical checklists with the children's names and ages. As the evaluators proceeded through marking the children's responses on their checklists, raters marked their own checklists accordingly. Evaluators and raters independently marked the same child, for the same task, at the same time. Raters did not see the evaluator's checklists or marks. As witnessed by the researcher or as related to the researcher by the teachers, the raters were not disruptive or threatening to the children or the evaluator.

5.3.1 Interrater Agreement - Outside Motor

In 1995 the range of Outside Motor (OM) exact agreement with actual marks, for 522 observations, was 59% - 75%. The two raters who worked with the Video and Manual prior to the screening session had the highest percentage of exact OM agreement at 75% and 72%. The remedial teacher who was more familiar with screening (as opposed diagnostic assessment), had the next highest percentage of exact OM agreement at 71%.

For the two physiotherapists, who had the lowest rates of agreement, reasons became apparent from telephone interviews. Both were more comfortable and had more expertise with individual diagnostic assessment. However, they each took a different approach to evaluating children in this whole class screening situation. In general, one was overly "kind" with many higher scores than the evaluator's.

The other physiotherapist seemed to still be thinking in terms of diagnostic assessment and at times scored too low. When evaluating performance, she considered response attributes beyond those provided in the scoring criteria, which is a form of construct-irrelevance. For example, for Checklist Item 9. (tossing a ball overarm), she looked for children to show cross-patterning with leg / arm opposition and shift of weight upon release of the ball. The Manual does mention these attributes, but as being more typical of age six; they are not part of the scoring criteria for younger children, especially early in the year. Information such as evidence of this excellent integrated action should certainly be recorded, but as qualitative comment.

The 1995 range of agreement for Outside Motor Items 1 - 5 was higher (72% - 78%), while the range for items 6 - 9 was 53% - 62%. Items 6 and 7 are the balancing items which require very specific details to be observed. For example, the length of time for controlled balance on each foot is up to eight seconds. Other details such as the child not tucking the raised leg behind the standing leg for stabilisation, must be observed. Owing to the evaluator having to stand directly in front of the child within reach in case the child starts to wobble, the raters did not always have a direct view of the child's response, so accurate counting of balance time was difficult. However, the rater who made the most use of the inservice video, had 87% exact agreement for Item 7.

A similar case could be made for raters not having had a clear view of details or direct contact with the child, for Checklist Items 8 and 9. For example, for Item 9, if a child has difficulty tossing the tennis ball, the evaluator may physically cue the child to determine what the child can do with help (see the Screening Manual, Appendix 1., A1.2, p.307, for details). Depending upon this additional information, the child would score a tick or a dot. Raters did not have access to this information.

However, again, both the raters who made use of the video each had 87% exact agreement for Item 8, (neither had observations for Item 9). These results pointed to the need for more attention to initial inservice education and precise definition of scoring criteria, especially for Checklist Items which include very specific details. The 1995 study also pointed to the need of more careful rater placement for the Outside Motor activities in 1996.

For 1996, scoring criteria were clarified and organised in a simpler, more explicit format. Some scoring criteria had been written as descriptive text inviting subjective interpretation. Scoring directions were rewritten as specific criteria for a given mark by age, and time of year, as appropriate. See scoring criteria in the Screening Manual, Appendix 1., 1.2, p.323. These changes resulted in improved Outside Motor rater agreement, (79% for exact agreement, and 84% when taking one plus or minus difference into account).

5.3.2 Interrater Agreement - Fine Motor and Language

The range of exact rater agreement for the Fine Motor Category was 75% - 86%, with the average agreement being 82% for 88 observations. The average agreement was 88% when adjusted (taking the plus / minus variance into account). This category is an inside activity and the rater was stationary, directly facing the child, and therefore more able to attend to detail. Agreement of two raters, a physiotherapist and the occupational therapist, who from their work had specific expertise in hand-writing and would have the most keen eye for potential problems, was 83% and 86%. It is interesting to note these specialists' high rate of agreement with the teachers, who were evaluating this category just using the criteria for success from the Manual. This result suggests the Fine Motor scoring criteria are adequate regarding clarity and depth of attribute definition.

The range of exact rater agreement with actual screening marks for the Language category was 66% - 84%, for an average 73% for 453 observations. The average adjusted agreement was 75%, when taking the plus / minus variance into account. The top percentage of 84% was for a rater who had used the video. Further, this category is also an inside activity with the same advantages of having the rater in a

stationary position facing the child. However, one rater wrote that it was hard for her to hear some children which may indicate she had difficulty processing auditory information in the class environment, like some children in the same situation.

None of the teacher-evaluators, or raters, had special expertise in language acquisition and they therefore had to rely on the defined scoring criteria for judgement. Despite this, the rate of agreement was close to the Fine Motor rate where specific expertise was present, indicating that the Language scoring criteria are also sufficient.

5.3.3 Interrater Agreement - Paper/Pencil and Reasoning (PP&R)

The Paper/Pencil & Reasoning Category (PP&R) evaluates written product with opportunities for subjective decisions if scoring criteria are not followed. For each scored attribute there are potentially many variations in the quality of the children's responses. However, there must be confidence in consistent evaluation decisions and therefore, PP&R evidence of rater agreement was collected in 1995 and in 1996 from the non-school raters and from classroom teachers. PP&R is the only screening category for which all raters marked many of the same children.

In 1995 the five non-school raters and two classroom teachers scored against actual screening marks for the same sixteen children. The children's worksheets were selected as being representative samples of all the children's work and of the age range. The researcher prepared identical packaged sets of the sixteen children's worksheets, directions and an evaluation paper inviting raters' comments on any issue. Each packet also included a covering letter explaining the need for the study and its purpose. The package was sent to each rater, including a stamped return envelope and no required return date.

Of 1298 PP&R observations in 1995, the average percentage of exact agreement was 63%. The average adjusted agreement was 69% (when taking the plus / minus variance into account). Because these percentages seemed low and because classroom teachers would be the ultimate evaluators, in 1996, six classroom teachers scored against the original scores for eight of the same 1995 children, and

three of these teachers also each scored eight children in their class, (all in comparison to the actual evaluator's scores) .

In 1996, for the eight children whose responses were assessed by all raters (539 PP&R observations), the highest individual percentage of exact agreement was with a country teacher, at 84%. The average exact agreement was 71%. For those teachers scoring children in their own class (336 PP&R observations), the average exact agreement was 79%. Two of the teachers evaluating their own children, one a city teacher and one a country teacher, each had 82% agreement. There were no calculations for the adjusted agreement option because there were a negligible number of plus or minus marks; presumably due to more exact scoring definition. These results indicate that identified and corrected sources of error, followed by more precise scoring definition did improve consistent evaluation among raters, in different contexts, and over time, and these kindergarten teachers were very good evaluators of children.

An example of PP&R construct-irrelevance occurred in 1995 when a non-school rater was swayed by the very astute detail one child included on his trees (Checklist Item 39). The child demonstrated artistry in visual processing and drawing. However, such artistry and attending skills are outside the boundaries of defined scoring criteria and should be noted as qualitative comment. For this rater, other children's responses were gauged by this most unusual one and were not given full credit as deserved. The explanation was discovered during a phone interview with the rater about her seemingly disparate scores. A similar example was a rater's comment that a human figure "lacked detail". Human figure detail is only quantitatively relevant within the boundaries of the scoring criteria.

Another example of potential bias were 1995 comments of a rater and one teacher (as rater), regarding neatness of work on the PP&R worksheet; but each for a different reason. The PP&R worksheet is a plain piece of A4 paper with no lines to guide spacing. The comment was that the worksheet should be divided into boxes in which the children would be instructed to place their responses. The rater felt this would be easier for the children to produce neater work. The teacher-rater thought it would make the papers easier to mark, (which is probably true).

However, most of the children could spatially organise their work on their papers as directed. It is important to find out which children have problems with sequencing and organisation as these factors can indicate and/or contribute to learning difficulties. The raters' suggestions disregard a goal of this assessment, to determine what each child can do independently - the measurement construct.

As with the other screening categories, the main difficulty with PP&R initially causing variance among raters was the lack of sufficiently clear definition and format of scoring criteria. One non-school rater reported using the scoring criteria for evaluating the human figure drawing from another instrument because "there was exact criteria and you don't have to agonise over it". Criteria were defined but some were in text form (such as in directions to the raters), and more precise direction needed to be incorporated in a simple format as specific criteria beside each scoring option. This was done for the 1996 PP&R interrater data collection and for the Manual. The 1996 rater agreement results indicate the positive effect of improved definition of scoring criteria.

A postscript to 'neatness' posing a potential source of bias is another rater's qualitative comment that, possibly inappropriately, assumed a child's 'messy paper' indicated poor concentration. While this may be at least be partially true, other helpful qualitative comment about a messy paper suggested further investigation of visual perception and/or the abilities and skills required for following directions such as auditory processing for the final sound in words (drawing a clown instead of cloud for Checklist Item 41), or for the singular/plural grammatic structure, Checklist Items 39-41 and 44). Other assumed comments considered messy papers as indicating the child was not ready for school and/or was immature and one declared the child's human figure to be "dysfunctional", but did add "investigate further". Assumptions are helpful only if they are recognised as being assumptions and if there is subsequent investigation, as unsubstantiated assumptions can lead to unwarranted labelling.

Other sources of potential error include gender and/or age bias fed by popular opinion about younger children and boys being less successful than older children and girls; trends which the general statistics from this study confirm. For example,

evaluators may allow their judgement to be more indulgent of younger children as was the case for one kindergarten teacher when evaluating the fine motor tasks. A younger child may attract high scores which may bias scores for other children. An older child might get a lower mark by comparison, but for a response which is actually typical for age. Girls may attract higher marks than deserved. All responses must be marked according to stipulated criteria or some children may miss out on helpful intervention.

On the whole, females tended to score more highly than males in all categories, although there are males in the highest percentile bands, and females in the lowest ones. The point is, that while this trend is consistent for all Screening Categories, those boys in the higher percentile bands and those girls in the lower bands must have their developmental and learning needs accommodated. The video seemed to prove a help in gaining gender and age objectivity as there were examples of all ages and genders performing at various levels of function, and the issue was stressed at all inservice opportunities regarding scoring.

Although having too many specific criteria can create stifling parameters, having too few criteria invites subjective decisions. Of key importance during inservice is stressing the significance of evaluators adhering to stated scoring criteria when evaluating, and writing individualised qualitative information in the checklist's comment space. Pursuing rater agreement over two years using various raters established an appropriate balance.

5.4 Paper / Pencil & Reasoning (PP&R) Scoring Study

Evaluation of The Kindergarten Screening construct is clearly tied to observable performance except for the PP&R screening category when written product is scored. For performance assessment scores to have meaning which can be generalised from assessment tasks to a broader domain of achievement, there must be justification for the accuracy and consistency of those scores discriminating difference (Linn et al.,1991). From the 1993 Sample, attributes which might appear on a child's PP&R worksheet were identified for the PP&R Study. Eventually the list

became 84 attributes. Incidents of each attribute were tallied from the 1995 and 1996 Samples by gender, age, time of year and city/country, for a total of 480 children early in the year (257 males and 223 females), and 514 children late in the year (267 males and 247 females).

The purpose of this process was: "Setting the boundaries of score meaning (which) is precisely what generalisability evidence is meant to address" (Messick,1994, p.15). According to Stiggins (1987), clearly stated scoring criteria based on "observable behaviours or attributes of products" are the most important factor contributing to the quality of a performance assessment.

The 84 attributes were recorded to gather very specific details about some items such as the human figure drawing. For example, there were four different attributes regarding body shape, (stick body, round / circle body, triangle body, shaped body). There were two attributes about nose shape. However for the purpose of scoring, the four body attributes were counted as one for 'body', and the two nose attributes counted as one for 'nose'. Gender differences among these various attributes were not considered for scoring.

An example of gender difference was found in the reversing of written letters and numbers. The children are asked to write their name and then some numbers - "their favourite numbers"- on the worksheet. Writing their name is a task that has presumably been practised numerous times; even from the beginning of kindergarten due to the high rate of preschool experience. Writing numbers is usually not directly taught or practised. When numbers are reversed, a general attitude is that young children reverse numbers anyway, and in time they will be correct. Results from the PP&R Study show this may not be the case for many children. In most instances the percentage of number reversals either did not improve or were higher, at the end of the year. Tables 5.2 and 5.3 (p.165) show the percentage of letter and number reversals for the Combined Samples (by age and gender within sample, and by gender within age, for time of year) and are a good example of the need to look beyond global scores to legitimate concerns for individuals.

Table 5.2

Letter Reversals for Combined Samples

	Early Year	Late Year
	N=480	N=514
% of N	16%	6%
	M=60%	M=45%
	F=40%	F=55%
Age 1-2	19%	10%
Age 2-3	14%	6%
Age 3-4	16%	5%

	male	female	male	female
Age 1-2	21%	17%	8%	11%
Age 2-3	16%	12%	7%	6%
Age 3-4	18%	13%	3%	6%

Note. Ages 1, 2 & 3 to the left are early year, Ages 2, 3 & 4 on the right are late year; M=male, F=female.

Table 5.3

Number Reversals for Combined Samples

	Early Year	Late Year
	N=480	N=514
% of N	34%	39%
	M=40%	M=49%
	F=60%	F=51%
Age1-2	22%	34%
Age2-3	37%	44%
Age3-4	42%	35%

	male	female	male	female
Age1-2	17%	28%	27%	39%
Age2-3	28%	48%	45%	44%
Age3-4	30%	56%	30%	39%

Note. Ages 1, 2 & 3 to the left are early year, Ages 2, 3 & 4 on the right are late year; M=male, F=female.

Tables 5.2 and 5.3 suggest the possibility of at least two issues. One may be an early indication of females' attitude towards the functional value of numbers, as the writing of numbers may seem less important to these young females. However, this idea would certainly need research to verify. The second issue, for both genders, is the effect of practice to mastery. The Tables show reduced late year percentages for the reversal of letters for all ages (although an increase for Age1 and Age3 females), but not the same for reversal of numbers. As a screening item, the writing of numbers seems to be a more true indication of independent function regarding the reversal of written symbols than the practised writing of the letters in one's name. These details show the sort of qualitative information schools can generate for their own population, in order to make instructional accommodations.

Some of the 84 attributes in the PP&R Scoring Study emerged from inspection of the children's worksheets, such as a human figure drawn with no face. In 1993 and early 1995, no incidence of the human figure drawn with no face was noticed. In late 1995 about 9% of the sample drew human figures with no faces and the percentages for early and late 1996 were about the same. Gender differences were very small, but more males omitted faces. The intriguing qualitative factor was that excluding the face seemed to be a deliberate decision, (not a factor such as being related to age or one of visual processing or drawing skill). The rest of the no-face figures fit the full descriptive range of various human figure attributes from those with legs coming from the head, to those with some details, to those with shaped bodies and dressed.[13] Because the incidence of this attribute (no face) was so infrequent, it attracts a zero score and should invite further investigation.

Scoring criteria were confirmed from the percentages of incidence from the Combined Samples. In general, if the percentage of attribute incidence was 20% or less for age and time of year (meaning that at least 80% of children did not show that attribute), that attribute was considered unscorable for that age and time of year. For example, for all ages and both genders, the early year percentage range of including a navel on the human figure was 7% - 10%, and the late year percentages were 2% and 3%. Clearly, the inclusion of a navel for these kindergarten children was not typical at either time of year. The same can be said about the inclusion of other attributes (with similar percentages), such as drawing: a square with a

rounded edge; a clown, (not cloud); only one and/or zero for numbers; eyelashes, eyebrows, lips or ears on the human figure; mirror writing.

In general, when the percentage of inclusion of an attribute was between 20 - 50%, that possibility was considered as scoring one point. Percentages of more than 50% were considered to be of high enough frequency to score two points. In some instances age differences were taken into account for scoring and are so noted in the manual. For example, the Age1 early year percentage for inclusion of large round eyes on the human figure was 50%, the Age2 percentage for the same attribute and time of year was 46%, while the Age3 percentage was just 24%. Therefore, Age1 scored two points if they included large round eyes early in the year, Age2 was given one point for the same attribute, while this attribute did not score for Age3. By contrast, the percentage of children including a mouth early in the year was 69%-80% across the ages and therefore that attribute was taken as typically expected for all kindergarten children at that time of year, and scored.

While parameters of the PP&R scoring criteria may seem unusually flexible, specific definition of so many unique attributes and their translation by so many unique children, challenged precision. Scoring rubrics had to be defined based upon empirical evidence. The completion of the interrater agreement study in 1996 (see 5.3), showed an exact PP&R scoring agreement of 71% among the six kindergarten classroom teachers scoring against actual screening marks for eight children assessed by each rater, (539 PP&R observations). The 1996 interrater group also showed 79% exact agreement for three of these teachers scoring eight different children in their class against actual screening marks, (336 PP&R observations). For two of the kindergarten teachers evaluating their own children, one a city teacher and one a country teacher, there was 82% exact scoring agreement. These percentages of rater agreement justify confidence in interpretations from results of the PP&R category of this screening instrument.

5.5 Derived Target Scores

The Kindergarten Screening is meant to identify those children whose profile of demonstrated abilities and skills in affecting domains is shown to be either expected,

less than expected, better than expected for age, requiring immediate intervention, or a combination of these factors across domains. A child with combined factors is one who may demonstrate receptive and/or expressive language skills which are better than expected for age (possibly even suggesting potential giftedness), but whose motor ability and related skills may even be of concern sufficient to invite a referral for specialist diagnostic assessment, (see Table 8.4. p.279).

If low muscle tone or postural instability / balance are a problem for the above child, the child may have significant difficulty sustaining an appropriate or efficient sitting position for writing, or even directly attending, for periods of time. If fine motor skills are a problem for that child, the child may have significant difficulty physically writing, and may eventually be unable to successfully write clearly or fast enough to complete the ever increasing volume of written work required in school and other requirements, such as timed tests. Further, secondary problems such as low self-esteem and lack of motivation can quickly become entrenched; for some, by the end of kindergarten.

A goal of standardised screening should be to provide a profile, in this case indicating levels of function, which informs the "where-do-we-go-from-here" question. Supplying valid target scores should help guide interpretations and decisions. Target scores are usually defined from standard deviations or quartiles. For this inquiry, with three chronologically separate comparison groups, it was necessary to attain one set of target scores per screening category comprising information from all three samples; the Combined Samples. Standard deviations were computed for the Combined Samples (Table A2.12, Appendix 2.), and teachers can use them to calculate local target scores. However, specific target scores were derived from the integration of information generated from regression analysis and early year sample means (see below for a complete description of the derivation of target scores in this study).

The purpose of target scores is to identify early year screening results indicative of those children at the extremes most likely needing direct intervention, (and for comparison to local scores). Target scores give teachers a more complete range of

scores to accountably describe the developmental and learning needs of each child in their class, beyond using means, quartiles, or standard deviations alone. These specific target scores (see Table 5.4), are meant to advise teachers when referral may be appropriate, and enhancing instruction by appropriately challenging those children demonstrating excellent competence and those demonstrating lack of foundation competence. The process of identifying the specific derived target scores was as follows:

1. Standard deviations were determined for the Combined Samples (see Combined Samples SDs, Table A2.12, Appendix 2.).

2. Using early year quartile cut-scores, the children's screening scores placed them in either high and low quartiles and their percentages were determined for Success Rate and each screening category with results tabled by total (N) and by subgroups within each sample (see quartile tables in Chapter Six, at the end of reporting for each screening category).

3. Again, from early year scores, linear regression was used to predict late year scores, identifying each child who either achieved (residual gain), or did not achieve (residual loss), their predicted score.

4. Then, within each high or low screening quartile the percentage of children was identified in relation to their residual gain or loss, with results tabled by N and by subgroups within each sample (see regression tables in Chapter Six for each screening category).

5. Then, the early screening means for each child in each sample identified in step three were listed and averaged to determine a mean, or target score, for children in those quartiles who subsequently achieved or did not achieve predicted scores.

6. The early year means of the Combined Samples (Table 6.1, Chapter Six) were then compared with the target scores to determine any differences, and by how much these differences varied from one standard deviation away from the mean of the Combined Samples.

The purpose was to determine if there may be more precise target scores / cut-scores, beyond just using standard deviations to identify cut-scores. Differences

were found between the two sets of scores:

1. the derived target score - averaged from children in a high or low screening quartile identified in step 5;

2. standard deviation applied to the actual early year means of the Combined Samples.

For example, in Table 5.4 below, for the Paper/Pencil & Reasoning Category (PP&R), of the children in step 4., their high average early score (target score) of 79 was identified, being .9 higher than one and one-third (1⅓) standard deviations above the total Combined Samples PP&R early year mean. Conversely their low average early score (target score) of 18 was identified, being just .1 below one and one-quarter (1¼) standard deviations lower than the total Combined Samples PP&R early year mean.

Teachers can use these predetermined target scores to guide decisions, and/or can use standard deviations per screening category to calculate target scores for their population (see Tables A2.12 & A2.13). Schools, or even districts, can create local norms for their own use. These derived target scores have been rounded.

Table 5.4
Derived Target Scores and Corresponding Standard Deviations Differences

Screening Categories	High Target Score		Low Target Score	
	score	SD	score	SD
Success Rate	79	+1⅓	40	- 1⅓
Outside Motor	84	+1⅓	28	- 1⅓
Fine Motor	88	+1⅓	42	- 1⅓
Language	92	+1	38	- 1⅓
PP&R	79	+1⅓	18	- 1¼

Note. There are no derived scores for Personal Characteristics due to there being only four Checklist Items. Quartile cut-scores were the same for all three samples and therefore averaging mean scores becomes irrelevant.

Table 5.4 shows the high and low specific target scores for the Combined Samples,

derived from information generated by quartile grouping and regression analysis. These same scores were also analysed by gender (Table 5.5). Gender score differences are small and they are interesting because they also show the similarity of scores for males and females at the extremes. These derived target scores have been rounded.

Table 5.5

Derived Target Scores by Gender within Combined Samples

Screening	High Target Score		Low Target Score	
Categories	male	female	male	female
Success Rate	77	80	39	43
Outside Motor	82	86	28	28
Fine Motor	88	88	42	45
Language	92	92	39	39
PP&R	78	79	17	22

Children at, or above / below target scores are at the extreme ends of the score range. Table 5.6 shows the number and percentage of these children in the Combined Samples, by total (N) and by gender (M / F). While the trend of more females than males with higher scores remains, there are males with high scores and there are females with lowest scores, emphasising the need to assess all children. For a discussion of the practical significance of these target scores, in combination with the classroom teacher surveys collected in the present study, see Chapter Seven, 7.2.

Table 5.6

Percentage of Combined Samples Target Scores

Screening Categories	High Target Scores			Low Target Scores		
	N	M	F	N	M	F
Suc. Rate N=692	12%	3%	9%	13%	9%	3%
Out. Motor N=774	10%	3%	8%	15%	10%	4%
Fine Motor N=752	11%	4%	7%	11%	8%	3%
Language N=754	17%	8%	9%	11%	7%	4%
PP&R N=753	8%	2%	6%	16%	11%	5%

5.6 Technical Characteristics

Trust in a measurement's ability to consistently and accurately discriminate difference over time should precede implementation of consequential decisions for individuals and policy, based upon assessment results. The following standard processes were used in this study to further verify the extent to which results from The Kindergarten Screening can confidently be generalised.

5.6.1 Confidence Intervals

Confidence intervals describe the range of mean scores in which the theoretical true mean score lies and can indicate the stability of scores over time. Identifying confidence intervals around sample means demonstrate the range of those sample means which contain the probable population mean. In this study, the standard of error of the mean and screening means of the Combined Samples were used as benchmarks in determining the yearly sample confidence intervals, being the best available estimate of the population mean.

The Combined Samples early year standard error of the mean were: Success Rate .60; Outside Motor .80; Fine Motor .66; Language .82; Paper/Pencil and Reasoning .88; Personal Characteristics 1.11. The Combined Samples screening means are within Table 5.7. The confidence intervals in Table 5.7 for each yearly sample and for gender and age within each sample, for Success Rate and each screening category, were calculated at the 95% level of confidence .

Consistency of obtained scores was established by comparing equivalent confidence intervals for the different sets of scores using the same instrument over time from the three different samples, across contexts and evaluators. Cross-sample comparisons are made to show the closeness and similarity of the interval ranges, and to determine the extent of over-lap with the means of the Combined Samples. These figures are recorded in Table 5.7.

While the criteria for sample selection were the same for all three samples, the children and their demographics, age, language and school mix were different. Even so, the confidence interval for each early year sample mean and also those for gender and age within in each sample, contain the early corresponding Combined Samples means in seventeen of eighteen opportunities per column. These findings clearly demonstrate the similarity and consistency of these different sets of scores over time, encouraging confidence in generalising inferences made from limited experience to the population of kindergarten children.

Table 5.7

Early Year Combined Sample (CS) Means and Confidence Intervals at 95% Level

Screen	N	male	female	Age1	Age2	Age3
CS means	60.1	55.6	65.1	53.4	61.4	65.4
Suc. Rate 1993	57.3-61.3	52.0-57.4	62.2-67.4	50.2-58.5	56.2-61.6	60.9-68.3
1995	59.9-63.9	55.0-60.5	63.4-68.6	50.9-59.5	60.6-65.1	65.0-74.3
1996	57.6-61.6	52.2-57.9	61.8-67.8	48.1-55.4	59.6-66.3	60.5-68.1
CS means	57.4	51.4	63.9	55.4	57.4	59.9
OM 1993	56.3-61.9	48.8-56.3	62.1-69.8	54.0-65.8	54.1-62.0	55.0-65.9
1995	52.7-58.7	44.9-53.5	59.1-66.9	47.5-59.1	51.2-59.4	54.3-70.2
1996	54.5-59.3	48.6-54.8	59.1-66.4	49.8-58.1	54.4-62.2	53.8-63.6
CS means	65.8	61.9	70.0	59.4	66.9	71.3
FM 1993	65.8-69.8	62.2-68.0	67.8-73.6	**60.2-69.2**	65.0-71.0	66.6-73.9
1995	60.2-65.0	55.3-62.2	63.3-70.5	49.7-59.6	60.6-66.8	68.2-80.2
1996	63.8-68.2	58.1-64.3	68.5-74.3	54.9-62.5	65.3-72.0	66.9-75.3

Screen	N	male	female	Age 1	Age 2	Age 3
CS means	68.3	65.8	71.1	63.9	68.4	73.5
Lang 1993	64.3-69.9	60.8-68.9	65.5-73.7	56.4-68.4	61.3-69.6	69.5-79.9
1995	**70.1-75.7**	65.5-74.6	**72.2-79.4**	61.0-73.4	70.3-77.7	71.6-86.0
1996	64.1-69.3	60.6-67.7	65.7-73.2	58.4-67.9	63.1-71.0	65.9-75.4
CS means	47.5	42.9	52.4	37.8	50.0	54.0
PP&R 1993	42.4-48.0	35.0-43.0	48.1-55.9	30.3-42.7	41.9-49.9	45.3-56.3
1995	49.6-55.6	**44.4-53.3**	52.5-60.5	36.3-49.2	**51.0-58.1**	**56.4-70.8**
1996	43.6-49.2	39.0-46.5	45.9-54.8	31.4-40.6	45.8-55.5	48.1-58.5
CS means	62.6	57.2	68.5	53.8	64.3	70.1
Per 1993	58.8-66.4	49.9-61.3	64.9-74.8	47.6-65.2	54.3-65.1	67.0-80.4
1995	56.7-65.5	49.2-61.2	61.0-73.3	43.8-59.0	58.6-70.4	55.3-77.7
1996	60.2-67.0	54.9-64.2	63.4-72.8	47.8-59.2	63.8-73.8	61.7-75.1

Note. The intervals in bold are those which have no over-lap with the Combined Samples mean.

5.6.2 Internal Consistency

Cronbach's Alpha was used to compute internal consistency; the dependability of single score performance. Reliability coefficients indicate the internal consistency of scores across tasks and over repeated occasions (Gipps,1994). Test-retest, a technique to establish this form of reliability was a functional impossibility for this study when considering screening a whole class of children in schools. Further, owing to the instrument being performance assessment and developmentally based, initial screening might serve as practice for the next session, and with even as much as a month between the two screening sessions, there could be an affect from natural maturity and/or other factors such as intervention from school activities.

Cronbach's Alpha, being the average of all possible split-half combinations of the assessment's items, compares the equivalence of scores thereby establishing the internal consistency of the scale. Alphas were computed for the total assessment (Success Rate) and for each screening category. Tables 5.8 and 5.9 below, show the alpha coefficients for each yearly sample and then those for the Combined Samples.

Table 5.8

Early Year Cronbach's Aplha Coefficients

	Success Rate	Outside Motor	Fine Motor	Lang.	PP&R	Personal
1993	.90	.79	.73	.86	.85	.88
1995	.87	.77	.71	.82	.80	.89
1996	.93	.78	.77	.88	.88	.87

Table 5.9

Early Year Alpha Coefficients for Combined Samples

Children	Success Rate N=692	Out. Motor N=774	Fine Motor N=752	Lang. N=754	PP&R N=753	Personal N=767
N	.91	.78	.75	.87	.86	.88
male	.91	.75	.75	.87	.85	.88
female	.90	.80	.72	.86	.85	.87
Age 1	.91	.77	.74	.86	.86	.87
Age 2	.90	.79	.73	.86	.85	.87
Age 3	.91	.78	.73	.87	.84	.88

While the Combined Sample Alphas are the best indication for the population, it is important to note the steady high alpha figures for the three samples (Table 5.8) giving confidence in the dependability of scores over time. The three separate samples in this study provided in-depth sampling of assessment tasks in each domain and the consistently high alpha figures authenticate the internal consistency of item to screening categories within the scale (total). Table 5.10, below, shows the correlations of early year screening categories to scale (Success Rate) are understandably moderately high to strong, although there is a range. The early year screening category to category correlations show the more discrete motor categories, and stronger relationships between Fine Motor, Language and especially the Personal Characteristics to the Paper/Pencil and Reasoning category. It is also interesting to note the moderate relationship between Fine Motor and Personal.

Table 5.10

Correlations - Early Screening Categories to Scale

Out. Mot.	Fine Mot.	Lang.	Pap./Pen.	Personal	Suc. Rate
	.32	.19	.29	.29	.55
Fine Mot.					.64
Language	.26				.70
Pap. /Pen.	.44	.44			.83
Personal	.43	.35	.52		.69

A contributing factor to high reliability coefficients (a difficulty for performance assessment), is the achievement of consistent rating (Gipps,1994). For The Kindergarten Screening, rater agreement was improved by enhanced rater training and identification of confounding variables leading to clarified definition and format of scoring criteria.

5.6.3 Standard Deviations

A point should be made regarding the use of early year and late year standard deviations (SDs) (Tables A2.9 - A2.13, Appendix 2., p.368-9). In every instance the late SDs are lower than those early in the year which while going against the general statistical trend of increased SDs over time, suggests they reflect gains made by the lower achievers. The degree to which this positive progress can be attributed to typical development, experience, and/or interventions can only be suggested. However, the attribution of definitive progress can better be seen at the local level owing to individual and/or regional school gains and interventions.

Therefore, the functional significance of the late SDs is that children whose late year scores are one or two SDs lower than the late means, after a full year in school, are not achieving anywhere near their peers. At the end of the year, the late year SDs must be used to identify children who may still be at risk (as the late SDs are different from those early in the year and the derived target scores are only for use early in the year). Application of this information to local results can be coupled with year one assessments / achievements to identify local screening cut-scores for special help selection beyond kindergarten, and to evaluate local teaching and/or intervention programmes.

5.7 Concurrent Validity

Evidence of concurrent validity demonstrates corroborating results between the instrument in question and another standardised instrument or recognised source of identification which claims to measure the same criteria, giving assurance that the instrument is measuring what it claims to measure. A problem gathering concurrent evidence for The Kindergarten Screening is that The Kindergarten Screening is whole class screening administered in the familiar group settings of school. Other available instruments intending to measure the same criteria are usually individually administered and often in settings unfamiliar to the child. Also, individual assessments are generally specifically diagnostic although the same children are to be identified. Screening identifies strengths and weaknesses (in this case to guide instruction) and where concerns exist, children are then referred for diagnostic assessment to identify specific attributes of the difficulty and to determine appropriate remediation.

However, there has been positive concurrent evidence that The Kindergarten Screening identifies children appropriately. For example, some children who had very low early year motor screening scores were recommended by their school to the Uniplay Program, University of NSW, School of Teacher Education. This Program was a remedial motor program for children with motor integration deficits. Acceptance into Uniplay depended upon the child scoring at or below the fifteenth percentile on the individually administered standardised ABC Motor Assessment (Henderson & Sugden, 1992). All children recommended by the school were accepted into the Uniplay Program indicating The Kindergarten Screening accurately identifies those children with motor problems concerning enough to be referred, and in need of special motor instruction.

Other examples of concurrent validity include children whose fine motor difficulties as identified from The Kindergarten Screening were confirmed by a professional community based therapy resource team and accepted for occupational therapy. Also, comments from the ESL / language teachers (who participated in the screening as evaluators for the language category from two schools), confirmed that the language screening information was sufficient to confidently know which children would at least initially, need to be withdrawn for language help and for which classroom support would be adequate. These teachers were pleased at the time saved formerly taken for individual evaluation.

Chapter Six - Results: Presentation and Discussion of Quantitative and Qualitative Information

Introduction

While general statistical information is used to summarise what is typical for whole groups and subgroups of children, this information is not intended to describe individual children. Statistical information can give an homogenised picture of those being assessed, leading to general statements about populations which often become a standard (Dorn,1998), but which can unfairly affect subgroups and individuals. Statistical information can be helpful for general purposes when creating policies, planning programmes and securing resources, but classroom instruction must reflect accommodation for each child's individual strengths and weaknesses based upon assessed needs, not upon generalities.

On the other hand, description of results at the extremes often leads to legitimate concerns for individuals. Therefore, the reporting of results in this chapter will move from the general toward diversity at the extremes, looking at result differences among schools and differences among children. In particular, comparisons will focus on gender, age, language (English / English as a Second Language - ESL), and city / country differences, from the early year assessment results and also those late in the year, within each screening category. Results will also highlight a review of popular opinions and the degree to which in fact, on the basis of results from this study, they can be generalised.

Two popular general opinions are that upon school entry, boys are developmentally less ready for formal school than girls and older children are more likely to be successful in kindergarten, than younger children (Gredler, 1980; Huffer, 1999). Table 6.1 presents the early year screening means for the Combined Samples (1993,1995, and 1996) for Success Rate (total screening score), and the five screening categories. With a total of 776 children assessed at school entry (403 males and 373 females), Table 6.1 shows that in every instance female means are higher than the males', and that means increase with age. So within this study at

this level of reporting (the Combined Samples by gender and age), the above general opinions are true.

Table 6.1

Early Year Kindergarten Screening Means for Combined Samples

	SR	OM	FM	La	PP&R	Per
Children	N=692	N=774	N=752	N=754	N=753	N=767
N	60.1	57.4	65.8	68.3	47.5	62.6
male	55.6	51.4	61.9	65.8	42.9	57.2
female	65.1	63.9	70.0	71.1	52.4	68.5
Age 1	53.4	55.4	59.4	63.9	37.8	53.8
Age 2	61.4	57.4	66.9	68.4	50.0	64.3
Age 3	65.4	59.9	71.3	73.5	54.0	70.1

Note. SR=Success Rate; OM=Outside Motor; La=Language; PP&R=Paper/Pencil & Reasoning; Per=Personal. Age Groups: Age 1=4.6-4.11; Age 2=5.0-5.5; Age 3=5.6-5.11.

Table 6.2 shows the early year Success Rate (SR) screening means for the Combined Samples (N=692) in comparison to each yearly sample (n), and by gender and age within the Combined Samples and each yearly sample. These sample means corroborate the higher female means and increasing means by age. Further, these means show consistency over time and approximate equivalence to the Combined Samples means, further confirming the trends.

Table 6.2

Early Year Samples Screening Means - Success Rate

Children	Combined Samples	1993 n=247	1995 n=176	1996 n=269
Total	60.1	59.4	61.9	59.6
male	55.6	54.7	57.7	55.0
female	65.1	64.8	66.0	64.8
Age 1	53.4	54.4	55.2	51.7
Age 2	61.4	58.9	62.9	62.9
Age 3	65.4	64.6	69.7	64.3

However, the screening means across subgroups was more dissimilar. For example, Table 6.3 shows that the early year school range of Success Rate screening means across the study, was considerably wider than that of the yearly samples, (samples SR means range = 59.4-61.9 / schools SR range =51.1-66.2).

Table 6.3

Early Year School Success Rate Screening Means

Sample	Schools 1	2	3	4	5	6	7	8
1993	64.5	56.4	61.5	51.7	56.1	63.7	61.5	
1995		57.7				52.3		57.0
1996 (City)		57.5						66.2

1996	Schools 12	13	14	15	16
(country)	61.1	58.6	55.9	51.1	60.6

Note. Schools 9 and 11 were end of year schools only (1993). There was no school 10 owing to coding procedure.

These figures demonstrate the diversity of results when analysed by schools, and qualitative information will help explain these differences. However, the trends of higher scores for females and older children still exist in most early screening means

and to a lesser degree, although with a few exceptions, in late screening means.

While means and standard deviations define typical distributions, percentile bands indicate relative standing, helping define diversity. Tables 6.4 and 6.5 show the percentage of Combined Samples Age1 children in the early high and low percentile groups. While this percentile information again confirms the gender trend, it also shows there is a considerable percentage of Age1 males in the highest percentile group and a considerable percentage of Age1 females in the lowest percentile group, (with the exception of Success Rate). These results emphasise the need and fairness of assessing all kindergarten children.

Early and late summary percentile groups for each yearly sample and subgroups within sample for each screening category, are reported at the end of each screening category section in this Chapter. Complete percentile tables for the early and late Combined Samples are in Appendix 2., Tables A2.2 and A2.3.

Table 6.4

Highest Percentile Group - Early Age1 Combined Samples

Children	SR N=55	OM N=129	FM N=148	La N=283	PP&R N=63	Per N=281
Age1	7%	25%	17%	23%	17%	18%
male	0	44%	27%	41%	27%	51%
female	100%	56%	73%	59%	73%	49%

Note. The Age1 percentage is of total children from the Combined Samples in the highest percentile group (calculated from 81-100) for Success Rate and each screening category. For example, there were 55 children from the early Combined Samples in the highest percentile group for Success Rate (N=55), and of those children 7% were Age1, all of whom were female.

Table 6.5

Lowest Percentile Groups - Early Age1 Combined Samples

Children	SR N=87	OM N=114	FM N=82	La N=103	PP&R N=200	Per N=134
Age1	48%	32%	50%	38%	44%	39%
male	74%	67%	76%	64%	61%	66%
female	26%	32%	23%	36%	37%	34%

Note. The lowest percentile groups for Success Rate (SR), Fine Motor (FM) and Language (La) were calculated from 0-40, and for Outside Motor (OM), Paper/Pencil & Reasoning (PP&R) and Personal (Per), from 0-30, reflecting the numbers of children at those levels.

Age1 was chosen here (and will be emphasised throughout reporting of results), because popular opinion often says the youngest children are least likely to be successful in kindergarten. In fact this appears to be true for many Age1 children in this study, especially males. While Tables 6.4 and 6.5 show placement of the Age1 children at the beginning of the year, it is their achievement (and that of all the other children) by the end of the year, which informs the potential impact of school entry kindergarten screening. For example, end of year quantitative and qualitative evidence will be presented which seems to indicate that improved Age1 outcomes depend more on school policy (eg. regarding specific intervention) and/or teacher philosophy and instruction, than chronological age.

The following selected results for each screening category are organised to demonstrate the necessary combination of quantitative and qualitative evidence to fully survey children's current function and progress, especially those at the extremes. Quantitative information shows the children's initial placement from early year scores (means, percentile groups and quartile groups), end of year placement (from means, school mean gains from early to late in the year, and regression information). Relevant qualitative information informs of factors contributing to results. For this study, the impact of screening is in the details of the school results. As Dorn (1998) has observed, "One political legacy of judging public schooling by test scores is the assumption that schooling is a monolithic entity that fails or succeeds as a single body. What this myth of a monolithic system hides is wide

variations in schooling ..." (P.8).

The format for reporting further results in this chapter is as follows. Each screening category is reported separately. Because quantitative results are referenced through out each screening category section, a summary table at the beginning of each section gives an overview of sample changes in screening results and the diversity in school mean gains. These tables show comparative early and late screening means, average school mean gains, and the range of school mean gains by age for each sample. At the end of each screening section are the tables reporting early and late screening means, percentile groups, quartile groups, and regression information, by each total sample, and gender, age and language within sample. Within each screening category age comparisons will be reported first, and then some details by gender, country/city and language.

As there are several references throughout Chapter Six to age proportions by samples and subgroups within samples, Tables 6a and 6c (included here from Chapter Four), and Table 6b, summarise valid cases across the study.

Table 6a

Children Screened Early in the Year

Children	1993	1995	1996	1996 Syd.	1996 Dub.
N	268	190	318	172	146
male	51%	52%	52.5%	57%	47%
female	49%	48%	47.5%	43%	53%
Age1	23%	29%	34%	37%	31%
Age2	51%	56%	41%	41%	42%
Age3	26%	15%	24%	22%	27%

Note. Age1 = CA4.6-4.11; Age2 = CA5.0-5.5; Age3 = CA5.6-5.11.
Syd. = Sydney (city), Dub. = Dubbo (rural).

Table 6b

Valid Total Cases per Screening Category for each Sample by Time of Year

Samples	Success Rate	Outside Motor	Fine Motor	Language	PP&R	Personal
1993	E=247	E=267	E=268	E=259	E=255	E=265
	L=300	L=320	L=321	L=303	L=316	L=320
1995	E=176	E=189	E=190	E=183	E=184	E=184
	L=115	L=161	L=136	L=135	L=182	L=138
1996	E=269	E=318	E=294	E=312	E=314	E=318
	L=233	L=294	L=257	L=323	L=330	L=302

Note. PP&R = Paper/Pencil & Reasoning.

Table 6c compares total valid cases for each yearly sample both early (E) and late (L) in the year and by city (Syd = Sydney) and country (Dub = Dubbo). N = total number of children for each sample and the number of male / female within each total sample. n = number of children by age group within sample. % of N = percent of children for that age group, by each sample. M = male. F = female.

