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The Impact of Structural and Process Elements of Pre-school and Primary School Environments on Children's Cognitive Development at Four Years of Age

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B.Sc. Applied Psychology

Submitted in fulfilment of the requirements for the degree of

MASTERS OF PHILOSOPHY

School of Social Science

Dublin Institute of Technology

September 1999

Declaration

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NODLAIG MOORE, B.Sc.

Acknowledgements.

Acknowledgements are due to the following people without whom it would not have been possible to complete this study.

I would like to thank Noirin Hayes, my academic supervisor, whose boundless energy, interest and advice have been invaluable in the completion of this work.

To Dr. Eilis Hennessy, my advisory supervisor, who gave generously of her time and whose expert guidance was much appreciated particularly regarding data analysis.

To Margaret Kernan of the Centre for Social and Educational Research, DIT, for her willingness to help with my many queries regarding the IEA Preprimary Project.

I would like to extend a heartfelt thanks to my parents for their consistent support and at times much needed reassurance and encouragement. Thanks to the rest of my family Michael, Margie, Josie (second home) and Liz (who endured my moods at close proximity) for all of their help.

To all the *hard working postgrads in dittie* where coffee breaks were always short but frequent, it was great to get to know you all, best of luck in the future to one and all.

Finally to the Cork gang for the welcome weekends that kept body and soul together.

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Abstract

The structural and process elements of the early years classroom have contributed to much research in the area of early childhood education. Structural elements have been referred to as regulatable features that are "assumed to indirectly affect the child" (Burchinal, Roberts, Nabors & Bryant et al 1990). Process elements are directly related to children's experiences and are "more difficult if not impossible to regulate" (Howes, Phillips & Whitebook 1992, p. 480). The structural elements of the early educational environments examined in this study include adult-child ratio, group size and teacher training. The process elements include preacademic activity, expressive activity and the social contexts (i.e. adult and children present, only adult present and only children present) of children's activities. The aim of this study was to investigate the influence of selected structural and process elements on 4-year-olds cognitive development in pre-schools and primary schools. This involved the secondary analysis of specific data collected in Phase 2 of the IEA Preprimary Project (Hayes, O'Flaherty with Kernan 1997).

A sample of 361 children and their mothers (182 in primary schools and 179 in pre-schools) that participated in Phase 2 of the IEA Preprimary Project were included in this study. Forty-five pre-school teachers and 47 primary school teachers participated. From Phase 2 of the IEA Project the Child Observational schedule provided data on the adult-child ratio, group size and on all the process variables. The Family Background Interview revealed information on maternal education and the Provider Survey provided data on the level of teacher's training. Children's cognitive development was assessed using the IEA Cognitive development measure.

Stepwise regression analyses showed that for the pre-school sample group size and mother's education were significant predictors of children's cognitive development. For the sample of primary school children the regression analyses revealed child's age and adult-child ratio as significant predictors. The process variables were not found to be significant predictors of children's cognitive development.

Chapter 1

Introduction

Introduction

Need for Research in Early Years Education in Ireland.

To date very little research has been done in the area of early childhood education in Ireland. However due to the current public and political interest regarding early years services in Ireland such research is of paramount importance. The National Forum for Early Childhood Education (1998) agreed on the "need to expand research activities in the area" (p. 113). The Forum identified a number of topics that future research should address one of which included "variation in provision in early childhood education described in terms of structural characteristics (such as adult-child ratios, group sizes, adult preparation) and process characteristics (adult-child interactions the developmental appropriateness of activities)" (p. 114). In keeping with this, the research reported herein concentrates on certain structural and process variables of the primary school and pre-school settings and their influence on the cognitive development of four year olds attending such settings. In the present climate it is envisaged that this research will contribute in expanding the relatively limited research base in the field of early education in Ireland.

At this juncture it is important to mention that research in the area of early childhood education is multidisciplinary in nature. This is reflected in the thesis presented herein which demonstrates sensitivity to the areas of developmental psychology and early childhood education and also to issues relating to social policy. The following outline of the chapters unveils this fusion of disciplines.

Chapter 2, initially offers a commentary on the distinctive shift in developmental psychology from studying the child in isolation to studying the child in context. This trend has become increasingly popular due mainly to the theoretical exploits of Vygotsky (1978) and Bronfenbrenner (1979). Drawing from Bronfenbrenner's ecological systems model of development and the importance of investigating a child's development within a social and cultural context, this present study investigates the child in the "microsystem" of the early years setting. Within this microsystem the structural variables of group

size, adult-child ratio and teacher training and the process variables of child activities and the social context of children's activities are the focus of this investigation. As seen from the early education literature the structural and process elements of the early setting have been operationalised by a number of researchers as a means of conceptualising the quality of these settings in terms of the service provided. A brief review of the current expert ideology regarding the concept of quality in early years services is included in this chapter. The structural and process elements of early years settings have received much research attention by our American and British counterparts, the findings of relevant studies are reviewed in chapter 2.