Age Groups: Age1 = 4.6 - 4.11; Age 2 = 5.0-5.5; Age 3 = 5.6 - 5.11; Age 4 = 6.0+

Table 6c

Valid Cases for each Yearly Sample

	EARLY Year Children					LATE Year Children				
Children	E93	E95	E96	Syd	Dub	L93	L95	L96	Syd	Dub
N	268	190	318	172	146	321	182	330	181	149
male	137	99	167	98	69	174	102	175	100	75
female	131	91	151	74	77	147	80	155	81	74
Age 1 n	61	55	108	63	45					
% of N	23%	29%	34%	37%	31%					
Age 2 n	137	107	132	71	61	41	19	43	20	23
% of N	51%	56%	41%	41%	42%	13%	10%	13%	11%	15%
Age 3 n	70	28	78	38	40	137	87	127	76	51
% of N	26%	15%	24%	22%	27%	43%	48%	38%	42%	34%
Age 4 n						143	76	160	85	75
% of N						44%	42%	48%	47%	50%
Age1 M	54%	62%	47%	51%	42%					
F	46%	38%	53%	49%	58%					
Age2 M	48%	51%	55%	59%	51%	51%	42%	46%	55%	39%
F	52%	48%	45%	41%	49%	49%	58%	53%	45%	61%
Age3 M	54%	36%	55%	63%	47%	59%	62%	50%	47%	53%
F	46%	64%	45%	37%	52%	41%	38%	50%	53%	47%
Age4 M						50%	53%	57%	52%	52%
F						50%	47%	42%	38%	48%

6.1 Outside Motor

Table 6.6

OUTSIDE MOTOR

Yearly Samples		Screen Means Early	Late	School Mean Gains Mean	Range
1993	Age1/2	59.9	64.2	6.5	-6.9 / 22.7 (sch.3)
	Age 2/3	58.1	66.6	14.6	4.8 / 25.6 (sch.1)
	Age 3/4	60.4	74.2	15.8	2.9 / 34.5 (sch.3)
1995	Age1/2	53.3	68.2	11.8	7.5 / 16.1 (sch.2)
	Age 2/3	55.3	64.2	12.2	11.1 /13.4 (sch.2)
	Age 3/4	62.3	68.2	13.5	9.3 / 17.7 (sch.2)
1996	Age1/2	54.0	66.6	14.9	0 / 23.0 (sch2)
	Age 2/3	52.3	73.1	19.1	10.3 /29.5 (sch16)
	Age 3/4	58.7	79.9	15.3	0 / 23.8(sch2&16)

Age groups: Age1 = 4.6-4.11; Age2 = 5.0-5.5; Age3 = 5.6-5.11; Age4 = 6.0 +

Note. In the first column of Table 6.6, Ages 1,2 and 3 on the left of the age slash mark are early year ages, and Ages 2,3 and 4 on the right, are late year ages. For example, in Table 6.6 the early 1993 Age1 screening mean was 59.9 and the late mean was 64.2. In the school mean gains column, the bracketed school number at the end indicates the school with the highest mean gain for each cell. For example, in 1993 for Outside Motor, School 3 posted the highest Age1/2 mean gain of 22.7. Tables at the beginning of each screening category follow this same format.

In early childhood developmental theory, as discussed in Chapter Two, in the first paragraph of section 2.1.1 (p.48), a traditional view is that many motor skills typically develop and emerge sequentially, in their own time. When children enter kindergarten, success for motor screening tasks is expected to, and does, vary by age. For example, typically, age four children may still have a one-sided skip pattern whereas by age five, and certainly by age six, children are expected to be able to skip rhythmically, sustaining the hop-step pattern, alternating feet. Table 6.7 (p.193) clearly shows the similarity and consistency of early year Outside Motor responses expected for age across this study in the mean scores by total for sample, and by gender and age within each sample. The reliability of these scores is

confirmed by the confidence intervals in Table 5.10 (Chapter Five), which were calculated at the 95% level of confidence.

However, Table 6.8 (p.193) shows wider differences between late Outside Motor screening means, especially for the 1996 Sample. Even wider differences can be seen among the schools in Table 6.6, as mean gains appear to reflect the effect of school interventions. (For complete school mean gain information see Appendix 2., Tables A2.4-A2.8.)

6.1.1 Outside Motor (OM) Age Comparisons

Tables 6.9 and 6.11 (pp.194 & 195) show that in each yearly sample the percentage of Age1 children in the early high OM percentile and quartile groups remained very constant despite changes in their age proportions from sample to sample. For example, the percentage of Age1 children in the highest OM percentile bands was 24% in both 1993 and 1995, and 26% in 1996. Age1 figures in the high OM quartile group were similar. The consistency of these figures suggests a degree of developmental dependency for success in these motor tasks. These may be average numbers of Age1 children entering kindergarten whose outside motor ability and skills, at the independent level of function, are those expected or better than expected for age. Differences in Age2 and Age3 percentages in these high and low OM percentile and quartile groups generally followed their age proportions across the samples, with exceptions of Age1 and Age3, 1995 (see Table 6a, p.184, for age comparisons within samples).

A 1995 Sample gender variance illustrates the importance of looking at subgroups in relation to results. In this case, while the gender proportions across all three total samples are almost identical (Table 6a), Table 6c shows that in 1995 there were almost twice as many Age1 males, as females. This consideration may help explain the raised 1995 male percentages in the low percentile and quartile groups in Tables 6.9 and 6.11. Note the similarity and lower corresponding 1993 and 1996 figures in those tables.

Further, in 1995, there were also almost twice as many Age3 females as males, which may have influenced other raised 1995 results. For example, the raised 1995 percentage of females remaining the high OM quartile both early and late in the year (Table 6.12). Also, the 1995 the low Age3 residual loss from the low quartile, by comparison to the same 1993 and 1996 figures (Table 6.13).

Table 6.12 (p.195) shows that the percentage of Age1 children in the low quartile both early and late in the year, increased by 26% from 1993 to 1996. Further, regression information in Table 6.13 shows that of Age1 children in the Outside Motor low quartile, the number of those with residual gain decreased slightly but is quite consistent. However, the number of those with negative residual scores increased by 23% from 1993 to 1996, (coinciding with the Age1 low quartile figures in Table 6.12). These results appear to illustrate a widening gap of achievement within this group of children initially presenting with weaker outside motor skills, as an increasing number of these children did not gain.

The results by schools also reveals diversity. Some schools that directly intervened, intending to enhance outside motor skills, achieved very positive outcomes as illustrated by the following results.

Table 6.6 (p.187) shows the 1993 Outside Motor Age1 range of school mean gains is -6.9 to 22.7, and for Age3, from 2.9 to 34.5. The average 1993 Age1 mean gain for the seven schools was 6.5. The average Age3 mean gain was 15.8. These figures illustrate that the respective gains of 22.7 (Age1) and 34.5 (Age3) for School 3, were very good. Explanations for these differences seem to reflect school-based interventions: for example School 3 intervened with a well designed and structured Outside Motor Program which included parent involvement established from early in Term I, (as described in section 8.4.3, Parent Involvement, Chapter Eight).

Another example of direct intervention apparently affecting results is School 8 in 1995 and 1996. School 8 introduced an outside motor programme in 1995 and continued the programme in 1996 with some modifications made by the researcher.

Tables A2.6 and A2.7 (Appendix 2.), show School 8's Age1 mean gains increased from 7.5 in 1995 to 17.5 in 1996, Age2 mean gains increased from 11.1 to 21.1, and Age 3 from 9.3 to 17.9, showing the Motor Program's apparent effectiveness for all their children. This programme also involved parents and is briefly described in section 8.4.3, Parent Involvement, Chapter Eight, and summarised by example in A1.8, Appendix 1.)

Regarding school policy, it is interesting to note in Table 6.6, that the highest Age1 Outside Motor school mean gain of 23.0, 1996, was achieved by School 2. Although this school scored -0.7 in 1993, notice the frequency of School 2 posting the highest Outside Motor mean gains. School 2 completed assessment with The Kindergarten Screening for four consecutive years. They accumulated experience and expertise using screening results to flexibly group their children by identified needs. As observed by the researcher, School 2 was effectively able to accommodate their children's assessed developmental and learning needs with flexible grouping, direct teaching and structured practice.

A traditional and still widely held concept that younger children (in this study the Age1 children) just need time and they will 'catch up', may cause difficulties if their learning is not directly supported. Examples include School 6 in 1993 posting -6.9 mean gain for Age1. That kindergarten class had no Age3 children. The children were very young and there was no attempt to directly teach outside motor skills. However, gains in other areas where learning was supported and there was direct teaching, were good.

In 1993 Schools 1 and 2 also posted negative Age1 mean gains, which at the time, may have resulted from a 'give them time' attitude. However, subsequently School 2 posted the highest gains for the youngest children (Table 6.6, p.187). Conversely, in 1996, School 12, where the kindergarten teacher was a staunch proponent of the 'give them time' approach, the Outside Motor Age1 mean gain was 0, (1.4 gain Fine Motor, minus 1.9 Language and 0 Personal, although a healthy plus 25 for Paper/Pencil & Reasoning where teaching was directly supported). These schools did not have a specific Motor Program in place.

6.1.2 Outside Motor Gender and City / Country Comparisons

The obvious gross motor activities of young boys have led to a popular opinion that often predicts that boys' outside motor skills will be developmentally more mature than the girls' upon entry to school. In fact, in this study, Tables 6.7 and 6.8 (p.193) show that in almost every instance early OM screening means favour females and the situation remains the same with the late screening means. While across the study high OM quartile information does show improvement for males at school entry with an increased proportion of 7% from 1993 to 1996 (Table 6.11), the gender gap in the highest early 1996 percentile bands (with a difference of 51 - Table 6.9) was the widest for all three samples.

However, late year OM high percentile information (Table 6.10) shows an increase for males. Although a gender gap for this high group still remained, the difference was reduced to 21. Further, the 33% decrease in the percentage of males from 1993 to 1996 in the late lowest percentile information, shows positive progress. Yet across the study, there was a 34% increase in the proportion of females in this low OM percentile group by the end of kindergarten. An interpretation is that the needs of these females were not being met. At least some of these females would probably be in need of special help to enhance their motor skills and to hopefully avoid secondary problems. This result should be investigated further with more research.

Data from the schools suggests that expectation and intervention are factors contributing to success. For example, in 1993, School 4 had a trained female physical education teacher who worked with the children every week. Also, in conjunction with this study, School 4 conducted a developmental program which specifically included a separate component of outside motor activities, (see Appendix1., A1.7, p.349, for an example of that Developmental Programme). School 4 was the only school posting a higher female gain, and the highest female mean gain of nine schools for 1993 and 1995.

Popular opinion might also say that country children would be more successful with

outside motor skills than city children. However, Tables 6.7 and 6.8 show that early city screening means were just above country early screening means (by gender and for all ages), and Outside Motor is the only screening category for which city late means are higher than those for the country, (except for Age2). While the city male gains were 20.8 and female 19, country male gains were 21.7, and 14 for country female.

Two country schools (14 and 16) had male mean gains of 24.6 and 26.6 respectively, with female gains at 19.2 and 24.4 (Appendix 2., Table A2.7). Mean gains for two other country schools (12 and 15), were male 3.1 and 16.3, with respective female gains at 5.5 and 9.1. The gains in School 12 for Age 1 and 3 were 0. These figures seem again to reflect affect of supported teaching. School 14 was attentive to enhancing the children's motor skills with some supported teaching for children who needed extra help. School15 had an established, well researched and structured outside motor program in place. School 16 was the school who only accepted children after their fifth birthday which may reflect the developmental nature of these motor activities. However, School 16 did make a point of accommodating needs. School 12 had no motor program and supported traditional early childhood developmental theories.

In general, longitudinal regression information in Table 6.13 (p.196), shows a higher percentage of males with residual gains, especially from the low quartile. Gender differences from the low quartile show a big increase of males with residual gains (50%-72%), and decreasing numbers of females with residual gains (50%-29%). These figures illustrate the need to look beyond trends which may be set by general statistical information, and to accommodate the assessed developmental and learning needs of each child.

Table 6.7

Early Year Screening Mean Scores - OUTSIDE MOTOR

Children	E93	E95	E96	Syd E96	Dub E96
total	59.1	55.7	56.9	57.3	56.5
male	52.5	49.2	51.7	52.8	50.1
female	66.0	63.0	62.7	63.2	62.2
Age 1	59.9	53.3	54.0	54.1	53.8
Age 2	58.1	55.3	58.3	59.6	56.9
Age 3	60.4	62.3	58.7	58.4	59.0

Note. Age1 = 4.6-4.11; Age2 = 5.0-5.5; Age3 = 5.6-5.11. Syd = city / Dub = country

Table 6.8

Late Year Screening Mean Scores - OUTSIDE MOTOR

Children	L93	L95	L96	Syd L96	Dub L96
total	69.7	66.8	75.7	77.3	74.0
male	65.2	62.5	72.8	73.6	71.8
female	74.9	71.7	79.2	82.2	76.2
Age 2	64.2	68.3	66.6	62.8	69.5
Age 3	66.6	64.8	73.1	76.8	68.0
Age 4	74.2	68.2	79.9	80.7	78.9

Note. Age2 = 5.0-5.5; Age3 = 5.6-5.11; Age4 = 6+. Syd = city / Dub = country

Table 6.9

EARLY Year Percentile Groups - OUTSIDE MOTOR

Children	Highest % Bands:81-100			Lowest % Bands: 0 - 30		
	1993 n=59	1995 n=21	1996 n=49	1993 n=36	1995 n=29	1996 n=49
total	22%	11%	15%	13%	15%	15%
male	29%	33%	24%	69%	79%	67%
female	71%	67%	75%	30%	21%	33%
Age1	24%	24%	26%	25%	38%	35%
Age2	51%	57%	47%	53%	52%	47%
Age3	25%	19%	26%	22%	10%	18%

Note. Age1 = 4.6-4.11; Age2 = 5.0-5.5; Age3 = 5.6-5.11.
For total numbers of children screened, see Table 6b.

Table 6.10

LATE Year Percentile Groups - OUTSIDE MOTOR

Children	Highest % bands:81-100			Lowest % Bands:0 - 30		
	1993 n=107	1995 n=43	1996 n=145	1993 n=14	1995 n=8	1996 n=9
total	33%	27%	49%	4%	5%	3%
male	39%	37%	44%	78%	62%	44%
female	61%	63%	65%	21%	37%	55%
Age2	9%	9%	8%	14%	12%	11%
Age3	40%	42%	30%	86%	62%	67%
Age4	50%	49%	62%	0%	25%	22%

Note. Age2 = 5.0-5.5; Age3 = 5.6-5.11; Age4 = 6+.

Table 6.11

EARLY Year Quartile Groups - OUTSIDE MOTOR

	High Quartile			Low Quartile		
	1993	1995	1996	1993	1995	1996
Children	n=59	n=51	n=98	n=59	n=51	n=100
% of N	22%	27%	31%	22%	27%	31%
male	29%	35%	36%	64%	76%	67%
female	71%	65%	64%	35%	23%	33%
Age 1	24%	23%	26%	25%	33%	36%
2	51%	55%	48%	54%	59%	41%
3	25%	21%	25%	20%	8%	23%
ESL	13%	20%	6%	27%	23%	7%
Eng.	86%	80%	94%	72%	76%	93%

Note. Outside Motor Quartile Cut-Scores:
1993 78 - 100 = High Quartile / 0 - 44.4 = Low Quartile
1995 72.3 - 100 = High Quartile / 0 - 38.9 = Low Quartile
1996 84.8 - 100 = High Quartile / 0 - 44.4 = Low Quartile

Table 6.12

Children in High or Low Quartile Group BOTH Early & Late
OUTSIDE MOTOR

	High Quartile			Low Quartile		
	1993	1995	1996	1993	1995	1996
Children	n=28	n=15	n=30	n=25	n=24	n=38
% of orig.	47%	29%	31%	42%	47%	38%
male	25%	7%	30%	84%	79%	76%
female	75%	93%	70%	16%	21%	24%
Age 1	21%	13%	17%	16%	33%	42%
2	57%	53%	53%	64%	62%	32%
3	21%	33%	30%	20%	5%	26%
ESL	14%	20%	7%	16%	33%	8%
Eng.	86%	80%	93%	84%	67%	92%

Note. % of orig. = % of children in initial early high or low quartile group; Table 6.11. For example, the 28, 1993 children in the high quartile both E and L (Table 6.12), are 47% of the 59 children initially in the high OM quartile, (Table 6.11).

Table 6.13 shows the percentage of children from the early Outside Motor screening high or low quartiles, in each yearly sample, whose late screening scores were more than predicted (residual gain), or less than predicted (residual loss), as identified by regression analysis, by: total; gender, age and language within total.

For example, of all 1993 children in the early screening high Outside Motor quartile (High 1/4), the actual late year screening score for 49% (Total), showed a higher gain than predicted, while the late year score for 32% showed a lower gain than predicted, (Row 1.).

Table 6.13

Regression Information for Children from the High or Low Screening Quartiles - **OUTSIDE MOTOR**

	High 1/4: gain			High 1/4: loss			Low 1/4: gain			Low 1/4: loss		
Children	1993	1995	1996	1993	1995	1996	1993	1995	1996	1993	1995	1996
Total	49%	43%	46%	32%	35%	37%	41%	29%	40%	37%	41%	34%
male	24%	14%	38%	47%	61%	36%	50%	73%	72%	86%	76%	73%
female	76%	86%	62%	53%	39%	64%	50%	27%	29%	14%	24%	26%
Age 1	17%	27%	20%	37%	11%	33%	33%	27%	30%	18%	33%	41%
Age 2	59%	50%	49%	42%	67%	44%	46%	53%	50%	64%	62%	29%
Age 3	24%	23%	31%	21%	22%	22%	21%	20%	20%	18%	5%	29%
ESL	10%	18%	2%	16%	22%	8%	33%	33%	7%	18%	28%	9%
English	90%	81%	98%	84%	78%	92%	66%	67%	92%	81%	71%	91%

6.2 Fine Motor

Table 6.14

FINE MOTOR

Yearly Samples		Screen Means Early	Screen Means Late	School Mean Gains Mean	School Mean Gains Range
1993	Age1/2	64.7	73.6	14.6	.6 / 22.1 (Sch.2)
	Age 2/3	68.0	73.0	8.9	-.4 / 18.8 (Sch.3)
	Age 3/4	70.2	75.5	8.9	4.3 / 15.7(Sch.7)
1995	Age1/2	54.7	80.6	32.4	18.7 / 46.2 (Sch.6)
	Age 2/3	63.7	79.7	25.7	19.3 / 32.2 (Sch.6)
	Age 3/4	74.2	88.7	17.7	17.7[a](Sch.8)
1996	Age1/2	58.7	66.1	10.5	-1.8 / 32.6 (Sch14)
	Age 2/3	68.6	73.6	10.4	-5.9 / 26.1 (Sch14)
	Age 3/4	74.2	78.6	7.0	-2.5 / 20.7 (Sch16)

[a] In 1995 only Schools 6 and 8 had early and late screening results for Fine Motor, and since School 6 had no Age3 children enrol, there was only School 8 to report.

6.2.1 Fine Motor (FM) Age Comparisons

Like outside motor skills, fine motor skills tend to develop sequentially and evaluation criteria can be age dependent. For example, four year old and early age five children are not expected to be as adept with the finger-thumb task, while later age five and age six children should have no difficulties, (Checklist Items 15 and 16). Older children are usually considerably more successful with fine motor tasks due to their more developmentally refined motor integration. The percentage range for Age3 in both the early high percentile and quartile groups was 27% to 35% (Tables 6.17 & 6.19, pp.202 & 203). And although the 1995 Age3 Sample proportion was 10% less than in 1996 (Table 6a, p.184), the percentage of Age3 in the high quartile group was still 27%, and 34% in the highest percentile bands. Because these figures do not follow Age3 proportions within the samples, they suggest a consistent percentage of these older kindergarten children with well defined independent fine motor function, to be expected in these highest scoring groups.

Conversely, Tables 6.17 (p.202) and 6.19 (p.203) show that upon school entry from 1993-1996, the percentage of Age1 children presenting with weaker fine motor function, increased. Despite the 10% increase in the proportion of Age1 children over this time (with an Age1 increase of 14% for the 1996 city children - Table 6a), the percentage of Age1 dropped slightly in the early high FM percentile and quartile groups, and increased 27% in the lowest FM percentile bands. Such children may have had less practice with fine motor skills in preschool and could certainly be expected to have difficulty successfully achieving some outcomes of the current NSW kindergarten curriculum with its heightened emphasis on written expression, as is indicated by some late year screening results.

While late year FM percentile age information from 1993-1996 (Table 6.18, p.202) shows an increase of 14% for the oldest children in the highest bands, there is a decrease of 7% for the youngest children. The lowest bands show a decrease of 22% for the oldest children representing positive progress, but virtually no change for the youngest children. Further, the raised 1995 Age1 percentage in the lowest early and late FM percentile bands for these youngest children may reflect the increased number of youngest males that year.

FM regression information shows that from 1993 -1996 the percentage of Age1 children from the high quartile with residual gains dropped by 11% and those with residual losses increasing by 20% (Table 6.21). And although the percentage of the youngest children from the low quartile with residual gains increased 16%, again representing positive outcomes, the proportion of those with losses increased 33%.

Also, the end of year Fine Motor results for the youngest children show the percentage of these children whose screening scores placed them in the low FM quartile both early and late in the year, increased 34% (Table 6.20). And as evident on Table 6.16, late screening FM means for the youngest children are the lowest in 1996. In general, these collective figures demonstrate the superior fine motor skills of older children and a widening gap of achievement among the youngest children for some of whom implementation of the kindergarten curriculum was probably inappropriate. The implications for instruction should be clear. Also, older children

with depressed FM results, should be targeted for further investigation and possible intervention.

Emphasis placed on mastery of foundation fine motor skills seemed to vary widely in participating schools. Appendix 2., Tables A2.4, A2.6 and A2.7 show that the range of Age1 school mean FM gains across the fifteen schools is the widest of all five screening categories, at any age: from lows of .6 in 1993, and negative 1.8 and positive 1.4 both in 1996, to highs of positive 46.2 in 1995 and 32.6 in 1996. The average schools mean FM gain was 16.1. For discussion of fine motor skill practice in schools, see The Kindergarten Timetable within section 8.4.2, Chapter Eight.

6.2.2 Fine Motor Gender and City / Country Comparisons

Popular opinion usually says females have better fine motor control than males, especially for youngest children. Table 6.15 shows almost identical early 1993 and 1996 city screening means for males (65.1 and 65.2), and very close Age1 means (64.7 and 62.9). However, the corresponding means for 1995 are lower (male = 58.7 and Age1 = 54.7). The gender difference is that while there were 54% and 51% respectively in the 1993 and 1996 city Age1 groups (Table 6b), there were 62% males in the 1995 Age1 group. Therefore, these results indicate that some younger males may need to have their fine motor developmental requirements very carefully assessed and monitored.

In fact, Table 6.17 shows that from 1993-1996, the percentage of males in the early highest percentile bands shows a small decrease, while their percentage in the early year lowest FM percentile bands increased by 20%. However, age comparisons show these differences, especially in the lowest bands, mostly occur for Age1. These observations seemed to indicate increasing numbers of youngest males were commencing kindergarten at risk regarding successful achievement of some outcomes in the current curriculum which expects daily written expression from the start of kindergarten. These results may also reflect the more academic nature of the curriculum of many preschools, and less time to practise foundation skills.

Fine Motor regression information shows that while the proportion of males from the high quartile with residual gains increased 5% between 1993 and 1996, 33% more did not achieve predicted scores (Table 6.21). These percentages are mirrored for children from the low quartile with more males achieving or exceeding predicted scores, but also more males not achieving predicted scores. Further, Table 6.20 shows that the percentage of males initially placing and remaining in the low FM quartile steadily increased from 50% in 1993, to 78% in 1996. Although again, the concentration of losses are for Age1. These figures indicate that at the end of the year, many of these younger males continued to be at risk for fine motor difficulties in the future when the volume of written work in school increases. The percentage of residual losses for the two older age groups actually decreased.

However, Tables 6.15 and 6.16 show city / country early and late Fine Motor screening means indicate this situation of declining FM achievement probably does not have to exist: city early FM mean = 70.5 / late mean = 72.1; country early FM mean = 61.7 / late mean = 81.6. Within the city / country subgroups there were gender differences. Both FM early city gender screening means were above those for country (male by 8.9 and female by 11.8). The city late female screening mean dropped below its early mean, while the late country mean for females increased by 16.1 points and the late male country mean by 24.5. The late city male FM mean also increased, but only by 5.3. The differences lie in school results.

School mean gains show this situation of declining FM achievement probably does not have to exist. School mean gains were extremely varied. Table 6.14 shows the range of average FM gains to be from 7.0 - 32.4. Tables A2.6 and A2.7 (Appendix 2.) show in 1995, School 8's Fine Motor gains were male = 21.4, female = 16.6, and Age1 = 18.7. In 1996 School 8's Fine Motor gains were male = negative 1.6, female = negative 5.3, and Age1 = negative 1.8.

Further, the 1996 average city Fine Motor mean gains were Total = 0.4, male = 3.9, female = 0.45, and Age1 = 4.1. Average country mean gains were Total = 19.6, male = 16.9, female = 14.9, and Age1 = 17.0. The highest 1996 school gain is a country school for each age group (Table 6.14). These differences are too great to

ignore the impact of school / teacher policies regarding specific practice of foundation fine motor skills within the kindergarten curriculum for many children. These figures also continue to demonstrate the importance of comparing the results of subgroups to identify similarities and differences, to identify effective practices, and should have implications for instruction.

Table 6.15

Early Year Screening Mean Scores - FINE MOTOR

Children	E93	E95	E96	Syd E96	Dub E96
total	67.8	62.6	66.0	70.5	61.7
male	65.1	58.7	61.2	65.2	56.3
female	70.7	66.9	71.4	78.2	66.4
Age 1	64.7	54.7	58.7	62.9	54.1
Age 2	68.0	63.7	68.6	73.2	64.5
Age 3	70.2	74.2	71.1	77.2	65.9

Note. Age1 = 4.6-4.11; Age2 = 5.0-5.5; Age3 = 5.6+. Syd = city / Dub = country.

Table 6.16

Late Year Screening Mean Scores - FINE MOTOR

Children	L93	L95	L96	Syd L96	Dub L96
total	74.2	83.3	75.1	72.1	81.6
male	71.9	82.9	73.5	70.5	80.8
female	77.0	83.8	77.1	74.3	82.5
Age 2	73.6	80.6	66.1	63.0	70.8
Age 3	73.0	79.7	73.6	70.7	81.0
Age 4	75.5	88.7	78.6	75.3	85.1

Note. Age2 = 5.0-5.5; Age3 = 5.6-5.11; Age4 = 6+. Syd = city / Dub = country.

Table 6.17

EARLY Year Percentile Groups - FINE MOTOR

	Highest % Bands:81-100			Lowest % Bands:0 - 40		
	1993	1995	1996	1993	1995	1996
Children	n=59	n=29	n=60	n=18	n=26	n=37
total	22%	15%	20%	7%	14%	12%
male	37%	38%	32%	61%	73%	81%
female	63%	62%	68%	39%	27%	19%
Age1	19%	24%	13%	28%	58%	55%
Age2	54%	41%	52%	61%	42%	31%
Age3	27%	34%	35%	11%	-	13%

Note. Age1 = 4.6-4.11; Age2 = 5.0-5.5; Age3 = 5.6 +

Table 6.18

LATE Year Percentile Groups - FINE MOTOR

	Highest % Bands:81-100			Lowest % Bands: 0 - 40		
	1993	1995	1996	1993	1995	1996
Children	n=127	n=82	n=96	n=18	n=3	n=7
total	39%	60%	37%	6%	2%	3%
male	45%	49%	49%	50%	33%	57%
female	55%	51%	51%	50%	67%	43%
Age2	14%	10%	7%	11%	33%	11%
Age3	40%	39%	32%	44%	67%	67%
Age4	46%	51%	60%	44%	-	22%

Note. Age2 = 5.0.5.5; Age3 = 5.6-5.11; Age4 = 6 +

Table 6.19

EARLY Year Quartile Groups - FINE MOTOR

	High Quartile			Low Quartile		
	1993	1995	1996	1993	1995	1996
Children	n=59	n=63	n=60	n=75	n=62	n=75
% of N	22%	33%	20%	28%	33%	25%
male	38%	40%	32%	63%	63%	72%
female	63%	60%	68%	37%	37%	28%
Age 1	19%	13%	13%	25%	47%	43%
2	54%	60%	52%	53%	48%	40%
3	27%	27%	35%	23%	5%	17%
ESL	30%	17%	7%	18%	26%	5%
Eng.	70%	82%	93%	83%	74%	95%

Note. Fine Motor Quartile Cut-Scores:
1993 80.1 - 100 = High Quartile / 0 - 55 = Low Quartile
1995 75.0 - 100 = High Quartile / 0 - 50 = Low Quartile
1996 80.1 - 100 = High Quartile / 0 - 52.5 = Low Quartile

Table 6.20

Children in High or Low Quartile Group BOTH Early & Late

FINE MOTOR

	High Quartile			Low Quartile		
	1993	1995	1996	1993	1995	1996
Children	n=19	n=12	n=14	n=14	n=19	n=23
% of orig.	32%	19%	23%	19%	31%	31%
male	26%	42%	29%	50%	53%	78%
female	74%	58%	71%	50%	47%	22%
Age 1	10%	-	7%	14%	42%	48%
2	53%	67%	43%	50%	58%	39%
3	37%	33%	50%	36%	-	13%
ESL	32%	33%	7%	14%	32%	9%
Eng.	68%	67%	93%	86%	68%	91%

Note. % of orig. = % of children in initial early high or low quartile group; Table 6.19. For example, the 19, 1993 children in the high quartile both E and L (Table 6.20), are 32% of the 59 children initially in the high FM quartile, (Table 6.19).

Table 6.21 shows the percentage of children from the early Fine Motor screening high or low quartiles, in each yearly sample, whose late screening scores were more than predicted (residual gain), or less than predicted (residual loss), as identified by regression analysis, by: total; gender, age and language within total.

For example, of all 1993 children in the early screening high Fine Motor quartile (High 1/4), the actual late year screening score for 41% (Total), showed a higher gain then predicted, while the late score for 36% showed a lower gain then predicted, (Row 1.).

Table 6.21

Regression Information for Children from the High or Low Screening quartiles - **FINE MOTOR**

	High 1/4: gain			High 1/4: loss			Low 1/4: gain			Low 1/4: loss		
Children	1993	1995	1996	1993	1995	1996	1993	1995	1996	1993	1995	1996
Total	41%	49%	48%	36%	32%	28%	46%	40%	29%	40%	42%	29%
male	33%	30%	38%	43%	53%	76%	59%	72%	68%	65%	45%	77%
female	67%	69%	62%	57%	47%	23%	41%	28%	32%	34%	55%	23%
Age 1	21%	4%	10%	9%	33%	29%	29%	48%	45%	17%	35%	50%
Age 2	50%	73%	48%	71%	40%	59%	50%	40%	36%	59%	65%	41%
Age 3	29%	22%	41%	19%	27%	12%	20%	12%	18%	24%	0%	10%
ESL	37%	30%	10%	19%	0	0	20%	32%	9%	10%	25%	9%
English	62%	69%	90%	81%	100	100	79%	68%	91%	90%	74%	91%

6.3 Language (La)

Table 6.22

LANGUAGE

Yearly Samples		Screen means early	Screen means late	School mean gains Mean	School mean gains range
1993	Age1/2	62.4	73.9	15.2	7.6 / 21.4 (Sch.2)
	Age 2/3	65.4	77.7	15.0	2.8 / 29.8 (Sch.4)
	Age 3/4	74.7	79.4	9.5	-2.3 / 24.0 (Sch.4)
1995	Age1/2	67.2	81.2	11.6	10.1 / 13.1 (Sch.6)
	Age 2/3	74.0	79.4	8.3	6.8 / 9.8 (Sch.6)
	Age 3/4	78.8	84.6	4.4	4.4[a] (Sch.8)
1996	Age1/2	63.2	66.4	10.8	-1.9 / 33.4(Sch15)
	Age 2/3	79.8	74.5	11.6	-1.2 / 32.0(Sch16)
	Age 3/4	73.4	81.2	13.8	0 / 34.6(Sch.13)

[a] Only Schools 6 and 8 had early and late screening results for 1995 Language, and School 6 had no Age3 Children enrol, there was only School 8 to report.

6.3.1 Language Age Comparisons

Table 6.25 (p.212) shows that upon school entry the percentage of Age1 children in the highest language percentile bands increased from 15% - 29% between 1993-1996, following the steady rise in the proportion of their numbers within each sample. However, the Age1 percentage in the lowest percentile bands increased (24%-48%) with a corresponding decrease for Age2 and 3, and became disproportionate for Age1 within the samples (Table 6a, p.184). This same Age1 trend can also be seen in the Language quartiles (Table 6.27, p.213).

End of year Language regression information shows that for Age1, the gap widened between those children who achieved beyond predicted scores and those who did not (Table 6.29, p.214). The percentage of Age1 from the high Language quartile with residual gains steadily increased from 16% (1993) to 28% (1996). However,

the percentage of Age1 children from the high Language quartile with residual losses increased considerably from just 7% in 1993, to 30% in 1995, to 35% in 1996, (and the 1996 children were all English speakers as there were no ESL speakers in the high Language quartile in 1996 - Table 6.27). The percentage of Age2 and 3 high quartile children with negative residual scores, was lower.

These figures indicated a widening gap in initial Age1 language function over the three years of this study, with increasing numbers of youngest children in the high result groups, but also more in the low groups beyond proportions for age within sample and despite a considerably higher percentage of English speakers in 1996. Further, Table 6.22 shows the late screening Language means for these youngest children (Age2), dropped from 73.9 to 66.4 over this time, having been at a high of 81.2 in 1995. Table 6.22 also shows the lowest average Age1 school mean gain and the widest Age1 school range of mean gain. Also notice that while the 1995 Sample late means are the highest for each age group, the 1996 Sample late means are the lowest, (except for Age 3, in comparison to 1993).

Although popular opinion might say these differences could be due to an ever increasing number of English as Second Language speakers (ESL), in NSW schools, the density of City ESL speakers across the study decreased from the high of 22% in 1995, to 10% in 1996 (Table 4.3,p.126). One inference to be made was that by 1996 the presenting independent language function of many Age1 English speakers became weaker / less than expected for age. An example of school policy and teacher expertise will highlight result differences.

In 1995 the percent of ESL speakers in School 8's Kindergarten population was 23.2%. In 1995 School 8's commitment to helping the kindergarten ESL speakers included use of support staff. A Support Teacher Learning Difficulties (STLD) and an ESL language teacher worked in some of the five kindergarten classrooms several days a week, sometimes with the whole class and sometimes small groups, but still within the classroom. The language teacher also helped plan literacy activities.

School administrators made a decision to place all ESL speakers in two of the five

classes: one with a very effective male teacher doing a masters degree in linguistics and the other, a very effective female teacher with experience in early childhood education and in teaching ESL. The timetable was cited as justification. The reasoning was: if the ESL children were spread across the five kindergarten classes (which current research recommends, to ensure the ESL speakers are surrounded with peer English language models - Filmore, 1991), support staff would use too much time in kindergarten. There were over 800 students in this primary school.

In 1996 School 8 had four kindergarten classes in which the total percentage of ESL speakers had greatly reduced from the 23.2% to 7.9%. All but one ESL child were placed in one class with the most experienced of the teachers in early childhood education and ESL instruction. The STLD had no rostered kindergarten time and the language teacher helped only once a week, in the one class. The classroom teacher's experience and expertise helped her children achieve progress in language beyond the other kindergarteners. For example, at the beginning of the year of children in the high language quartile for School 8, only 7.5% were in this teacher's class. By the end of the year (regression information showed), of all those high quartile children with residual gain, 40% were in this teacher's class. And of Age1 children from the low quartile with residual losses, only one child (Age1 and ESL), was in this teacher's class.

However, School 8's Age1 Language mean gain declined from 10.1 in 1995, to negative 1.5 in 1996, and their total school Language mean gain declined over the two years from 7.8 to .2, (see Appendix 2., Tables A2.6 and A2.8). In light of these gain differences, School 8's Age1 Language screening results are of particular interest:

- early Age1 Language screening means for the two years virtually matched each other at 67.9 and 67.5, despite the very different Age1 language mix;
- the early Age1 1995 screening mean virtually matched the 1995 Sample Age1 mean of 67.2, and was above the 1996 Age1 Sample mean, of 63.2;
- late screening means for these children were one point above the 1995 Sample late mean, but half a standard deviation below the 1996 late mean and this loss was

primarily for English Speaking children. (See Appendix 2., A2.9-A2.11 for a complete listing of standard deviations by sample and by time of year.)

6.3.2 Language Gender and City / Country Comparisons

A view often taken is that upon school entry to kindergarten, female language skills are more mature than those of males. An example of excellent female language skill could be the raised 1995 Age3 early mean at 78.7 (Table 6.23, p.211). In the 1995 Sample, Age3 was 64% female (Table 6c, p.186). How much of this raised score was due to age and/or gender will never be known. However, it is interesting to note that the 1996 city early mean was lower at 73.4, when the Age3 city percentage of females was only 37%. Further, in both cases, the English / ESL factor would not have been appreciable as there was only one female and two male ESL speakers in the 1995 Age3 group, and there were no ESL speakers in the 1996 city Age3 group.

Initial gender comparisons in the high Language quartile and percentile groups were very consistent and considerably closer than in the other screening categories. Across this study, 47-48% of children in the high Language quartile were males; although many may have been the older boys as the high quartile percentage of Age1 children was considerably less than Age 2 and 3 (Table 6.27). With the exception of 1995 (the sample with the highest proportion of ESL speakers), these percentages remained almost exactly the same in the late highest percentile bands with 48% male for both 1993 and 1996 (Table 6.26). The indication is that there is very little gender difference in the oral language competence of kindergarten children as measured by The kindergarten Screening, a strength of kindergarten males which may not be appropriately recognised or enhanced.

It is particularly noteworthy regarding the language gender comparisons in Table 6.28. Although the percentage of children in the high Language quartile both early and late in the year dropped substantially (from 59% in 1993, to just 29% in 1996), the gender mix of these children continued to be close, (divided at 50% in 1993, with 48% male in 1996) . Further, notice that by age in this table, many of the

children who did not maintain their excellent initial language results were the oldest children. The percentage of oldest children in the high Language quartile both early and late in the year decreased from 50% (1993), to 45% (1995), to 33% (1996). These figures suggest instructional adjustments may need to be made, especially for the oldest children, (whose numbers appear to be increasing in the kindergarten population probably due to children being held back from school entry in hope of them being more successful with the current kindergarten curriculum - see discussion in 1.3, Chapter One).

In the low Language quartile, while gender numbers were still very consistent and closer than in other screening categories across the study, there were more males (range = 59%-62% - Table 6.27). Gender proportions in the late lowest percentile bands also remained consistent with the male range at 64% - 68% (Table 6.28). End of year regression information (Table 6.29) shows that males from the low La quartile consistently achieved higher residual gains than females with 56% in both 1993 and1995, and 64% in 1996. Instructional implications here are that perhaps more attention should be given to females in kindergarten who demonstrate weaker language skills.

City / country comparisons again indicate that intentional intervention can alter outcomes. For example, in general, city / country screening results clearly show the language achievement of the country schools. Tables 6.23 and 6.24 show that in every instance early country (Dub) screening scores are lower than those of the city schools and in every instance (save one where country was just .1 lower than city for Age3), country late screening scores are higher than those in the city.

Individual school results help explain these outcomes. In 1996, School 15 (Country) reported "from experience, language is their biggest problem"; not due to an ESL factor (0%), but due to a high percentage of Aboriginal kindergarten children (37.5%). [And in fact, of all children in the 1996 low La quartile, 61% were country, and of those children 24% were Aboriginal, as opposed to 7% in the high quartile.]

School 15's early La screening means were: Age1 = exactly one standard deviation (SD) below the 1996 Age1 early mean; Age2 = just over one SD below the Age2 mean; Age3 = just over half a SD below the Age3 mean. See Table A2.11 (Appendix 2.), for the 1996 standard deviations.

School 15 targeted language instruction as a priority. The accommodation of their students' language learning needs within and across the curriculum produced highly successful age and gender outcomes. For example, of all schools in the Combined Samples, School 15 had the highest mean gains for Age1 and Age2, third highest for Age3, second highest for males and the highest for females (Table A2.8).

School 15's late La screening means were: youngest age group = 67.6 just above the late yearly mean, (a gain of 27.4 points); middle age group = 69.2, five points below the late yearly mean, (a gain of 17.6 points); oldest age group = 76.1, five points below the late yearly mean, (a gain of 18.7 points). These figures not only demonstrate the achievements of School 15, but the importance of looking beyond general statistics to fairly evaluate school achievements.

It is meaningful to note here similarities in school mean gain results between School 15 and School 4 (1993), regarding the apparent effect of their direct school intervention. The Age1 La mean gain for School 4 at 20.8 was just .6 off the highest Age1 gain, while their gains for Age2 and Age3 were the highest (Appendix 2.,Table A2.5). These outcomes were remarkable despite 42% ESL speakers in their kindergarten population. After early screening, School 4 decided to give top priority to a collaborative language program across the curriculum, designed and taught daily (in the kindergarten and language classrooms), by the specialist ESL teacher and classroom teachers. Further, language was also part of the Developmental Program run two afternoons a week prior to 'going home time', (so parent helpers did not have to come to school an extra time). This Developmental Program was a direct collaborative intervention by classroom teachers, the ESL teacher, and the researcher, (see the example of this Developmental Program in Appendix 1., A1.7).

These figures again demonstrate that in this study, direct intervention was associated with improved student outcomes, and in this case flowing on for all ages. Of all seventeen schools in the Combined Samples, School 15 and School 4, with their very diverse student populations, achieved the highest total school La mean gains at 26.5 and 26.7 respectively.

Table 6.23

Early Year Screening Mean Scores - LANGUAGE

Children	E93	E95	E96	Syd E96	Dub E96
total	67.1	72.9	66.7	69.6	63.4
male	64.8	70.0	64.2	66.4	61.2
female	69.6	75.8	69.4	73.7	65.4
Age 1	62.4	67.2	63.2	65.8	59.6
Age 2	65.4	74.0	67.0	70.8	62.8
Age 3	74.7	78.7	70.6	73.4	68.2

Note. Age1 = 4.6-4.11; Age2 = 5.0-5.5; Age3 = 5.6 +. Syd = city / Dub = country

Table 6.24

Late Year Screening Mean Scores - LANGUAGE

Children	L93	L95	L96	Syd L96	Dub L96
total	78.0	81.7	76.7	75.9	77.7
male	75.1	75.1	74.0	72.2	76.3
female	81.4	88.0	80.0	80.0	79.1
Age 2	73.9	81.2	66.4	64.5	67.8
Age 3	77.7	79.4	74.5	74.5	74.4
Age 4	79.4	84.6	81.2	79.6	83.0

Note. Age2 = 5.0-5.5; Age3 = 5.6-511; Age4 = 6 +. Syd = city / Dub = country

Table 6.25

EARL Year Percentile Groups - LANGUAGE

	Highest % Bands: 81-100			Lowest % Bands: 0 - 40		
	1993	1995	1996	1993	1995	1996
Children	n=91	n=83	n=109	n=37	n=14	n=52
total	35%	45%	35%	14%	8%	17%
male	46%	47%	43%	62%	71%	61%
female	54%	53%	57%	39%	28%	38%
Age1	15%	22%	29%	24%	36%	48%
Age2	49%	59%	43%	59%	57%	36%
Age3	35%	19%	27%	16%	7%	15%

Note. Age1 = 4.6-4.11; Age2 = 5.0-5.5; Age3 = 5.6+

Table 6.26

LATE Year Percentile Groups - LANGUAGE

	Highest % Bands: 81-100			Lowest % Bands: 0 - 40		
	1993	1995	1996	1993	1995	1996
Children	n=172	n=86	n=180	n=14	n=6	n=25
total	57%	64%	56%	5%	4%	8%
male	48%	36%	48%	64%	67%	68%
female	52%	64%	52%	36%	33%	32%
Age2	10%	10%	8%	28%	-	24%
Age3	41%	44%	34%	50%	50%	44%
Age4	48%	45%	58%	21%	50%	32%

Note. Age2 =5.0-5.5; Age3 = 5.6-5.11; Age4 = 6+

Table 6.27

EARLY Year Quartile Groups - LANGUAGE

	High Quartile			Low Quartile		
	1993	1995	1996	1993	1995	1996
Children	n=62	n=54	n=65	n=80	n=49	n=87
% of N	24%	29%	21%	31%	27%	28%
male	47%	47%	48%	62%	59%	61%
female	53%	54%	52%	37%	41%	39%
Age 1	11%	21%	29%	29%	39%	40%
2	47%	57%	41%	56%	49%	39%
3	42%	22%	29%	15%	12%	21%
ESL	3%	6%	-	27%	45%	10%
Eng.	97%	94%	100	72%	55%	90%

Note. Language Quartile Cut-Scores:
1993 84.8 - 100 = High Quartile / 0 - 57.7 = Low Quartile
1995 88.4 - 100 = High Quartile / 0 - 65.3 = Low Quartile
1996 84.8 - 100 = High Quartile / 0 - 53.8 = Low Quartile

Table 6.28

Children in High or Low Quartile Groups BOTH Early & Late LANGUAGE

	High Quartile			Low Quartile		
	1993	1995	1996	1993	1995	1996
Children	n=34	n=11	n=21	n=26	n=14	n=26
% of orig.	55%	20%	32%	32%	28%	30%
male	50%	64%	48%	65%	86%	65%
female	50%	36%	52%	35%	14%	35%
Age 1	15%	9%	29%	38%	36%	61%
2	35%	45%	38%	46%	64%	27%
3	50%	45%	33%	15%	-	11%
ESL	-	-	-	35%	57%	-
Eng.	100	100	100	65%	43%	100

Note. % of orig. = % of children in initial early high or low quartile group; Table 6.27. For example, the 34, 1993 children in the high quartile both E and L (Table 6.28), are 55% of the 62 children initially in the high La quartile, (Table 6.27).

Table 6.29 shows the percentage of children from the early Language screening high or low quartiles, in each yearly sample, whose late screening scores were more than predicted (residual gain), or less than predicted (residual loss), as identified by regression analysis, by: total; gender, age and language within total.

For example, of all 1993 children in the early screening high Language quartile (High 1/4), the actual late year screening score for 59% (Total), showed a higher gain then predicted, while the late year score for 22% showed a lower gain then predicted, (Row 1.).

Table 6.29

Regression Information for Children from the High or Low Screening Quartiles - **LANGUAGE**

	High 1/4: gain			High 1/4: loss			Low 1/4: gain			Low 1/4: loss		
Children	1993	1995	1996	1993	1995	1996	1993	1995	1996	1993	1995	1996
Total	59%	39%	55%	22%	42%	31%	34%	23%	48%	38%	31%	32%
male	51%	28%	47%	43%	43%	60%	56%	56%	64%	67%	83%	64%
female	49%	71%	53%	57%	56%	40%	44%	44%	36%	33%	17%	36%
Age 1	16%	19%	28%	7%	30%	35%	26%	44%	38%	40%	33%	43%
Age 2	40%	57%	42%	64%	43%	50%	63%	33%	43%	47%	67%	32%
Age 3	43%	24%	30%	28%	26%	15%	11%	22%	19%	13%	0%	25%
ESL	0	0	0	14%	17%	0	26%	67%	14%	30%	58%	7%
English	100	100	100	86%	83%	100	74%	33%	86%	70%	42%	93%

6.4 Paper / Pencil & Reasoning (PP&R)

Table 6.30

Paper / Pencil & Reasoning

Yearly Samples		Screen means early	Screen means late	School mean gains Mean	School mean gains range
1993	Age1/2	36.5	62.1	31.0	16.4 / 41.0 (Sch.6)
	Age 2/3	45.9	67.8	23.5	7.5 / 32.1 (Sch.3)
	Age 3/4	50.8	71.9	20.9	16.9 / 26.9 (Sch.3)
1995	Age1/2	42.7	81.0	32.0	26.0 / 42.5 (Sch.2)
	Age 2/3	54.6	76.3	27.1	22.8 / 32.8 (Sch.2)
	Age 3/4	63.6	81.8	20.0	16.2 / 23.8 (Sch.2)
1996	Age1/2	36.0	63.1	28.9	9.2 / 39.8(Sch15)
	Age 2/3	50.7	69.6	21.4	-3.5 / 39.2(Sch15)
	Age 3/4	53.3	74.8	23.4	-1.7/ 46.4(Sch.13)

Note. In 1996, the high mean gain for Age3/4 achieved by School 13 is not indicative of the whole sample because School 13 is a very small independent school with just eight kindergarten students and only one child in that age group. By disregarding this one child's score, the top gain mean becomes 21.9, which brings the Age3/4 mean PP&R gain consistently within one point, across the samples. The next highest 1996 gain for Age 3/4 was achieved by School 16, at 32.3.

Success for the PP&R screening category seems to depend on a mix of many factors such as the abilities and skills of fine motor, visual and auditory processing, receptive language, visual motor integration, attention, motivation. Success for this category can also be greatly influenced by experiential factors such as: cultural expectations; pre-school experience; the nature of the pre-school programme; and opportunity, such as access to preschool and/or assessment and early intervention for developmental difficulties. It is extremely difficult to ascertain with certainty the relevance each factor contributes to success for this activity due to the multitude of differently combined abilities, skills, conceptual understandings and experiences each child brings to school.

In an effort to identify any outstanding child or ability / skill factors which may have influenced lack of PP&R success more than another, some biographical details and regression information about the children from the low PP&R quartile who did not achieve predicted scores are collected in Table 6.31 below.

Key for Table 6.31: n = the number of children in each early low PP&R quartile group identified by regression analysis with residual loss, and their percent of all low PP&R quartile children, for each year. Percentages in column two are also of all low quartile children, (for all ages). **Syd.** = Sydney (city). **Dub.** = Dubbo (country). Screening categories are: OM = Outside Motor; FM = Fine Motor; La = Language; Per = Personal Characteristics. A = Aboriginal.

Table 6.31

Low Quartile PP&R Children NOT Achieving Predicted Scores

Yearly Samples	Biographic Information	at least 1 other loss Category	Other Screening Categories OM	FM	La	Per
1993 n = 33 48%	30%ESL Age1 = 33% 79% Male	57% 31%ESL	12%	18%	27%	39%
1995 n = 21 42%	28%ESL Age1 = 70% 67% Male	57% 5%ESL	24%	28%	8%	24%
1996 n = 33 39%	3%ESL Age1 = 51% 83% Male	54% all Eng.	6%	27%	30%	45%
'96 Syd. n = 19 57%	1 ESL child Age1 = 53% 74% Male	63% all Eng.	10%	47%	26%	53%
'96 Dub. n = 14 42%	0%ESL Age1 = 50% 57% Male	8% all Eng.	0%	0%	36% 80% A	36%

In the first column of Table 6.31 (Yearly Samples), note that 9% fewer 1996 children failed to achieve predicted scores. However, the 1996 percentage is affected by the country result. The second column (Biographic Information) does not reveal any unusual information. The Age1 and male details follow general trends although the percentage of both increased. The 1995 drop in the ESL percentage

(when the ESL sample percentage was the highest), and lowest percent in La being another 'loss' category (8%), may reflect the degree of direct language teaching that year. The 1996 ESL percentage drop follows the much lower ESL sample percentage for that year. However 3% (one ESL child), is lower than proportion for the sample, and that child did not have residual loss in any other screening category. All children with residual loses in other screening categories were English speakers.

A relationship between PP&R and other screening categories can be seen in the percentage of children with regression losses in at least one other category (third column Table 6.31). That figure is identical for 1993 and 1995 at 57%. The small decline in 1996 to 54% is substantially modified by the country results. The actual city percentage of children not achieving predicted scores in other screening categories increased to 63%, compared to 8% for country.

Other city / country differences in Table 6.31 show country with a lower percentage of males overall, and no residual loss in Outside Motor and Fine Motor (indicating those screening categories were not factors for the country children not achieving predicted PP&R scores). However, Language (where Aboriginality was a major factor), and Personal Characteristics were obvious country difficulties. Nevertheless, the country Personal percentage was considerably lower than that of city.

There are no consistently outstanding 'other' screening categories evident in Table 6.31, (fourth column):

- The lower overall OM percentage in 1996 probably reflects schools' outside motor programmes that year.
- The large Sydney (city) rise in the 1996 FM category is notable, especially when compared to the zero Dubbo (country) FM percentage.
- The 1996 Sydney La percentage being one point less than the 1993 percentage (when the ESL sample percentage was 20%), is notable as all these children are English speakers.
- In the Personal Category, Sydney (city) percentages rose sharply from 39% in1993 to 53% in1996. The overall1996 percentage is modified by the country

result. The Dubbo (country) percentage (1996) is less than that of Sydney in 1993. The indication was that negative effects of the attributes evaluated in the Personal Screening Category became increasingly pronounced for the city children.

These results suggest that Fine Motor, Language and Personal Characteristics are specific influencing factors in PP&R success, but their influence varies depending upon individual strengths and weaknesses, reaffirming the importance of assessing, identifying, and accommodating the individual needs of each child. In general, it seems clear that Age1 city males were most at risk and that Fine Motor skills and Personal Characteristics became more problematic.

Although there are many variables impinging upon success for the PP&R screening category, there were general score consistencies across the study despite variation in the age and language mix of all three samples. While the range of 7.4 between the early PP&R total sample means (Table 6.32) is the widest for all screening categories, it is still narrow. (By contrast, the smallest range of total early sample screening means is 2.5, shared by the Personal Characteristics Category and Success Rate.)

It is especially interesting to note PP&R screening similarities of the 1993 and 1996 Samples because of their variant mix of age, language, and city / country considerations, to emphasise the consistency in which The Kindergarten Screening discriminates difference:

- The total early PP&R screening means and those for females, Age1 and Age3 are within 2.5 or less of each other, with 3.8 the difference for males, (Table 6.32).
- The percentage of Age1 in the highest percentile groups is exactly the same at 14%, (Table 6.34).
- The percentage of total and Age3 in the high quartile is exactly the same with 3 or less the difference for gender and Ages 1 and 2, (Table 6.36).
- The percentage of total in the low quartile for all three samples is exactly the same at 27%. However, result differences within the low quartile subgroups are quite varied, (Table 6.36).

6.4.1 Paper / Pencil & Reasoning (PP&R) Age Comparisons

Age1 percentages in the high PP&R quartile group (Table 6.36) were quite stable across the study, despite different Age1 sample proportions, and the Age1 percentage in the high percentile group (Table 6.34) is the same in 1993 and 1996. The suggestion is that generally, because these percentages do not follow the Age1 proportion of children within samples, they may be expected proportions of youngest children to be so successful with PP&R upon school entry. However, in the early year low percentile group the percentage of Age1 children almost doubled over the time of this study and the percentage of Age1 children in the low quartile also increased. These figures seem to indicate that more younger children were presenting with weaker skills required for PP&R success, despite a large percentage having preschool experience, (see 4.5, Chapter Four, for details).

By the end of the year, Table 6.35 shows very few children in the low percentile group (percentile bands 0-30), by 1996. However, Table 6.37 shows a large increase in the percentage of Age1 children initially in the low quartile who remained there (from 37-61%). Further, of Age1 children from the low quartile, regression information (Table 6.38) shows that in 1993, 33% achieved less than predicted scores, 62% in 1995, and 51% in 1996. While the 1996 figure may seem to indicate improvement, it still means that just over half of all children in the low quartile for the 1996 Sample with residual loss, were the youngest children. Notice in Table 6.38, the percentages of Age2 and 3 children from the low quartile not achieving, decreased across the study.

These results suggest the possible inappropriateness of at least some portion of the kindergarten curriculum and/or teaching methods for the youngest children. For example, judging from results already reported and influencing factors to PP&R success, fine motor probably presents difficulties for the youngest males. There may also be difficulties with listening comprehension, especially if a written response is expected. The significance of listening comprehension to PP&R success is a factor which needs more investigation.

However, school mean gains information (Table 6.30) again illustrates the wide range of gain among the schools, at all ages, and it is interesting to note the

consistency of results in some schools, such as School 2 and School 3. Additionally, for these two schools, in 1993 the next highest gains for the youngest children were achieved by School 2 (40.3) and School 3 (38.9), which further illustrates their consistency (Table A2.5). Although School 6 posted the highest Age1/2 gain in 1993, it actually had the lowest gain for the same age in1996 (Table A2.8). Some individual school results did vary from year to year which could happen for various reasons such as degree of English competence or in the case of School 6 in 1996, significant behaviour difficulties of several children.

6.4.2 PP&R Gender and City / Country Comparisons

There did not seem to be a clear relationship between gender proportions and early PP&R screening means. For example: the 1993 Age1 screening mean was 36.5, with the proportion of males at 54%; the 1995 Age1 screening mean was 42.7, with the proportion of males at 62% (Tables 6b, p.185, & 6.32). However, the 1996 Age1 city mean was 42.2 when the male percentage was 51%. So the two closest Age1 early PP&R means had the most disparate proportion of males. Further, the ESL factor did not appear to have had an appreciable affect. The males in the 1993 Age1 group (with the lowest early screening mean), also had the lowest percentage of ESL speakers at 15% or nine children, (18% of the 1995 Age1 children were ESL males, ten children, and 25% of the 1996 Age1 children were ESL, or eight children.) If the Age1 females were included in these ESL figures, the two almost identical early Age1 screening means (1995 and 1996 city), 1995 would have been 39% ESL and in 1996,16% ESL. These results certainly highlight the need to assess all children and not base individual decisions upon generalities such as language background.

By the end of the year, gender percentages were very similar across the study in the late high percentile group (which was also true for their corresponding age groups), and there were too few children in the low percentile group to suggest any pattern (Table 6.35). Gender percentages for children in the high PP&R quartile group both early and late in the year show a progressive decrease for males (from 50% in 1993 to 24% in 1996) and corresponding increase for females (Table 6.37). An implication could be that by 1996, the curriculum and teaching policies / strategies had a detrimental affect upon many males in so far as they influence skills required

for success in the PP&R screening category.

Gender percentages for children in the low PP&R quartile group both early and late in the year look similar across the study with almost half as many females, as males (Table 6.37). However, again, there was a large increase of youngest children remaining in the low quartile. The suggestion is that since the male percentage is so high in that quartile, that most of those youngest children were male. This suggestion is further substantiated by evidence from the PP&R regression information (Table 6.38). Since the written product of the PP&R screening category (the paper and pencil worksheet) reflects many kindergarten literacy outcomes stated in the K-6 English Syllabus, the implications for instruction are that more attention should be paid to the component abilities and skills required for PP&R success, for the youngest children and especially, the boys.

While gender PP&R screening means favour females for each sample and for city / country, both early and late in the year (Tables 6.32 and 6.33), the gender mix when looking at school mean gains, is varied. Of schools across the study (some the same schools but different years), females gained more than males (Appendix 2.,Tables A2.5- A2.8). However, in each school posting the highest gain on Table 6.30, males gained more than females. The suggestion is that instruction in those schools was more conducive to males succeeding and that this situation is again, a good example of the need to look beyond general statistics to fully appreciate assessment results, and in this case, where value is added.

The 1996 PP&R city / country screening mean differences presented the same circumstance as the Language Category with the early screening country mean reducing the city mean, and the late country mean raising the city mean (Table 6.30). The early 1996 city screening mean of 53.1 is notably higher than the country equivalent at 38.9, (which may in part reflect the extent of city children's preschool experiences - see Chapter Four, 4.2.8). However, the late 1996 Sample mean (71.3) is also modified by country results; city late mean = 69.9 / country late mean = 72.9. From the 1996 Sample, School 15 (country) provides an example of the positive effects of intervention policy and again the need to look beyond general statistics to understand the complete picture of results.

School 15 posted the lowest early sample school PP&R mean at 31.3, (next lowest = 37.8 / range = 31.3 - 58.3), and the fifth highest late sample mean at 69.3, (next highest = 70.0 / range = 55.4 - 86.5). However, School 15 made the highest actual PP&R gains for the youngest and middle age groups (Table 6.30), and third highest gain for the oldest age group (Appendix 2.,Table A2.8). Further, in the Language Category, School 15 also posted the highest gain for the youngest age group (Table 6.22), and the second highest gain for the middle and oldest age groups (Table A2.8). If outcome scores are to be the only judge of programme effectiveness then there is no recognition of value added or appreciation of the effectiveness of educational policies and teaching strategies such as School 15's.

Table 6.32

Early Year Screening Mean Scores - PP&R

Children	E93	E95	E96	Syd E96	Dub E96
total	45.2	52.6	46.4	53.1	38.9
male	39.0	48.8	42.8	47.8	35.7
female	52.0	56.5	50.4	60.1	41.7
Age 1	36.5	42.7	36.0	42.2	27.9
Age 2	45.9	54.6	50.7	59.1	41.0
Age 3	50.8	63.6	53.3	59.5	47.9

Note. Age1 = 4.6-4.11; Age2 = 5.0-5.5; Age3 = 5.6+ Syd = city / Dub = country

Table 6.33

Late Year Screening Mean Scores - PP&R

Children	L93	L95	L96	Syd L96	Dub L96
total	68.8	79.1	71.3	69.9	72.9
male	64.8	75.4	68.1	66.8	69.8
female	73.7	83.8	74.9	73.8	76.2
Age 2	62.1	81.0	63.1	62.5	63.6
Age 3	67.8	76.3	69.6	68.2	71.6
Age 4	71.9	81.8	74.8	73.2	76.7

Note. Age2 = 5.0-5.5; Age3 = 5.6-5.11; Age4 = 6+. Syd = city / Dub = country

Table 6.34

EARLY Year Percentile Groups - PAPER/PENCIL & REASONING

	Highest % Bands: 81-100			Lowest % Bands: 0 - 30		
	1993	1995	1996	1993	1995	1996
Children	n=14	n=14	n=35	n=75	n=27	n=98
total	5%	8%	11%	29%	15%	31%
male	36%	21%	31%	71%	70%	53%
female	64%	78%	68%	29%	30%	47%
Age1	14%	28%	14%	29%	59%	51%
Age2	43%	36%	63%	51%	33%	35%
Age3	43%	36%	23%	20%	7%	14%

Note. Age1 = 4.6-4.11; Age2 = 5.0-5.5; Age3 = 5.6 +

Table 6.35

LATE Year Percentile Groups - PAPER/PENCIL & REASONING

	Highest % Bands: 81-100			Lowest % Bands: 0 - 30		
	1993	1995	1996	1993	1995	1996
Children	n=97	n=91	n=110	n=12	n=0	n=6
total	31%	50%	33%	4%	-	2%
male	40%	41%	37%	83%	-	50%
female	60%	59%	63%	17%	-	50%
Age2	10%	10%	8%	42%	-	33%
Age3	33%	41%	32%	25%	-	50%
Age4	57%	49%	60%	33%	-	17%

Note. Age2 = 5.0-5.5; Age3 = 5.6-5.11; Age4 = 6 +.

Table 6.36

EARLY Year Quartile Groups - PAPER/PENCIL & REASONING

	High Quartile			Low Quartile		
Children	1993 n=55	1995 n=57	1996 n=65	1993 n=68	1995 n=50	1996 n=84
% of N	21%	31%	21%	27%	27%	27%
male	34%	40%	32%	73%	64%	52%
female	65%	60%	68%	26%	63%	48%
Age 1	14%	17%	17%	31%	54%	46%
2	54%	58%	52%	51%	42%	37%
3	31%	24%	31%	18%	4%	17%
ESL	9%	9%	6%	34%	28%	1%
Eng.	91%	91%	94%	66%	72%	99%

Note. Paper/Pencil & Reasoning Quartile Cut-Scores:
1993 64.4 - 100 = High Quartile / 0 - 25 = Low Quartile
1995 67.8 - 100 = High Quartile / 0 - 39.3 = Low Quartile
1996 71.5 - 100 = High Quartile / 0 - 25 = Low Quartile

Table 6.37

Children in High or Low Quartile Groups BOTH Early & Late
PAPER/PENCIL & REASONING

	High Quartile			Low Quartile		
Children	1993 n=22	1995 n=13	1996 n=25	1993 n=27	1995 n=23	1996 n=26
% of orig.	40%	23%	38%	40%	46%	31%
male	50%	46%	24%	63%	70%	65%
female	50%	54%	76%	37%	30%	35%
Age 1	14%	15%	12%	37%	61%	61%
2	54%	54%	52%	37%	35%	27%
3	32%	31%	36%	26%	4%	11%
ESL	4%	8%	8%	33%	26%	-
Eng.	95%	92%	92%	67%	74%	100

Note. % of orig. = % of children in initial early high or low quartile group; Table 6.36. For example, the 34, 1993 children in the high quartile both E and L (Table 6.28), are 55% of the 62 children initially in the high Language quartile, (Table 6.27).

Table 6.38 shows the percentage of children from the early PP&R screening high or low quartiles, in each yearly sample, whose late screening scores were more than predicted (residual gain), or less than predicted (residual loss), as identified by regression analysis, by: total; gender, age and language within total.

For example, of all 1993 children in the early screening high PP&R quartile (High 1/4), the actual late year screening score for 34% (Total), showed a higher gain then predicted, while the late year score for 44% showed a lower gain then predicted, (Row 1.).

Table 6.38

Regression Information re Children from the High or Low Screening Quartiles - **PAPER/PENCIL & REASONING**

	High 1/4: gain			High 1/4: loss			Low 1/4: gain			Low 1/4: loss		
Children	1993	1995	1996	1993	1995	1996	1993	1995	1996	1993 1996	1995	
total	34%	51%	43%	44%	37%	45%	29%	28%	15%	48%	42%	39%
male	53%	32%	28%	29%	56%	41%	85%	64%	46%	70%	71%	67%
female	47%	68%	71%	71%	44%	59%	15%	36%	54%	30%	28%	33%
Age 1	16%	23%	14%	12%	19%	21%	35%	43%	54%	33%	62%	51%
Age 2	58%	50%	46%	54%	56%	59%	55%	57%	38%	42%	33%	30%
Age 3	26%	27%	39%	33%	25%	21%	10%	0%	8%	24%	5%	18%
ESL	10%	0	3%	4%	6%	7%	30%	36%	0%	30%	28%	3%
English	89%	100	96%	96%	94%	93%	70%	64%	100	70%	71%	97%

Table 6.38 shows the percentage of children from the early PP&R screening high or low quartiles, in each yearly sample, whose late screening scores were more than predicted (residual gain), or less than predicted (residual loss), as identified by regression analysis, by: total; gender, age and language within total.

For example, of all 1993 children in the early screening high PP&R quartile (High 1/4), the actual late year screening score for 34% (Total), showed a higher gain then predicted, while the late year score for 44% showed a lower gain then predicted, (Row 1.).

Table 6.38

Regression Information re Children from the High or Low Screening Quartiles - **PAPER/PENCIL & REASONING**

	High 1/4: gain			High 1/4: loss			Low 1/4: gain			Low 1/4: loss		
Children	1993	1995	1996	1993	1995	1996	1993	1995	1996	1993 1996	1995	
total	34%	51%	43%	44%	37%	45%	29%	28%	15%	48%	42%	39%
male	53%	32%	28%	29%	56%	41%	85%	64%	46%	70%	71%	67%
female	47%	68%	71%	71%	44%	59%	15%	36%	54%	30%	28%	33%
Age 1	16%	23%	14%	12%	19%	21%	35%	43%	54%	33%	62%	51%
Age 2	58%	50%	46%	54%	56%	59%	55%	57%	38%	42%	33%	30%
Age 3	26%	27%	39%	33%	25%	21%	10%	0%	8%	24%	5%	18%
ESL	10%	0	3%	4%	6%	7%	30%	36%	0%	30%	28%	3%
English	89%	100	96%	96%	94%	93%	70%	64%	100	70%	71%	97%

6.5 Personal Characteristics

Table 6.39

PERSONAL CHARACTERISTICS

Yearly Samples		Screen means early	Screen means late	School mean gains Mean	School mean gains range
1993	Age1/2	56.4	66.8	14.8	-25 / 35 (Sch.3)
	Age 2/3	59.7	69.7	11.9	-4.6 / 35.8(Sch.5)
	Age 3/4	73.7	76.8	2.1	-12.5 / 17.1(Sch.5)
1995	Age1/2	51.4	80.8	18.8	10.2 / 25.0 (Sch.2)
	Age 2/3	64.5	69.1	15.7	4.1 / 37.5 (Sch.6)
	Age 3/4	66.5	82.9	18.7	18.7 [a] (Sch.8)
1996	Age1/2	52.5	52.6	15.6	0 / 37.5 (Sch.13)
	Age 2/3	68.8	73.1	19.5	-3.5 / 75 (Sch.13)
	Age 3/4	68.4	79.0	6.4	-12.5 /22.9(Sch.2)

[a] In 1995, School 6 had no Age3 children enrol, and School 2 had no Age4 children (as only five children had late results for this category), so there was only School 8 to report for this age group.

Note. In 1996, School 13 had only one child for the middle age group. If that gain were disregarded, the average gain for that age group would have been 10.3, (more in keeping with that of 1993).

6.5.1 Personal Characteristics (Personal) Age Comparisons

Table 6.40 (p.231) shows the early Age1 screening means are similar, with a spread of just five points from sample to sample. Tables 6.42 (p.232) and 6.44 (p.233) show early year Personal percentile and quartile Age1 percentages to be quite similar and consistent across the study, despite changes in Age1 sample proportions. These figures suggest they are typical percentages and scores to be expected of the youngest children early in the year who are entering formal school with very competent personal characteristics with which to cope and be successful in kindergarten. However, by late in the year the picture changed, especially for the youngest and oldest children.

Table 6.41 (p.231) shows the samples' spread of late year Personal screening means for the youngest children was 28.2 points. By 1996, their late year Personal screening mean was just .1 higher than their early 1996 mean, indicating virtually no positive progress in this personal category for some of these children during that full year in kindergarten.

Across the study, the early year percentages of the youngest children in the highest Personal percentile bands somewhat increased, while their corresponding late year percentages decreased (Tables 6.42 & 6.43). Of the Age1 children initially placing in the high Personal quartile, a small but decreasing percentage of those children remained by the end of the year (Tables 6.44 & 6.45). By contrast, across the study, the percentage of children in the low Personal quartile both early and late in the year increased from 33% - 49%. Further, regression information shows that while the percentage of Age1 children initially in the low quartile with residual gains rose from 25% to 39%, the percentage of those with residual loss rose from 27% to 53% (Table 6.46, p.234).

Sample comparisons of the middle age children in the early year high scoring groups show their 1993 and 1996 percentages to be quite similar (Tables 6.42 - 6.46), while the corresponding early 1995 Age2 percentages were higher, (when their sample proportion was at its highest - 56%). By the end of the year their sample percentages in the high scoring groups remained quite constant while their numbers in the low scoring groups declined, representing positive progress. For example, although regression information shows 34% fewer children in the low quartile made gains, it also shows that 37% fewer of those children losing (Table 6.46). The implication is that the kindergarten curriculum and teaching methods or strategies used, may have been appropriate for most of these children.

Sample percentage comparisons across the study of the oldest children in the early high scoring groups are very similar and vary according to their sample proportions (Tables 6.42 & 6.44). However, by 1996, end of year results showed there were appreciably more oldest children in the lowest scoring groups with a rise from 27% to 43% in the lowest percentile bands (Table 6.43), and from 12% to 22% in the lowest quartile group (Table 6.45). Regression information for these oldest children (Table 6.46) shows that over the three years of the study:

- the percentage of oldest children in the high quartile who gained, remained stable;
- the percentage of oldest children in the high quartile who lost, increased;
- the percentage of oldest children in the low quartile who gained, increased;
- the percentage of oldest children in the low quartile who lost, also increased.

There clearly seemed to be a widening gap among those oldest children who made gains in this screening category, and those who did not.

In general, these collective age results indicate that the kindergarten experience, in relation to the personal characteristics being evaluated, was most appropriate for the middle age children, the majority of children. However, the same experience was not as appropriate for an increasing number of the youngest and oldest children. It is these children at the extremes for whom their first full year in school had at least a partial negative effect and who may be especially at risk of loss of self-esteem and motivation. According to Ramey and Ramey (1994) the effects of children's transition to school can matter for a lifetime. Research by Riley (1995) indicates that children who successfully settle into school are four times as likely to be successful with early reading skills.

The wide range of school gains indicate inconsistent achievement among the schools in the Personal screening category (Table 6.39). School and/or teacher policy regarding the degree of program structure and method of classroom implementation may have been factors influencing success for the Personal Category. For example, Table 6.39 shows in 1993 School 3 posted the highest Age1 Personal school mean gain and also approximated the second highest Age2 gain (with .4 the difference) at 22.6 (Appendix 2., Table A2.5), which was still well above the average school mean gain at 14.8. School 3 also enjoyed:

- the highest PP&R school gains for the middle and oldest age groups (Table 6.30), and was just 2.1 off the top for the youngest age group for PP&R gain, (Appendix 2., Table A2.5);
- the highest school gains for Outside Motor youngest and oldest age groups (see Table 6.6), and was third highest for the middle age group (Appendix 2., Table A2.5). As observed by the researcher, School 3's kindergarten teachers conducted very well organised, structured (although not restrictive) programmes across their

curriculum, with a large amount of direct teaching, student participation, parent involvement, and supported play such as frequent pretend telephone conversations.

By contrast, the learning environment in School 12 (1996) was less structured, seemingly due to the teacher's philosophy of early childhood development. She spoke of the children as "just babies" needing time to "mature" without being pressured. Personal age gains for School 12 were zero or negative. In fact, of fifteen chances to achieve gain, School 12 posted zero or negative numbers for nine. However, School 12 did have large positive PP&R gains for Ages1 and 2; Appendix 2.,Tables A2.7 and A2.8.

6.5.2 Personal Characteristics Gender and City / Country Comparisons

To appreciate these comparisons, consider the screening means in Tables 6.40 and 6.41. The early total sample Personal screening means are very consistent for all three years with a spread of just 2.5, and .3 the difference between city and country means. Late whole sample screening means are also close with the three year spread of 3.4, although the late (1996) city / country spread is 6.7. However, as before, results become diverse when looking at subgroups. For example, Personal gender screening gains below (from tables 6.40 and 6.41) show :

male = 1993, 11.8	female = 1993, 8.7
1995, 12.1	1995, 17.3
1996, 10	1996, 9.9
1996 city, 3	1996 city, 9.9
1996 country, 18.3	1996 country, 9.1

Although the gender mix across samples was quite even (51% - 52.5% males, Table 6a, p.184), the 1996 city (Syd.) sample portion of males was 57% and the country (Dub.) portion of males was 47%. The difference between the city / country male Personal screening gains may at least in part, be explained by the city / country discrepancy in proportion of males. Further, there is also discrepancy between the gains of the city / country youngest children. City Age1 posted a seven point screening mean loss from early to late in the year, while country posted a 4.8 gain. The indication is certainly that the youngest city males became most at

risk regarding the attributes in this category, which should warrant investigation.

Another gender screening gain difference to notice above, is the almost identical female gains across the samples except for 1995, which may be due to that sample's higher percentage of oldest females (Table 6a, p.184). The 1996 female results are especially interesting as their city / country late Personal screening means were exactly the same at 78.0 (Table 6.41). An implication is that as female gains seem to indicate uniformity in progress, the raised 1996 male country gain and lower male city gain may have resulted from differences in the appropriateness of the kindergarten experience for males. It is notable that for every age group in every other screening category (except Age2 and Age3 Outside Motor), country late screening means are above city means.

Table 6.40

Early Year Screening Mean Scores - PERSONAL

Children	E93	E95	E96	Syd E96	Dub E96
total	62.6	61.1	63.6	63.7	63.4
male	55.6	55.2	59.5	61.2	57.3
female	69.9	67.1	68.1	67.3	68.9
Age 1	56.4	51.4	52.5	56.1	50.0
Age 2	59.7	64.5	68.8	69.2	68.4
Age 3	73.7	66.5	68.4	66.2	70.3

Note. Age1 = 4.6-4.11; Age2 = 5.0-5.55; Age3 = 5.6+. Syd = city / Dub = country.

Table 6.41

Late Year Screening Mean Scores - PERSONAL

Children	L93	L95	L96	Syd L96	Dub L96
total	72.5	75.9	73.4	70.1	76.8
male	67.4	67.3	69.5	64.2	75.6
female	78.6	84.4	78.0	78.0	78.0
Age 2	66.8	80.8	52.6	49.1	54.8
Age 3	68.7	69.1	73.1	69.7	77.1
Age 4	76.8	82.9	79.0	74.6	83.4

Note. Age2 = 5.0-5.55; Age3 = 5.6-5.11; Age4 = 6+. Syd = city / Dub = country.

Table 6.42

EARLY Year Percentile Groups - PERSONAL CHARACTERISTICS

	Highest % Bands: 81-100			Lowest % Bands: 0 - 30		
	1993	1995	1996	1993	1995	1996
Children	n=103	n=62	n=116	n=50	n=34	n=51
total	39%	34%	36%	19%	18%	16%
male	44%	39%	43%	72%	68%	63%
female	56%	61%	57%	28%	32%	37%
Age1	18%	14%	21%	29%	35%	51%
Age2	48%	66%	48%	57%	53%	31%
Age3	37%	19%	31%	12%	12%	18%

Note. Age1 = 4.6-4.11; Age2 = 5.0-5.55; Age3 = 5.6-5.11.

Table 6.43

LATE Year Percentile Groups - PERSONAL CHARACTERISTICS

	Highest % Bands: 81-100			Lowest % Bands: 0 - 30		
	1993	1995	1996	1993	1995	1996
Children	n=164	n=74	n=148	n=37	n=12	n=28
total	51%	54%	49%	11%	9%	9%
male	46%	38%	49%	73%	83%	71%
female	54%	62%	51%	27%	17%	28%
Age2	11%	12%	3%	24%	-	28%
Age3	40%	38%	36%	49%	67%	28%
Age4	49%	50%	61%	27%	33%	43%

Note. Age2 = 5.0-5.55; Age3 = 5.6-5.11; Age4 = 6+.

Table 6.44

EARLY Year Quartile Groups - PERSONAL CHARACTERISTICS

	High Quartile			Low Quartile		
Children	1993	1995	1996	1993	1995	1996
	n=70	n=40	n=82	n=72	n=45	n=82
% of N	26%	22%	26%	27%	24%	26%
male	40%	35%	47%	69%	60%	65%
female	60%	65%	52%	30%	40%	35%
Age 1	20%	15%	21%	26%	35%	47%
2	47%	67%	50%	61%	51%	30%
3	33%	17%	29%	12%	13%	22%
ESL	16%	22%	1%	25%	20%	7%
Eng.	84%	77%	99%	75%	80%	93%

Note. Due to there being only four Personal Characteristics Screening Items, the Quartile Cut-Scores are the same for each Yearly Sample: 100 = Quartile; 0 - 37.5 = Low Quartile.

Table 6.45

Children in High or Low Quartile Groups BOTH Early & Late

PERSONAL CHARACTERISTICS

	High Quartile			Low Quartile		
Children	1993	1995	1996	1993	1995	1996
	n=27	n=13	n=25	n=24	n=13	n=41
% of orig.	39%	32%	30%	33%	29%	50%
male	30%	46%	24%	79%	61%	76%
female	70%	54%	76%	21%	38%	24%
Age 1	18%	15%	12%	33%	38%	49%
2	44%	54%	52%	54%	61%	29%
3	37%	31%	36%	12%	0	22%
ESL	7%	8%	8%	29%	23%	7%
Eng.	93%	92%	92%	71%	77%	93%

Note. % of orig. = % of children in initial early high or low quartile group; Table 6.44. For example, the 27, 1993 children in the high quartile both E and L (Table 6.43), are 39% of the 70 children initially in the high Per quartile, (Table 6.43).

Table 6.46 shows the percentage of children from the early Personal Characteristics screening high or low quartiles, in each yearly sample, whose late screening scores were more than predicted (residual gain), or less than predicted (residual loss), as identified by regression analysis, by: total; gender, age and language within total.

For example, of all 1993 children in the early screening high Personal quartile (High 1/4), the actual late year screening score for 54% (Total), showed a higher gain then predicted, while the late year score for 28% showed a lower gain then predicted, (Row 1.).

Table 6.46

Regression Information for Children from the High or Low Screening Quartiles - **PERSONAL CHARACTERISTICS**

Children	High 1/4: gain			High 1/4: loss			Low 1/4: gain			Low 1/4: loss		
	1993	1995	1996	1993	1995	1996	1993	1995	1996	1993	1995	1996
total	54%	55%	49%	28%	25%	22%	44%	33%	38%	42%	27%	41%
male	34%	23%	35%	45%	60%	50%	69%	60%	64%	73%	67%	73%
female	66%	77%	65%	55%	49%	50%	31%	40%	35%	27%	33%	26%
Age 1	18%	9%	15%	15%	30%	17%	25%	40%	39%	27%	42%	53%
Age 2	45%	68%	50%	55%	70%	33%	66%	33%	32%	63%	58%	26%
Age 3	37%	22%	35%	30%	0	50%	9%	27%	29%	10%	0	20%
ESL	5%	4%	2%	10%	50%	0	25%	20%	6%	30%	17%	3%
English	95%	95%	97%	90%	50%	100	75%	80%	93%	70%	83%	97%

Chapter Seven - Classroom Teacher Surveys

Introduction

Establishing definitive predictive criteria for The Kindergarten Screening (based on initial screening scores and subsequent attainments), was not the purpose of following children in this study. There would be no way to categorise or control for a sufficient number of school intervening variables (such as specific interventions or accommodated instruction), or child intervening variables (such as development, practice and experience), across contexts and samples, to produce predictions which could validly be generalised. The purpose was to analyse relationships between initial screening results and subsequent school attainments to discover critical screening considerations which influence subsequent attainments, thus further substantiating need for direct intervention in kindergarten, in areas of concern.

7.1 Pilot Questionnaire and Teacher Survey Items

The classroom teacher surveys were designed to collect information about the subsequent developmental and academic attainments of the children in the present study so that initial screening results could be analysed in light of later school outcomes. A pilot study was first undertaken. The process began with telephone interviews of three (of the seventeen) Year One teachers of the children who participated in the 1993 Sample. This approach was used to establish the content and format of the pilot questionnaires by identifying the teachers' interpretations of the specific concepts, academic outcomes, and teaching strategies they considered to be important. This step was essential to help to ensure successful communication between the researcher and the teachers, and to reduce the possibility that the final student survey items would be confounded by any bias or misunderstandings of the researcher, (given that the impact of the screening could really only be accurately judged from within the natural school context in which the study took place).

Three main issues surfaced from the telephone interviews: 1. results directly related to the initial screening; 2. attainment of reading skills; 3. achievement of stated

NSW K-6 English Syllabus outcomes (Board of Studies NSW,1994). Pilot Survey questions were then designed to cover these issues. The second issue (attainment of reading skills), was expanded to include the wider concept of literacy - reading, writing, talking and listening - as defined in the NSW K - 6 English Syllabus.

Pilot questions were open-ended to encourage teachers to freely designate their own issues, and for the researcher to learn their interpretation of terms. Some terms in the pilot questions were defined to indicate the researcher's intent, to increase understanding of interpretation between researcher and respondent and to help narrow the frame of reference when coding responses (Foddy 1994). School principals were consulted before sending the information to teachers.

The principals received an explanatory letter about the Pilot Questionnaire, a copy for approval, and the promise of a copy of the Year One Survey for their approval before it was sent to their teachers. The questionnaire had University ethics approval. Stamped, addressed envelopes were included for the surveys' return.

Pilot Questionnaire responses provided an adequate core of information of which it seemed to the researcher, teachers would have a common understanding, even though viewpoints might differ. As a validity check to further confirm the researcher's interpretation of the Pilot responses, a kindergarten teacher from a participating school, very experienced in early childhood education and learning difficulties, gave her time to discuss the responses and review intended survey items. The objective was to help to ensure that the survey items were inclusive (covering all areas of concern), mutually exclusive (each item yielding unique information), and exhaustive (providing a full range of possible response alternatives). This strategy was helpful in fine tuning the twenty Year One Survey items.

The Year One Survey items chosen reflected the abilities and learning skills corresponding to The Kindergarten Screening and/or academic content corresponding to the curriculum. The Year One Survey Items can be grouped to correspond to The Kindergarten Screening Categories (see Appendix 1., A1.10, p.356). For example: survey Items 1 - 3 correspond to the Kindergarten Screening Outside Motor

activities; Items 4 - 5 correspond to the Fine Motor / Eye-Hand Co-ordination activities; Items 6, 7, 9 and 10 correspond to the Language activities; Items 13, 15 and 18 - 20 correspond to the Personal Characteristics. Year One Survey items can also be grouped to correspond to the three state K - 6 English Syllabus strands (BOS, 1994): Talking and Listening = Items 6, 7, 9, 10 and 13; Reading = Items 11, 12, 14 and 17; Writing = Items 8, 9, 14, 16 and 17.

7.2 Procedure for Teacher Surveys

Each Year One classroom teacher of all children assessed when in kindergarten, in the 1993 Sample, was sent: a list of those children in that class; a survey for each child; a cover letter; and a stamped, addressed return envelope. For the Year Two and Year Three Surveys, the children's names were typed on the surveys to save teachers' time writing them. The teacher cover letter sent by the researcher asked:

> When completing the Student Survey, please trust your spontaneous judgement. Comment space is provided for any qualifying remarks you care to pass along. I really appreciate your time and acknowledge your professional expertise in identifying the current relative attainments of these children as they compare to their peers.

Year Two Surveys were sent to those schools who did not respond for Year One, and the Year Three mix of schools was different again. Changing schools was meant to spread the work in an effort to get the best return rate possible, and to give a different mix of children for comparison of results, (although some schools were common to more than one survey). Owing to the late arrival of the Year One surveys at the schools, only two schools responded (N=47). However, a lot was learned about their children and about procedure for the subsequent surveys. The Year Two Surveys were sent earlier to the other 1993 schools, with four schools responding (N=123). 88 Year Three Surveys were returned.

Classroom Teacher surveys were also sent to the Year One teachers of the 1995 Sample. The return of the Year One Surveys following the 1995 Sample, from two schools, was 138.

The Year Two and Year Three Surveys had some wording modifications as some

Year One items seemed less relevant for the older children, but the categories were not changed. For example, 'balance' on the Year One Survey was changed to 'fitness' on the Year Two Survey, but still counted as an outside motor item. 'Handwriting' only was retained on the Year Two Survey for fine motor skills, instead of 'fine motor skills' being a separate item, as well as 'handwriting' on the Year One Survey. Also, 'language - articulation' was removed from the Year Two Survey. This also had the advantage of reducing the number of survey items. An additional item, social skills, was added to the Year Two and Year Three surveys.

As the teacher surveys were collected, each child's original identification code was written onto each survey. In this study, no child's name is retrievable from any database or analysis. See Appendix 1., A1.10 (p.356) for the actual surveys.

7.3 Survey Results: Children Receiving Special Help after Kindergarten and Survey Results in Relation to Target Scores

Teacher survey information coupled with corresponding initial individual screening scores quartile information was compared for children placing in one of two groups. Quartile information was used to help reduce possible confounding factors from the teacher surveys in that a child's relative achievements in comparison to peers may be perceived differently from one school population to the next. Across the samples quartile placement was calculated in the same way for all the children, providing a common factor in these comparisons. The two groups of children were:

Group 1. = those children who received any 'special help' (in-school or privately), during the school year in question, as reported on a teacher survey, regardless of quartile placement;

Group 2. = those children who did not receive 'special help' and whose screening results placed them in the high or low Success Rate quartile *both* early and late in the year.

In Group 1. there were 75 children, or 21% of the 349 children for whom teacher surveys were returned, were reported as having received in-school special help beyond kindergarten, (with three children in more than one category). Across the

study, 67 children had in-school special help. Eight children from the 1995 Sample had private special help. Special help varied from school to school. Two schools had Reading Recovery, accounting for 15 of the 62 children. Three schools had Support Teachers Learning Difficulties (STLD), or STLD help in combination with reading or ESL, accounting for 33 of the special help children. Seven children received ESL help. Another school offered remedial reading, for six children.

In one large (all English speaking) school, with no Reading Recovery, parents paid a portion of the STLD's salary so that teacher could work full time in that school, (accounting for 22 of the special help children). Other isolated special help included: two 'special needs' children; two home phonics programs and two daily phonics programs organised by the school; one child in a special language class; one child supported two hours per week by a teacher's aide; one child receiving "unofficial" help from a teacher's aide; eight children had private help such as occupational therapy or help from the community "motor resource therapy team". Table 7.1 below, summarises biographical details for the Group 1. children.

Table 7.1

Biography of Children Receiving Special Help

Classroom Teacher Surveys	Gender	Language	Age		
1993 Year One n=8 / 17%	M 50% F 50%	Eng.50% ESL 50%	1. 0	2. 62%	3. 38%
Year Two n=30 / 23%	M 63% F 37%	Eng.70% ESL 30%	1. 17%	2. 66%	3. 17%
Year Three n=13 / 15%	M 69% F 31%	Eng.100 ESL 0	1. 31%	2. 61%	3. 8%
1995 Year One n=24 / 17%	M 67% F 33%	Eng.62% ESL 38%	1. 33%	2. 54%	3. 13%

Note.1 n / % = the number of special help children for those schools with teacher surveys, for that year, (not the total sample). Age1 = 4.6-5.11, Age2 = 5.0-5.5, Age3 = 5.6-5.11.

An interesting result in Table 7.1 is the differences in the Year One, Age1

percentages, increasing from 0% in 1993 to 33% in 1995. When the 1993 Sample got to year one (in 1994), no Age1 children were recommended for special help. However, by the time those youngest children got to their year two and then to year three in school, an increasing number of those children were in need of special help. By 1995, with that increased sample proportion of Age1 children, possibly the developmental and/or learning difficulties of those youngest children could not be ignored. This rise in the youngest children subsequently receiving special help in year one, should have implications regarding the possible benefit of providing more developmentally appropriate activities and instruction in kindergarten.

Another result to notice is the increasing percentages of English speaking children still reported with special help, suggesting that language help given ESL Speakers was effective. This trend goes against a popular opinion that because English is a child's first language, the child has achieved appropriate language skills to successfully cope with school language. ESL speakers often receive direct language teaching which is not usually available to English speakers regardless of need (unless an assessed language disability has been established).

To determine the comparison of teacher survey marks for the two groups of children, databases were constructed listing each child and his/her teacher's mark for each survey item. Survey marks were quantified as being either low, middle, or high, to correspond with the quartile groups. From the Year One Survey for the 1993 Sample, both the "minimal" and "low" ticking columns were counted as low.

If a teacher placed a tick anywhere on a line between marking columns (ostensibly to make an addition to the child's mark), the lower mark was counted. Table 7.2 below, summarises the percentage of high and low classroom teacher survey marks for the special help children in Group 1., and for those Group 2. children in the low Success Rate (SR) quartile both early and late in the year.

Table 7.2

Percentage of High / Low Teacher Survey Marks

	1. Special Help Children		2. Early & Late Low Quartile Success Rate Children	
Classroom Teacher Surveys	high survey marks	low survey marks	high survey marks	low survey marks
1993 Year One	1.2%	40%	4%	30%
Year Two	8%	37%	12%	48%
Year Three	8%	23%		
1995 Year One	7%	38%	8%	25%

Note. Percentages are of survey items, for that year.

Table 7.2 shows positive of achievement for the special help children over the years with their reduction of low survey marks by their Year Three (40%-23%), suggesting that special help was beneficial for these children. Conversely, the percentage of low classroom teacher survey marks for the children who did not receive special help increased over two years (30% - 48%).

It is interesting to note the percentages of low survey marks for the special help Year One children in 1993 (40%) and 1995 (38%). Because of their similarity and despite a different (age, gender, language) mix of children in those samples, those Year One percentages suggest they may be the typical numbers of children in need of special help and/or these are typical numbers of children for which the system provides special help. However, percentages of children receiving special help in each school varied, suggesting individual school policy is the actual determiner of which children receive special help. For example, of the special help children on the Year Two surveys, from four schools, 8% each of School 1 and 2 received special help, while 27% from School 3 received help, and 20% from School 7 received help.

To obtain a comparative picture of initial screening scores for those children who received special help (Group 1.), and those in the high or low Success Rate [SR]

quartile both early and late in the year who did not (Group 2.), the early screening scores for each child in those groups, were listed and averaged. Table 7.3 shows those early screening means (for Success Rate and each screening category), for Group 1. (special help children). Table 7.4 shows the early screening means for Group 2. children. These means are also further identified as being either derived target scores (as described in Chapter Five, 5.5), or being one standard deviation below the early means of the Combined Samples. The Combined Samples means were used as they are the best available estimate of the population of kindergarten children.

In Table 7.3 and Table 7.4 below, asterisks indicate scores at or below low derived target scores and dots indicate scores near or below Combined Sample average means less one standard deviation. To further compare and appreciate the relationship between these sets of early screening scores, Table 7.5 shows the Combined Samples early year standard deviations and means, and the low and high derived target scores.

Table 7.3

1. Early Screening Means for Special Help Children

Screening Categories	1993 Teacher Surveys Yr One	Yr Two	Yr Three	1995 Yr One
Suc.Rate	40*	50	49.8	53
Out.Mot.	49	57.9	57.3	55.5
Fine Mot.	58.5	56.8	48.3•	54.1
Language	43.9•	56.8	48.9	65.6
PP&R	29	36.2	39.7	36.6
Personal	64.5	46.2	48.3	40.1

Note. Asterisk = score at or below derived target score.
Dot = score near or below Combined Samples mean less one standard deviation.

Of the children represented in Table 7.3, seven 1993 and two 1995 children were in the low Success Rate quartile both early and late in the year and would have been in Group 2. if they had not received special help.

Table 7.4

2. Early Screening Means for Low SR 1/4 Children

Screening	1993 Teacher Surveys			1995
Categories	Yr One	Yr Two	Yr Three	Yr One
Suc.Rate	34.4*	36.5*	35*	44•
Out.Mot.	56.7	45.4	45.9	50.6
Fine Mot.	65	40.8*	37.5*	39.3*
Language	23.8*	50.6	49	50.5
PP&R	12.1*	13.7*	14.3*	35.6
Personal	20•	33.7	31.2•	34.3

Note. Asterisk = score at or below derived target score.
Dot = score near or below Combined Samples mean less one standard deviation.

Table 7.5

Statistical Details for the Combined Samples & Low & High Target Scores

Screening Categories	Comb.Samp. Early SDs	Comb.Samp. Early Means	Low Derived Target Scores	High Derived Target Scores
Suc.Rate	16.0	60.1	40	79
Out.Mot.	22.3	57.4	28	84
Fine Mot.	18.2	65.8	47	88
Language	22.6	68.3	38	92
PP&R	24.2	47.5	18	79
Personal	30.7	62.6		

Note. Personal Characteristics has no derived target score due to their being only four items in this category. The Personal average mean less one standard deviation = 31.9.

The most obvious difference between the sets of scores in Tables 7.3 and 7.4 is the number of lowest scores for Group 2. In Table 7.3, just 12% of those Group 1 tabled scores are near or below one SD below the average mean, with no scores below derived target scores, (although the 1993 Year One Success Rate is at the derived target score). By contrast, in Table 7.4, 62% of the Group 2 scores are at

or below scores one SD below the mean, or at target scores. These figures suggest that children who seemed most in need of special help, did not receive it. Another interpretation could be that the schools chose those children more likely to have positive outcomes from special help such as Reading Recovery, rather than choosing those most in need.

Outside Motor (OM) did not present great difficulties for children in Groups 1 or 2. All OM scores in Tables 7.3 and 7.4 are at or near the mean. However, for children in Group 2 who generally received low teacher survey marks in their school years two and three, their initial OM screening scores were ten points lower than the other children, (about half a SD down). OM was and remained difficult for other children in the 1993 and 1995 Samples as 10% of those samples combined, were in the low OM quartile both early and late in the year, including nine children in one of the above groups.

Tables 7.3 and 7.4 show that by year three (for the 1993 Sample), the initial Fine Motor (FM) scores for both groups of children were lower, especially for Group 2. The indication is that the lower the initial FM screening score, the more likely the child is to have continued fine motor problems, such as for handwriting. A suggestion is that as the volume of required written school work increases over time, children with FM difficulties struggle more and more to complete their work. Also notice the 1995 Year One initial screening FM score is lower than its 1993 counterpart for both groups, but again, especially for Group 2. These results should encourage teachers and policy-makers to look toward implementing more effective developmentally appropriate FM activities and practice based upon assessed need.

Another consistent difference between the above groups of children is the scores for Paper/Pencil & Reasoning (PP&R), and Personal Characteristics (Personal). While the Group 1 PP&R and Personal means are all above the Combined Samples mean less one SD, the corresponding Group 2 means are well below those levels. These figures again suggest that school policies might need to be modified to provide consistent and equitable access to special help. The use of a standardised scoring system, in this case designated target scores, provides a method of student selection based on evidence, rather than one based on presumption.

The 1993 screening means of Group 2 (children who did not receive special help), were much lower than those of the Group 1 children. The 1995 PP&R scores for both groups are almost identical, (just one point difference). The comparable Group 2 1995 Language and FM scores are well below those for Group 1. On the face of it, it appears that these differences should be noticed by decision-makers and help given to children with difficulties in these areas. A true indication of the meaning of these differences would only be known if there were year three teacher surveys for the 1995 children for comparison.

By contrast, Table 7.6 shows the early screening means of the Group 2 children who were in the high Success Rate screening quartile both early and late in the year. Asterisks indicate scores at or above high target scores. Dots indicate scores near or above the Combined Sample means plus one standard deviation.

Table 7.6

2. Early Screening Means for High SR 1/4 Children

Screening Categories	1993 Teacher Surveys			1995
	Yr One	Yr Two	Yr Three	Yr One
Suc.Rate	75.4•	79.1*	79.6*	80*
Out.Mot.	71.1	76.1	76.9	76.6•
Fine Mot.	84•	70	72.6	79.6
Language	78.5	86.8	89.3•	88.4•
PP&R	67.2	74.9•	71.2•	71.4•
Personal	82.5	83.6	75	90.8

To further place the Table 7.6 screening means into perspective, Table 7.7 shows the percentage of high derived target scores for the same children in Table 7.6, for SR and those for each screening category. Language has the highest percentage of high target scores suggesting that those children with very competent oral language skills at the beginning of the year, tended to retain those levels. The lower 1995 Language percentage may be due to the higher incidence of ESL Speakers that year.

Table 7.7

2. Percentage of High Target Early Screening Scores for Early and Late High SR 1/4 Children

Screening Categories	1993 Teacher Surveys		1995 Teacher Survey
	Yr Two	Yr Three	Year One
Suc. Rate	48%	46%	73%
Out. Motor	39%	46%	33%
Fine Motor	17%	8%	20%
Language	56%	61%	47%
PP&R	26%	23%	20%

The purpose of low and high standardised target scores is to advise teachers about each child's entrance level function to better inform instruction, and to use in comparison to local results. Target scores allow the identification of those children most likely in need of direct intervention as their early year screening results are atypical, at the extremes. Low target scores should alert teachers to those children whose instruction may firstly need to be further informed by specialist diagnostic assessment prior to direct teaching or probable practice to mastery of foundation skills to prevent failure. Instruction for children with high target scores, possibly indicating competence at entrance beyond stated outcomes, should challenge and enhance their excellent entrance level skills to prevent boredom.

Inappropriate instructional challenge, frustration and boredom at any level can result in lack of progress, disruptive behaviour, and the formation of low levels of self-esteem (Diezman & Watters, 1997b). For example, longitudinal Outside Motor information from this study showed decreasing percentages of females gaining (Table 6.13, Chapter Six, p.196) and increasing percentages of Age4 children in the lowest late percentile bands (Table 6.10, Chapter Six, p.194). The suggestion is that instruction was increasingly not meeting their developmental and learning needs.

There is one more teachers' survey comparison to be made between the children in Group 1 and the children in Group 2. Looking at the percentage of high / low placements on the year two and year three surveys for children on both surveys, gives an idea of their progress by year three:

- Of 15 special help children on both surveys (Group 1.) - 10 improved (had an overall higher percentage of high ticks), 2 declined, 2 stayed the same, 1 moved more toward the middle (some better, some worse).

- Of 9 children in the early and late high SR quartile on both surveys (Group 2.) - 2 improved, 5 declined, 1 stayed the same, 1 moved more toward the middle.

- Of 4 children in the early and late low SR quartile on both surveys (Group 2.) - 2 improved and 2 declined.

Of nine Group 2 children from the high SR quartile (all English speakers), two children improved and five declined. The two children who improved (females age 5.4 and 5.6 on school entry), each had 4 high target scores including SR, Outside Motor (one with 100%), one with 100% for Fine Motor, one with 100% for Language, and PP&R. Children with comparable initial screening results could justifiably be targeted as being potentially gifted and should receive appropriate accommodated instruction.

Of the five Group 2 high quartile children who declined, two were males age 5.6 and 5.1 on school entry, three were females (age 5.2, 4.8, and 5.6 on school entry), and each had one or two high target scores - two for SR, four for Language with two at 100%, (one Outside Motor and one PP&R). While their initial screening results were only somewhat lower than the two children in the same group who improved, these children should also be targeted because with appropriate instructional accommodation, they may have been more successful.

There were four Group 2 children on both year two and year three teacher surveys from the low SR quartile. Again, all were English speakers but this time all male: two were Age1 (one improved and one declined); the other two, an Age2 child who improved and an Age3 child who declined. Of the two who improved, one had

two low target scores and the other had three low target scores. Of the two who declined, one had four low target scores and the other had no low target scores. Again, comparable initial screening results should attract special attention.

It would probably be impossible to firstly identify all the variables intervening in these children's lives by the time they got to the end of their year three in school and then, to determine which ones most affected year three achievement. Information from the teacher surveys in this study can only suggest the effects of interventions and their relation to initial screening scores. The special help children show the highest percentage of improvement by year three. Their average early Success Rate score of 49.8 is 9.8 above the low target score and 5.8 above the average combined mean less one SD. Their range of early Success Rate mean scores was 19 - 75 with five of fifteen SR scores being above the mean indicating there was no relevant pattern of initial scores, further emphasising the necessity to assess all kindergarten children and individually intervene as required.

Table 5.6 (repeated p.249, from Chapter Five), shows the percentage of children in the Combined Samples attaining early year high or low target scores. These percentages represent significant numbers of children (plus those children whose scores may also be targeted by using standard deviations), and should encourage schools to be more flexible in assessing every child and in accommodating instruction within the existing kindergarten curriculum, in recognition of each child's developmental and learning needs.

Table 5.6

Percentage of Combined Samples Target Scores

Screening Categories	High Target Scores			Low Target Scores		
	N	M	F	N	M	F
Suc. Rate N=692	12%	3%	9%	13%	9%	3%
Out. Motor N=774	10%	3%	8%	15%	10%	4%
Fine Motor N=752	11%	4%	7%	11%	8%	3%
Language N=754	17%	8%	9%	11%	7%	4%
PP&R N=753	8%	2%	6%	16%	11%	5%

7.4 Relationships between Initial Screening Results and Subsequent School Attainments

Spearman correlation coefficients were calculated to examine relationships between initial screening results and the subsequent year two and year three school attainments of the 1993 Sample, as identified from their Year Two and Year Three Teacher Surveys. These correlations illustrate the strength of association between screening results and later personal attributes and school achievements, and as such, they indicate their relative importance to subsequent attainments.

Some teacher survey and screening items were exactly the same (41% for the Year Two survey and less for the Year Three survey). As described in 7.2, modifications were made in some survey items (mostly in wording only), to enhance their relevance to the age of the child and reflect current curriculum. However, equivalent categories were not changed. 53% of survey items are identical. Maths computation and maths logic were added to the Year Three Survey. Survey items were grouped to form survey categories comparable to the screening categories (for the actual groupings of survey items, see Comment space in Tables 7.10 and 7.11):

Survey Categories	Screening Categories
OM srv	Outside Motor (OM)
FM srv	Fine Motor (FM)
La srv	Language (La)
Per srv	Personal Characteristics (Per)
Tot srv	Success Rate (SR)

Tables 7.8 and 7.9 show the correlations between the Year Two and Year Three Teacher Surveys categories and the screening categories, calculated from composite scores from the early year results of those 1993 Children with teacher surveys. Tables 7.10 and 7.11 illustrate the association of the screening categories to the specific areas of personal development and academic achievement on the teacher surveys by showing the correlations of each teacher survey item to the screening categories calculated from composite screening scores to each survey item.

7.4.1 Discussion

In general, the Year Three Survey correlations with the screening categories, are weaker than those for Year Two. This result is to be expected as another year of development, experience and instruction has intervened. However, the relationship between the Paper/Pencil and Reasoning Screening Category (PP&R) and screening Success Rate still remains moderate to strong with many subsequent attainments and to the Total Survey. Some Year Three associations are actually somewhat stronger than in Year Two. The Year Three association between the Fine Motor survey category (FM srv - handwriting) and PP&R is stronger, and the associations between the Personal survey category (Per srv) and both the Outside Motor and Fine Motor screening categories, are stronger, indicating the accumulative affect of initial difficulties in these areas (Tables 7.8 & 7.9).

Table 7.8

Pearson Correlation Coefficients - Early Screening Results and Year Two Teacher Survey

Screen	Survey Categories - Year Two				
Cats.	OM srv	FM srv	La srv	Per srv	Tot srv
OM	.31	.20	.04	.23	.16
FM	.38	.28	.24	.32	.38
La	.13	.10	.37	.27	.37
PP&R	.26	.41	.66	.59	.66
Per	.38	.20	.28	.37	.42
SR	.38	.36	.53	.54	.59

Note. The above correlations were not significant: Om to La srv, Per srv and Tot srv; La to FM srv. The following were significant at the .05 level: Om to FM srv; FM to La srv; Per to FM srv. All other items were significant at the .01 level or better.

Screening categories = OM (Outside Motor); FM (Fine Motor); La (Language); PP&R (Paper/Pencil & Reasoning); Per (Personal Characteristics); SR (Success Rate).

Table 7.9

Pearson Correlation Coefficients - Early Screening Results and Year Three Teacher Survey

Screen	Survey Categories - Year Three				
Cats.	OM srv	FM srv	La srv	Per srv	Tot srv
OM	.09	.17	.08	.26	.27
FM	.16	.20	.14	.31	.29
La	.08	.24	.21	.25	.29
PP&R	.10	.49	.48	.43	.59
Per	.31	.24	.21	.26	.32
SR	.18	.43	.37	.45	.53

Note. The above correlations were not significant: OM to OMsrv, FMsrv and La srv; FM to OMsrv, FMsrv and La srv; La to OMsrv and La srv; PP&R to OMsrv; SR to OMsrv. The following were significant at the .05 level: OM to Per srv and Tot srv; FM to La srv and Per srv; Per to OM srv, FM srv and Per srv. All other items were significant at the .01 level or better.

Table 7.10 **YEAR TWO STUDENT INFORMATION SURVEY**

Pearson Correlation Coefficients Year Two Teacher Surveys & Early Screening Results

CURRENT Attainments	Screening Categories OM	FM	La	PP&R	Per	SR
1. co-ordination	.33	.36	.17	.26	.30	.38
2. fitness	.34	.41	.12	.28	.45	.42
3. ball skills	.20	.29	.08	.18	.32	.27
4. handwriting	.20	.23	.10	.41	.20	.36
5.appro.sentence structure -spoken	.03	.23	.35	.58	.29	.49
6.appro.sentence structure -written	.06	.26	.33	.69	.31	.55
7. uses descriptive words	.04	.20	.38	.60	.29	.51
8. recount of stories / events	.01	.19	.29	.57	.14	.42
9. reading - decoding	-.03	.23	.35	.59	.23	.46
10. reading - comprehension	-.00	.25	.36	.60	.27	.49
11. follows directions	.22	.35	.17	.55	.40	.50
12. spelling	.03	.22	.24	.58	.25	.43
13. completes tasks	.24	.17	.06	.43	.16	.33
14. attends	.11	.32	.06	.30	.26	.30
15. social skills	.09	.21	.36	.43	.33	.44
16. confidence / self-esteem	.13	.21	.34	.49	.22	.45
17.wk. independ.	.29	.26	.27	.56	.34	.53
Total Survey	.16	.38	.37	.66	.42	.59

COMMENT

Yr. 2 Survey Categories

Outside Motor = survey items 1,2 & 3

Fine Motor = survey item 4

Language = survey items 5, 6, 7 & 8

Personal Characteristics = survey items 11, 13, 14, 15, 16 & 17

Significance

The following survey items were not significant: OM to 5-10,12 & 14-16, & to total survey; FM to 8 & 13; La to 1-4,11,13 & 14; PP&R to 3; Per to 13.

The following survey items were significant at the .05 level: OM to 3,4 &11; FM to 5,7,9,12 &15; La to 12; Per to 4, 14 & 16.

All other survey items were significant at the .01 level or better.

Table 7.11 **YEAR THREE STUDENT INFORMATION SURVEY**

Pearson Correlation Coefficients Year Three Teacher Surveys & Early Screening Results

CURRENT Attainments	Screening Categories OM	FM	La	PP&R	Per	SR	COMMENT
1. int. in sport	.09	.09	.06	.08	.29	.15	**Yr.3 Survey Categories:** Outside Motor = survey items 1 & 2 Fine Motor = survey item 3 Language = survey items 7, 9, 10 &11 Personal Characteristics = survey items 14, 15, 16 & 17
2. skill in sport	.08	.21	.09	.10	.29	.19	
3. handwriting	.17	.20	.24	.49	.24	.43	
4. reading decoding	-.02	.12	.23	.41	.28	.32	
5. rdg. compre. / inference	.15	.21	.21	.51	.22	.42	
6. rdg. compre. / detail	.10	.19	.29	.50	.20	.42	**Significance** The following survey items were not significant: OM to 1-13,15 & 17; FM to 1-7,9-12 &14; La to 1 & 2,5,7,9,10,12,15& 17; PP&R to 1&2; Per to 6, 8-11,15 &17; SR to 1&2.
7. written lang. grammar	.10	.20	.20	.54	.24	.42	
8. spelling	-.04	.22	.24	.34	.19	.30	
9. spoken lang. grammar	.04	.15	.19	.41	.17	.32	
10.factual recount stories / events	-.01	.07	.12	.36	.13	.23	The following survey items were significant at the .05 level: OM to 14&16; FM to 8, 13, &15-17; La to 3, 4, 8,11&13; PP&R to 13; Per to 3-5, 7,12-14 &16; SR to 10,15&17.
11. use of descriptive words	.14	.08	.26	.43	.22	.36	
12. maths computation	.12	.12	.15	.53	.22	.39	
13. maths - logic	.17	.27	.25	.63	.27	.51	
14. foll.s directions	.25	.19	.22	.50	.23	.44	All other survey items were significant at the .01 level or better.
15. attends	.18	.25	.07	.18	.14	.23	
16. social skills	.24	.23	.31	.31	.25	.41	
17. confidence / self-image	.10	.26	.15	.25	.16	.28	
Survey Total	.27	.29	.29	.59	.32	.53	

The above correlations clearly demonstrate the magnitude of the Paper/Pencil and Reasoning (PP&R) screening category, as well as the total screening score Success Rate, as predictors of subsequent achievement up to three years later. On the basis of this observation, a temptation might be to administer only the PP&R screening category to children, to indicate risk. However, task analysis of component PP&R abilities, skills, and understanding and use of concepts shows that PP&R success relies upon the synthesis of accurate auditory and visual processing (eg. of directions given by the teacher), receptive language and visualisation (eg. PP&R Checklist Items 39, 40 and 41), written spatial organisation (PP&R Checklist Item 46), and visual-motor integration (eg. fine motor skill to write responses).

Lowered PP&R screening scores alone would not indicate which components (such as the Fine Motor, Language and/or Personal screening categories) may be weaker for a child, thus possibly delaying appropriate intervention and/or instructional adaptation based upon assessed need, and designed to help prevent failure. For example, regarding the relevant PP&R spatial concepts (top, under, beside, middle, next to, between and above), results across the 1995 and 1996 Samples show that by the end of their kindergarten year, a 15-26% age and gender range of children still demonstrated some sort of processing difficulties producing appropriate responses to items involving these concepts.

Therefore, to evaluate a child's strengths and/or weaknesses in component areas, teachers should also know the child's screening results for Fine Motor, Language, and Personal Characteristics. For example, the stronger Year Three Survey association of handwriting to the screening PP&R, helps corroborate the suggestion that the fine motor difficulties of young children become more problematic when the volume and demands of written work increase as they progress through school (see discussion in Chapter Two, 2.1).

Reliability coefficients (Chapter Five, 5.6), have established confidence in the internal consistency of the screening items to category and to scale. Tables 7.8 and 7.9 show the moderate to strong associations of PP&R screening category with the Fine Motor, Language and Personal survey categories on the Year Two surveys, and still moderate associations on the Year Three surveys.

Although the Year Two and Year Three survey items are differently ordered and some have different wording, 53% of items are the same, allowing direct comparison. Some items merit special mention.

Tables 7.8 and 7.9 (p.251) show that while the Outside Motor (OM) correlations are weak, they became somewhat stronger with the Language and Personal survey categories from the Year Two to the Year Three Teacher Surveys, and more so with the Total survey. Further, Tables 7.10 and 7.11 (pp. 252 & 253) show that on the Year Three Survey the OM Screening correlation became stronger with such individual teacher survey items as attending, following directions and especially social skills. Because skills required for success in outside motor are highly developmentally dependent, it would seem their influence might become less influential as a child gets older and gains more experience. However, specific research regarding Developmental Coordination Disorder (DCD) in this area (as discussed in Chapter Two, section 2.1, p.51), substantiates the above trend of increased motor skill influence in children's lives.

OM results from the present study regarding the possible incidence of DCD, or possible developmental delay, show that across the samples the percentage range of children placing in the early year 0-30 percentile bands was 13.5%-15.4% (with 15.4% for both the 1995 and 1996 Samples suggesting a consistent level of expectation). The range for children placing in the 0-20 percentile bands was 4.8%-5.6%. Of the 774 children in the Combined Samples with early OM screening results, 87 (11%) placed in the low OM quartile both early and late in the year. Of those 87 children: 79% were male; 32% were age 4.6-4.11; 49% were age 5.0-5.5; 18% were age 5.6-5.11.

The above figures show that significant motor difficulties are not specific to gender or age. The research is clear regarding the increasingly serious secondary effects of DCD as children get older. In the discussion in Chapter Two, the effects of DCD upon attention (eg. owing to the need for motor planning taking space in working memory for what otherwise might be an automatic response), self-esteem and social skills were identified, and also the coincidence of DCD with learning difficulties, especially reading problems. Every kindergarten child with an initial low OM target

screening score should be referred for further investigation.

An unexpected result from these correlations was the moderate to strong association between the screening PP&R with Year Three Survey maths computation (.53) and maths logic items (.63). The PP&R Checklist Items relating directly to maths are 34 (writing at least three different numbers), 43 (1:1 counting to five), 44 (shape pattern completion), and 45 (concept 'same as' for counting). However, while these screening items may appear basic, they were still causing some children difficulty by the end of their kindergarten year. For example, across the 1995 and 1996 Samples, late year screening results identified 17 (27%) of the youngest children, 66 (30%) of the middle age children, and 60 (26%) of the oldest children still did not spontaneously and independently write at least three different numbers (see PP&R Scoring Study, Chapter Five, section 5.4, p.163). These results should have implications regarding the need for more developmentally appropriate instruction for some children, concentrating on foundation skills, to improve those outcomes.

The 'following directions' item, while in the Personal category for both the screening and the surveys, could also be considered a language item. While the Year Three correlation is almost half the Year Two (.40 / .23), in the Personal category, the Year Two correlation of following directions with PP&R is .55, and Year Three .50. This result should alert teachers to investigate further to determine if a child's difficulty with this item has more to do with a personal characteristic or possibly receptive language. Affecting language factors could be grammatic structures (eg. singular /plural as for Checklist Items 39,40,41 and 44) and/or understanding of concepts / vocabulary. A good example of conceptual misunderstanding due to cultural diversity causing a difficulty was discovered by the researcher in a conversation with the mother of a Chinese child. The Chinese mother explained that in the Chinese language there is no equivalent for the English word / concept 'between'. This means the concept must be directly taught to the child, instead of just being a matter of translation.

Finally, it is especially purposeful to recognise the effectiveness of the total screening Success Rate as a predictor of an over-all picture of subsequent

achievement. The screening Success Rate association to the Total Survey is moderately high at .59 for the Year Two Survey and by the end of Year Three, this same association (total to total), is still moderate at .53. To further substantiate this association, the following compares the percentages of high and low teacher survey marks for those children from the 1993 Sample who might subsequently be expected to perform well or poorly in school, on the basis of their initial screening Success Rate quartile placement:

- for children with teacher surveys initially placing in the high SR screening quartile, (42 of the original 61 children)
  - of 37 children on the Yr.2 Survey, 19 (51%) had at least 65% high teacher marks
  - of 25 children on the Yr.3 Survey, 10 (40%) had at least 65% high teacher marks
- for children with teacher surveys initially placing in the low SR screening quartile, (25 of original 62 children)
  - of 25 children on the Yr.2 Survey, 13 (52%) had at least 53% low teacher marks
  - of 16 children on the Yr.3 Survey, 8 (50%) had at least 35% low teacher marks

While the above numbers of children are not large, the relationship of their teacher survey marks with initial Success Rate quartile placement indicates that The Kindergarten Screening effectively and accurately discriminates difference among kindergarten children. Further, information from the teacher surveys confirms direct relationships between initial screening results and subsequent attainments, at least up to three years later. This finding adds validity to the importance of initial screening scores and the importance of providing intervention and adjusting instruction to the assessed developmental and learning needs of kindergarten children to prevent failure.

Chapter Eight - Interpretations of Theory in Practice

Introduction

Early childhood education ideally seeks to optimise the development and learning of young children. In light of the range of diversity that kindergarten children bring to school, accurate identification of children's individual differences is central to effective programming and implementation of individualised instruction. Screening kindergarten children at school entry is a form of initial assessment to identify areas of concern which may interfere with, or possibly restrict, a child's optimal development and/or learning. Kindergarten screening is intended to help teachers identify the strengths and weaknesses of each child's abilities and skills to confidently guide consequential decisions. Screening does not label, determine cause, or predict specific outcomes.

Theory and practice can be merged, in schools, to solve problems. The problem considered by this inquiry was the gap between concern for the full range of individual differences among kindergarten children and the provision of equal access to suitable intervention and instruction based on accurate assessment of each child's developmental and learning needs, to accommodate those differences. This chapter restates the research questions to frame interpretations of information from this study in relation to theory in practice. The problem investigated was posed in a two-fold research question which in turn, gave rise to subsidiary questions. Sections 8.1 and 8.2 will present arguments relating to the general research question. Sections 8.3 and 8.4 will present arguments relating to each of the two subsidiary research questions.

8.1 Contemporary Theory and Practice

The first part of the general research question was: Can kindergarten screening based in contemporary developmental and educational theory in early childhood, and contemporary measurement theory, justifiably be used to assess the developmental and learning needs of school entry kindergarten children within affecting developmental and academic domains, to inform instruction ?

The present study was empirical research in early childhood with both qualitative and quantitative aspects. Regarding early childhood development, Katz (1991) said,"While the normative dimension deals with aspects of development that are thought to be universal, the dynamic dimension focuses on the unique or idiosyncratic patterns of development of the individual" (p.57). Theoretically for this study, the independent variable is the normative aspects, while the dynamic dimension is the combination of intervening variables in relation to the independent variable, contributing to the dependent variable (see section 1.4, Research Variables, p.7). Policy and decision makers should be aware of both dimensions in relation to early childhood education, including relevant screening and curriculum issues, to provide the most effective learning environment for kindergarten children, because contemporary research has unequivocally altered traditional views (Horin, 1999; Hotten, 1999; Larriera, 1995; Louisson, 1994).

While acknowledging the contribution of biological factors to early childhood development and the significance of achieving necessary foundation skills to school success, learning in early childhood is seen as being context specific, dynamic, and not predominantly dependent on universal biological linear stages of development. Educators have a responsibility to be aware of and respond to that changing knowledge (Dockett, 1994).

As discussed in Chapter One of this thesis: the efficacy of early intervention has been clearly established. Contemporary early childhood educational theory acknowledges the debate between the appropriateness of the construction and transmission of knowledge and the readiness of children to succeed despite their diversity, and the use of assessment in the learning process. As discussed in Chapter Two: Contemporary motor developmental theory in early childhood recognises the interdependencies of perceptual, cognitive, experiential and environmental factors in skilled motor function. Contemporary theories of language acquisition and cognitive development in early childhood recognise the necessity for children to be able to use language as a tool for expression and for decontextualised thought. Contemporary information about personal

characteristics of temperament in young children acknowledges their predictive significance depending upon the balance between known risk factors and resilience factors in a child's life.

However, contemporary educational practice has not sufficiently recast the scope of the kindergarten curriculum (see discussion in 1.2, The Kindergarten Curriculum, p.20), or sufficiently enhanced teacher training (see discussion in 8.4.1, this Chapter,.p.282), to reflect current knowledge about young children's development and learning. The current kindergarten curriculum seems to be predicated upon a given level of readiness mostly based upon a presumption of skills achieved in preschool. Children without these prerequisite skills can be left behind.

For example, in the race for younger children to learn formal literacy and numeracy skills, results from this study suggest that in general, relevant developmental factors are being ignored and the acquisition of some foundation skills is being neglected both in preschool and formal school. Across this study there was a decrease in the early and late screening means for Fine Motor skills (FM), and FM school gains for the youngest children showed gains for some schools while others appeared to regress, (see section 6.2, FM Age Comparisons, Chapter Six, p.197). These results take on added meaning in light of the significance of fine motor skills for handwriting as seen on the Teacher Surveys (see section 7.4, The Relationship Between Screening Categories and Subsequent School Attainments, Chapter Seven, p.249).

Therefore, screening all kindergarten children at school entry to determine levels of independent function in all relevant affecting domains seems the only equitable and productive path to successful early childhood education. Contemporary theory in educational measurement can in practice, successfully combine the functional advantages of performance assessment with adequate standardising procedures by which all test instruments should be judged. The definition, perceived advantages and validation of performance assessment were discussed in section 3.4 of Chapter Three (p. 96). However, before choosing any screening instrument, compelling

considerations should be the theoretical frame of the instrument, relevance of the construct as observable behaviour which can be validly measured, and relevance of the connection from the theoretical frame to pragmatic help for teachers and children.

The theoretical frame of The Kindergarten Screening was summarised in the Introduction to this study (p.5.), and presented in full in Appendix 1., A1.1 (p.304). The theoretical frame outlines components of typical development and learning affecting the 'whole child' and is tied to the curriculum by task analysis of the abilities and skills required within the curriculum (as represented by the screening categories and their criterion tasks), and those within the theoretical frame.

For example, is a child's difficulty catching a ball due to a motor problem or inability to visually track the ball? Is a boy's inability to draw a diamond or write his name 'properly' due to fine motor immaturity (as compared to girls as is so often said), or is it more to do with lack of experience in dealing with mental images and/or difficulty with visual-motor integration? Most young boys are very adept at creating complex structures using very small objects from toy construction sets. It was very interesting to note from screening results within the present study that a higher percentage of girls reversed numbers when writing, than did the boys; a finding that could be a subject for future research (see Tables 5.2 & 5.3, Chapter Five, p.165). Having identified a child's base level of independent function, contemporary educational theory encourages strategies such as direct teaching, scaffolding, mediated teaching, and peer tutoring, to teach from there. [For further explanation of task analysis, see section 5.2.1, Chapter Five (p.148).]

The construct for The Kindergarten Screening is the level of children's independent ability and skill function within affecting developmental and academic domains; which is observable and able to be measured, in this case, against the specifically stated scoring criteria (see the Screening Manual, A1.2, Appendix 1., from p.307). The term 'whole child' has at times been misconstrued to constitute all aspects of a child's life and therefore when used in relation to education, has been criticised as being

presumptuous[3]. Although, the contemporary dynamic, functional, non-linear view of development has certainly mitigated former rigid lines of demarcation between the various disciplines involved in the early childhood arena.

Within education the breadth of interrelated motor, language, cognitive and personal abilities and skills and degrees of competence required for success, is great. For example, while some believe that competent reading comprehension will follow automatic decoding skills (Reynolds, 1992), others recognise the importance of the relationship between oral language use and the higher order decontextualised thinking skills required for competent reading comprehension (Iacono & Brown, 1992; Snow, 1991). "The oral language competence which develops in these years (birth to eight years of age) supports the acquisition of literacy in the first years of school" (Department of Employment, Education, Training and Youth Affairs, 1997, p.15).

Over the course of this study the researcher became aware that in general, children's receptive vocabulary can be quite extended, possibly helped by the variety of content on television. However, as evidenced by conversations with the children and screening results, some children's oral use of language, especially in regard to grammatical structures and complete sentences (syntatical awareness), and descriptive words, was weak. This was documented in screening results in which scores for the Paper/Pencil and Reasoning (PP&R) category were typical or better, but the Language scores were depressed.

Further, again possibly owing to fast pace of television with its constant visual reinforcement and also the general faster pace of life today, children's competence in accurate and evaluative listening comprehension and following directions, seemed diminished. The screening evidence indicating this situation was the children's lower PP&R scores but typical or better Language and Fine Motor scores. These considerations reinforce the need to assess oral and receptive language separately and to also account for motor and personal factors. A kindergarten screening instrument must have sufficient content coverage to identify the strengths and weaknesses of

children's function in all relevant affecting developmental and academic domains to inform intervention and instruction.

8.2 Accommodating Diversity

The second part of the general research question was: can decisions based upon screening results accommodate the diversity that kindergarten children bring to school? Katz said "... the school needs to ready itself to respond to the wide range of cultural and linguistic experiences and needs children bring with them to school" (cited in SECA Institute Report,1993, p6). A more inclusive interpretation may be that of Boyer, who said schools should be ready to accept all children with a curriculum that supports all children's learning (cited in SECA Institute Report, 1993). [For a more complete discussion of these issues, see section 1.3.4, Chapter One, p.37.]

At school, kindergarten teachers can use screening to identify the range of individual differences in the various affecting domains, among the children in their class. Table 8.1 (p. 264) summarises the early year screening scores of four English speaking children in relation to their class screening means and range of scores (a range which is typical of all those within the study), and the instrument's target scores. Children 1, 3 and 4 are in the same class, illustrating the range of ability and skill competencies for which teachers may need to cater.

While Table 8.1 shows children who would be at risk, it also identifies the children with high ability and skill function at school entrance by the highest scores of the class score range (R), which are at or above the high target scores (Hts - in the first column). Assessment must also identify the individual developmental and learning needs of those children who may be potentially gifted.

Gifted children are an under-served population, especially those who are economically disadvantaged, and who are not always easily identified (Barbour, 1992; Borland & Wright, 1994; Wright & Borland, 1993; Diezmann & Watters, 1997; Shaklee &

Hansford, 1992). Borland and Wright (1994) argued for a multi-faceted identification process which is site-appropriate, dynamic, functional, emphasising observation of best performance and de-emphasising use of only standardised tests. Brody and Mills (1997) said the use of IQ tests alone, for the identification of gifted students (as has been past practice) is controversial, as these tests only measure a limited range of abilities and do not contribute to programming decisions.

Table 8.1

Early Year Individual Screening Scores & Class Means & Score Range

Screening	Ch.1 / F CA 4.7	Ch.2 / M CA 5.0	Ch.3 / M CA 5.1	Ch.4 / M CA 5.3
SR - Lts = 40 Hts = 79	19 class: M 61 R 19- 91	43 class: M 71 R 43 - 83	25 class: M 61 R 19 - 91	25 class: M 61 R 19 - 91
OM- Lts = 28 Hts = 84	11.1 class: M 54 R 11- 88	27.8 class: M 61 R 17 - 89	16.6 class: M 54 R 11 - 88	22.2 class: M 54 R 11 - 88
FM- Lts = 42 Hts = 88	40 class: M 77 R 40-100	40 class: M 77 R 40 - 100	50 class: M 77 R 40 - 100	40 class: M 77 R 40 - 100
La - Lts = 38 Hts = 92	30.7 class: M 64 R 31-92	65.4 class: M 84 R 65 - 100	30.7 class: M 64 R 31 - 92	30.7 class: M 64 R 31 - 92
PP&R- Lts = 18 Hts = 79	0 class: M 53 R = 0 - 86	22.1 class: M 60 R 22 - 89	14.2 class: M 53 R 0 - 86	10.7 class: M 60 R 0 - 86
Per - Lts & Hts = NA	12.5 class: M 64 R = 0 -100	50 class: M 69 R 37 - 100	0 class: M 64 R 0 - 100	25 class: M 69 R 37 - 100

Note. Ch. = child. Lts = low target score / Hts = high target score (see Chapter Five, 5.5 for explanation of target scores). M = class mean. R = class range. Class means and range scores have been rounded.

A group of children within the gifted population who must be identified and who are most often overlooked, are those who may be gifted and may also have a learning disability (Brody & Mills, 1997) [14]. These may be the children whose result profile from

The Kindergarten Screening is very uneven, with large discrepancies among different category scores, such as the results of the three children in Table 8.3 (p.271).

Shaklee (1992) points to lack of teacher knowledge to recognise gifted children, inadequate curriculum development, and school policy as issues which compound the complexity of the identification process. These are among the same issues which plague the identification process of most students at the extremes, and especially those who have non-manifest learning difficulties or disabilities. While one principal in a school in the present study asked if The Kindergarten Screening would identify "gifted" children, there was seemingly no attempt to recognise or to make adjustments within the curriculum to accommodate the needs of children achieving very high scores. It is hard to realise that children 1, 3 and 4 (Table 8.1) were in the same class, with a class early year Success Rate score range from 19 - 91. As observed by the researcher who was collaboratively teaching in that school, for the whole school year these children (and all the rest in that class) were taught the same lessons, with the same materials and strategies, at the same time, every day: 'one-size-fits-all' education.

A problem has been that at times, aspects of diversity and risk factors have been generalised to eclipse the fundamental aspiration of equal access to successful early childhood education for all children. In fact the misuse of labelling has been promoted as a general reason for not screening in kindergarten. A problem with generalities is that they often miss their target.

For example, the socialising of young children can produce results at school which if unrecognised as a cultural trait, can bias expectations regarding a child's potential. In the Greek culture young boys seem generally allowed to almost always do as they please and therefore they tend to have difficulties when expected to listen and follow directions in school; and an intrinsic language deficit may be wrongly inferred. In the Chinese culture young girls seem not to be encouraged to be convivial; and a potentially gifted child may go unrecognised. In the Australian Aboriginal culture, objects are considered communal and sometimes young Aboriginal children just pick up another's

property if they need it (classroom teacher, personal communication, February 1996); and a negative characteristic of temperament may be wrongly inferred.

According to Marie Clay (writing primarily of developmental differences), classroom school work determines the effectiveness of some children's learning due to teachers not knowing which children may even be up to, or can even get up to, the curriculum starting point: "even our style of helping may prevent Johnny from bringing to the task what he has already learnt" (Clay,1991a, p.269). Bowman (1994) sees diversity within a social context as the mismatch between a child's unique set of personal variables and what is expected at school: "if schools are to maintain the critical balance between educational excellence and cultural diversity, educators' knowledge of child development must be embedded in a broader social context" (p.222).

Care must be taken to determine the nature of an apparent diversity, deficit, delay or personal attribute as this information will make a difference to intervention and instruction, and parent surveys can be most helpful in this area of the screening process. For example: Comments on the parent survey for child 2, Table 8.1 (p.264), revealed the child "requires" speech therapy, was "a little slow with fine motor skills" , had a 30% hearing deficit in one ear from infections, and was shared equally by his parents who were separated when the child was four. With this information coupled with screening results his teacher could make adjustments in his learning environment such as appropriate seating to accommodate his hearing loss and supported help to accommodate articulation and fine motor difficulties and atypical behavioural patterns.

Parent comments about child 3, Table 8.1 (p.264), explained the child had language comprehension problems with some difficulty understanding / following directions. And in the case of another child (female, CA 4.10 - whose initial screening profile was uneven with a much higher score for language than in the other screening categories), parent comments explained the child was six weeks premature (weighing 2.3 kilos at birth) and had several serious medical problems during the first year of life, and the parents were "carefully" watching the child's development to assess the impact of the

child's first year. In this case teachers should also monitor development and progress with a view to ensuring this child's achievement of foundation motor and receptive language skills.

Still on the issue of generalities missing their target, the issue of readiness and risk for younger boys entering kindergarten was the topic of a recent article regarding entrance age to kindergarten. The headline said, "Early starts may damage boys" (Huffer, 1999). Other generalisations in that article included statements that at age six or seven boys are six to twelve months less mentally developed than girls, and that they need more time for their fine motor skills to be ready for paper and pencil work. Research from Yale University demonstrated that owing to teachers' general expectations, four to five times more boys were identified by teachers as having reading and learning problems (Delbonis, 1990). According to Delbonis, in testing for actual reading disability in second grade, researchers found that 8.7% of the boys were identified (as opposed to the 13% identified by the teachers from the same sample), and 6.9% of the girls (as opposed to the 3.2% identified by the teachers).

Results from the present study show the gender mix in the highest percentile bands for the Language screening category to be the most even, and 15 - 29% of those children were Age1 (see Table 6.25, Chapter Six, p.212). In the highest Fine Motor percentile bands the early year gender mix favoured females, but 37% were males. Regarding age, the early year Age1 highest percentile range for Fine Motor was 13-24%. The point is that there were males and youngest children in the highest percentile bands with females and oldest children lowest bands across all the screening categories, and all their developmental and learning needs should be accommodated. Therefore, all kindergarten children should have equal access to assessment to identify their actual (not assumed) developmental and learning needs.

However, by the end of the school year the percentage range of youngest children in the highest Language percentile bands had fallen to 8-10% (Table 6.26, p.212). The gender mix for Fine Motor was more even by the end of the year, but age percentages

favoured the oldest children (see Fine Motor discussion and tables in section 6.2.1, p.199). The range of school mean gains across the present study indicates the actual results of instructional accommodations made in the schools.

The range of school mean gains from early to late in the year across the three samples for Age1 (the youngest children), was: Success Rate 10.4 to 24.8; Outside Motor negative 6.9 to 23.0; Fine Motor negative 1.8 to 46.2; Language negative 1.5 to 33.4; Paper/Pencil & Reasoning 16.4 to 42.5; Personal Characteristics negative 25 to 37.5. The 1993 and 1996 gain achievements of one school is shown in Table 8.2 below. Despite proportional shifts in their ESL and Age1 1993 and 1996 kindergarten populations, the results of their interventions were exceptional.

Table 8.2

Mean Age1 Gains for School 2, 1993 and 1996

			Screening Success Rate and Categories					
Sch.2	ESL	Age 1	Suc.Rate	OM	FM	Lang.	PP&R	Per
1993	41%	23.%	23.5**	-0.7	22.1*	21.4*	40.3**	30.3**
			Sm18.7	6.5	14.6	15.2	31	14.8
1996	11%	41% & 26%ESL	22.7**	23*	10**	25.4**	32.3	11.8
			Sm16.2	14.9	10.5	10.8	28.9	15.6

Note. Sm = Sample mean gain for all schools that year.
* = highest gain in schools range of gain / ** = second highest gain. See Tables A2.4 - A2.7, Appendix 2., for the complete review of all school mean gains.

The wide range of these school gains and the example of consistent gains by one school are clear evidence of the extent to which success for these children depends on the learning environment in which they are placed, and not necessarily the diversity of their age, gender or language. However, the learning environment depends upon school administrators' interpretation of systemic policies, school policies, interpretation of the curriculum, teacher knowledge, expertise and motivation, and classroom instruction.

For example, in a personal communication (27 July, 1996) a school assistant principal (AP) , in a government school, was quite definite regarding how ready their school was to accommodate diversity. For child 1, Table 8.1 (p.264), whose entrance level skills were not commensurate with those of her peers, the AP said that the same level of instruction for all students is fine as we accept them where they are, even if they are at the foundation level just producing scratches on the page. Teachers couldn't be expected to cater for the wide range of individual differences in kindergarten; and instructional accommodations were not made. If sufficient progress toward the stated and measurable outcomes of the NSW state English K-6 Syllabus were not observed, the child repeated kindergarten (as did this child); in the same learning environment.

The initial screening scores of child 2, Table 8.1 (p.264), were also low. Several months later, from individual testing, the school counselor said the child showed a very uneven profile. The AP said we can't cater for him in the "regular system". The system dictates expectations and if children don't fit the system the parents should find a school which better suits their needs.[15] If the present research had only one message to disseminate regarding screening kindergarten children at school entry, it would be that screening allows 'the system' to adapt to the needs of the child, not visa-versa. Assessment allows the system to adjust the curriculum and instruction to best suit the developmental and learning needs of children, and therefore, improve opportunities for more successful outcomes.

Child 3, Table 8.1 (p.264), whose screening scores were also low, seemed more acceptable to the school. However, prior to entering school, that child was said to show some autistic behaviour, and had a language disability label of "semantic pragmatic disorder"; even so, the child was on the waiting of list community resource team for ongoing language services. It would seem that prior-to-school labeling is not only acceptable, but children with prior-to-school labels can access special services when they come to school; as they are available. The researcher knows of a child who in 1995 was enrolled in kindergarten under the NSW Disabilities Act, with a language disability, and who was unable to access the district language disability class convened

in that school. For those children who have had no prior-to-school assessment (who are in the vast majority in the NSW kindergarten population), there is currently in NSW no readily or equally available access to in-school assessment or intervention for their developmental and some of their learning needs other than teacher observation over time, the procedure recommended in the Early Learning Profiles, (1994).

Subsequent to initial screening the researcher did speak to the classroom teacher about grave concerns for child 4, Table 8.1 (p.264). However, the teacher's response was actually a denial of the child's immediate problems and need for referral by saying that the child's mother said the child was just shy. In that school, parents were not notified about screening results. Whether schools refer to risk factors, individual differences or diversity as the excuse for inequity, the blame for lack of success is usually placed on the child rather than the system being unready and/or unwilling to accommodate the diversity which the children bring to school (Flores, Cousin & Diaz, 1991).

For example, Table 8.3 (p.271), shows the early year screening results for three more English speaking children, all in the same class, with mixed, or uneven result profiles. Each child shows exceptional differences in function levels which should attract further investigation. The motor difficulties of child 5 were extreme and should have been referred for specialist assessment. However, as his language was so mature in use and content, his motor difficulties were dismissed and he was accepted as a very clumsy child. It seemed to the researcher that when child 5 entered kindergarten, he was already using his language and humour defensively.

Table 8.3

Individual Early Year Screening Scores

Children	Suc. R	OM	FM	Lang.	PP&R	Per
child 5 M / 5.5	77*	33.3	65	96.1*	89.3*	100
child 6 F / 5.4	77	88.9*	85*	92.3*	46.4	87.5
child 7 M / 4.9	48	83.3*	40**	73.1	17.8	12.5

Note. Using the gender target scores (Table 5.5, Chapter Five, p.171), * = the score is at or above the high target score / ** = the score is below the low target score. The low male PP&R target score is 17, (notice child 7).

Child 6 was not well known to the researcher, but owing to her strength in every screening category except PP&R, the PP&R collapse should certainly be investigated. The researcher had a close teaching relationship with child 7 who probably would have fitted into the Brody and Mills (1997) subgroup 3, of children with mixed abilities which mask each other [14]. However, this child presented with several known family risk factors which were taken as proof of his lack of experience, skills and motivation, and his personal factors of resilience were not recognised as they were often masked by unruly behaviour. Further, this child had a learning style which did not match his school instruction (which may have been one source of the unruly behaviour), so he did not progress sufficiently and was he left to repeat kindergarten, in the same learning environment.

Ironically, this child would probably not have been able to access Reading Recovery in Year One had he been identified as being in need owing to his age, as he would not yet have been age six. Access to Reading Recovery depends upon initial testing to determine need and then usually the oldest children who are at least age six are chosen first (personal communication, Reading Recovery teacher, November 1996). This situation could have affected 34% of the 1996 Sample who were Age1 upon entering school. Further, because child 7 repeated kindergarten he would not be able to access

Reading Recovery as state systemic policy is that children must be in their second year of school to receive this special help. His next window of access to special help would be after he was assessed to be failing as compared to his peers, by at least two to three years. The opportunity could occur from the Year Three Basic Skills testing.

In the present investigation the learning needs of child 7, and those of others, were clearly identified in such a way that curriculum modifications could have been made to accommodate their needs. Kindergarten programs must have an outcome continuum with sufficient scope to recognise the full range of entry level skills and to accommodate all students at the extremes. With knowledge of contemporary developmental and learning theory in early childhood education, this task is not difficult. The task of creating developmental and academically appropriate programs is firstly a matter of policy, motivation and organisation, and does not need to incur extraordinary financial costs.

Although the debate about appropriate or inappropriate instruction may be keenly contested in the journals, lines defining classroom practice are not clear (see section 1.2.1, the Kindergarten Curriculum, Chapter One, p.23). From the study reported in this thesis, classroom practice seemed either dominated by the expectancies of school policy or moderated by degrees of teacher interpretation and conceptual bias. While there was little consistency in beliefs and practices between schools, there usually was within schools, although not always.

Of the fifteen schools over the three years, beliefs and practices could clearly be placed somewhere along the appropriate- to- inappropriate continuum. There were seeming discrepancies between theory and practice. For example, the use of commercial workbooks is considered by some to be developmentally inappropriate while the use of hands-on materials and supported teaching to teach the same (workbook) content, is considered to be appropriate. There were adoptions and adaptations of innovations to suit the system, (such as state-wide adoption of Reading Recovery and school use of portfolios for reporting children's progress to parents). The more successful child

outcomes seemed to be achieved by those teachers whose primary concern and instructional accommodations catered for the developmental and learning needs of each child, before adherence to theory or policy.

For some children the current kindergarten curriculum commences at too high an academic level (eg. for child 1, Table 8.1, p.264), requiring motor skills and an abstract decontextualised thought process which needs more practice. This is not to say that the curriculum has to be compromised, but teaching strategies do need to be adjusted, need to be developmentally appropriate for these children to succeed (Bergan, Sladeczek, Schwarz & Smith, 1992). For example, (as demonstrated by the researcher with children), a child who may not be able to order pictures or symbols by size on paper, may well be able to order objects by size such as pencils, gum leaves or rocks, thus demonstrating understanding of the concept, (see the Components of Typical Development and Learning - the Process of Learning, Appendix 1., A1.1, p.304).

Developmentally appropriate practices can suit the curriculum to the developmental and learning needs of each child. Educators can design kindergarten programs which help socialise children, prepare children for the student role and the importance of academic learning, and teach significant content (Spodek & Saracho,1988). Hence the seeming conflict between child centred versus academic centred learning environments can be resolved. However, Seefeldt and Barbour (1988) pointed out that depending on the prescriptive nature of school policies, teachers are the ultimate curriculum builders: "Professionally they have the responsibility to follow mandates, yet at the same time they must protect children's rights to appropriate education" (p.5).

Individual differences are magnified in kindergarten. As Huffer (1999) said, it is ridiculous to teach children at the same level for whom there can be as much as 18 months difference in age. Where one-size-fits-all instruction is practised and/or expectations are founded on generalities, children at the extremes seem not to learn to their best advantage. However, as has been demonstrated by the present study, where screening in relevant developmental and learning domains identifies children's needs and

appropriate intervention and instruction are implemented, and when expectations are for success, most children can succeed to the best of their potential and opportunities to learn.

However, one problem for schools identifying students at the extremes is that then these students may attract special services, which may be an underlying factor in the argument for decategorisation. Although a problem with decategorisation which then occurs is that students need to have a disability label to access special services within the schools (personal communication, Learning Difficulties Co-ordinator, NSW Department of Education and Training, Nov.,1998). However, a primary focus should be commitment to provide all children with educational programs which meet their individual educational needs (Barbour, 1992); which is usually a part of policy statements at all levels of educational service provision.

8.3 The Kindergarten Screening: The Instrument

There were two subsidiary research questions. The first was about the instrument.

1. Can a standardised whole class in-school kindergarten screening instrument which is economical and time efficient to administer, score and interpret, with teachers and other school staff as evaluators, be considered adequately valid and reliable across contexts, evaluators and time to:

- fairly evaluate and identify children's levels of independent function observed from demonstrated performance of familiar criterion tasks as being typical for age, accurately and consistently discriminating difference among children ?
- generate appropriate information to confidently guide interventions such as referral for specialist attention and instructional adjustments, and which may be applicable to the population of kindergarten children ?

A sufficiently standardised valid school entry screening instrument can consistently discriminate and identify children's individual differences to determine school entrance

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A sufficiently standardised valid school entry screening instrument can consistently discriminate and identify children's individual differences to determine school entrance

level function. Contemporary measurement practices articulate an expanded process of validation which looks for on-going evidence ensuring the validity and reliability of instruments. This process uses traditional statistical analysis, standardising procedures such as justifying content and measurement conditions (identifying and countering factors which may confound results), and includes consideration of intended or unintended consequences of interpretations and decisions based upon assessment results. Specific statistical procedures and validation of measurement conditions used to standardise The Kindergarten Screening instrument have been described in detail in Chapters Four and Five of this thesis. For example, evidence to substantiate the consistency of the obtained scores in the present study was established by comparing equivalent confidence intervals for the different sets of scores using the same instrument over time, from the three different samples, and across contexts and evaluators (see 5.6.1, Chapter Five, p.172).

Further, the Cronbach Alpha reliability coefficients, indicating the internal consistency of the instrument, were adequately stable and high across all three samples giving confidence in the dependability of single score performance (see 5.6.2, Chapter Five, p.175). A sufficiently standardised instrument will also indicate normative scores and those identifying specific areas of concern, in this case designated target scores (see 5.5, Chapter Five, p.167), which provides a method of student selection based upon evidence, rather than one based on presumption. Given that The Kindergarten Screening would be considered valid and reliable, remaining issues could be: the cost and time required to implement the screening; the fairness of evaluation in relation to intent; information generated from results.

8.3.1 Cost and Time

The financial cost of implementing the screening instrument used in this study is minimal. Materials are common and few, and no help beyond school staff is required. Time requirements are primarily for initial inservice, preparing photocopying (which can be done by office staff or volunteers), scoring and recording (some of which can be

done by volunteers), and interpretation. The extent of inservice depends in part upon the experience of the evaluators, in early childhood development and in screening. Within the present study, most initial inservice was done either in one group session using the video and the manual, or individual evaluators took the manual and video home. In every case subsequent time was made available for questions, and scoring criteria were always reviewed immediately prior to every screening session. The video provided the opportunity to see a range of responses from many children in each screening category in actual screening sessions to compare to scoring criteria, and to see how the screening is administered.

Prescribed quantitative scoring criteria were minimal, user-friendly and had a summarised format for each screening category, for use during screening. However, the expertise of evaluators can make a difference to the value of quantitative comment. For example within this study, we made sure that either the classroom teacher or language teacher assessed the Language screening category as they would be familiar with the typical language expectancies of these children, and usually with knowledge of the local population. Therefore, the teacher would probably know if a child's use of language indicated a manifest language difficulty or was at least in part, due to a cultural idiosyncrasy, which could make a difference to scoring. This instance is similar to that in the Outside Motor category when the evaluator can indicate when an apparent weakness may be due to lack of practice, or a delay.

Another advantage is that these teachers gained first-hand knowledge of the language competencies of each child in the class, and general levels of the whole class; as is also true for the other screening categories. Accurate and specific information from the screening about the whole child, for all children, is collected in one morning and can immediately be applied to programming and instruction, (as opposed to individual observation about some skills, usually limited to reading and writing, over time).

8.3.2 Fairness in Relation to Intent

The intended purposes of The Kindergarten Screening are to provide immediate and accurate information about the developmental and learning needs of each child, the range of individual differences among kindergarten children, and to monitor progress. In this instance, fairness means the degree of impartiality and consistency by which screening results are generated across contexts and time, giving teachers and parents confidence to make decisions based upon those results.

Firstly, fair evaluation of the in-school performance of kindergarten children, from The Kindergarten Screening, lies in the pragmatic value of it taking place in school, using criterion tasks that are functional and meaningful to kindergarten children. Results derived from contrived tasks presented in unfamiliar circumstances or a different context may produce different responses. Since research is telling us that task performance is specifically context dependent (Shavelson, Baxter & Pine, 1992), and school is where the children are expected to succeed, then school, among peers, is where they should be assessed.

The point is that normative information from The Kindergarten Screening can be generalised to other kindergarten children whose same abilities and skills are assessed from their performance on the same tasks, in similar circumstances and context. For example, it was very interesting to note the almost invariable consistency of age expected response to the first screening item, walking downstairs, (which gives a very good indication of motor integration and degree of dependence upon visual monitoring required for action). In this case, the motor act of moving on stairs was the specific context. There were virtually no deviations between city children, who have a lot of practice on stairs, and country children who often have little practice on stairs. This discovery gave further assurance of the universality and fairness of this screening item.

The fairness of The Kindergarten Screening also lies in results from the instrument's standardisation process. For example, content justification for its breadth and inclusion

across affecting domains as seen in the Reference Sample of same and similar screening tasks compared to other standardised screening instruments (see A1.4, Appendix 1, p.345). Also, the consistently high Cronbach Alpha reliability coefficients (see Tables 5.7 & 5.8, Chapter Five, p.173), demonstrate the dependability of single score performance across all three years of this study, from different samples. Standardisation gives confidence that the instrument is valid and reliable for its intended purpose. Standardisation means that teachers and schools can rely upon results to inform parents, intervention, programming and instruction, and to gauge requirements for resources in terms of materials, support personnel and money. These ideas were presented in the notes prepared for the introductory workshops for this study (see Workshop Notes A1.3, Appendix 1., Assessment, p.339).

8.3.3 Information Generated from Results

Information generated from screening results comes from both quantitative (screening scores), and qualitative (comment on screening checklists and parent surveys) sources. Early year target scores and other individual scores along with qualitative comment can be used: 1. to indicate those children who should be referred for specialist intervention or who may be especially talented or present with a combination of factors, and who may need individual attention; 2. for organising flexible grouping for individualised instruction within a class, (or among several classes so as not to duplicate services). Such grouping is individualised in so far as children with like needs can be grouped for particular skill practice and flexible, in that groups would change depending upon evaluated progress and current need (ideas for Programming and Teaching were presented in the Workshop Notes, see A1.3, Appendix 1, p.344).

The needs of talented children must be considered in this process as their entrance skills in some areas may already be near or even at, stated outcome levels. These children should have activities which incorporate and enhance their skills, and help prevent boredom which can lead to behaviour problems. Further, programming for children with a combination of high and low results should consider how to help a

child's weaknesses through the child's strengths, so the child experiences success.

Early year screening information should be reported to parents to inform decisions. Some parents are unaware of the complexities or even the existence of their child's difficulties until advised the child is demonstrating behaviour(s), atypical for age. Some participating schools informed parents. Some schools treated the task as just additional work. Other schools understood that communicating to parents specific information about their child helped create a more collaborative and positive home / school alliance and a more realistic understanding about the children, especially in terms of expectations, for parents and teachers. Again, the combination of screening results and information from parent surveys can help in this area. For example, Table 8.4 shows the early year screening scores for a male (child 8), CA5.8, with matching sample age and gender means, for time of year:

Table 8.4

Early Screening Scores & Matching Early Sample Means

child 8	SR	OM	FM	La	PP&R	Per.
means	61.7	54.5	70.5	67.4	51.6	62.5
ch. score	61	27.7	75	96.1	46.4	37.5

Comment on child 8's Outside Motor Checklist was "skipping out of control", his score was zero for both skipping items and both balance items. While his Fine Motor category score was above the mean, he scored zero for pencil grip and he had some difficulties folding his paper as required. His Language score would have been 100% save one point off for articulation. In the PP&R category he scored zero for writing numbers, copying the triangle and diamond, shape pattern, and 'same as' for counting, and he had difficulties writing is name. In Personal Characteristics he score zero for attending.

Comments on child 8's parent survey said: The birth weight of this child was 2.8, (in the low quartile - see p.127, Chapter Four). His developmental milestones were typical. The child was adopted at age 12 weeks from an orphanage in a South American country and was always an extremely active happy child. He "verbalised very well from an early age ... has a great sense of music ... tends to be very theatrical ... tries to be helpful, but always is in a rush ... we think he is very intelligent - maybe 'gifted'".

If decisions were only based on the global Success Rate score, child 8 would be seen as average. However, on the basis of category and even specific task scores, and parent information, further investigation would certainly be warranted for the sake of the child, his parents and teachers, appropriate intervention and instruction, and accountability. While inept performance does not prove incapacity or deficit, it does deserve additional investigation as historically, children with learning disabilities present a mixed profile of development, and "processing weakness, language difficulties, or perceptual motor problems can mask the child's overall ability" (Johnson, 1999, p.13).

Other information which can be generated from results include evaluation of school programs and/or instruction to appreciate their actual worth by comparing gains from early to late scores. For example, School 4 had the highest Language gains for the middle and oldest age groups and was just .7 off the highest gain for the youngest age group, despite starting the year with a school Language screening mean 19.1 points below the early Sample mean. However, School 4's late school Language screening mean did not quite reach the late Sample mean. Therefore, if normative scores were used as outcome targets, School 4 would not be seen to have achieved even the average outcome. Further, if funding and/or resource availability were dependent upon reaching such a stated outcome target, School 4's exceptional language program might have been placed at risk. Program evaluation only based upon the comparison of general norms to the achievement of stated outcomes, may not be a true assessment of what actually occurred.

The demonstration of outcomes may be a great achievement for some children, while

other children can demonstrate the same outcomes upon entrance, and if stated outcomes at any level are minimal, then the range of student achievement will look optimal. True evaluation of added educational value must be based on the full range of achievement results, including demonstration of entrance level function. Accountability should be in the interests of all children and should connect student performance with classroom practice (Dorn, 1998).

Normative scores such as means and standard deviations and local results can also be used to create local norms for comparisons, either within schools or school districts. School results and local norms can indicate actual local needs to guide allocation of time for support staff, money and resources.

8.4 The Kindergarten Screening: Use of Results

The second subsidiary research question was: Can knowledge of children's identified individual developmental and learning needs facilitate teachers' and parents' undertakings to help kindergarten children achieve to the best of their abilities, skills, and opportunities to learn in school and in their daily lives?

Regarding teachers, the answer to this question is quite simply, yes, depending upon circumstances such as school policy regarding early intervention, teacher effectiveness, and parent involvement. Assessment results are only as good as the consequent decisions which they guide. For example, screening scores, especially target scores and/or relevant local norms identify those children about whom there is sufficient concern to warrant a recommendation for further investigation. An extended school assessment process (after screening), could be to group those children by area of concern for individual specialist diagnostic assessment. The most pragmatic next step would be to contract community services to come to school (with financial arrangements agreed upon between parents and the school), for individual child assessment and consultation with teachers and parents. Such services could be delivered by developmental diagnostic and therapy resource teams and/or private

specialists such as physiotherapists, occupational, optometrists therapists or speech pathologists. In the present study, this step was left for parents to pursue.

To give an idea of how many children could be involved: 13% of the 692 children in the Combined Samples had the lowest Success Rate target score and 16% of 753 children had the lowest PP&R target score (see Table 5.6, Chapter Five, p.172). From the NSW kindergarten population in 1998 (as determined by the Australian Bureau of Statistics), these percentages would have translated into 11,745 children with the lowest Success Rate target score and 14,455 children with the lowest PP&R target score, being at risk of failing to achieve their best results within the current kindergarten curriculum.

An extended assessment program would give school systems and schools an accountable cost and time effective program for responsibly continuing the identification of kindergarten children's developmental and learning needs to inform instruction. Teachers and parents would receive immediate specific diagnostic information (only as required) and advice regarding remediation and/or appropriate school / home instruction. Parents would receive professional help for their child which they might otherwise not have been able to arrange, if, for example, there were factors such as ESL, cultural or geographic isolation and/or socioeconomic factors interfering. Teachers should have more confidence in decisions based upon results. Children should immediately receive instruction specifically adjusted for their assessed needs instead of being made to wait to demonstrate progress, which may not occur. Parents, teachers and the community would be co-operating for the sake of each child and efficient, cost effective education.

This objective and comprehensive process could easily be completed within the first three to four weeks of school and therefore should not adversely affect the already complex school timetable. Further, with this program in place the anticipation would be that many fewer children would be retained in kindergarten or in need of Reading Recovery in year one, rendering that remedial program more cost efficient and

accessible to more children most in need. Future research could inquire into the efficacy and implementation of this part of the assessment process.

8.4.1 Teacher Effectiveness

While initial success for the above extended assessment process in schools would firstly depend upon school policy, it would subsequently depend upon teacher effectiveness. Knowledge of the children's identified developmental and learning needs will only facilitate help for children to the extent of teacher knowledge and experience in early childhood development and education. In recent years specific training of infants school teachers (K-3), and their mentors infants mistresses (who acted in a role similar to an assistant principal), was discontinued in NSW. Teachers now become certified as primary or secondary teachers, and can be shifted into areas of teaching for which they have little or no experience. The researcher had first-hand knowledge of a year five teacher who was asked to teach kindergarten and who ultimately felt uncomfortable with some results she was observing, deciding they were due to her lack of knowledge of the ability and skills range of kindergarten children and therefore, her unrealistic expectations.

Classroom instruction depends upon how teachers balance their interpretation and implementation of policy, and knowledge and experience in early childhood education, to accommodate the developmental and learning needs of their students. While it was not within the scope of this study to determine the parameters of the kindergarten teachers' knowledge and experience in the field of early childhood, observations highlighted certain issues surrounding teacher effectiveness. Better management of the kindergarten school timetable and more realistic strategies regarding the enhancement of self-esteem are two major factors observed to be affecting kindergarten teacher effectiveness.

The Kindergarten Timetable:

Today's kindergarten timetable is affected by the addition of curriculum mandates and other initiatives encouraging more whole class teaching with less attention to individual differences, while discouraging time for small group or individual activities which may be more developmentally appropriate. Teachers reported that their job seemed stressful due to constraints from the incorporation of innovations into the kindergarten curriculum (such as computer literacy), new discrete subjects (such as environmental education), and new policies (such as inclusion and portfolio reporting). Many of the kindergarten teachers made comments like, "the children don't count any more / there is no time to teach / in some respects I feel I have failed the children." The timetable has become complex, for example, with the inclusion of *computer time,* and in some cases the exclusion of enough time for essential practice in foundation *fine motor skills* for writing, oral language activities such as *news time* (as a supported language event), and large blocks of time for *play.*

Computer time: While computer time in kindergarten begins the process of computer literacy, this time is not developmentally appropriate for practising decontextualised language (as there is no need to verbalise or visualise) or foundation fine motor skills. However, this is not to say computers can not be used in developmentally appropriate ways. For example, the child with fine motor problems can practise connecting the vocabulary of spatial concepts (between, above, below, right, left, etc.) to position in space using a computer mouse to move through a maze on the screen, which has the advantage of the screen being in the same upright spatial orientation as the child. Other practice can include sight words, matching lower and upper case letters, matching letter sounds to the printed symbol, or1:1 counting of objects matched to number symbols, although all advantages of including fine motor practice in these otherwise multisensory activities is prevented, as the child only needs to press the keyboard arrows. A general consensus of kindergarten teachers in this study was that the time and money spent with computers in kindergarten could be more equitably spent to resource more developmentally appropriate help for all children.

Fine motor skills: The current NSW Kindergarten Curriculum places early and prominent emphasis on writing (Board of Studies, 1994 / 1998), requiring sufficient fine motor skills to control a pencil at the independent level of function. To write, the child must use his/her fingers to stabilise the pencil and isolate movement (L.Lennox, O.T., personal communication, November 1998). When the motor skills of writing are automatic the child is more free to attend and to concentrate on the cognitive aspects of the task and speed of processing, which will be crucial to enable students to successfully meet the ever increasing expectations in volume of writing in school, (for discussion of relevant developmental theory see section 2.1.3, Directions in Contemporary Research, Chapter Two - from p.55.).

Successful fine motor outcomes were achieved by the infants trained teacher in School 6, who was well versed in the necessity of practising foundation fine motor skills with appropriate prewriting activities. As observed during four years of collaborative teaching by the researcher in this school, she did the usual activities such as having the children roll modelling dough into logs between their hands to then shape into letters and rolling small pieces between fingers to form small balls to dot the 'i's. She did unusual activities such as winding elastics between the children's fingers to be stretched in different directions. She did craft activities such as teaching the children to cross-stitch their names and numbers. But equally important developmentally, as with the computer screen being in the same spatial orientation as the child, the children practised writing on the classroom chalkboard. Unfortunately, besides the timetable crowding out a lot of fine motor practice, from the majority of classrooms observed in this study, classroom chalkboards are covered with examples of immersion in literacy rather than being available for foundational practice.

News time: The importance of news time was stressed by Cazden (1988), who wrote that it may be the only class time for children to speak in a conversational manner (more than just short answers), and to create their own oral texts without having to make connections to previous discourse. Of course, teachers can guide children's cognitive structuring of their news reports. One teacher was helping her class

understand the spatial and time concepts of 'where' and 'when'. The children would think ahead and preface their news report by saying, "I'm going to talk about when".

Another teacher (infants trained), who became an equal participant in news time, demonstrated that she obviously recognised the value of active engagement in the relationship between language and cognitive development. From initial Language screening results, this teacher noticed a complete lack of descriptive words. She modelled the news time process by telling her own stories and asked questions of each child, primarily regarding the attributes of things and actions mentioned in their stories, and encouraged the children listening to ask at least three questions of each speaker. This procedure, while primarily intending to enhance children's listening and visualisation skills, also helped them learn the appropriate school language scripts of asking and answering questions, the behavioural skill of impulse control, and the social skill of taking turns. And as Cazden (1988) pointed out, the children were also learning to speak at the same time to the dual audience of children and teacher.

Play: Currently, the fragmented kindergarten timetable usually precludes large blocks of time for imaginative play (either just observed or actively supported by teachers), which in turn supports the development of decontextualised language, social skills, general knowledge and problem solving. Classroom free-play usually occurs only for those children who finish their work. However, adults shape both the physical and human environment in which children play (Dockett, 1994) and a good example of a whole class strategy of teacher supported play was a teacher's imaginary bus ride with her children, attended by the researcher, with all the class chairs correctly organised (by the children) down the middle of the room.

That play episode took at least 45 minutes and included content from across the curriculum (eg. vocabulary, counting, giving directions, sight words, safety), and the children's experience (eg. home address, animals expected to see at the zoo, social skills). Such a language activity would be considered developmentally appropriate (eg. by providing individualised language and information scaffolds for the children), but can

also satisfy systemic reporting requirements (eg. as teachers observe and then record the children's emerging oral language skills). The teacher's role in various teacher supported play situations are described in the Dictionary of Classroom Practices, in the NSW English K-6 Syllabus (Board of Studies, 1994, p.196).

Children's make-believe symbolic play expands their representational thought by gradually separating thought from action and objects, and by communicating their growing understanding of reality in preparation for the later development of abstract reasoning, use of symbols, and appropriate personal relationships (Berk, 1994a,b &c; Cannon, 1999; Dockett, 1994; Gowen, 1995; Johnson & Yawkey, 1988; Rossmanith, 1997); skills required for reading comprehension. In a study in a summer program for parents and gifted children from minority and low income backgrounds (preschool through year three), parents identified child play with parents and peers as being a highly favourable activity for improving child behaviour and language, and thus increasing child maturity (R. Strom, Johnson, S. Strom & P. Strom, 1992).

"Instructional mediation ... (can adapt) instructional treatments in terms of the information-processing demands and degree of self-control required by students" (Wang & Haertel, 1995, p.170). The attitude of a mentor, providing mediated teaching, compels teachers to decide among developmentally appropriate practices, a skill-based curriculum with stated outcomes to be measured, and adherence to mandates and various constraints.

Self-Esteem:

Teacher effectiveness to help children feel personally successful (initially guided by the identification of developmental and learning needs), tends to depend upon their view of early childhood development, commitment to systemic policies, and view of self-esteem as being either a cause of success or result of achievement (Begley, 1998). When a traditional maturational view of development prevails in early childhood education, at whatever level - teacher, school, department - adults seem content to wait for positive

progress to emerge and with it, attending success. Others realise that if you want to make a difference, intervene. The maturational view has led to exaggerated policy which promotes acceptance of product, regardless of aptness or process, ostensibly in fear of damaging a child's self-esteem as in time, the child will learn.

Instilling and protecting children's self-esteem led to the establishment of a self-esteem movement arguing that self-esteem should be "a paramount goal of child rearing and education" (Begley, 1998). A prevailing concept has been that success is predicated upon a high level of self-esteem. Conversely, failure can be caused by low self-esteem, and low levels of self-esteem can be improved by self-help books and self-esteem courses or classes at any age. However, research has demonstrated that self-esteem can not be taught or vested upon children by constant praise and acceptance of product or behaviour which is not based on actual capability or perceived by the child as being competent and self-achieved (Begley, 1998; Duda, 1987; Feldman, 1994; Schoemaker & Kalverboer, 1994; Weiss, McAuley, Ebbeck & Wiess, 1990). In fact, Begley (1998) reported continued indiscriminate positive reinforcement can create unjustified self-esteem, a narcissistic attitude which constantly needs boosting and when the "real world fails to deliver", such unstable self-perceptions of always being OK, even wonderful, can result in low frustration tolerance and degrees of hostility and aggression.

Across the present study both views of self-esteem, being either a cause of success or result of achievement, were evident. With some teachers there was acceptance of all work produced in hopes the child will feel successful while awaiting positive progress, (usually in accordance with policy). For example, as witnessed by the researcher, daily, children would stand in a queue at the teacher's desk waiting for their written work to be stamped. The children would often look at each other's work with kindly, and sometimes unkindly comparisons. However, they all got the same stamps regardless of process, and went away for free play, as time allowed. For other teachers, individual differences were evaluated, process discussed by child and teacher, and competent value added recognised by child and teacher rewarded

accordingly.

Diener and Dweck, and Dweck and Elliot (cited in Weiss et al., 1990) said, "... success experiences alone are not sufficient to enhance self-esteem but, rather, the child must perceive that he or she was responsible for that success" (p.22). Sending a child to self-esteem class, or saying, as is often said about children who underachieve for whatever reason, the child lacks motivation and/or self-esteem, is blaming the child for the system's failure.

8.4.2 Parent Involvement

The present study showed that in some cases parent knowledge of screening results did facilitate parents' decisions helping their child. However, it also showed that parent action taken after screening firstly depended upon their knowledge of their child's screening results and then upon their knowledge of, and access to, information regarding early childhood development and education and access to individual diagnostic assessment and therapy services, and also, parents' relationship with their child's school. There were a few parents whose concerns prompted them to seek individual diagnostic help for their child at various times, but mostly later in the year.

Certainly a limitation of this study was lack of an appropriate reporting system of screening results to inform, support and facilitate parents' decisions. Although this aspect of the assessment program remained at the discretion of school policy, it seemed obvious to the researcher through informal discussion with parents and discussion at gatherings such as viewing the inservice video, that parents were keen to learn about contemporary theory and practice in early childhood, and as it related to their child (personal communication 1993-1996). A direction for future research would be to develop and implement effective assessment reporting and dissemination of information about early childhood development and education, to parents.

However in general, research shows that parents' undertakings to help their children

achieve are best served by active involvement in school. Positive effects identified from parent school involvement research, as reviewed by Wang and Haertel (1995), are:

- enhancement of student performance, achievement, and school attendance;
- children in adverse family conditions are highly likely to benefit academically and socially from family involvement in education-related programs;
- the degree of parent involvement is related to their sense of being informed and the extent to which they believe they can contribute to their child's learning;
- participating parents feel better about themselves and are more likely to enrol in courses to advance their own education;
- schools become more effectively organised when parents are highly informed, co-operative and involved.

Parent involvement programs include assisting parents to become better home educators, to become directly involved in school management and decision making, to collaborate with community organisations, and direct services to families ("Visit By", 1994; Wang & Haertel, 1995). Elements of parent program success include written policy (legitimising the importance of the program), administrative support (funds, materials, resources), staff and parent training, collaboration, communication (eg. in ethnic languages as required), and evaluation (Davis, 1989; Williams & Chavkin, 1989).

As a result of the present study examples of parent involvement programs included the collaborative teacher / parent Developmental Program at School 4, (see summary description, A1.7, Appendix 1., p.349). Another example is School 3's Outside Motor Program which ran every day and was structured to teach the basic motor skills of sustained motion, balance and rhythm. The children were flexibly grouped by level of function as initially identified by the screening, and then subsequently regrouped when required, according to teacher evaluation. Teachers had time to evaluate because two days a week, just after bringing their children to school in the morning, parents were rostered to lead various groups. This system freed teachers to work with individual children, and to evaluate and record progress. Two indices of the success of this

program were inservice help given to parents regarding explicit and systematic teaching of developmentally appropriate skills, and parent/teacher consultation regarding children's progress, (although teachers did all direct evaluation).

Another example of parent involvement was the Outside Motor Program at School 8 when parents were also rostered to lead various groups. However, initially in 1995, the parents were only given details about the materials for each activity and relevant rules. In 1996 School 8 continued their Outside Motor Program. As a collaborative effort between the teacher and the researcher, the Motor Program was rewritten to include: basic information regarding motor integration; teaching strategies; modified activities; and specific skill details involved in each activity to directly teach as required. An example of a developmentally appropriate skill that parents need to know is that these children should be taught to catch a ball in their hands, not trap it in their arms against their body (a much younger response). For a summary of this Motor Program see A1.8, Appendix 1. (p.350).

Other examples of parent involvement programs included a former Reading Recovery teacher in School 2, teaching parents to level children's books according to difficulty. Parents then devised and operated the kindergarten colour coded lending library. These parents were directly involved in school management by not only keeping track of the books, they kept track of which books the children had read and appropriate levels at which each child would experience success.

An example of a parent program that went (partially) wrong was one which was intended to allow the children to have hands-on experiences with maths activities, with parents attending different activity stations such as a large sand table for measuring volume and weight and a large water maze for boats to learn about displacement. However, the parents were given no inservice help, eg. about helping the children learn content-specific language concepts, and had problems with discipline. If parents or community helpers are ostensibly child-minders, the children do not progress and their behaviour becomes less than exemplary. Parents and teachers can get discouraged at

the lack of progress and the program is often discontinued with an 'I told you it wouldn't work' attitude.

A highly successful parent involvement program designed to help parents to become better home educators was run by School 7. The school acquired a reading program written by a government special education centre to teach parents how to understand and teach phonetic decoding skills to their children. This reading program, with weekly hand-out notes, had 35 parents / carers in attendance once a week for six weeks. Most parents / carers are very genuinely concerned about the welfare and achievement of their children and will become active contributors to their success, regardless of supposedly moderating factors such as low socioeconomic status (Goldenberg, 1982). Parent efforts can be significant. Tizard and Hewison (1982) reported highly significant and consistent improvement in reading achievement by children of all ability levels who received home reading instruction, with no comparable improvement in the control group who had received a lot of extra help at school. A direction for future research would be to determine, based upon a needs assessment of local students and parents, an effective format and strategies for parent involvement.

Within the frame of the research questions, this chapter has explored interpretations of contemporary issues in early childhood development and education, and educational measurement, in light of findings from the literature review and empirical research from this study. In each instance the relationship between theory and practice seems clear, although not always mutually supportive owing to a lack of mutual understanding, entrenched traditional views, and political policy.

CONCLUSION

The Teaching Cycle presented in the initial workshop notes for the present study (A1.3 Appendix 1., p.342), was: Assess (to identify), Program (to organise), Teach (to instruct), Evaluate (to monitor progress), Regroup (to ensure instruction suits current needs and resources). Within that frame, the principal dimension of the inquiry reported in this thesis was in the area of assessment, specifically: political, educational, family and child issues surrounding kindergarten screening (Chapter One); early childhood developmental and educational theory and research (Chapter Two); educational measurement theory and research (Chapter Three); and validation of The Kindergarten Screening instrument (Chapters Four and Five).

However, as argued in Chapter Three, while contemporary measurement theory in education still requires traditional validation techniques, it also requires consideration of the impact of consequential decisions based upon assessment results as part of the validation process. Therefore, the contribution of school entry screening to adding value to the academic and personal successes of kindergarten children, and potential affect on teachers and parents, were also considered within the scope of this inquiry (Chapters Six and Seven). Realities of theory in practice based in findings from the study for schools, teachers, children and their parents were discussed in Chapter Eight.

Study results indicate that while there is still wide consensus regarding typical developmental milestones expected for age, evidence from current research and measurement technology has revised theory regarding the relationship between development and learning. Strict biological and cognitive linear stages of maturation are no longer seen as universal or necessary precursors to learning. Some see development as contextually dependent and as a result of learning. For some, primary interest is more in the process of learning, instead of the achievement of product. According to Katz (1992), the maturation concept declares when children are more or less ready to benefit from formal instruction, while interactionists assert that it is the combination of inherent processes and experience which contribute to learning. According to Stone (1996), educationally appropriate teaching (as opposed to

'developmentally appropriate practice'), does not treat current performance as being at the limit of developmental function, but rather as a guide to academic advancement.

Because of the competent infant profile, prior-to-school child care experiences, and pressure from the downward push of academic curriculum into kindergarten, policy makers have hoped that children will successfully learn formal literacy and numeracy skills at a much earlier age than formerly thought possible. In fact, the Australian Education Union (AEU), based upon the study Towards a National Plan for Preschool Education, has called for the Federal Government to introduce a minimum of ten hours per week attendance by all four year old children (the year prior to formal school), at preschool (Jamal, 1999). The AEU is concerned about the seriousness of efforts toward literacy in early childhood education. Jamal reported that child care centres are facing more pressure to teach reading and writing while child care experts say that quality early childhood education should teach children the concepts needed to learn such basics, while the director of the newly established NSW Office of Child Care says child care licensing requires all centres to provide an educational component that promotes children's development. However, NSW licensing regulations only require a trained early childhood teacher when there are thirty children, (for a more detailed discussion of these issues see section 1.3.3, Chapter One, p.34).

The debate regarding when to start formally teaching literacy and numeracy must not overshadow the necessity to ensure that children have previously achieved foundation skills. For example, the segmentation and blending of sounds in words are two skills of phonemic processing. However, many children do not understand until directly taught that words are made of sound pieces (phonemes), and many teachers are not informed that children may have this problem. NSW policy makers seem to have side-stepped the fact, as stated by the Education Department of Western Australia (1994), that difficulties learning literacy and numeracy may result from delays and/or disorders in one or more of the following developmental ability areas: motor skills, visual-motor perception, visual / auditory perception, cognition, and language. (For an inclusive presentation of these ability areas as set-out for this study, see A1.1, Components of Typical Human Developmental and Learning, Appendix 1., p.304.)

Owing to the current academic orientation of the kindergarten curriculum and prevalence of attendance at day care and preschool, kindergarten readiness expectations have changed considerably. By 1990, Willer and Bredekamp had observed that when children enter kindergarten they are expected to have already acquired the skills that used to comprise the entire year's curriculum. [See sections 1.2 and 1.3 Chapter One, for detailed discussion of these issues.] Further, it would seem that (despite government funding cuts to child care probably impacting the quality of prior-to-school experiences), policy-makers of the kindergarten curriculum seem to assume that all preschool experience is optimal and that a given state of readiness has been achieved when children enter formal school.

However, reality can be the English speaking female child in the 1996 Sample of the present study, CA 4.6 on school entry. Her parents commented on their Parent Survey that they did not send their child to preschool because they "found it expensive ... we just joint [sic] the Playgroup once a week for 2 hours". The parent comment also expressed some worry that the child "can't handle the pressure ... and I like her to like go to school ...(but) I'm not pushing her to do something she can't handle at her age".

Horin (1999a) reported from research that while the home environment is the most significant influence on a child's social and cognitive development, the quality of non-maternal care determines outcomes for children. However, according to Horin (1999a) in NSW pressure is mounting from some in private industry, to weaken State standards regarding quality child care. Horin (1999b) quoted Adrian Ford, director of the Centre for Children at the Benevolent Society as saying: "Very little early intervention work has been done in Australia ... the need is huge and there are few services. But suddenly everyone is talking about it. So that's a good start" (p.4s).

Huffer (1999) reported the opinion of an Australian clinical family psychologist, that some parents send children to school before they are ready because the parents want the children to be entertained five days per week, while others hold their children back owing to readiness issues, which is creating problems for teachers in government schools. However, there was no suggestion of what abilities, skills or social attributes constitute being ready for school. In fact, school readiness depends upon child

competencies in relation to the prevailing school policies, teacher expertise, the curriculum, and outcome expectations.

Ability and skill entrance levels to the NSW kindergarten curriculum seems to assume certain foundation skills are in place, and if not, kindergarten teachers are advised to accept the product each child offers with positive reinforcement, and observe progress over time (in hopes the child will learn), or then retain the child until that elusive state of readiness arrives, at which time the child should learn and progress within the system.

Children who are developing typically, in conditions promoting resilience, seem to learn appropriate social skills and foundation skills for the formal learning of literacy and numeracy, sometimes even without being directly taught. However, as has been shown in the present study, based upon assessed developmental and/or learning needs, the teaching and practice of foundation skills need not preclude access to the academic curriculum and direct intervention achieves more successful outcomes. Early childhood teacher education needs to disseminate this information; which offers an area for future research.

Current systemic policy regarding the kindergarten curriculum is said to be predicated upon the need to ready this generation for the economic and technological requirements of the next century and the belief that child development research shows children can be academically successful at a younger age. However, it is not fair to then blame children for not learning what is expected by falling back on the traditional developmental explanation of immaturity or lack of readiness, when what is expected by the system does not reflect the full range of foundation skills and is not prepared to assess and identify or teach to the full range of children's individual differences. It is not fair to allow kindergarten children to continue to make mistakes in the name of retaining a positive self-esteem, to then possibly be faced with failure and remediation - as available. It is not fair to blame children with headlines such as "Today's kindy brat tomorrow's chronic drink-driver" (Larriera, 1995), when research shows that intervention can make a difference.

Further, it is not fair to blame teachers for not achieving academic outcomes in early childhood education, eg. with headlines such as "Teachers may be the real culprits for unruly children" (Sweet, 1997), when they have not been provided with appropriate resources and specific education in contemporary early childhood development, education and measurement. Equal access to assessment of each kindergarten child's independent school entrance level of developmental and learning abilities and skills, should be the universal first step to optimal learning in school. This situation accentuates the need for an urgent collaborative and pragmatic implementation of contemporary theory in practice to help all young children achieve to the best of their abilities, skills, and opportunities to learn in school, and in their daily lives.

Directions in future research identified from within this study include:

1. A collaborative school / parent extension to the assessment process described in this thesis, integrating screening with individual child diagnostic assessment by contracting community services and/or private specialists to come to school to assess and advise about those children for whom screening initially identified specific concerns (see section 8.4, Chapter Eight, from p. 282, for elaboration on this part of the assessment process).

2. An expansion of parent involvement with dissemination of contemporary information in early childhood development and learning for children prior to school and during school years K-3, and access to relevant services. In NSW there is no state legislated policy supporting parents regarding the readiness of children for school; although the Department of Education and Training offers the Early Intervention Program which is being expanded in scope and access [1]. In The United States, the second objective of Goal One, Education 2000, specifies that parents will be their child's first teacher, devoting time daily to help their child learn, and receiving training and support (Stief, 1993).

Stief reviewed exemplar American initiatives to support parents in compliance with Goal One, noting the attributes of several effective state and federal parent education programs as being voluntary, intensive, flexible, accessible, respectful of families,

culturally sensitive, and comprehensive. The report also noted these programs provide multiple delivery systems, staff reflecting the background of the target population, recruiting first-time parents and fathers as well as mothers, and use "well-developed curricula".

As a consequence of participation in the present study one school (in which usually all children are English speaking), felt so strongly about this area of concern that they decided to send home a child language survey for parents. This survey was devised by the speech pathology department of the local hospital community health services, with a total of 25 items in the areas of understanding, talking, sounds, voice and stuttering. Parents were advised under what circumstances, where and when, to ring the community service to discuss any issues. This is a positive example of a school, parents, and community services working together.

3. To generate and then investigate parameters of effective and pragmatic initial teacher training and professional education for early childhood teachers, consistent with contemporary theory and systemic policy. According to Spodek (1996) professional development should undertake to create conditions for optimal teacher growth and functioning. Spodek (1996) reviewed stages in a teacher's career from initial concerns for survival, through mastering and consolidation, to a level of competency when "teachers either settle into stale routines and become resistant to change or they become concerned with the consequences of their actions ... the impact they have on their students" (p.117). Responsive and effective professional development for teachers should reflect and respect their personal career experience and interests, beyond the usual inservice concerning implementation of current policy directives. In a study investigating how to close the gap between theory and practice in early childhood education, Shepard (1995) wrote that to make conceptually meaningful changes, teachers need: appropriate materials to try and to adapt; time to reflect and develop new instructional approaches; ongoing support from experts to learn and challenge the conceptual bases behind intended reforms. These identified areas of influence could provide a frame for developing training and professional education for early childhood teachers.

NOTES

1. [Introduction, p.2, Ch.4, p.143 & Conclusion, p.297] In 1993, the NSW Education and Training Foundation and the Australian Early Intervention Association (NSW Chapter), published a comprehensive training package for the NSW Early Intervention Service System presenting a multidisciplinary approach for the identification, education, and support for families of children with special needs age 0 - 6. The Manual contains, 'factors affecting identification', 'the process of identification', and fifty pages of Checklists of typical developmental milestones expected for age. The Manual states:

> "There is no debate in Australia or overseas about whether Early Intervention services should be available. It is accepted that there is a social, educational and moral mandate for governments, communities and individuals to ensure that Early Intervention services are provided" (p.4).

In August1998 the above early intervention association joined with state government organisations - the New South Wales (NSW) Department of Community Services and the NSW Department of Education and Training, under the auspices of the NSW Ageing and Disability Department, to launch The Early Intervention Coordination Project of NSW. This project intends to broaden the net to help children with disabilities, prior to school. For example, a state-wide an Early Childhood Infoline has been set up, for the cost of a local call.

2. [Introduction, p.7] For a compilation of developmental milestones in the areas of sensory motor (receptive / expressive), adaptive / cognitive, language (receptive / expressive), personal / social, see Twaddell (1994) *Evaluating Developing Learners I*. Sydney: The Learning Place - to be supplied upon request to the author.

3. [Ch. One, p.19 & Ch.8, p.261] The term 'whole child' is questioned owing to lack of consensus re definition. The term implies inclusion. However, "Conflicting interpretations may be located not only between parents and educators, but among educators themselves who are unclear about the parameters of professional responsibility and of social license" (Alloway, 1997, p.2).

Margaret Donaldson, Professor of Developmental Psychology, University of Edinburgh, thought of the whole child in connection with discovering the development and capabilities of children's thinking, within the child's context. She thought the traditional psychologists' approach of using standardised experimental unfamiliar tasks, usually in an unfamiliar clinical setting, to discover what a child understands, "needed to be augmented by observations of children in more natural surroundings" (Grieve & Hughes, 1990, p.2). She taught the importance of gaining a better understanding children's abilities if observed from the child's point of view, as well as an experimental one.

Catherwood (1994), Senior Lecturer, School of Early Childhood, University of Queensland, refers to the linking, or interdependencies of developmental domains such as language, social, emotional, motor and cognitive, as focussing on the whole child. Currently, this interpretation seems to be the more common. Conversely,

there are studies which are only concerned with "academic readiness" (Gullo & Burton,1992).

Peck et al. (1988), writing in a NAEYC policy monograph, spoke of kindergarten as development of the whole child by ensuring a love of learning, expanding general knowledge, the ability "to get along and reaching out to the world" (p.35). This interpretation is an earlier, more nebulous version, in reaction to the inappropriate practices of an academically oriented learning environment.

4. [Ch. One, p.21] In 1960 there were 2.3 million employed American women with children under age six, by 1988 this figure had risen to 7.1 million, with an expected two thirds of American infants and toddlers having working mothers by 1995 (Baydar & Brooks-Gunn,1991). In Australia, Brennan (1995/6) wrote that 45% of mothers with children up to age four, were working, and two thirds of mothers with children between the ages of five to twelve. Loane (1997) says about half the mothers with children under five are working.

5. [Ch. Two, p.49] Spatiotemporal, environmental conditions include position in space, speed and force, and also surface conditions. An example requiring movement organisation differences due to environmental conditions is jumping and landing on a trampoline or jumping and landing on the ground (Larkin & Hoare,1992). The task requirements of each action dictate different movement organisation.

6. [Ch. Two, p.51] Although Denkla and Roeltgen (1992) quoted the diagnostic criteria for DCD from the DSM-III-R, the criteria below are quoted directly from the American Psychiatric Association DSM IV (1994), in which the Diagnostic Criteria for Developmental Coordination Disorder (315.4), are as follows (pp.54 & 55):

A. Performance in daily activities that require motor coordination is substantially below that expected given the person's chronological age and measured intelligence. This may by manifested by marked delays in achieving motor milestones (eg. walking, crawling, sitting), dropping things, "clumsiness", poor performance in sports, or poor handwriting.

B. The disturbance in A significantly interferes with academic achievement or activities of daily living.

C. The disturbance is not due to a general medical condition (e.g., cerebral palsy, hemiplegia or muscular dystrophy) and does not meet criteria for a Pervasive Developmental Disorder.

D. If Mental Retardation is present, the motor difficulties are in excess of those usually associated with it.

7. [Ch. Two, p.71] An example of the wait-and-see catch-up strategy at policy level from the NSW Department of School Education (see Note 8.), can be found in their 1994 publication Ideas for Assessing and Reporting, Early Learning Profiles in which it is stated that teachers should not be concerned if children demonstrate the achievement of an outcome in one context and not in another. The reason given is that children do not always learn in predictable ways so just wait and collect evidence of achievement over time. The implication is that given time, the child will learn and achieve an expected level of function. Further, there is no suggestion that

the demonstrated achievement in one context and not in another may indicate a splinter skill, a possibility which ought to be investigated.

8. [Ch. Four, p.109] As of 1998, the NSW Department of School Education became the Department of Education and Training (DET).

9. [Ch. Four, p.111] Rural interest was exceptional, not only the topic but the out-reach aspect was most gratefully received. While it was logistically impossible to include the school furthest away, they were included as far as requested, by post.

10. [Ch. Four, p.116] There are instances during the screening when cueing is actually encouraged to find out what the child can do with help, to determine if a weak initial response may be due more to lack of practice rather than a developmental delay or some other difficulty. These instances are explained in the manual and do effect scoring.

11. [Ch. Four, p.139] One country teacher offered further information regarding family details in a letter to the researcher about her class. Of 23 children: "five had parents with tertiary education qualifications (22%); four had parents with Year 12 secondary education (17%); nine children came from single parent families (39%); most other children had non-working parents ie home duties, or Social Security". [see if can match this to any city info. eg. fr. bureau of stats]

12. [Ch. Five, p.154] The reference for this Checklist item is: Quick Neurological Screening Test (1989), Revised Edition. Novato, California: Academic Therapy Publications.

13. [Ch. Five, p.166] An explanation from some adults was that these no-face human figures were copied from a baby doll character on a television children's show, although not verified by the researcher with the children. If that explanation was true, these children would have good visual processing ability and, made a conscious decision not to draw a face on their human figure.

The mother of one of the "no-face" children spontaneously told the researcher (on the parent survey and privately), her child has a particular interest in visual detail. This child also had recognised learning difficulties, (also acknowledged by his mother). The child is one who was individually taught by the researcher in school and in the researcher's privately sponsored after school motor program, (convened at school, after school). The child did have some recognised motor delay as identified by the screening results and concurrently confirmed from individual assessment by a developmental physiotherapist with a standardised test of motor ability.

The intent here is not to suggest the motor delay or other learning difficulties were the cause of the no-face human figure this boy drew, but to accentuate the suggestion that further investigation would be appropriate in this case and also for the others, owing to the unusual and infrequent circumstances. For example, in the Combined Samples, 73.5% of males this boy's age early in the year drew a mouth, with 82.% late in the year. 87% of all children in the Combined Samples drew a mouth early in the year.

14. [Ch. Eight, p.264 & p.271] Brody and Mills (1997) cite three subgroups of gifted and learning disabled (LD) children:

A. Students who are recognised as being gifted but who, due to their LD difficulties, do not achieve to perceived potential and are labelled as underachievers, and even lazy.

B. Students whose learning disabilities are sufficiently severe to be recognised, but whose exceptional abilities go unrecognised.

C. Students whose mixed abilities mask each other and who appear to be functioning "reasonably well", usually at grade level and not seen as having special needs, but who are performing below their potential.

15. [Ch. Eight, p. 269] Within the same remarks about the system, the AP also said that computers and printers in every kindergarten classroom were justified as they were a one-off expense and impressive for parents; although the children were receiving very little teaching with computers. One of the five kindergarten teachers in that school voiced her opinion to the researcher that the computers were just technology for the sake of show, and the money would have been better spent on support resources for children.

APPENDIX 1. - RESOURCES

Note. Checklists, the Paper/Pencil & Reasoning Worksheet, Cutting Paper and Class Record Form for The kindergarten Screening are available upon request to the researcher.

A1.1 - Components of Typical Human Development and Learning

The PROCESS OF LEARNING: attending to, receiving, processing, organising and storing information from the physical world, and responding

I. **Process**

A. **Input** - reception
1. internal and external information gained through the senses eg. tactile perception
2. visual, auditory and motor perception and discrimination
3. understanding language - oral / manual / written

B. **Organisation** - association, memory and sequencing
1. receiving and arranging information, storage and retrieval
2. visual, auditory and motor memory and sequencing
3. reasoning
   a. conceptualising, sorting, categorising, synthesising
   b. developmental sequence for understanding = concrete level (hands–on / 3D), to representation (pictures / 2D), to symbolic, to abstraction, to level of mental operations (visualising)
   c. analysis of feedback and amended response
   d. ability to generalise and transfer

C. **Output** - responding
1. responses = visual motor and/or auditory motor integration
2. expressive use of language - oral / manual / written

II. **Affecting Variables**
A. inherent - medical, physical, neurological, cognitive
B. environmental - home, culture, community, experience
C. impulse control
D. attention / behaviour
E. self-concept / motivation

ABILITIES and SKILLS: using developing motor, visual and auditory abilities to process information and integrate skills to create, store and produce appropriate responses

I. **Motor Ability**
A. motor planning - conscious imitation or random happening of a motor pattern, practised, remembered and sequenced until the response is automatic eg. tying laces, riding a bike, drawing, taking dictation, dancing
B. body image / awareness - position in space, (direction eg. up/down/between); laterality, (left/right); position in time, (motion / speed)
C. gross motor - use of large muscles developing from the body centre to the extremities; balance (postural stability); co-ordination; strength
D. fine motor - use of small muscles eg. hand grasp, finger/thumb opposition and release; dexterity; strength; tactile discrimination

A1.1 cont.

NOTE: All Motor Acts Involve:

1. patterning - ability to preform an action by imitation, or with visual and/or auditory or physical cuing
2. memory - ability to automatically and consistently perform actions without cuing
3. sequence - ability to perform actions in combination with other actions necessary to successfully complete a task; motor integration

II. **Visual Ability**

A. perception
   1. seeing colour, shape, size
   2. focus; maintain gaze; tracking from one object to another; tracking in all directions

B. discrimination
   1. learning similarities and differences between attributes eg. colour and shape
   2. figure ground / closure - the ability to pick out desired shape from any background, (the affect of conflicting visual stimuli)

C. memory - consistently correct identification and comparison eg. of shapes and symbols no matter what the size, colour or placement in space

D. sequence - gaining meaning from specific ordering of things seen eg. spelling, reading words or music notes

E. visual motor integration - following written / graphic directions, eye hand / foot co-ordination, writing, drawing, crafts, playing the piano by reading the music notes, typing

III. **Auditory Ability**

A. perception - hearing and locating the direction of sound; tracking sound

B. discrimination
   1. learning the similarities and differences between attributes eg. volume/tone/pitch of the voice, rhythm and duration of sound
   2. figure ground / closure - the ability to pick out the desired sound from any background, (the affect of conflicting auditory stimuli)

C. memory - consistently correct identification and comparison of sound no matter what the duration, intensity or direction

D. sequence - gaining meaning from a specific ordering of sounds/words, music

E. auditory motor integration - speech, with accurate and clear sound production / articulation; following oral directions; singing; playing the piano 'by ear'

A1.1 cont.

COMMUNICATION and COGNITION: using all forms of language as a tool to receive, compare, evaluate, and integrate new and stored information and expressively convey meaning

I. Comprehension - understanding meaning from speech, grammatic structures, vocabulary, concepts of space and time, voice inflection, body language, gesture, and from representation eg. writing and the arts

II. Verbal Expression - using oral and written language to convey meaning

III. Manual Expression - using physical expression to convey meaning eg. gesture, body language, pantomime, art and crafts, music and dance

PERSONAL/SOCIAL: achieving successfully as an individual and as a member of communities

I. Personal Development
   A. self-care: dressing, eating, hygiene
   B. work habits: attend, work independently, complete tasks, take direction, take initiative
   C. emotional development: impulse control, accept responsibility, accept criticism; adapt, be empathetic

II. Social Development
   A. ability to contribute to a group
   B. willingness to listen while others are talking
   C. willingness to share, take turns and play by the rules
   D. accept diversity

A1.2 - pages 307 - 338 Note. Spacing has been altered to suit this document.

THE KINDERGARTEN SCREENING MANUAL

OUTSIDE MOTOR ACTIVITIES: Checklist Items 1 - 9

Place the children into four groups according to their classroom table groups for ease when doing the pencil and paper worksheets. The Outside Motor activities are done with two groups of children together, at the same time, taking about 45 minutes to complete. When the first two groups are finished, they shift with the two inside groups, (who have been doing the Language and Fine Motor Activities).

Both the Outside Motor groups can do Items 1 - 5 together. For Items 6 - 9 it is better to work with one group at a time, shifting the groups item by item. The waiting group will usually stay quiet and not distract, (although another adult to maintain order can be helpful). Encourage the waiting group to rest and to watch so they will know what to do.

Two adult evaluators are required. One evaluator works with the children while the other evaluator holds and marks the Checklist. The evaluators should confer about the quality of responses, eg. if an action is easier for the child on his/her left or right side. Copy the specific Outside Motor directions and scoring criteria from the master provided, to have available with the checklists. *Scoring criteria must be followed, to uphold consistency and fairness in scoring.*

One evaluator instructs and/or demonstrates each item for the children, keeping the children moving quickly through each activity. This evaluator must give full attention to each child as each child does each activity, always giving enough trials to be sure of each child's typical response. Age appropriate, spontaneous and independent function is the ideal response. In general, extra trials are to identify what the child can do with practice or help and if an improvement is seen, a plain tick (one point) is scored as the response was not spontaneous or independent.

The other evaluator: • records each child's marks on the Outside Motor checklist;

- maintains the order of the children doing the activities matched to their order on the checklist to ensure the correct mark for each child;
- watches the children's ages to ensure recording the correct mark;
- helps keep track of left and right responses.

1. WALK DOWNSTAIRS - use stairs with a hand rail and at least 4 steps so the children will get into their typical rhythm. If stairs with more than 4 steps are not available, have the children go up and down twice, consecutively, to see their most typical independent action. Start the children at the top and stand at the bottom encouraging each child to smile as they come down one at a time.

Note: If the staircase is long or unusually steep, some children may feel hesitant. Further, using a long staircase takes too much time.

Criteria for Success: walk down stairs with confidence and no hesitation, alternating feet and not holding onto the rail. Four-year-olds should alternate feet but may still hold the rail, at least to get going.

Comment: if a child descends one step at a time or needs to look at each step, mark with a dot at any age. If a child seems hesitant, the mark should be a plain tick even if the child does not hold the rail and alternates feet. The confident child will spontaneously step out, knowing where the edge of the step is and when to step down without having to constantly look, especially after getting started.

2. and 3. SKIPPING - use a long enough space for children to get going and to sustain their typical rhythm. To save time, skip all the children to one end of the space and then hop back. Demonstrate for the whole group and as required for each child. Take a child's hand to help get going if necessary, but this would not be counted as a spontaneous response. Note: Sometimes girls hold their arms straight at their side to hold their skirt down, do not confuse this action with body stiffness.

Criteria for Success: alternating feet, sustaining a controlled, well integrated rhythmical action. Four-year-olds may have a one sided skip (step-hop pattern one side only, but not a gallop), but should have good co-ordination and rhythm.

Comment: if there is excess motion of arms, head, or body to get going or to keep going, or if the body seems stiff. Sometimes children need a running start before being able to achieve their typical action - which is not an automatic response.

A child may alternate feet to score a slashed tick for No.2, but may have upper body stiffness and/or not show rhythmical co-ordination, so the mark for No.3 should be a tick or a dot depending on degree of awkward action - especially at the end of the year.

4. and 5. HOPPING - demonstrate for the group including changing feet.

Criteria for Success: 5-7 consecutive controlled quiet hops off the front of each foot with very little effort and looking ahead. Arms may be used for balance but NOT flinging upward or around. Four-year-olds may only do 3 - 5 and may be less controlled.

Comment: if there is excess motion such as swinging arms to help get off the ground or to keep balanced. The problem can be lack of muscle power or poor muscle tone. Notice if left or right side is more controlled with better balance and rhythm than the other, which can indicate lack of integration.

Heavy sounding flat footed hops, often with the child looking down instead of ahead, indicate lack of control and excessive effort. Going too fast with big steps often angling off to the side indicates being totally out of control which should be marked with a dot.

6. and 7. BALANCE - be sure each child has sufficient space. Tell the children about how the trees just stand there, while demonstrating. Looking ahead, pick up one foot just off the ground in front of your body, quietly holding your arms to each side with bent elbows. For children who have difficulty, you can usually cheer them up by gently suggesting the wind must be blowing their tree. Stand very near each child holding your hands within reach to help the child if required.

Criteria for Success: controlled balance on each foot at least 5 - 8 seconds, looking ahead, with NO - falling over or using arms for counter-balance, or leaning forward, or tucking the raised leg behind the standing leg for stabilisation. Four-year-olds may be less controlled but should balance with little compensatory action.

Comment: if arms or legs are held at various extreme angles as counter balance to achieve or sustain balance - arms may be used to maintain balance but should be quiet. Notice if control is better left or right, which can indicate lack of integration.

Does the child need to look down to achieve or sustain balance - looking down limits the field of vision making it easier to concentrate on balancing. The child who can look ahead and maybe manage a smile while balancing quietly, is demonstrating an automatic controlled response without having to motor plan, to think about 'how to'.

8. CATCH BEAN BAG IN ONE HAND - use a bean bag filled with beans, NOT soft fill. Give enough tries with gentle tosses to be sure of the typical response. If the child continually misses, ask the child to try catching with the other hand. Children should not have to think about 'how to' catch, in order to concentrate on watching (visually track) the bean bag.

NOTE: Sometimes a disruptive child will calm down if given the responsibility of holding the bean bag until it is required.

Criteria for Success: controlled catch using the whole hand held away from the body (not trapping the bean bag against the body), at the body midline and at least to the preferred side.

Comment: L or R preferred hand. Record if - the child shifts hands when trying to catch indicating inconsistent use of a preferred hand; the child has firm whole hand control of the bean bag or has happened to snag the bean bag with one or two fingers; the child turns his/her head away in anticipation (showing an inability to judge the distance).

If a child is having difficulty watching the bean bag into the hand, step closer to the child to shorten the tracking distance; which the child may do spontaneously and which should be noted. To further check visual tracking ability, toss the bean bag slightly higher/lower or left/right, to see if the child adjusts looking, body and hand to the different position - eye hand co-ordination. Catching is easier on the preferred side.

When tossing left or right, notice if the child will cross the body midline with the preferred hand to catch, or changes hands for each side, avoiding the midline - which can indicate the child is not yet consistent with a preferred hand and may not have integrated control of both sides of the body.

9. THROW A BALL OVERARM - First offer the tennis ball to the child slightly out of reach at the midline, so as not to influence the child's choice of hand. If a child is having difficulty tossing, physically cue the child by placing the ball in the child's hand and gently guide the child's arm up and behind the head and then forward, to see if the child's arm/body feels stiff and the child still shows difficulty motor planning the action, (eg. how and when to release the ball and guide the direction of the toss). If the child quickly self-corrects, the initial problem may just lack of practice - which should be noted and scored with a tick.

If you are still unsure after giving help, lengthen the tossing distance between you and the child and encourage the child to toss the ball all the way to you on the full.

NOTE Rolling the ball back to the child usually saves chasing time. Sometimes a disruptive child will calm down if given the responsibility of standing behind the child currently tossing, to stop the ball and roll back to the evaluator, if it gets away from that child.

> Criteria for Success: consistent use of preferred hand to easily toss the ball overarm from the shoulder, starting behind the head, with slightly bent elbow and some step forward, but may have leg/arm same side. Throwing with leg/arm opposition and shift of weight is more an age six response. Four-year-olds may have less control.
>
> Comment: if a child is obviously still having to think 'how to' (motor plan); if the ball is pushed from a bent elbow and forearm extension - a more immature action. Record if the child shifts hands indicating inconsistent use of a preferred hand.

Rolling the ball back to the child usually saves time. However, If trying catching the ball (on return for the next toss), children may trap the ball against their body, which is a younger response. Age five and six can usually catch the ball in two hands only held away from the body. Notice if the child seems to startle as the ball comes near to catch, which can indicate lack of integration with a poor signal between eyes, brain, and hands. Check appropriateness of responses to other tasks requiring accurate eye hand co-ordination.

FINE MOTOR/EYE HAND/MIDLINE ACTIVITIES: Checklist Items 10 - 19

NOTE: Only Items 10 - 16 are done in the small groups. Copy the specific Fine Motor directions and scoring criteria from the master provided, to have available for the evaluator, with the checklists. *Scoring criteria must be followed, to uphold consistency and fairness in scoring.* Items 17 and 18 are observed when the whole class is doing the Worksheet. Item 19 is marked directly from the Worksheet.

Start the whole group cutting and as they work ask each child come to you individually for Items 11 - 16. If crayons and sticky tape are available, those who finish cutting often like to colour-in the cut strips and the spontaneously make a crown. Comment about the children who independently busy themselves, quietly staying on task.

10. USING SCISSORS - have double edged or left handed scissors available. Copy one page of cutting lines per child from the master provided. There are no specific directions for this item so as not to influence spontaneous responses. Simply tell the children to get started cutting on the lines, and you will ask each child to come to you to do some special activities.

Criteria for Success: smooth continuous cutting the preset straight and curved lines, with good co-ordination holding the paper. Four-year-olds may have less control holding the paper.

Comment: lack of co-ordination between hands; awkward scissors grip, sometimes with frequent adjustments; false starts; jagged edges; tearing the paper; frequently turning the paper instead of using the holding hand to guide the angle of the paper. Sometimes a child may turn the paper to start from the other end which can be very practical, but the cut edge should still be smooth.

11. and 12. SCREW BOTTLE TOP ON/OFF - use a plastic container with a handle and small screw top for items 11-14. Be sure the top is not screwed down excessively tightly or misaligned. Ask each child to come to you and before the child sits down, hand the child the bottle to lessen the opportunity to rest or anchor the bottle, showing less control.

Criteria for Success: for each hand, the co-ordinated, integrated action of easily taking the top on and off with the fingers and thumb of one hand while controlling the bottle in the other hand, not resting the bottle against the body for support, accurately and easily aligning the top on the bottle.

Comment: if the child needs to use the whole hand to manipulate the top, or even hold the top still and turn the bottle (for a dot) - showing a lack of finger dexterity; if the left or right hand is more efficient. Sometimes children steady the bottle against their body for control - showing a lack of dexterity and/or strength, and/or co-ordinated controlled use of both hands.

The child may use hands and fingers appropriately but have trouble aligning the top which can indicate a problem with eye-hand co-ordination and/or lack of attention - mark with a plain tick. If unsure have the child repeat the task saying, "watch what you are doing".

Also watch for facial activity, eg. an open mouth and/or tongue moving out of the mouth, indicating excessive concentration is required to integrate and co-ordinate this task - mark with a dot.

13. and 14. PICK UP AND RELEASE - use objects small enough to easily fit into the plastic bottle, (but do not use round objects as they are often dropped and take time to retrieve). Sit the child opposite you or at least on a corner. First tip out the objects at the child's body midline to note child's choice of pick up hand. Then shift objects both right and left with the bottle on the opposite side (held straight up and slightly out of reach), to note the child's adjustments.

> Criteria for Success: for each hand, easily pick up each small object with index finger and thumb and then accurately release it into the bottle held just out of reach (by the evaluator) left, right, and centre, easily crossing the body midline and not missing the target by reaching to far or not far enough.
>
> Comment: if the child uses several fingers to pick up; if the child shifts the objects from hand to hand when picking up on one side to release on the other side, or picks up using which ever hand is nearest the objects, indicating an avoidance of crossing the body midline and/or lack of preferred hand. Excessive facial activity can indicate the actions are not automatic and require excessive concentration.

15. and 16. FINGER/THUMB CIRCLES - **First practice this action (in front of a mirror) to be sure you are modelling *finger tip to thumb tip circles with 3 consecutive repeats of the pattern.*** Model the action keeping both your hands up by your ears, out of your sight. SAY, "looking - hands up - watch - touch each finger tip to your thumb to make a circle 3 times with one hand and then try 3 times with the other hand." Encourage the child to keep going ... praise their effort ... if necessary say, "and again" ... "don't look, you know where your fingers are" ... "now the other hand". If the child starts while you are modelling, say, "wait, watch, my turn first".

If a child is struggling to understand your words, use hand signals, eg. if the child starts before you are finished modelling, hold your hands flat against their hands to stop their action and repeat "watch". Further, when you make the first circle with the finger tip and thumb of one hand, run the index finger of the other hand around the circle to exaggerate the round "circle" shape.

> Criteria for Success: with each hand placed beside each ear, same side and out of sight, one hand at a time automatically and independently touch each finger tip to thumb tip forming a circle, sequencing from index finger to little finger without looking, smoothly and quickly repeating the complete pattern

three times. Four-year-olds may need to look sideways at his/her hand and may not efficiently repeat the pattern 3 consecutive times. Adequate responses after extra prompting should be marked with a tick.

Comment: on confusion in sequence; overflow action in the opposite hand, (the opposite hand should remain held up, but motionless); any tongue action, or evidence of tension or twitch; touching finger and thumb pads instead of tips showing less control; having to look at the hand eg. bringing the hand forward into peripheral vision - all indicating poor muscle-directing capacity to easily and automatically isolate action in one hand necessary to control delicate fine motor tasks eg. writing or sewing. An even less mature response is when the child turns a hand around (facing the child) to look directly into the palm of the hand - mark with a dot.

17. FOLD PAPER AND CREASE - observe during the Worksheet activity.

Criteria for Success: a co-ordinated effort using both hands to align corners and edges of the paper and to firmly crease, creating the 3 sections as directed.

Comment: on false starts; difficulty visually aligning the corners and edges - eye-hand co-ordination; insufficient dexterity to successfully complete the task, eg. using the forearm to make the crease. Further, notice if difficulty seems more an inability to follow directions eg. not understanding the language or lack of attention, or a combination of language, attention, and visual motor factors. However, language should not be a factor as children can copy the action from others.

The child may use hands and fingers successfully, but may not have aligned the corners properly and sometimes end up with extra sections in an attempt to compensate. NOTE: After trying, if a child is obviously struggling and distracting others, an evaluator may help (recording help was given and mark with a dot), so the child can attend to the next directions.

18. PENCIL GRIP - observed during the Worksheet activity.

Criteria for Success: the standard tripod grip with pencil lightly held between thumb and index finger, resting on middle finger, with no wrist tension or stiff fingers.

Comment: note preferred hand, or if a child shifts hands, (which is unusual); record the nature of an atypical grip, eg. two fingers over the pencil. Any fisted grip is marked with a dot.

If the pencil grip is awkward and writing poorly controlled, look at other fine motor and eye-hand activities for difficulties, especially the finger/thumb circles and bean bag catch. The child who has to think about 'how to' control a pencil, which takes space in short

term memory, can not thoroughly attend or concentrate on the task.

Heavy, dark pencil lines or uneven lines (light / dark / wobbly) can indicate tension in fingers and wrist when gripping the pencil and inappropriate pressure using the pencil.

19. PENCIL STROKES - evaluated directly from the Worksheets, when they are marked.

Criteria for Success: continuous lines drawn with even pressure, which are not excessively light or dark or wobbly, indicating the child does not have to think about 'how to' control the pencil.

Comment: on false starts; wobbly lines; a combination of light and dark lines - all indicating lack of pencil control; continually turning the paper to change direction of the stroke, eg. when colouring in the stars (with their pencil) for No.45. Very dark, heavy strokes can indicate physical and/or emotional tension.

LANGUAGE ACTIVITIES: Checklist Items 20 - 32

NOTE Copy the specific Language directions and scoring criteria from the master provided, to have available for the evaluator, with the checklists. *Scoring criteria must be followed, to uphold consistency and fairness in scoring.*

For the language speaking items (22-32), notice articulation difficulties and mark for Item 29.

20. UNISON RHYTHM CLAPPING - Children and evaluator do this activity together. The evaluator starts and continues a sequenced clapping pattern of five claps, with the children and evaluator clapping at the same time, (eg. quick - quick - quick - slow - slow). Consecutively repeat the pattern long enough to identify each child's response. Be sure all the children have a clear view of your hands.

Criteria for Success: to initiate and rhythmically sustain the sequenced clapping pattern.

Comment: ability to initiate and sustain pattern and/or rhythm, indicating ease in processing and responding to this combination of auditory and visual information.

21. SINGLE CLAP PATTERN - individually model a different single 5 clap pattern for each child, once, in any quick-slow combination (eg. slow - quick - quick - quick - slow). Remember the immediate pattern to repeat same if that child needs a second try.

Criteria for Success: to appropriately copy a single 5 clap sound pattern on the first try.

Comment: if a child needs a second try and is then successful, mark with a tick.

NOTE: for Items 20 and 21, if children have difficulty with a 5 clap pattern, try a 3 clap pattern (eg. quick - quick - slow), as they may not be able to process and sequence 5 sound parts. However, the 3 clap pattern should not be repeated and if successful scores a plain tick, anything less should score a dot. As time allows try these Items with the children's eyes closed to negate the visual information, to determine skill processing only auditory information. These items show ability to segment and blend sound parts, with the advantage of visual cues.

22, 23, and 24. TELL 1st & LAST NAME, AGE/B-Day Month, and HOME ADDRESS - these Items should be asked in a conversational manner; they ask for survival information which every child should recall automatically.

Criteria for Success: For full credit children should respond with full name, how many years old and month of birthday, house number, street, and town or suburb. Sometimes children know their phone number and not their address (which should be verified), to be credited with a plain tick.

Comment: if child is hesitant, indicating a possible problem with auditory memory and/or sequencing; if prompting is necessary to elicit last name give a plain tick - if last name is not given mark Item 22 with a dot. Find out if the child has recently moved and therefore may not remember home address.

Articulation errors can be due inappropriate auditory discrimination and/or not knowing the motor characteristics of producing certain sounds. Some English sounds don't exist in other languages such as the English /l/, in Japanese. The physical production of some sounds may need direct teaching, even for English speakers.

Saying /f/ sound for the /th/ in 'three' and 'with' is quite common for ages four and five, so should not be considered a problem, although should be noted for corrective practice.

25, 26, and 27. RECITE A RHYME OR SONG - invite each child to tell a rhyme or sing a song. Give the child time to think to see if the child has the ability to recall and remember a piece, and the confidence to spontaneously recite it. If the child remains hesitant, suggest a familiar piece to encourage a response. Invite ESL speakers to recite or sing in their first language, which can demonstrate confidence, speech rhythm, and memory.

Criteria for Success: confident spontaneous reciting, accurate speech rhythm, and accurate sequencing of the words in the piece recited. More than one prompt to elicit a piece should be scored with a tick, assuming the piece is then delivered correctly.

Comment: if the child struggles to remember; gets words or phrases out of

sequence; mispronounces letter sounds/articulation, (include for response to No. 29); inappropriate pacing - starts and stops in the wrong places. Looking to the ceiling is usually a clue the child is having a problem remembering the words and/or sequencing - trying to visualise what must be said next.

Sometimes children make up a song or joke, often delivered with good articulation and rhythm. This shows a good measure of creativity and adaptive behaviour, but can be an attempt to cover trouble accurately remembering what they have learned, or maybe never learned.

28, 29, 30, 31 and 32. THREE COMPLETE SENTENCES - ask the child in a conversational manner, "What did you do yesterday after school?" The main idea is to set the scene in the immediate past (being easier to remember), to see if the child receptively processes the grammatic structures accurately and expressively responds with appropriate structures. Appropriate use of the future verb tense is more an age six response. A complete sentence must have at least a subject and a verb, and usually an object - not just a phrase.

Criteria for Success: at least 3 complete sentences with appropriate articulation and grammatic structures. A child may respond with complete sentences but may need help with the other factors such as some prompting for descriptive words - although appropriate responses after more than one or two prompts, should be marked with a plain tick as they were not spontaneous.

Early in the year children should be expected to spontaneously use at least one descriptive word: an adjective to describe such as a colour, or for comparisons - "this apple is bigger"; or adverbs to describe function - "he runs quickly / she swims fast".

Comment: if prompting is necessary to elicit a response; if the child responds only in phrases instead of complete sentences; record articulation errors; if verb tense is wrong (if the form of the verb does not match the time sequence eg. "yesterday I play after school"); if the form of the verb does not match the noun/pronoun (eg. "the dogs drinks ... / he drink ... / they was"); use of descriptive words - use of descriptive words indicates good visualisation..

NOTE: have regard for the language experience of each child, especially if English is not the child's first language. However, English speakers also have language difficulties which often go unnoticed as adults tend to assume English speakers automatically have appropriate language skills. Children tend to watch a lot of television which broadens their vicarious experiences and receptive language, but lessens time available for expressive oral language. Listen carefully to all the children, equally evaluating their language skills without bias.

PENCIL / PAPER and REASONING: Checklist Items 33 - 46, and Fine Motor/Eye Hand Checklist Items 17 - 18, and Personal Checklist Items 47 - 50.

Have one writing pencil available for each child. When crayons or coloured pencils are within reach some children waste time making decisions about which colour to use. Further, the children should use the pencil with which they are expected to do their daily written work. Copy one Worksheet per child, front and back, from the Master provided.

The Worksheet is presented to the whole class together, just after recess when the children should be refreshed. If the children are grouped according to their table groups, they can sit in their own seats and their names will correspond to their order on each checklist. Pass out the papers when the children are seated as the children play with them if left within reach. Place the papers with the snails looking at the child. As the papers are passed, talk about the snails to draw the children's attention to them.

A teacher instructs the children using the specific directions copied from the master provided. When instructing the children, hold the model worksheeet and copy forms in front, facing the children, with the directions behind, facing you.

The copy forms are easier to handle if pasted onto a piece of cardboard. Further, the copy forms seem easier for the children to see if cut-out and pasted onto a light green piece of cardboard, as was done during the research.

The teacher giving the Pencil and Paper directions may need to stop at different table groups when giving directions as all children may not be facing front. All the children must have an equal chance to see and hear, especially for the copy forms. However, continued repetition of directions, eg. more than twice, encourages children to not listen and their responses are certainly not spontaneous.

The evaluators observe the children as they work, using the Fine Motor Checklist to mark and comment upon Fine Motor items 17 and 18, and the four Personal Characteristics, Items 47-50, (which are separate, but on the same checklist). The pencil and paper items are marked on their own Checklist, when time permits.

Evaluators stand behind the children to observe their behaviour (not sitting on the edge of a table group), and must resist the temptation to prompt. The assessment is meant to identify spontaneous responses and what each child can achieve independently. Evaluators should comment on any behaviour which might affect learning eg.: when writing a child's head is held on one side or down on one arm; a child constantly repeats directions audibly and/or checks with another child; a child who can't sit still. See Personal Characteristics scoring criteria for further comment.

Immediately as the children are finished (about ten minutes), the evaluators should be sure each child's name is legible and if not, write the child's name on his/her paper.

Evaluators then quickly collect the papers as sometimes children try to change or add onto what they have written after looking at other papers. The papers should be attached to their corresponding set of checklists.

If children copy from other children simply record appropriately on the Checklist, eg. as a COMMENT within the Personal Characteristics Category, (Items 47-50). Some items are meant to be copied (name, numbers, always copy forms), especially early in the year. However, if Items 39-41, or 43- 45 were copied, record either on the Checklist or on the child's paper as these Items reflect reasoning as well as the visual motor response.

The actual Worksheet figures and writing strokes are marked directly from the children's papers. Notice if letters, numbers, or copy forms are drawn in parts as the child may not discriminate the figure as a whole and will need some help to learn about the sum of the 'parts' equalling the 'whole', and then how to write the whole figure. Broken lines can also indicate lack of pencil control.

17. FOLD PAPER AND CREASE - Each folding action is demonstrated as the direction is given. Be sure all the children can easily see the model worksheet. Enlarging the Model worksheet to A3 size paper and attaching to an easel, may be of help to the children.

Criteria for Success and Comment: see Fine Motor scoring criteria.

18. PENCIL GRIP

Criteria for Success and Comment: see Fine Motor scoring criteria.

33. WRITING NAME - at the beginning of the year the children may copy their name if necessary eg. from their name tag if stuck on their desk.

Criteria for Success: while letters may be large, with reversals, but should start from the left side of the page, be appropriately sequenced, and be of similar size. By the end of the year names should be written from memory, starting with a capital letter and appropriately sized small letters for the rest of the name. Most letters should be written in a continuous line, such as 'a', 'g', and 'e'.

Comment: if letters are different sizes; turned different directions in space - upside down and/or reversed; in the wrong sequence; letters omitted; letters written in parts. By the end of the year watch for mixed capital and small letters and letters still written in parts. Occasionally children mirror write - reversed letters sequenced right to left.

34. WRITING NUMBERS - eg. numbers 1 - 5. At the beginning of the year, show the children where some numbers are displayed in the room to copy, as required.

Criteria for Success: numbers may be large, with reversals, but should start from the left side of the page placed horizontally across the page, be drawn

in a continuous line except for 4 and 5, and be of similar size. Responses should clearly demonstrate knowing the difference between letters and numbers. By the end of the year numbers should be written from memory.

Comment: if figures are turned different directions; if letters are mixed with the numbers; if scribble marks are supposed to be numbers; if numbers 6, 8, or 9 are drawn in parts.

35, 36, 37, and 38. COPY FORMS - do not influence placement of the shapes on the paper beyond the direction given. These items are meant to be copied so be sure all children have a clear view of each model. Present the shapes in the following order: circle, square, triangle, diamond.

Criteria for Success: drawn in horizontal orientation sequenced from left to right across the page. Placing the shapes in a vertical orientation, one under the other, is more typical of younger children and should be marked with Spacing, Item 46. Also, placement 'beside' the child's name is scored with Item 46. For further details see Pencil and Paper scoring criteria, either early or late in the year as applicable.

39, 40, and 41. CONCEPTS OF POSITION IN SPACE - do not influence the children's spacing of figures drawn beyond the directions given.

Criteria for Success: placement of figures in relation to each other must be as directed and in their correct number, (2 trees, 1 flower, 1 cloud). Placement and orientation on the page should be scored for spacing, Checklist Item 46.

Comment: if a child copies the responses of another. Drawing a 'clown' instead of the 'cloud', or more than one flower or cloud, gives information about auditory discrimination and/or processing grammatic structures for singular/plural (receptive language), for English as well as ESL speakers.

For these items difficulty with receptive language would probably cause inappropriate responses and should be commented upon so children are not unfairly marked. Further, if responses are inappropriate, check the child's understanding of these spatial concepts with concrete, 3D materials. If difficulty still occurs, check the child's understanding by body position in space.

42. HUMAN FIGURE DRAWING - the bottom section of the children's papers should be empty if they have followed directions carefully, but this does not matter for scoring this item.

Criteria for Success: see scoring criteria for details, early or late in the year as applicable.

Comment: if the drawing is distorted and lacking in detail as this can

indicate poor body awareness - intuitive understanding of body parts, how they are all connected and what they do eg. eyes to see, ears to hear, muscles to feel. Further, heavy dark pencil strokes can indicate physical and/or emotional tension.

NOTE: for the following three Items evaluators should silently check to be sure each child's finger is correctly placed, moving fingers as necessary. Also notice if children copy from another and simply write 'copied' on their paper beside the copied figure or on the Checklist. Inappropriate responses at this level of representation (2D), may only indicate the child's independent level of thinking is still at the concrete (3D) level, in need of hands-on materials and direct observation with multisensory input for understanding. However, the child may accurately understand the concept.

43. 1:1 FOR COUNTING - items 43,44 and 45 are on the back of the worksheet.

Criteria for Success: drawing one circle around five flowers indicates the child can mentally identify one group of five and has specifically followed the direction. Any five flowers each within an individual circle mark with a plain tick as the child has accurately counted five - a response more common at the beginning of the year. By the end of the year the children can usually visualise a single group of 5 without verbalising as they count or using their fingers to count.

Comment: If the flowers are incorrectly counted. 1:1 correspondence for counting may not yet be automatic, at least at this 2D level. The difficulty could also be receptive language.

44. PATTERN RECOGNITION - it is important directions for this item be repeated at every table group.

Criteria for Success: to accurately process the oral direction, to recognise and analyse the shape pattern and to respond by drawing a single circle. Early in the year give a tick if the child shows some understanding of pattern and next, by drawing one square.

Comment: drawing a square/circle may indicate sequencing from right to left. Drawing more than one shape may indicate misunderstanding of the singular/plural grammatic structure. For those with an inappropriate response, check understanding of pattern and sequence and language with concrete materials.

45. 'SAME AS' COUNTING - this item may need repeating at each table group.

Criteria for Success: any two stars are indicated.

Comment: if more or less than two stars, or all the stars are indicated - the child may not have accurately processed the language; if work copied; if pencil strokes are heavy. Further, note children who turn their papers around to change direction of pencil stroke, indicating possible confusion with position in space.

46. SPACING - Typically at the beginning of the year figures may be large, with reversals, but should be in their own space with no overlap or go off the page.

Criteria for Success: figures in horizontal orientation (not vertical - vertical orientation is more typical of younger children), evenly sized and evenly placed over the whole page as directed, with each figure in its own space. Figures should be sequenced left to right, starting from the left side of the page and continue from top to bottom. By the end of the year figures should certainly be placed as directed eg. name (top left), numbers (under name) and copy forms (beside name), etc.

Comment: if figures are drawn only on one side/corner of the page as this can indicate one eye is more dominant, the eyes may not be working together and/or avoiding crossing the vertical body midline;

if figures are drawn in pieces which can indicate the child does not perceive or discriminate the figure as a whole unit;

if the figures are not drawn in the appropriate sections of the paper but are appropriately spaced to each other, which can indicate the child did not understand and/or follow the directions;

if scribble numbers are drawn in the correct section, the child understood and has followed directions, but has no idea how to write numbers;

if the figures are poorly organised in space, eg. run into each other, are over size or of uneven size, which can indicate the child still needs help getting physically organised and controlled in space - check with successes for their Outside Activities and Fine Motor control.

47, 48, 49, and 50. PERSONAL CHARACTERISTICS which directly effect learning - to be marked during the Worksheet session for each child: Working Independently (47); Following Directions (48); Attending Quietly (49); Completing Tasks (50).

Criteria for Success: the child is able to quietly sit comfortably still and attend long enough to process directions and confidently complete each task, not talking out or checking with or distracting other children. See specific scoring criteria.

Comment: if the child is fidgety, agitated or lethargic, quiet or talkative,

confident or asking for help, willing to try; repeat directions; does the child self-correct if required.

Is the child's inability to cope due to a problem with receptive language and frustration with not really understanding what to do? Can the child effectively filter out extraneous noise, focussing on the teacher's directions? Is the child distracted by others? Are the children too busy with coloured pencils to attend, listen for and accurately follow directions?

SCORING

1. **Screening Checklists:** The Paper/ Pencil Reasoning (PP&R) worksheets are marked on the PPR& Checklist, with folding and pencil strokes being marked on the Fine Motor Checklist. Then, for each screening category, count each child's points across each row, and record the sum in the scoring box at the end of the row.

- 2 points for each slashed tick (✗) - indicating the response was spontaneous, excellent quality and age appropriate or better;
- 1 point for each plain tick (✓) - indicating the response was spontaneous, fair to good quality and near age appropriate;
- 0 for each dot.

No partial scores are awarded, (plus or minus signs should be taken into account when programming).

2. **CLASS RECORD:** The Class Record documents total Success Rate, success for each screening category, and relevant comments for each child. Copy enough Record Forms to accommodate the whole class. Ten children fit onto one form. Fill in the children's names, ages (years and month eg. 5.1), and gender (M/F) .

In the first column, 'pts.', for each category, fill in each child's total point score for that category from the Checklist scoring boxes.

To find SUCCESS RATE (first column after the children's names), add together ALL the category points for each child. The sum of all category points = SUCCESS RATE. A perfect score for the 50 Checklist Items = 100.

The number in each category heading box = total points possible for that category. To find each child's percent of success for each category (second category column, '%'), divide the child's score by the total points possible for each Category and multiply by 100.

For example, if the child scored 12 points for Outside Motor Activities, divide 12 by 18 and multiply by 100, (66.6, or 67%). If using a calculator enter 12, divide by 18, then

enter the percent (%) sign. The resulting number = the percent of success for that category. Record percent to the nearest tenth, (44.46 = 44.5%).

The right section on the Class Record is COMMENT space to record specific comments for each child, written on the Checklists. These comments help explain the plus or minus marks on the Checklists and can be very helpful when programming, referring, and speaking to parents.

NOTE The spacing of the following scoring pages have been changed to suit this document. For evaluators during the study, these directions and scoring criteria were placed all on the front and back of single separate pages, per screening category.

DIRECTIONS and SCORING OUTSIDE MOTOR, CHECKLIST ITEMS 1 - 9

1. Walk Downstairs *Directions:* Stairs with a railing and four steps are usually enough to identify typical responses. Have the children come down, or go up and come down. Stand at the bottom and individually encourage each child to look up and smile as they come down the stairs. If unsure of the response, have the child go up and down twice, consecutively.

✗ = walk down confidently with no hesitation, alternating feet and not looking down after the first step (or two), and not holding onto the railing.

✓ = some hesitation; landing flat footed on each stair; *Four-year-olds* may still need to hold the rail.

• = one step at a time; unable to look up; uncontrolled walk - bounces / misses a stair / slips of the edge of a stair - if this happens, give the child another try, but score ✓ if improved.

2 & 3. Skipping *Directions:* use enough space for the children to initiate and sustain their typical action. Marks can differ for these items as legs may be correct but the rhythm awkward.

✗ = **2**- alternating feet, sustaining the step / hop pattern; *Four-year-olds* may have a one-sided skip with the step / hop only on one side, (but must be sustained). **3** - child looking ahead with controlled and consistent flowing rhythmical action; arms may swing in opposition.

✓ = **2** - self-corrects skip pattern and then sustains; some looking down. **3** - some arm action eg. pumping arms upward, to keep going; somewhat awkward rhythmical action; stiff or awkward legs eg. more straight in front of the body, but sustains pattern; flat footed.

• = **2** - galloping or any single sided high stepping awkward gait at any age; unable to initiate or sustain appropriate skip pattern or direction; needs to look down all the time. **3** - out of control; continuous arm action to keep going; stiff, rigid looking upper body.

4 & 5. Hopping *Directions:* Always move along near each child and be ready to help as sustaining action may be difficult and they may stumble. **SAY** and **Demonstrate** - "hop on one foot and then change feet when I say to". Mentally count 7 hops and then **SAY** - "change feet", (sometimes hand signals are helpful with the words). Direct change of feet more than once as may required, if unsure of typical response. Marks can differ for left and right.

✓ = 7 consecutive quiet hops off the front of the foot, for each foot, and looking ahead while maintaining balance and direction; *Four-year-olds* may do only 3 - 5 hops and may be less controlled.

✓ = at least 5 consecutive controlled hops; flat footed with slapping sound on landing, but sustains action; some circular arm action to initiate and sustain action; some counter-balance with opposite leg to maintain balance eg. with leg held in front of the body.

• = out of control eg. going too fast, big steps, angling off to the side; continuous large circle arm action to get off the ground and keep going; needs help to get off the ground.

6 & 7 Balance *Directions:* Tell the children about how the trees just stand there in the ground. **Demonstrate** look ahead & bend one knee by picking up one foot about 12 cm. off the ground, quietly holding your arms to each side with bent elbows. **SAY** - "I want to see how long you can stand just on one foot with your legs not touching. Don't start until I come to you." Go to each child and mentally count 8 seconds as they balance on one foot; then direct the change of feet and count again. Stand very near each child with your hands within reach to help the child if required. Sometimes the child needs to be cued to look ahead, eg. **SAY** "looking", but you can also physically cue by just a light touch under their chin.

✓ = stable sustained balance on each foot 8 seconds, looking ahead with NO holding the opposite leg against / behind the standing leg to stabilise, and NO falling over or counter balance (eg. arms or legs held at various angles front or back to achieve or sustain balance); freedom from obvious concentration to maintain balance; *Four-year-olds* may be less controlled, balance sustained 4-8 seconds, but should achieve stability.

✓ = balance 5 seconds; stable sustained balance after being cued to "look"; self-corrected stabilised balance; an obvious amount of concentration to maintain balance; slight counter balance with the opposite leg or arms, but quiet balance sustained.

• = unable to initiate, stabilise or maintain balance; excessive concentration and/or counter actions to achieve or sustain balance; unable to look up and maintain balance.

8. Catch Bean Bag in One Hand *Directions:* **Demonstrate** by dropping the bean bag into the middle of your other hand with an immediate whole-hand closing response to control the catch. Toss first at the body midline to identify the child's preferred hand. Then toss slightly left / right to see: if the child consistently uses preferred hand, crossing the midline (no shift of hands); if the child adjusts look and hand alignment to the different positions, (visual tracking - catching is much easier on the preferred side). **If the child is having difficulty:** cue the child with two or three practice trials by dropping the bean bag into the child's hand and try again, (an improved response scores ✓); move closer to shorten the tracking distance - sometimes a child will do this spontaneously and note 'poor tracking' in COMMENT space).

✗ = consistent whole-hand controlled catch with preferred hand held away from the body at the midline and on the preferred side, visually tracking well (watching the bean bag into the hand); *Four-year-olds* may have less control, especially to the side.

✓ = catch less controlled eg. mostly whole hand but sometimes snagged with fingers; good control at midline but less to the side, (indicating poor tracking); clear indication lack of practice may be the problem eg. if the catch improves with 3-5 tries and encouragement to use the whole hand, (note in COMMENT space); good control but shifting hands.

• = continuous missing or snagging catch with one or two fingers, delayed reaction; trapping catch against the body; obvious thinking 'how-to' catch indicating the response is not automatic (motor planning); stiffness in hand and/or fingers causing difficulty; head turns away in anticipation.

9. Toss A Tennis Ball Overarm *Directions:* **Demonstrate** - look ahead and take your arm well behind your head with bent elbow. Fairly slowly swing your arm forward straightening the elbow, showing the (pretend) ball release well in front of your body in the direction you are looking. The toss should come from the shoulder with a straight wrist, not a push from the elbow and/or flick of the wrist. Children who have played Cricket may toss with a straight arm from behind which is fine, if the ball release is well in front and directed.

If the child is having difficulty: cue the child by gently guiding the child's arm up and behind the head and then bring forward to show when to release the ball: to see if the child can self-correct or still has difficulty motor planning; to feel any persistent stiffness in the child's arm. If unsure of response after help, lengthen the distance and encourage the child to do a "big toss with no bounce", and you will immediately see the effect of the help.

✗ = consistent automatic use of preferred hand (no shifting hands), to easily direct an overarm toss starting from behind the head and finishing well in front of the body with some step forward; *Six-year-olds* step forward with the opposite foot on release of the ball, and shift of weight from back to front.

✓ = less automatic toss; clear indication lack of practice is the problem, eg. if the toss improves after 2 - 3 tries and/or the direct physical cue, (note in COMMENT space).

• = inability to motor plan 'how-to' toss and direct the ball; persistent difficulty after help eg. push toss from elbow in front.

DIRECTIONS and SCORING FINE MOTOR, CHECKLIST ITEMS 10 - 19

NOTE: *Items 10-16 are done in the Fine Motor group.* Start each group doing their cutting at the same time and as they work, have each child individually come to you for Items 11-16. If crayons and sticky-tape are available, as children finish cutting often they spontaneously like to colour-in the cut strips and make a crown. Items 17 and 18 are observed as children do the PP&R worksheets. Item 19 is marked from the PP&R worksheet.

10. Using Scissors *Directions:* be sure double edged or left handed scissors are available and a cutting paper for each child (master provided). There are no specific directions for this item. Simply tell the children to get started cutting on all the lines, and you will ask each child to come to you to do some special activities.

✗ = smooth continuous cutting lines with excellent coordination of scissors and holding the paper; no jagged lines or false starts; *Four-year-olds* may be less coordinated.

✓ = smooth cut edge; may have some self-corrected false starts; good coordination of scissors and holding the paper.

• = continued false starts; jagged lines; tearing the paper; poor coordination of scissors and holding the paper; frequently turning the paper.

11 & 12. Screw Bottle Top On/Off (left & right) *Directions*: as the children are cutting, ask each child to leave their cutting for a moment (or bring their cutting to be checked), and come to you. ***Before*** the child sits down, give the child the bottle to lessen possibility of child resting the bottle on the table - each child does 11 & 12 standing. Simply, tell the child to take the top off and put it back on again; and then shift hands.

✗ = for each hand - excellent coordination of holding the bottle in one hand while easily screwing the top on & off with only fingers and thumb of the other hand, easily aligning the top on the bottle to fit exactly; no resting the bottle against the body.

✓ = awkward coordination on either side; diminished finger dexterity; tries to use only thumb; some resting bottle against body to get started; one false start regarding alignment, but self-corrected.

• = supporting bottle against the body with holding arm, or on table; using whole hand for screwing top on/off; continued difficulty aligning the top on the bottle; not using one hand; excessive concentration eg. tongue out of mouth showing the action not automatic.

13 &14. Pick Up & Release (left & right) *Directions*: seat the child opposite you or at a corner so you can easily place the objects on the table directly in front of the child at the midline and then to each side. ***Hold the bottle straight up & slightly out of the child's reach*** to note the child's accuracy reaching with each hand. First tip out the objects at the midline. The hand first used is usually the child's preferred hand. Then shift the objects to each side, holding the bottle to the other side, to see if child will cross the body midline with the same hand. Then ask the child to try again using the other hand, again shifting the objects and the bottle.

✗ = for each hand - easily pick up each object with index finger and thumb and then accurately release it into the bottle (centre, left & right), easily crossing the body midline as required, and not missing the target by reaching too far, or not far enough.

✓ = diminished finger dexterity; self-corrects target aim or crossing the midline with the designated hand; pick up same side as objects but good aim and dexterity.

• = uses several fingers to pick up; shifts objects from hand to hand to pick up on one side and release on the other; reach continually missing the target; excessive concentration, eg. tongue out of mouth showing action not automatic.

15 & 16. Finger/Thumb Circles (left & right) *Directions*: **Face Child and Demonstrate** finger tip to thumb tip circles with 3 consecutive repetitions of the index finger to little finger pattern, unsighted. Place each hand beside your ear, same side, out of your sight. Move only one hand at a time. Do all 3 consecutive repetitions of the pattern with one hand and then, repeat with the other hand. **SAY** "looking - hands up - watch - touch each finger tip to your thumb tip to make circles, 3 times with one hand and then 3 times with the other hand." If the child starts while you are demonstrating **SAY** "wait, my turn first". Encourage and praise as required, **SAY** "and again" / "don't look, you know where your fingers are" / "now the other hand".

✗ = with BOTH hands up each side by the child's ears while moving one hand at a time, easily make distinct finger tip to thumb tip circles, accurately repeating three consecutively sequenced patterns from index finger to little finger, for each hand, with NO looking and NO motion in other hand / fingers. *Four-year-olds* & *early Age 5* may have less control and may not be able to repeat the complete pattern three consecutive times. *Later Age 5* & *Age 6* should have no difficulties.

✓ = extra prompting; slightly flatter circles (more touching pad of fingers);

disrupted sequence of finger pattern but self-corrected; slight side peek at fingers; determined concentration.

• = *any one of the following*: overflow action in other hand; very flat circles; disrupted, incomplete, or confused finger pattern; direct looking at hands; excessive concentration.

17. **Fold Paper & Crease** *Directions:* This item is observed during the PP&R worksheet activity, but marked on the Fine Motor Checklist. Directions for this item are the first given for the pencil and paper worksheet.

✗ = a co-ordinated effort using both hands to align the corners and edges of the paper and to firmly crease, creating the three sections as directed.

✓ = one self-corrected false start or problem with alignment; diminished dexterity but completes task with three sections.

• = insufficient dexterity eg. using the forearm to make the crease; several false starts; inaccurate alignment eg. finish with extra sections; inability to follow / copy the model, (motor planning); asks for help. **NOTE:** comment if difficulties seem to be more due to fine motor skill, motor planning, or following directions.

18. **Pencil Grip** *Directions:* This item is observed during the PP&R worksheet activity, but marked on the Fine Motor Checklist. There are no directions for this item. **NOTE:** comment on preferred hand, and if a child needs to turn the paper to change stroke direction.

✗ = the standard tripod grip with pencil held between thumb and index finger, resting on middle finger, with no observable wrist tension or stiff fingers.

✓ = a somewhat awkward grip eg. two fingers over the pencil, but controlled writing.

• = any fisted grip; obvious concentration to control the pencil. **NOTE:** excessively dark, light or wobbly lines can indicate inappropriate pencil grip and/or pressure.

19. **Pencil Strokes** *Directions:* This item is marked from the PP&R worksheet. **NOTE:** sometimes children colour-in the stars with heavier dark strokes trying to match the black circles. Check the child's whole paper to determine the most typical strokes.

✗ = continuous lines drawn with even pressure eg. not excessively light, dark or wobbly.

✓ = some broken lines but mostly consistent direction and pressure .

• = short broken lines; obvious inconsistent pressure; combination of light & dark lines.

DIRECTIONS and SCORING LANGUAGE, CHECKLIST ITEMS 20 - 32

NOTE: have books available (on the floor), for children to read when they are not individually speaking with you. Item 20 is done with the group together. Then, simply invite the children to choose a book and you will ask each child to come to you to do some special activities.

20. Unison Rhythm Clapping *Directions*: with each group of children start and continue a 5 clap pattern (eg. quick - quick - quick - slow - slow) for ALL the children to copy and clap together with you. Continuously repeat the pattern long enough to be sure which children can initiate and maintain the pattern and rhythm. **NOTE:** if children have difficulty with a 5 clap pattern, try a 3 clap pattern, but mark accordingly. Be sure all the children can see your hands.

✗ = spontaneously start & accurately maintain a 5 clap pattern with rhythm.

✓ = spontaneously start & rhythmically try to maintain accurate clapping pattern with self-correction as required; can accurately start & maintain a 3 clap pattern with rhythm.

• = inability to start and/or sustain pattern; lacks appropriate rhythm.

21. Single Clap Pattern *Directions*: model one different 5 clap pattern for each child in any quick-slow combination (eg. slow - quick - quick - quick - slow). Be sure to remember the pattern to repeat, if the child needs a second try. **NOTE:** if a child has difficulty with a 5 clap pattern, try a 3 clap pattern, but mark accordingly.

✗ = spontaneously & accurately copy a 5 clap pattern modelled by teacher, after one try.

✓ = accurately copy the first pattern after a second modelling; can accurately copy 3 clap pattern after one try.

• = any inappropriate response after second try & can not copy 3 clap pattern after one try.

22, 23 & 24. Tell When asked: 1st. & Last Name, Age & B-Day Month, Home Address
Directions: these Items should be asked in a conversational manner to each child. They ask for survival information which every child should recall automatically. Take into consideration if the child has moved home recently, (eg. ask where the child used to live / ask for the phone number). Comment on articulation errors to include for Item 29.

✗ = spontaneously tell: full name; age & B-day month; address including house /unit number, street, & suburb / town.

✓ = give the above information with some prompting: age, suburb / town only; phone number.

• = a lot of prompting required; difficulty giving / remembering the required information.

25, 26 & 27. Recite a Rhyme or Song *Directions*: invite each child to tell a rhyme or sing a song. Give the child some time to think. If the child remains hesitant, suggest a familiar piece to encourage a response. Encourage different pieces so the same one isn't heard over and over.

✗ = **25** - spontaneous, confident recitation. **26** - accurate memory with correct sequence. **27** - appropriate & sustained speech rhythm.

✓ = **25** - good recitation after some prompting. **26** - disrupted sequence but self-corrected. **27** - complete recitation of piece but somewhat halting - poor phrasing.

• = **25** - a lot of prompting required & still hesitant. **26** - disrupted sequence with no self-correction. **27** - inaccurate / inappropriate phrasing.

28 - 32. Three Complete Sentences including accurate expression of details on the Checklist

Directions: in a conversational manner **SAY** "What did you do yesterday (after school)?" The main idea is to set a scene in the immediate past to see if the child receptively processes the language structures accurately, by expressively responding using appropriate corresponding grammatic structures, as well as clear and accurate articulation.

A complete sentence must have at least a subject and agreeing verb (I can jump.), and usually an object - **not** just phrases eg. "go park" ... "eat dinner" ... "play with Caro".

NOTE: some prompting may be required to elicit descriptive words, **SAY** "what did ... look like / how did ... move ?" However, an appropriate response now scores a ✓, as the response was not spontaneous.

✗ = spontaneous, confident, and appropriate demonstration of all factors; early in the year use of at least one descriptive word, (adjective or adverb). Late in the year use of two or more descriptive words.

✓ = appropriate expression of all factors, but prompting necessary; one descriptive word.

• = speaking in phrases; inappropriate use or lack of any factor, eg. lack of descriptive words.

DIRECTIONS TO GIVE PAPER, PENCIL and REASONING WORKSHEET

17. FOLD PAPER AND CREASE - DEMONSTRATE EACH FOLDING ACTION as you give the direction. Be sure all the children are facing you and can easily see your Model Worksheet.

SAY: "Looking! place your paper so the snails are looking at you. Fold the bottom corners up to the snails and crease/press." (Pause for children to complete the action.)
SAY: "Now bring the bottom corners up to the top corners and crease/press. (Pause) Now open your paper so the snails are looking at you again."

Briefly talk to the children about the three "sections" of the paper made by the folds, *pointing* to each and *naming* each separate section, "top / middle / bottom".

33. WRITING NAME - at the beginning of the year the children may copy their name as required, eg. from their name tag if stuck on their desk. Pointing to the top third of the paper, **SAY:** "In the TOP section of your paper you will do some writing and draw some shapes. Write your name at the TOP of your paper".

34. WRITING NUMBERS - eg. numbers 1 - 5. At the beginning of the year show where some numbers are displayed in the room to copy, as may be required. **SAY:** "Write some numbers UNDER your name / write your favourite numbers / any numbers you like."

35, 36, 37, and 38. COPY FORMS - do not influence placement of the shapes on the paper beyond the direction given. *Present the shapes in the following order*: circle, square, triangle, diamond. Show each copy form, at each table group.

SAY: "BESIDE your name you will draw four shapes. Here is the first shape to copy." (Hold up the circle. Be sure all children can easily see the model - show once from the front of the room and once at each table group. Remove each model before presenting the next.) **SAY:** "And here is the next shape to copy, ..., etc.."

39, 40, and 41. CONCEPTS OF POSITION IN SPACE - do not influence spacing of figures drawn beyond the directions given. Repeat directions at least twice, but carry on quickly. Group Leaders must NOT prompt. Comment on the Checklist if children copy.

SAY: "Listen! in the MIDDLE of your paper draw two trees NEXT TO each other. (Pause - you can ask the children to look at you when finished.)
SAY: "Draw a flower BETWEEN the trees ... Draw a cloud ABOVE the trees."

42. HUMAN FIGURE DRAWING - by now the children have often filled up their paper even though the bottom section should be empty. **SAY:** "Find a space on your paper and draw a person."

For *Items 43-45* encourage independent work. Repeat directions but carry on quickly as the spontaneous independent response is the one to be scored. Record if children copy from others or ask for directions to be repeated, to score for Personal Characteristics.

43. 1:1 FOR COUNTING - **SAY:** "Turn your paper over. Put your finger in the box of flowers. Draw a circle around five flowers."

44. PATTERN RECOGNITION - Point to the beginning of the row and **SAY:** "Put your finger on the row of circles and squares." Slowly run your finger across the row and **SAY:** "Look at the pattern of shapes and draw ***the shape*** which comes next" - pointing to the space at the end of the row. Repeat the direction at each table group.

45. 'SAME AS' COUNTING - **SAY:** "Put your finger in the bottom box with the stars. Colour-in the **same number of stars** as black circles". You may need to mention "using your pencil", as 'colour-in' often triggers a search for a crayon or coloured pencil.

Early Year Criteria For Scoring Paper, Pencil and Reasoning Worksheet

NOTE: *Age 1* = 4.6 - 4.11; *Age 2* = 5.0 - 5.5; *Age 3* = 5.6 +. Size of letters, numbers and figures, and their placement on the page, should be scored with Spacing, Item 46.

Early Year 33. WRITING NAME

✗ start from the left and ordered from left to right, with correct sequence of letters; start with a capital letter.

✓ may be of uneven size & mixed capital and small letters; letters may be written in pieces (non-continuous line); *Age 1* - may have reversed letters.

• mirror writing; letters omitted; incorrect letter sequence; *Age2 & 3* - reversed letters.

Early Year 34. WRITING NUMBERS

✗ three or more different numbers (not including one or zero), written left to right, but need not be in sequence; numbers written with a continuous line (except for 4 and 5); clearly demonstrate knowing the difference between letters and numbers; *Age 1* - may have only two numbers, including number one, and size may be uneven.

✓ numbers may be reversed; *Age 2 & 3* - at least two different numbers & may include one or zero & size may be uneven.

• only one and/or zero for numbers; no numbers; scribble marks for numbers; numbers written in pieces.

Early Year 35, 36, 37, 38. COPY FORMS

Circle

✗ closed circle drawn top down with a continuous line and of even size; *Age 1* - may be of uneven size and/or over size.

✓ drawn bottom up with a continuous line and closed; *Age 1* - bottom up may be open; *Age 2 & 3* - may be of uneven size and/or over size.

• no circle; *Age 2 & 3* open circles; circles traced through from the back of the page.

Square

✗ drawn with a continuous line, straight sides and closed.

✓ may be slightly distorted eg. at the corners; *Age 1 & 2* may be a non-continuous line.

• no square; drawn in several parts; square with rounded side(s) or corner(s).

Triangle

✗ drawn with a continuous line and closed.

✓ non-continuos line; *Age1* may be distorted.

• no triangle; rounded side; attempted, but seemingly impossible.

Diamond

✗ may be a non-continuous line & lines may overlap at the corners.

✓ may be distorted, eg. have small 'ears' instead of corners; *Age 1* an obvious attempt.

• no diamond; attempted, but seemingly impossible.

Early 39, 40 and 41. CONCEPTS of POSITION in SPACE - 'next to', 'between', 'above'

NOTE: Score placement of these figures in the 'middle' of the page, as directed, with Spacing, (Checklist Item 46). A clown and/or extra clouds, flowers or trees or cloud misplacement, may indicate difficulty with auditory discrimination and/or processing of the singular/plural grammatic structure, and should be noted in the comment space.

✗ figures placed as directed in relation to each other, and in their correct number (2 trees, 1 flower, 1 cloud); the cloud drawn above both trees.

✓ extra clouds, flowers or trees, BUT correctly placed; the cloud above only one tree; a clown drawn above the trees.

• one tree; inaccurate placement of figures in relation to each other; trees placed on either side of the page; flowers placed beside tree(s) on the side of the page; a clown drawn ON the tree; the cloud (s) drawn at the top of the page or to one side.

Early Year 42. HUMAN FIGURE DRAWING

✗ must be a recognisable person including: head; hair; eyes; nose; mouth; body; arms,

(may not have hands or fingers), & legs (may not have feet); *Age 1* may have large round eyes, (empty or filled in); *AGE 2 & 3* should have feet & eyes in proportion.

✓ same as above; *Age 1* may have no hair or nose; *Age 2* eyes may be large and round, and may have no feet.

• arms / legs drawn from the head; no arms, legs or mouth; belly button; *Age3* large round eyes.

NOTE: Comment on details such as: shaped body with a neck; dressed; eyelashes; eye pupils; ears; lips; excessive dark colouring for hair or scribble dressing; no face; distortion eg. 4 arms, only eyes on face - indicating excellence and/or need of further investigation.

Early Year 43, 44, 45. COUNTING and PATTERN RECOGNITION

✗ **43** - any 5 flowers inside one single circle. **44** - one circle drawn as "the shape that comes next". **45** - any two stars filled in.

✓ **43** - any five flowers individually circled (five circles); two circles with any combination of 5 flowers indicating the logic of grouping. **44** - one square, or circle \ square, or accurate continued pattern indicating understanding of pattern and 'next' (but not having processed the singular/plural grammatic structure). **45** - other stars filled in but crossed out (self-correction), and just two left.

• any response other than the above.

Early Year 46. SPACING

✗ even size figures, each in their own space and placed as directed, in horizontal orientation (name - TOP of page, numbers - UNDER name, copy forms BESIDE name, trees/flower/cloud - MIDDLE of page); *Age1* some poor spacing eg. placement and/or use of space on page.

✓ figures may be of uneven size; copy forms not 'beside' name, trees not in the 'middle' of the page, or a lot of empty space; Age1 numbers not under name; Age2 &3: some poor spacing or use of space on page, copy forms not beside name.

• figures spaced right to left, eg. mirror writing; over-size figures or drawn in a vertical orientation, eg copy forms; Age 2 & 3 numbers not under name; figures running into or on top of each other, going off the page or overlapping; figures mostly placed at the very top of the page.

Early Year FINE MOTOR 19. PENCIL STROKES

✗ continuous lines, such as for the sides of the copy forms, drawn with even pressure (not excessively light or dark)

✓ may be somewhat wobbly; some inconsistent pressure

• very dark, heavy looking strokes; obvious false starts; very wobbly and often quite light, indicating lack of pencil control.

Late Year Criteria For Scoring Paper, Pencil and Reasoning Worksheet

NOTE: *Age 2* =5.0 - 5.5; *Age 3* =5.6 - 5.11; *Age 4* =6+. Size of letters, numbers and figures, and their placement on the page, should be scored with Spacing, Item 46.

Late Year 33. WRITING NAME

✗ written from memory; start from the left with correct sequence of letters ordered from left to right; start with a capital letter, followed by small letters.

✓ *Age 2 & 3* may be mixed capital and small letters.

• *Age 4* mixed capital and small letters; mirror writing; reversed letters; letters omitted; incorrect letter sequence; letters written in pieces.

Late Year 34. WRITING NUMBERS

✗ written from memory; three or more different numbers (not including one or zero), written left to right, but need not be in sequence; each number written with a continuous line (except for 4 and 5).

✓ may have some reversals.

• only one and/or zero for numbers; no numbers; scribble marks for numbers; numbers written in pieces.

Late Year 35, 36, 37, 38. COPY FORMS

Circle

✗ closed circle drawn top down with a continuous line.

✓ *Age2* - may be uneven size but must be a continuous line and closed.

• no circle; circle drawn bottom up or open; traced through from the back of the page.

Square

✗ drawn with a continuous line, straight sides and closed.

✓ a continuous line but may be slightly distorted eg. uneven length of sides.

• no square; drawn in pieces; rounded side square.

Triangle

✗ drawn with a continuous line and closed.

✓ may be drawn in a non-continuous line.

• no triangle; distorted triangle or rounded side; attempted, but seemingly impossible.

Diamond

✗ drawn with a continuous line.

✓ may be drawn with a non-continuous line; may be slightly distorted eg. lopsided.

• no diamond; distorted diamond eg. with ears; attempted, but seemingly impossible.

Late 39, 40 and 41. CONCEPTS of POSITION in SPACE - 'next to', 'between', 'above'

NOTE: Score placement of these figures in the 'middle' of the page, as directed, with Spacing, (Checklist Item 46). A clown and/or extra clouds, flowers or trees or cloud misplacement, may indicate difficulty with auditory discrimination and/or processing of the singular/plural grammatic structure, and should be noted in the comment space.

✗ figures placed as directed in relation to each other, and in their correct number (2 trees, 1 flower, 1 cloud), with the cloud drawn above both trees.

✓ extra clouds, flowers or trees, BUT correctly placed; the cloud above only one tree; a clown drawn above the trees.

• one tree; inaccurate placement of figures in relation to each other; trees placed on either side of the page; flowers placed beside tree(s) on the side of the page; a clown drawn ON the tree; the cloud (s) drawn at the top of the page or to one side.

Late Year 42. HUMAN FIGURE DRAWING

✗ must be a recognisable person including: head; hair; eyes in proportion; nose; mouth; body; arms; legs and feet.

✓ same as above; may not have hands or fingers or feet; *Age 2 & 3* eyes may be large and round.

• arms / legs drawn from the head; no arms, legs or mouth; no face; belly button.

NOTE: Comment on details such as: shaped body with a neck; dressed; eyelashes; eye pupils; ears; lips; excessive dark colouring for hair or scribble dressing; no face; distortion eg. extra limbs or only eyes on face - indicating excellence or need of further investigation.

Late Year 43, 44, 45. COUNTING and PATTERN RECOGNITION

✗ **43** - any 5 flowers inside one single circle. **44** - one circle drawn as "the shape that comes next". **45** - any two stars filled in.

✓ **43** - any five flowers individually circled (five circles); a self-corrected single circle. **44** - one square, or circle \ square, or accurate continued pattern indicating understanding of pattern and 'next', (but not having processed the singular/plural grammatic structure). **45** - other stars filled in but crossed out (self-correction), and just two left; two stars circled indicating an understanding of 'same as', but didn't accurately follow the direction.

• any response other than the above.

Late Year 46. SPACING

✗ evenly sized and spaced letters, numbers and figures, each in their own space on the page and placed as directed (name - TOP of page, numbers - UNDER name, copy forms BESIDE name, trees / flower / cloud - MIDDLE of page).

✓ some poor spacing eg. not using the whole page or trees may not be exactly in the 'middle' of the page, but no overlap of figures.

• any vertical or right to left orientation, eg. mirror writing; figures running into or on top of each other, or going off the page, or over size; very tiny figures and/or mostly placed at the very top of the page.

Late Year FINE MOTOR No. 19. PENCIL STROKES

✗ continuous lines drawn with even pressure

✓ even pressure but consistently somewhat light or dark

• wobbly; inconsistent pressure - combination of light and dark strokes

DIRECTIONS and SCORING PERSONAL CHARACTERISTICS, CHECKLIST ITEMS 47 - 50

These items are evaluated as the children are all together working on their pencil and paper worksheets. Personal Characteristics Items are found on the Fine Motor Checklist, to be marked along with the Fine Motor Items number 17 (folding) and 18 (pencil grip), during the paper / pencil worksheet session.

Because these items evaluate highly individual attributes, marking responses must be tempered by some knowledge of the children. For example, are obvious difficulties such as being slow to complete a task more due to weak fine motor skills or receptive language understanding directions or lack of attention when directions are given. Is the child fidgety, agitated or lethargic, quiet or talkative, confident or asking for help ? Qualitative comment is extremely important when evaluating these items, to help inform decisions.

The following attributes (each asterisk point below), should be evaluated.

47. Working Independently

* maintain focus on own work / not easily distracted
* will self-correct
* does not copy others due to inattention

48. Following Directions

* willing to try, to act on own interpretation of directions
* extent of repeating directions to self and/or checking with others - the child may be talking very quietly to him/her self as a form of self-regulation
* does not change own work after looking at another child's work

49. Attending Quietly

* effectively filter out extraneous noise and focus on the teacher's directions
* sit comfortably with both arms on the table, feet on the floor and head near the body midline - comment if head down to visually monitor writing
* does not intentionally distract other children or talk out

50. Completing Tasks

* attempts to initiate and complete each task, regardless of production quality or spacing
* does not labouriously remain on one task, missing directions of what to do next

A1.3 Workshop Notes

SETTING THE STAGE

Early human development and learning pass through predictable stages - however - the absolute uniqueness of each child must be recognised due to the unique collection of variables which define each being:

- Children are born with abilities which emerge, like learning to walk or learning to speak - many developmental milestones are remarkably similar across cultures.
- Skills require abilities, but are learned, practised and perfected as means to an end.
- Superior skill depends on ability as well as opportunity, practice, confidence and motivation.

During early childhood integration of the communication system between mind and body takes place allowing typically developing children to achieve spontaneous motor, language and cognitive responses at the independent level of function.

- *Typical Development* means the predictable and usually sequential emergence of specific motor, language and cognitive responses within given age ranges.
- *Spontaneous Responses* are free of hesitation, needing no external cues beyond the information given to be appropriate.
- *Independent Level of Function* means abilities and skills can automatically be generalised and transferred to new tasks - not having to think 'how to' (motor plan), freeing the child to attend and to think.

MAIN IDEA

When looking at the whole child and the whole learning process, understand that although the rate of developmental progress is highly individual, typical patterns are evident,

- and -

only against the typical can we view the atypical.

THE WHOLE CHILD:
- Personal and Social Development
- Emerging Abilities and Learning Skills
- Effects of the Child's Inherent, Medical, and Physical Factors
- Effects of the Child's Environment - home, culture, community, opportunity, experience.

A1.3 - cont.

MOTOR and VISUAL DEVELOPMENT

TYPICALLY - in early childhood sensory information is received through the senses, sent through the central nervous system to the brain to be processed and organised, with the result sent back through the central nervous system to initiate a motor response.

TYPICALLY - the sequence of motor development usually progresses from the head toward the feet, the centre of the body outward, and massive movement to directed, isolated and controlled movement - eg. necessary to automatically control a pencil.

TYPICALLY - the ocular motor system responds to the demands of focus and smooth co-ordinated action of the eyes, and is usually not fully efficient until school age. Children under age five often have slow imprecise eye movements. At age six the visual mechanism can still be unstable and children may have difficulty fixating at definite points like keeping their place while reading and copying from an angle or at a distance.

Degree of mature visual processing can affect motor planning eg. accurately judging distance for eye-hand, eye-foot co-ordination.

MOTOR PLANNING = takes place before action, actively imitating, imagining, remembering and sequencing the performance of motor actions until the action is secure in long term memory when movement patterns are integrated and automatic, at the independent level of function. Motor Planning involves the conscious awareness and accurate processing of the relevant internal and external aspects of movement to successfully master new or non-habitual motor tasks.

Major factors of Motor Planning include

- the feeling and observation of your own body actions
- understanding the relative nature of body placement to objects and other bodies in space, and of motion in time
- imitating, planning, remembering and sequencing motor patterns.

Major components of Motor Actions include

- Balance - Stability - Locomotion
- Strength - Co-ordination - Rhythm

Integration of the sensory motor system is achieved when the linking of paths in the brain (eg. left hemisphere processing language, right hemisphere processing visual motor information), and across the central nervous system (horizontal and vertical body midlines), are working efficiently and the mind is more free to attend and to think.

A1.3 - cont. **SPEECH and LANGUAGE DEVELOPMENT**

TYPICALLY - accurate auditory processing matures earlier than completely accurate visual processing and therefore presents a natural strength for early learning.

TYPICALLY - children the world over quite naturally and successfully learn to speak, competently using oral language as a tool before school entry. For example:

3 YEARS - increased interest in all language
- a reliable auditory base of hearing acuity can be determined
- control of vocal cords means the child can self-correct speech, and form different consonants in the same word
- uses pronouns they, she, and 'wh' words who and what
- 3-4 word sentences, with beginning use of adjectives, prepositions, conjunctions (connectives), and negatives

4 YEARS - most sounds are mastered and speech rhythm is good
- uses pronoun I, and 'wh' words where, when
- recites at least one rhyme/song
- can reorder words to produce more complex 5-6 word sentences
- 90% of speech is intelligible with grammatic rules essentially mastered re word classes and word order

5 YEARS - language has become integrated into total behaviour
- uses adjectives to compare quality
- grammar mistakes limited to exceptions eg. "I goed" or "2 sheeps"
- asks meaning of words - can identify rhyming words

Learning to speak is inherent. Conceptual development needs experience and practice and is learned as the physical world is named and described by the words adults give to children, then enhanced by each child's ability to process, categorise and compare.

Processing Information and Reasoning Develop Predictably

1. The Level of Sensory-Motor input requiring hands-on real life experience with direct observation for understanding;
2. The Level of Representation - comprehending pictures and recordings of real life;
3. The Symbolic Level - an abstraction of real life using words and written symbols for communication;
4. The Level of Mental Operations when real life can be recalled and regrouped - visualised / imagined (eg. tone of voice) - without the aid of external cues.

Young children learn through their senses needing direct observation with hands-on experience and corresponding language practice to accurately understand, use and compare concepts like hot/cold, sweet/bitter, edge/corner, loud/soft, fast/slow, anger/joke, same/different, whole/parts, before they can visualise these attributes.

Children need practice with motor activities coupled with appropriate language to know where they are in space, how they move, and at what speed, to become accurate with comparative relationships in the environment, then at the level of representation, then symbolically, to then accurately visualise mentally - a significant requirement for listening and reading comprehension.

A1.3 - cont.

THE TEACHING CYCLE

● Assess - Program - Teach - Evaluate - Regroup ●

ASSESS - to identify

PROGRAM - to organise

TEACH - to instruct

EVALUATE - to monitor progress

REGROUP - to ensure instruction suits current needs and resources

Assessment Helps Identify The Developmental and Learning Needs Of Children:

- Who are developing typically
- Who may be at risk for learning difficulties
- Who may need specialised intervention
- Who may be potentially gifted
- Who may have a combination of possibilities

Recorded Information of Children's Assessed Needs Will Guide:

- Referrals
- Individualised Instruction across the curriculum
- Flexible Grouping

Recorded Information Provides Accountable Documentation For:

- Program and Instructional changes
- Use of Time, Money, and Resources
- Support when writing reports for parents, administrators, referrals, another school

A1.3 - cont.

The Learning Place KINDERGARTEN SCREENING

The Kindergarten Screening reliably identifies children's developmental and learning needs to inform referrals, programming and instruction. Screening does not label. Screening Categories are: Outside Motor, Fine Motor, Oral Language, Pencil / Paper & Reasoning, and four Personal Characteristics eg. attention. The 50 screening items are typical kindergarten tasks (not clinically contrived), requiring no special materials, and are those for which school entry children age 4.6 - 6.0 would typically be expected to be spontaneously successful at the independent level of function.

* **Spontaneous Responses** are free of hesitation, needing no external cues beyond the information given to be appropriate. * **Independent Function** is the level at which abilities, skills and concepts are automatic and can be adapted and transferred to new tasks.

Screening sessions take place in the familiar setting of the children's school and classroom and can be completed within two to three hours for a whole class; but need not be done all at once. The class teacher organises the screening session with three support staff to help evaluate. The class is divided into four groups. While two groups do the Outside activities, the other two do both the Fine Motor and Language activities inside, then the groups shift. The Paper and Pencil Worksheet is done with the whole class together.

Responses are ticked on Group Checklists using the following KEY:

- ✗ = spontaneous and age appropriate or better, (2 points);
- ✓ = fair/good, (1 point);
- ● = in need of direct intervention, (nil).

Procedure and scoring criteria are stated in the Manual. An inservice video is available.

Because the appropriateness of responses to Checklist Items is developmentally based, the children's age at the time of assessment must be considered when ticking responses.

Evaluation and scoring are completed on Checklists and summarised on a Class Record. Comment space is provided on the checklists and Class Record to record performance information about each child which might affect learning eg. confidence, co-ordination, tilting head when writing, lack of practise causing motor difficulty, any disruptive behaviour. A master copy of Checklists, Records and Worksheets are available.

An on-going evaluation system is available to record initial screening information as well as attainment progress for the whole school year. These running-records clearly show children's strengths and weaknesses to guide flexible grouping and teaching strategies, insuring individualised instruction is based on current need across the curriculum. Further evaluation pages can easily be added for any unit of instruction - health / science - using the empty master ticking page provided. The record's categories and headings are sequenced by children's emerging abilities, skills and concepts and keyed to the revised Outcomes and Pointers of the NSW Early Learning Profiles.

A1.8 cont.

PROGRAMMING and TEACHING

* Individual developmental and learning needs can be accommodated efficiently and effectively across the curriculum.

* No single teaching strategy works equally well for all learners.

* Individualised instruction does not necessarily mean 1:1 teaching.

* Flexible Grouping = grouping according to assessed need as required.

* Young children, especially those at risk for learning difficulties, learn best during active investigation with supported teaching and structured practice to mastery using a variety of activities and multisensory materials to encourage spontaneous and independent generalisation and transfer of abilities, skills, and concepts to new tasks.

Activities Chosen Must

- Be age and interest, ability, skill and experientially appropriate
- Be presented at learners' level of reasoning (eg. 3D...2D...)
- Have an anticipated success rate of at least 85%
- Present challenge

Sequence of Presenting Activities

- Start with necessary foundation skills
- Then teach the consistent, highly predictable components
- Practise high utility skills before more diverse skills
- Teach confusing or variant components at different times

Partial Success Should Always Be Rewarded
To Boost Self Esteem and Help Shape The Eventual Goal

MAIN IDEAS

TASK ANALYSIS = identify the abilities, skills, and concepts necessary to complete a task and determine if learners' are functioning at sufficient levels to be successful.

PRACTICE TO MASTERY = when responses are sufficiently automatic and the child can independently adapt, generalise and transfer the use of abilities, skills and concepts to new tasks.

A1.4

REFERENCE SAMPLE OF DEVELOPMENTAL SCREENING ASSESSMENTS WITH CHECKLIST ITEMS AND RATIONALE CORRESPONDING TO THE LEARNING PLACE KINDERGARTEN SCREENING

A. **ESS PRESCHOOL PROFILE** (1985). Compiled by Shields, N. (Education Support Service) and Judith Langley (Kindergarten Union of NSW - Inc). Sydney, Australia: Education Support Service.

B. **EARLY SCREENING PROFILES** (1990). American Guidance Service. Harrison, Patti L, Co-ordinating Author. Circle Pines, Minnesota, USA: AGS.

C. **EARLY YEARS EASY SCREEN (EYES)** (1991). Clerehugh, J., Hart,K., Pither, R., Rider, K. & Turner, K. Windson, Berkshire, England: NFER - Nelson.

D. **GESELL DEVELOPMENTAL EXAMINATION - SCORING NOTES** (1971). Compiled by Richard,.N., Assistant Director, Hew Hampshire Readiness Project. Peterborough, New Hampshire, USA: Unpublished.

E. **GRIFFITHS MENTAL DEVELOPMENTAL SCALES** (1984). Griffiths, R. High Wycombe, Bucks, England: The Test Agency for The Association of Infant and Child Development, revised Edition.

F. **MACQUARIE PROGRAM, THE** (1986). Pieterse, M., Carins, S. & Treloar, R. Sydney, Australia: Macquarie University Special Education Centre.

G. **MINNESOTA PRESCHOOL SCALES** (1938 & 1940). Goodenough, F. L., Maurer, K.M. & Van Wagenen, M.J. Circle Pines, Minnesota, USA: AGS.

H. **NEALE SCALES OF EARLY CHILDHOOD DEVELOPMENT** (1976). Neale, M. D. Professor of Special Education, Monash University, Victoria, Australia: Science Research Associates (SRA).

I. **PRESCHOOL SCREENING SYSTEM** (1980). Hainsworth, P. K. & Hainsworth, M. L. Pawtucket, R.I., USA: ERISys.

J. **QUICK NEUROLOGICAL SCREENING TEST** (1989). Mutti, M., Spalding, N.V., & Sterling, H. M. Novato, California: Academic Therapy Publications, Revised Edition.

K. **SCHOOL ENTRY SCREENING TEST (SSEST)** (1975). Sheppard, M. Inspector of Schools, New South Wales Departement of Education. Mosman, NSW, Australia: SPELD, 3rd. Edition, 1975.

The following page lists the Learning Place Kindergarten Screening Items with the corresponding letter of the above Screening Assessments which have identical or similar Items.

A1.4 - cont. **Reference Sample - Comparable Kindergarten Screening Checklist Items**

OUTSIDE MOTOR ACTIVITIES: Checklist Items 1 - 9.

1. **Walk Downstairs** - A, B, E, F.
2 & 3. **Skipping** - A, C, K.
4 & 5. **Hopping** - B, C, E, F, H, I, K.
6 & 7. **Balance** - A, B, F, H, J, K & others, using a walking beam/or line on the floor.
8. **Catch Bean Bag in One Hand** - C, H & K: catch a ball with two hands.
9. **Throw Ball Overarm** - A, F, K.

FINE MOTOR/EYE HAND/MIDLINE ACTIVITIES: Checklist Items 10 - 19

10. **Using Scissors** - A, B, C, E, F.
11 & 12. **Screw Top On/Off** - B, C (for water tap), F (for a toy).
13 & 14. **Pick Up & Release** - can be observed in various items of other Scales.
15 & 16. **Finger/Thumb Circles** - I, J, C (wiggling fingers freely one hand at a time, with no overflow action).
17. **Fold Paper & Crease** - E, G.
18. **Pencil Grip** - A, C, D, F, J, K: to determine preferred hand.
19. **Pencil Stroke** - C, I, G: continuous lines with control, K.

LANGUAGE ACTIVITIES: Checklist Items 20 - 32

20. **Unison Rhythm Clapping** - A, J, K: can maintain clapped rhythm while skip/walk.
21. **Single Clap Pattern** - I, J, K: copy 5 tapped patterns.
22, 23, & 24. **Tell Full Name** - A, B, C, D, I; **Age** - A, C, E, F, I; and **Home Address** - A, B, C, E.
25, 26, & 27. **Recite Rhyme/Song** - C, F, K.
28, 29, 30, 31, & 32. **Three Complete Sentences** - A, B, C, E, G, H; **Articulation** - A, B, F, H, K; **Verb Tense** - A, C, F, G, K; **Noun/Pronoun/Verb Agreement** - A,C, E, F, K; and **Descriptive Words** - A,C, F, H, K.

PAPER / PENCIL and REASONING: Checklist Items 33 - 46

33 and 34. **Writing Name, J; and Numbers** - A (to recognise both in print); C (left/right orientation), E has write (not copy) No.33 at age 6, and No.34 at age 7.
35, 36, 37, and 38. **Copy Forms** - Circle A - K; Square A, C, D, E, F, G, H, I, K; Triangle B, D, G, J, H: just top 2 angled lines, K; Diamond D, G, J, K.
39, 40, and 41. **Concepts of Position in Space** - 'Next To'- F (several had 'beside' as the alternative); 'Between'- F, I; 'Above'- I (demonstrated by moving objects).
42. **Human Figure Drawing** - A, C, E, F, I, K.
43. **1:1 for Counting** - C, E, A (counting 3D objects).
44. **Pattern Recognition** - several Scales included this concept but at the 3D/concrete level eg. threading beads.
45. **'Same As' for Counting** - C.
46. **Spacing** - C; although most assessments do not include this Item, it is one which yields a lot of information and is especially important in today's kindergarten due to increased and early emphasis on paper / pencil work - eg. writing goes from left to right, top to bottom.

PERSONAL CHARACTERISTICS: Checklist Items 47 - 50

47. **Works Independently** - F. 48. **Follows Directions** - F. 49. **Attends Quietly** 50. **Completes Tasks** - F. NOTE: most assessments do not include these items as they would be impossible to assess during an individual session with any relevant generalisation to school. However, they are important to success in school, especially due to increased and early emphasis on formal learning.

A1.5 SUMMARY OF KINDERGARTEN SCREENING CHECKLIST ITEMS

OUTSIDE MOTOR: Checklist Items 1 - 9.
1. Walk Downstairs - alternating feet & not holding the rail, with little or no hesitation.
2. Skipping - sustain alternating feet & step / hop pattern each side.
3. Skipping - alternating feet with effortless body rhythm & often leg/arm opposition.
4 & 5. Hopping - 5-7 consecutive controlled quiet hops left & right feet.
6 & 7. Balance - controlled balance 5 - 8 seconds left & right feet, not looking down.
8. Catch Bean Bag in One Hand - controlled catch in preferred hand.
9. Throw Ball Overarm - effortless controlled toss from shoulder with preferred hand.

FINE MOTOR/EYE HAND/MIDLINE: Checklist Items 10 - 19.
10. Using Scissors - continuous cutting with good co-ordination holding the paper.
11 & 12. Screw Top On/Off - good co-ordination freely holding the container in one hand while easily take top on/off with fingers & thumb, easily aligning the top, for each hand.
13 & 14. Pick Up & Release - easily pick up & release small objects into the container, freely crossing body midline, for each hand.
15 & 16. Finger/Thumb Circles - without looking quickly touch each finger tip to thumb tip to form a circle, start with index finger & continue pattern 3 consecutive times, each hand.
17. Fold Paper & Crease - coordinated effort to align corners & edges, & crease.
18. Pencil Grip - pencil lightly held between thumb & index finger, resting on middle finger.
19. Pencil Stroke - continuous lines with even pressure, not too light, dark or wobbly.

LANGUAGE: Checklist Items 20 - 32
20. Unison Rhythm Clapping - within group maintain sequenced rhythmical clap pattern.
21. Single Clap Pattern - individually copy a single modelled clap pattern.
22 - 24. Tell Full Name, Age/B-Day Month, & Home Address - accurate automatic recall. **25 - 27. Recite Rhyme/Song** - accurate memory, sequence, articulation & speech rhythm.
28 - 32. Three Complete Sentences - accurate articulation, verb tense, noun/pronoun/verb agreement, & use of descriptive words.

PAPER / PENCIL and REASONING: Checklist Items 33 - 46.
33 & 34. Writing Name and Numbers - appropriate printed symbols starting from the left.
35 - 38. Copy Forms - accurate copy circle, square, triangle, diamond with continuous line.
39 - 41. Concepts of Position in Space - accurate understanding demonstrated in drawn response to 'next to', 'between', 'above', & in the appropriate number required.
42. Human Figure Drawing - understanding of body image.
43. 1:1 for Counting - circle 5 flowers of 8.
44. Pattern Recognition - analyse & complete a shape pattern.
45. 'Same As' for Counting - indicate same number of stars as circles.
46. Spacing - evenly sized figures sequenced left to right, top to bottom, placed over whole page - each figure in its own space with no overlapping or going off the page.

PERSONAL CHARACTERISTICS: Checklist Items 47 - 50.
47. Works Independently.
48. Follows Directions.
49. Attends Quietly.
50. Completes Tasks.

A1.6

MATERIALS

Stairs - a set of at least four landings, with a hand rail at one side.

Name Tags with children's first names only, to help Evaluators and early in the year for children to copy on their Paper / Pencil Worksheet as required. Self-stick address labels are usually sufficient, (although not on a very hot day).

Checklist Sets - four complete sets; one Checklist Set (four pages) for each group with each child's name, gender, and age (years / months) filled in - Masters provided.

Summary Class Record - enough copies to include the names of all the children in each class, (ten names to a page) - Master provided.

Copy Forms - *one set only* to be shown by the teacher for the children to copy on their Paper / Pencil Worksheet - Masters provided.

Cutting Papers - one for each child - Master provided.

Worksheets - one A4 size paper for each child, prepared with the snails on one side AND the three boxes backed onto the other side - Masters provided.

One A3 size Worksheet model for the Class Teacher is helpful, especially if the teacher stays at the front of the room, (but not necessary).

Clipboards - or something to hold the Checklists on which Evaluators can write.

Dark lead pencils or black pens for Evaluators to write on their Checklists. If copying the Checklists may be required, blue pens and light pencil strokes do not copy well.

Bean Bag - One bean bag about 12 cm. square and no more than two thirds filled with beans, NOT soft filled, (too many beans make the bag too heavy and soft filled makes
the bag very hard to catch).

Ball - one tennis ball, or ball of similar size and weight.

Pencils - one lead writing pencil per child, (preferably no coloured pencils).

Scissors - enough for one group, (have left handed scissors available as required).

One Plastic Bottle with a handle and small screw top (eg. a liquid dish soap bottle or two litre milk jug), and about five small objects which will easily fit inside the bottle, (eg. small peg board pegs or pebbles or Unifix cubes - round stringing beads are NOT good as they continually fall off the table).

Numbers - early in the year some printed numbers to show or point to, for the children to copy as required, (eg. number chart or wall clock).

A1.7 **DEVELOPMENTAL PROGRAM**

The following summarises the Developmental Program generated within this study in collaboration with the kindergarten classroom teachers, ESL teacher, parents and the researcher in School 4, in 1993.

Under the heading of Developmentally Planning

The stated goals of the program were:
- to accommodate the whole developmental and learning process for every child;
- to suit children's assessed developmental and learning needs;
- to be an integral part of the curriculum;
- to be easy to implement, affordable, and understandable;
- to suit staff, time, funds, available resources and parents;
- to periodically evaluate and to regroup as needs change.

The stated format was that the program should suit:
- time - after lunch until home-time to help parents involved;
- staff - a collaborative team headed by the classroom teacher;
- space - four stations called outside, inside, sit down, and language;
- activities - should combine developmental and learning needs with curriculum requirements.

The stated guidelines for parents were:
- provide parents with information;
- provide parents participation;
- Provide inservice help to parents to ensure understanding of their role.

Identified areas of Developmental and Learning Needs were:

1. Moving	**3. Speaking**	**5. Doing**
Motor Planning	Producing Sounds	Ball Skills
Rhythm	Producing Words	Playground Equipment
Integration	Grammatic Structures	Games
Locomotion	Vocabulary	Following Directions
Balance	Verbalise Actions	Whole Curriculum
Body Awareness	Intonation	Work Habits
Strength		Self- Care
Hands & Fingers	**4. Thinking**	
	Listening Skills	**6. Socialising**
2. Looking	Visualising	Impulse Control
Visual Tracking	Body Language	Share / Take Turns
Eye-hand/foot Coordination	Classify	Play by the Rules
Discrimination	Sequence	Confidence
Preferred Hand	Predict	Take Direction
Midline	Organise	Listen to Others
Position in Space	Position in Space &	Try Something New
Memory & Sequence	Time	

The stated aim was: practice to mastery when responses are spontaneous and the child can independently generalise and transfer abilities and skills to new tasks.

A1.8 **Sample of OUTSIDE MOTOR PROGRAM**

EARLY CHILDHOOD MOTOR INTEGRATION

(inservice information)

Motor Integration - efficient and purposeful interaction between developmental and environmental factors

Sensory Input and Feedback - internally organising information about the physical world received through the senses and from the body (muscles, joints and skin) such as visual tracking for games and accurate tactile discrimination eg. to know how much pressure to place on your pencil when writing, to negotiate the environment and initiate motor responses.

Balance - the ability to keep the body stable / to control body posture and body parts when in motion (dynamic balance), or stationary (static balance). ALL motor action requires ability and skill to stabilise some body parts while moving others.

Body Awareness - an inner sense of body movement, posture, balance and laterality; clear perception of body position in space and time, and identification of body parts.

Co-ordination - the ability to direct, isolate, and control body parts to perform specific actions (eg. throwing a ball / controlling a pencil), processing and integrating all internal and external aspects of a task required for the action to be successful.

Rhythm - an inner sense of timing which usually improves with practice and can help sustain control of whole body movement, and movement of specific body parts.

Fitness - appropriate flexibility, postural stability (up right, in motion, or sitting), strength (upper body and lower body), and endurance, to successfully control and sustain movement.

Motor Planning - takes place before action: actively imagining, remembering and sequencing the performance of motor actions until the action is secure in long term memory when movement patterns are integrated and automatic, at the independent level of function. Motor Planning involves the conscious awareness and accurate processing of the relevant internal and external aspects of movement to successfully master new or non-habitual motor tasks.

Teaching Strategies - to improve motor skills, enhance cognitive development, and build confidence by identifying the most essential motor and language elements of each task to be patiently taught and practised to the level of independent function when responses are automatic, and the child is successful and more free to attend.

3 Ways to Instruct: *Verbally*; *Model*, (for the children to copy); *Physically Cue*, by interaction with the child to actually position and move body parts to help the child see and feel appropriate motion coupled with corresponding language, as some children have trouble following instructions and/or imitating movement.

A1.8 cont. Combine Motor Practice with Use of Corresponding Language

- To ensure accurate understanding and use of the concepts of space (eg. between / over /above / left - right), and time (eg. fast / slow).
- To help focus attention and encourage self-regulation by verbalising instructions, direction of movement, description of actions, and self-monitoring of performance.
- To encourage accurate memory and sequence of body parts, instructions and motor patterns.
- To encourage creative problem solving - how to get from the here to there / what body parts do I need / how long will it take / where do I look / in what direction do I move.

Create an Encouraging Environment in which each child may come to experience and understand success by their own merit: children should not have to compete until they are psychologically and physically willing to cope.

Pointers - some essential elements of basic motor patterns

Posture: efficient *upright posture*, even in different positions, should have ears directly above shoulders, shoulders above hips, and hips above knees. Efficient *sitting posture* for writing should have elbows at right angles as hands rest on work top and with feet flat on the floor or foot rest, hips and knees form right angles while sitting with back supported by the chair.

Running: arms swing forward and back in opposition to legs; push off from front of foot (not flat footed); head held up; eyes looking forward; slight forward body lean; smooth, rhythmic gait; controlled start, stop and change of direction.

Jumping: bending knees before take-off to gain lift; weight on front of feet; controlled head during flight; arms reach (not swing); controlled quiet landing with bend at hip, knees and ankles ready to jump again, with no step or fall forward to regain balance.

Hopping: head held up and steady and posture held steady to maintain balance; arms held in front aiding balance and hop, (but extraneous arm movement upsets balance); light landing on front of foot with bend at hip, knee and ankle ready to hop again, (not flat footed); consistent height, length, direction of hops, with rhythmical action for both legs.

Tracking: maintain visual focus (on a ball) to predict direction and speed; use of visual cues to predict position of ball when tracking in the air or along the ground.

Catching: tracks a ball and moves body and hands in anticipation of the ball's position and time of arrival; adjusts posture for catching; uses hands for catching (not trapping ball against body); flexible hands and fingers to control ball when caught (so ball does not pop out); watches the ball until caught (not averting head as ball comes near).

Throwing: with a steady head, focus eyes on the target; orient body posture toward the target; sufficient backward extension of throwing arm to ensure ball reaches target; efficient hand and finger control to appropriately time grasp and release; rotation of shoulder from back to front, transfer weight forward with arm action and release and eventual leg/arm opposition.

A1.8 cont.

Manipulative Skills: specifically directed individual (one hand / finger), parallel (hands / fingers working together), and alternate (one hand grip / other hand working), co- ordinated and controlled action of hands and fingers. Voluntary control of reach, grasp, and release.

Outside Activities to Practise Skills and Promote Motor Integration

BALL

Tracking 1. Teacher or partner rolls ball to child at the body midline and left / right for child to stop, control ball, and then roll ball back - vary size of ball, speed of the roll, and distance.

2. Control ball with feet - dribble ball - using small kicks and pushes to negotiate ball around objects (eg. boxes, cones), and into a target at the end (eg. a plastic milk box).

3. Gentle toss or bounce pass (under and overarm) and catch ball for self, against a wall, with partner, against wall for partner to catch - vary size of ball and distance from wall.

Body Awareness and Balance 1. Place ball in different spatial position in relation to body eg. "next to left ear / behind right ankle / above head / between knees"- reverse the game and have children place ball and then tell where it is, or, have children direct children.

2. Place ball between knees or under right/left arms and move using different gaits, different speeds, start, stop and change direction on command (eg. a clap of hands).

3. Pass the ball from hand to hand around your waist or ankles, between and around your knees - change directions.

Rhythm and Co-ordination 1. Bounce and catch the ball with two hands; bounce, clap hands and catch; continuous bounce while walking / skipping to rhythm clapping; recite song or rhyme as bouncing to help focus attention and maintain concentration.

2. Continuous bounce while counting aloud, with one number per bounce, at least up to five - teacher can clap rhythm and vary speed; bounce alternating hands; one bounce to partner.

3. Toss ball above head and: catch; let bounce and catch; clap hands and catch.

4. Drop and hit ball to partner with open hand - keep pattern going back and forth in rhythm.

Fitness Between two chalk lines drawn some distance apart, 2 - 4 children line up behind one line to roll the ball to the other chalk line and then chase the ball. The first child rolls the ball to the other chalk line, then chases the ball to pick it up, stands at the other chalk line and rolls the ball back to the next child who repeats the action. When each child is at the other chalk line, repeat action back to the start. How many rounds can be completed in one minute? Vary size of ball, distance between chalk lines, and gait eg. walk / run / jump.

A1.8 cont.

A1.8 cont.

Note. The above Outside Activities format continued for hoops, bean bag, and jump rope. The program continued with examples of Inside Activities for tracking, fitness and balance (upper and lower body), rhythm and co-ordination, and body awareness. The last section was Fine Motor Eye-Hand Co-ordination Activities starting with pointers about grip, stability, and forearm and wrist movement, continuing with activities in the areas of tracking, balance and fitness, body awareness, tactile discrimination, rhythm and co-ordination, and manipulative activities. Daily activity stations were prepared for parents running the Outside Motor Program.

A1.9

KINDERGARTEN SURVEY - Parent Survey

Would you please complete this survey to help us learn more about kindergarten children. We will combine this survey information with what we have learned from the Kindergarten Screening. Mrs P. Twaddell from the University of Sydney, will help us collect and report the information. *All information will be kept in strict confidence.* Your child's name will never appear in any collection of data or on any report. Upon receipt of this survey the children's names will be replaced by a number code.

You are under no obligation to complete this survey, but the information would be most helpful when planning instruction for kindergarten children. If you have any concerns or questions Mrs. Twaddell is happy to meet and talk with you at school. Please ring the school office ... and make an appointment before, during, or after school until 4:00.

CHILD'S NAME _____ MALE / FEMALE _____

YOUR CHILD'S AGE AT ENTRANCE TO KINDERGARTEN _____

1. How much did your child weigh at birth? _____

2. At what age did your child:

   a. crawl on hands and knees _____
   b. walk with no help _____
   c. start using words correctly _____
   d. use 3 - 5 words together _____
   e. ask questions _____

3. Does your child like to be read to? , if yes, how often: _____

4. If your child has continuing problems with any of the following, please give some details:

   a. eating _____

   b. sleeping _____

   c. behaviour _____

   d. co-ordination _____

   e. following directions _____

   f. attention _____

   g. speech _____

   h. vision _____

   i. hearing _____

   j. allergies _____

A1.9 cont.

5. Has your child had any accidents which required medical attention? _____

_____

6. If your child requires any regular medication such as for asthma, please give some details: _____

_____

7. Did your child go to preschool? _____ , if yes, how many days a week:

_____

8. What are your child's favourite TV shows? _____

9. How much time does your child spend playing outdoors each week? _____

_____

10. Does your child attend any regular after school activities? _____, if yes, which ones and how often:

_____

11. Parent(s) occupation? _____

_____

Please feel free to write additional comments about your child's developmental or learning needs. Do you think more, or different help could be provided at school?

Thank you very much for your interest and help. We will keep you informed about the progress of this project.

A1.10 **YEAR ONE STUDENT INFORMATION SURVEY**

SCHOOL_____ DATE 11.94

NAME_____ Sex_____ DOB_____

Language Spoken at Home_____

Special Help (eg. Reading Recovery/Language)_____

please tick appropriate box regarding performance level as compared to peers

CURRENT Attainments	mini-mal	low	satis-factory	high	COMMENT
1.co-ordination					
2. balance					
3. ball skills					
4. fine motor skills					
5. handwriting					
6. language - oral; articulation					
7. language - oral; grammar/sentences					
8.language-written; grammar/sentences					
9. use of descriptive words					
10. oral recounting of stories / events					
11. reading - decoding					
12. reading - comprehension					
13.foll. direct./oral					
14.foll direct./write					
15.completes tasks					
16. spelling					
17. phonemic skills					
18. attention					
19. impulse control					
20.confidence / self-image					

A1.10 cont. **YEAR TWO STUDENT INFORMATION SURVEY**

SCHOOL _____ DATE 10.95

NAME _____ Sex_____ DOB_____

Special Help (eg. Reading, Language) _____

Please tick appropriate box regarding the child's relative class performance level

CURRENT Attainments	low 1/4	mid 1/2	top 1/4	COMMENT
1. co-ordination				
2. fitness				
3. ball skills				
4. handwriting				
5.appro.sentence structure -spoken				
6.appro.sentence structure -written				
7. uses descriptive words				
8. recount of stories / events				
9. reading - decoding				
10. reading - comprehension				
11. follows directions				
12. spelling				
13. completes tasks				
14. attends				
15. social skills				
16. confidence / self-esteem				
17. works independently				

A1.10 cont. **YEAR THREE STUDENT INFORMATION SURVEY**

SCHOOL _____ DATE 9.96

NAME_____ Gender_____ DOB_____

Special Help Received (eg. Reading Recovery / STLD / Motor) _____

_____

Please tick appropriate box regarding relative class performance level.
1 = lowest quarter and 4 = highest quarter.

CURRENT Attainments	1	2	3	4	GENERAL COMMENT
1. interest in sport					
2. skill in sport					
3. handwriting					
4. reading decoding					
5. rdg. compre. / inference					
6. rdg. compre. / detail					
7.written language grammar					
8. spelling					
9.spoken language grammar					
10. factual recount stories / events					
11. use of descriptive words					
12. maths computation					
13. maths - logic					
14. foll.s directions					
15. attends					
16. social skills					
17. confidence / self-image					

APPENDIX 2. - TABLES

Note. Complete school screening means by each school population and age within school, by time of year, and percentile bands for each total sample (1993,1995,1996) and by city (Sydney) / country (Dubbo) , and by age within sample, for Success Rate and each screening category, are available upon request to the researcher.

Table A2.1

Summary Mean Scores - E93 & E96 Total Sample Means & Age 4 Means

Children	Success Rate	Outside Motor	Fine Motor	Language	PP&R	Personal
E93 total	59.2	58.9	67.8	67.2	45.0	62.5
Age 4	49.6	38.8	65.0	67.9	28.5	50.0
E96 total	59.6	56.9	66.0	66.7	46.4	59.6
Age 4	56.2	63.8	64.0	55.3	32.1	72.5

E93 Age 4 children = 3 males.
E96 Age 4 children = 6 females, (1 from Sydney and 5 from Dubbo).

NOTE: There were no Age 4 children in the E95 Sample. There were no E93 Age 4 females and there were no E96 Age 4 males.

Table A2.2

EARLY Year Screening Percentile Bands - Percent of Children Combined Samples

Percentile Bands	Suc. Rate N = 692	Out. Mot. N = 774	Fine Mot. N = 752	Lang. N = 754	PP&R N = 753	Personal N = 767
0-10		.8	.1	1.0	6.7	4.7
11-20	1.1	3.9	.5	3.7	8.9	5.7
21-30	3.3	8.3	4.2	3.1	9.8	7.2
31-40	6.6	9.5	5.5	5.3	12.8	8.5
41-50	12.6	14.4	13.5	7.0	13.9	19.2
51-60	16.5	8.3	14.6	8.0	8.4	
61-70	22.4	18.7	19.2	16.2	14.9	10.7
71-80	18.4	13.4	19.2	15.6	12.3	7.4
81-90	6.4	9.5	13.2	19.8	7.3	11.7
91-100	.6	7.4	5.6	16.2	.8	24.9

Table A2.3

LATE Year Screening Percentile Bands - Percent of Children Combined Samples

Percentile Bands	Suc. Rate N=648	Out. Mot. N=775	Fine Mot. N=714	Lang. N=761	PP&R N=828	Personal N= 760
0-10					.1	2.4
11-20		1.2	.3	.5	.4	3.2
21-30		2.8	.8	1.6	1.7	4.6
31-40	1.7	4.5	2.7	3.8	3.1	5.0
41-50	2.9	9.8	6.4	5.5	8.1	13.6
51-60	9.1	5.8	10.9	4.9	7.1	
61-70	19.0	15.6	14.4	13.0	17.5	8.0
71-80	26.4	22.2	21.7	13.1	26.0	12.5
81-90	32.7	23.5	26.8	26.3	26.6	14.7
91-100	8.2	14.6	16.7	31.3	9.4	36.1

N = number of children with BOTH early and late screening results in each school. *For example*, School 7 had 61 children attend for the full school year, with a school mean Success Rate (Suc. Rate) gain of 14.6 (N gain = 14.6). School numbers are consistent across samples. *For example*, School 2 is the same school in 1993, 1995 and 1996.

Table A2.4

1993 - School Mean Gains

Categories & Children		Sch.1 N=20	Sch.2 N=26	Sch.3 N=40	Sch.4 N=33	Sch.5 N=39	Sch.6 N=12	Sch.7 N=61
Suc. Rate	N	9.3	15.3	20.7	19.2	20.3	10.6	14.6
	male	6.8	18.5	22.4	23.7	20.5	8.5	16.9
	female	13.4	10.6	18.4	16.3	19.7	15.3	12.9
	Age 1	10.4	23.5	24.8	17.2	22.1	18.0	15.1
	Age 2	8.8	15.3	20.4	20.2	20.4	8.7	16.5
	Age 3	9.2	9.0	16.8	18.2	18.1	-	11.2
Out. Mot.	N	14.1	5.9	23.3	15.1	16.9	.9	6.3
	male	20.8	6.6	31.8	11.1	20.7	0	3.7
	female	4.1	5.0	11.7	17.1	11.4	2.7	8.2
	Age1	-.7	-.7	22.7	4.1	18.0	-6.9	9.4
	Age 2	25.6	10.4	18.7	19.2	16.1	4.8	7.5
	Age 3	16.6	6.6	34.5	16.6	18.0	-	2.9
Fine Mot.	N	10.0	12.1	15.3	7.6	3.7	10.0	15.0
	male	3.7	16.3	14.7	9.5	5.4	10.6	16.2
	female	19.3	6.3	16.1	6.6	1.2	8.7	14.1
	Age 1	20.0	22.1	14.0	.6	15.0	12.5	18.0
	Age 2	3.1	8.8	18.8	10.0	-.4	8.7	13.5
	Age 3	7.0	8.0	8.8	10.0	4.3	-	15.7

Table A2.5

1993 - School Mean Gains

Categories & Children		Sch.1 n=20	Sch.2 n=26	Sch.3 n=40	Sch.4 n=33	Sch.5 n=39	Sch.6 n=12	Sch.7 n=61
Lang.	N	6.1	14.3	10.1	26.7	21.2	3.8	11.6
	male	1.3	18.9	9.3	37.6	19.2	-.5	16.6
	female	13.7	7.3	11.3	21.6	24.3	14.1	8.0
	Age 1	13.0	21.4	16.1	20.8	18.2	7.6	9.6
	Age 2	7.2	18.3	9.7	29.8	23.6	2.8	14.0
	Age 3	-2.3	4.7	4.7	24.0	17.7	-	8.7
PP&R	N	12.8	25.6	32.6	25.5	29.1	28.5	21.6
	male	9.4	30.0	33.3	32.5	27.6	29.4	24.8
	female	18.3	19.8	31.7	21.8	32.5	26.7	19.3
	Age 1	16.4	40.3	38.9	29.1	30.9	41.0	20.7
	Age 2	7.5	22.6	32.1	25.7	29.7	22.3	24.6
	Age 3	17.8	18.2	26.9	20.7	25.0	-	16.9
Per	N	-9.3	5.7	20.9	6.6	30.4	-3.1	17.4
	male	-9.3	9.1	25.0	18.0	36.9	-9.3	22.0
	female	-9.3	1.1	15.4	1.3	21.0	9.3	14.2
	Age 1	-25.0	30.3	35.0	4.1	28.1	12.5	18.7
	Age 2	-4.6	6.9	22.6	11.0	35.8	-10.9	23.0
	Age 3	5.0	-12.5	1.3	-5.0	17.1	-	7.2

Note. School 6 had no Age3 children enrol in 1993.

N = number of children with BOTH early and late screening results in each school. *For example*, School 8 had 106 children attend for the full school year, with a school mean Success Rate gain of 14.4 (N gain = 14.4).

Table A2.6

1995 - School Mean Gains

Categories & Children		Sch.2 N=41	Sch.6 N=17	Sch.8 N=106	Categories & Children		Sch.2	Sch.6	Sch.8
Suc. Rate	N	-	-	14.4	**Lang.**	N	-	11.2	7.2
	male	-	-	14.3		male	-	6.6	7.8
	female	-	-	14.4		female	-	21.5	6.7
	Age 1	-	-	15.9		Age 1	-	13.1	10.1
	Age 2	-	-	14.3		Age 2	-	9.8	6.8
	Age 3	-	-	12.5		Age 3	-	-	4.4
Out. Mot.	N	14.8	-	9.8	**PP&R**	N	34.1	25.9	22.8
	male	16.4	-	11.5		male	36.0	28.9	21.2
	female	12.8	-	8.3		female	31.7	20.0	24.3
	Age 1	16.1	-	7.5		Age 1	42.5	26.0	27.7
	Age 2	13.4	-	11.1		Age 2	32.8	25.8	22.8
	Age 3	17.7	-	9.3		Age 3	23.8	-	16.2
Fine Mot.	N	25.0	38.8	18.8	**Per.**	N	12.5	30.0	9.3
	male	25.0	42.0	21.4		male	6.2	40.0	4.0
	female	25.0	31.0	16.6		female	16.6	10.0	13.8
	Age 1	15.0	46.2	18.7		Age 1	25.0	21.4	10.2
	Age 2	31.6	32.2	19.3		Age 2	4.1	37.5	5.6
	Age 3	-	-	17.7		Age 3	-	-	18.7

Note. Scheduling end of year school activities prevented School 2 from completing all screening categories. All children did complete Outside Motor and Paper/Pencil & Reasoning. Fine Motor and Personal Characteristics had five children, with no late Language results. Missing Screening Categories, eg. because there were not sufficient adults available on screening day, or scores were considered skewed due to circumstances uch as inappropriate procedure, were not counted and therefore, there was no total for Success Rate (see School 6). In 1995, School 6 had no Age3 children enrol.

N = number of children with BOTH early and late screening results, in each school. *For example,* in 1996, School 8 had 95 children attend for the full school year, with a school Success Rate gain of 8.0 (N gain =8.0).

Table A2.7

1996 - School Mean Gains

Categories & Children		Sydney			Dubbo				
		Sch2 N=45	Sch6 N=22	Sch8 N=95	Sch12 N=16	Sch13 N=5	Sch14 N=33	Sch15 N=51	Sch16 N=21
Suc. Rate	N	17.5		8.0	6.0		22.3		25.5
	male	20.3		8.1	5.8		23.0		25.8
	female	12.6		7.8	6.1		21.6		25.2
	Age 1	22.7		10.6	8.5		23.3		
	Age 2	13.3		6.1	6.0		23.6		29.0
	Age 3	13.6		7.7	-1.5		16.4		23.9
Out. Mot.	N	20.0		19.0	4.5		22.2	12.1	25.5
	male	19.4		20.2	3.1		24.6	16.3	26.6
	female	20.9		17.4	5.5		19.2	9.1	24.4
	Age1	23.0		17.5	0		20.3	13.8	
	Age 2	15.4		21.1	10.3		26.9	11.9	29.5
	Age 3	23.8		17.9	0		15.5	11.1	23.8
Fine Mot.	N	8.2		-3.2	2.5		27.8		19.7
	male	9.4		-1.6	8.5		28.6		19.5
	female	6.2		-5.3	-2.2		27.0		20.0
	Age 1	10.0		-1.8	1.4		32.6		
	Age 2	9.7		-5.9	5.0		26.1		17.5
	Age 3	-		-.9	-2.5		18.0		20.7

Table A2.8

1996 - School Mean Gains

Categories & Children		Sydney			Dubbo				
		Sch 2	Sch 6	Sch 8	Sch12	Sch13	Sch14	Sch15	Sch16
Lang.	N	20.6	9.5	.2	.7	11.5	5.5	26.5	21.4
	male	22.9	5.5	-1.0	12.0	11.5	8.5	26.7	18.8
	female	16.9	16.6	1.7	-9.1		2.0	26.3	24.2
	Age 1	25.4	10.7	-1.5	-1.9	5.7	4.3	33.4	
	Age 2	19.4	7.3	-1.2	3.2	0	7.3	25.5	32.0
	Age 3	11.5	17.3	4.1	0	34.6	4.6	21.4	17.1
PP&R	N	20.7	16.0	17.2	17.8	28.5	36.2	36.4	33.8
	male	26.9	9.4	18.3	8.3	27.6	34.2	42.8	34.7
	female	10.2	22.7	15.7	24.2	32.1	38.5	32.6	32.8
	Age 1	32.3	9.2	23.8	25.0	33.3	39.2	39.8	
	Age 2	8.2	22.8	15.4	16.0	-3.5	36.0	39.2	37.5
	Age 3	25.0	16.0	12.4	-1.7	46.4	27.8	29.5	32.3
PER.	N	13.3		6.4	-2.3	35.0	21.0	7.5	20.8
	male	12.5		3.7	-3.5	28.1	23.5	20.0	25.0
	female	15.0		10.0	-1.3	62.5	18.3	-.4	16.2
	Age 1	11.8		12.9	0	37.5	21.4	10.5	
	Age 2	11.8		6.4	-3.5	75.0	24.0	6.5	16.6
	Age 3	22.9		-.4	-6.2	-12.5	12.5	6.6	22.5

Table A2.9

Standard Deviations **1993 Sample** - Early Year and Late Year

No. of Children	Success Rate	Outside Motor	Fine Motor	Language	PP&R	Personal
Early Sample N = 268	15.6 N = 247	23 N = 267	17.1 N = 268	23.4 N = 259	23.2 N = 255	32.1 N = 265
Late Sample N = 321	13.1 N = 300	19.3 N = 320	18.1 N = 321	17.8 N = 303	17.9 N = 316	28.9 N = 320

Table A2.10

Standard Deviations **1995 Sample** - Early Year and Late Year

No. of Children	Success Rate	Outside Motor	Fine Motor	Language	PP&R	Personal
Early Sample N = 190	13.2 N=176	21.3 N=189	17.7 N=190	20 N=183	20.7 N=184	29.8 N=184
Late Sample N = 182	10.6 N =115	19.5 N =161	13.4 N =136	17.1 N = 135	12.2 N =182	27.7 N =138

Table A2.11

Standard Deviations **1996 Sample** - Early Year and Late Year

No. of Children	Success Rate	Outside Motor	Fine Motor	Language	PP&R	Personal
Early Sample N = 318	17.9 N = 269	22.1 N =318	19.2 N = 294	23.0 N = 312	26.3 N = 314	30.3 N = 318
Late Sample N =330	12.9 N =233	18.5 N = 294	15.2 N = 257	20.5 N = 323	16.3 N = 330	27.2 N = 302

Table A2.12

Standard Deviations **Combined Samples** - EARLY in the Year

Children	Success Rate	Outside Motor	Fine Motor	Lang.	PP&R	Personal
N = 776	N = 692	N = 776	N = 752	N = 754	N = 753	N = 767
N SD	16	22	18	23	24	31
male	16	21	18	23	24	31
female	15	22	17	22	24	29
Age 1	16	22	19	23	24	30
Age 2	15	23	18	23	24	31
Age 3	15	22	17	21	23	29

Note. Age 1 = 4.6-4.11; Age 2 = 5.0-5.5; Age 3 = 5.6-5.11

Table A2.13

Standard Deviations **Combined Samples** - LATE in the Year

Children	Success Rate	Outside Motor	Fine Motor	Lang.	PP&R	Personal
N = 833	N = 648	N = 775	N = 714	N = 761	N = 828	N = 760
N SD	13	19	17	19	17	28
male	13	20	16	20	17	30
female	12	18	17	17	16	25
Age 2	15	20	19	21	20	30
Age 3	12	21	17	19	16	28
Age 4	11	17	16	18	16	27

Note. Age 2 = 5.0-5.5; Age 3 = 5.6-5.11; Age 4 = 6.0 +

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