Chapter 3 provides a description of the broader social and cultural context in which the Irish 4-year-old's early years setting is nested. Specifically the social and economic factors which have intensified the demands for early years services are examined. Following this the current structure and provision of early years services in Ireland detailing the Public Sector and Private Sector provision is presented. This chapter includes a number of Government initiatives and an outline of the Child Care Pre-school Regulations (1996), in the case of the present study it is of importance to mention that data collection for Phase 2 of the IEA Preprimary Project preceded the regulations. Chapter 3 concludes with a commentary on the recent developments orchestrated by the Irish Government in relation to the matter of the co-ordination of early years services in Ireland.

In ***Chapter 4*** the reader is re-introduced to the early years "microsystem" and the focus of this study which is to investigate the impact of structural and process variables of the primary school and pre-school settings on 4-year children's cognitive development. This chapter explains the genesis of the current piece of research from Phase 2 of the IEA Preprimary Project (Hayes, O'Flaherty with Kernan 1997) and outlines where the data for the structural and process variables and the 4-year-olds cognitive development was sourced from. Chapter 4 concludes with the research objectives and hypotheses.

Chapter 5 details the methodology, it includes a description of the sample which was extracted from the IEA Preprimary Project sample, the Child Observational Records, the Provider Survey, the Parent Interview and the Child Cognitive Development Measure.

In ***Chapter 6*** the results are presented in two sections. The first section presents the analyses of the pre-school data and the second section presents the analyses of the primary school data. Both sets of analyses followed the same statistical format which included: 1) Descriptive analyses, described the structural and process variables for the pre-school and primary school settings, 2) Correlation analyses described the simple associations between the structural and process variables and children's cognitive development 3) Stepwise Regression analyses investigated the contribution of the structural and process variables in predicting children's cognitive development. Consequently each of the research hypotheses are presented and accepted or rejected based on the statistical findings.

Finally ***Chapter 7*** discusses the findings of the present study in relation to previous research and current policy. A critique of specific aspects of the research reported herein is offered and directions for future research are outlined.

Chapter 2

Literature Review

Literature Review

2.1. Theoretical Issues.

The literature on early childhood education overlaps with the literature from developmental psychology. Traditionally in the domain of cognitive development there has been a concentration on the study of single individuals however a number of psychologists have swayed from that focus to encompass the relationship between individuals and the social contexts in which they do their thinking. Greene (1994) identifies this phenomenon as a "shift from studying the child in isolation to studying the child in context" (p. 355). This shift can be traced to the differences observed between Piaget's and Vygotsky's theoretical perspectives on children's cognitive development and has been propagated by the renewed interest in Vygotsky's theoretical formulations. At a general level Piaget places more emphasis on the child's interaction with the physical environment whereas Vygotsky's "socio-cultural" perspective places more emphasis on the interaction with other people.

Piaget's (1966) most fundamental concepts were that cognition is one form of adaptation between the organism and the environment, which proceeds through the processes of assimilation and accommodation. Assimilation involves the incorporation of "new information into the conceptual schemes we already have as far as it is possible for us to do so" (Meadows, 1988, p. 20) while accommodation refers to the modification of "the conceptual schemes to cope with new information " (Meadows 1988, p. 20). The idea that cognition is adaptation, apparently a biological process, is an assertion of Piaget's values as a biologist. Therefore this perspective may have contributed to Piaget's tendency to "underestimate the cultural aspects of cognition; but allowed him to draw very interesting analogies between aspects of biological development across species" (Meadows 1988, p. 20). According to Piaget the child's interaction with the physical environment provides the main constraints on and contributions to intellectual functioning. Children construct their own knowledge by acting upon objects in space and time. Although Paiget's focus was on how individuals engage in "learning on one's own or.... learning by

invention" (Bruner 1986, p. 127) he did not completely ignore the influence of social processes on psychological development. He argued that social interactions may facilitate development by exposing a child to alternative view points and to conflicting ideas which may encourage the child to rethink or review his own ideas. Therefore Piaget maintained that social processes have merely a secondary function and only impact on an individual's mental life when "the groundwork has been laid by individual cognitive development" (Wretsch & Penuel 1996, p. 420).

In contrast to Paiget's theorising Vygotsky argued for the need to recognise social factors as underlying psychological processes of the individual. Statements of the following type reinforced such an argument: "the social dimension of consciousness is primary in time and in fact. The individual dimension of consciousness is derivative and secondary" (Vygotsky 1979, p. 30). This point is expanded and clarified in Vygotsky's "general genetic law of cultural development".

> "Any function in the child's cultural development appears twice, or on two planes. First it appears on a social plane and then it appears on the psychological plane. First it appears between people as an interpsychological category, and then within the child as an intrapsychological category. This is equally true with regard to voluntary attention, logical memory, the formulation of concepts and the development of volition...(1981a, p. 163).

From this perspective individual mental functioning derives it's existence and form from social processes and as a result such individual functioning is characteristically social. Unlike Piaget, Vygotsky places far more emphasis on the role played by culture and it's systems of symbols in forming an individual's intelligence. The increased interest in Vygotsky's work over the recent years is reflected in the adoption of "socio-cultural", "social constructivist" models and paradigms in the work of a number of developmental psychologists. Woodhead (1996) states that while most mainstream psychologists "continue to endorse the basic tenets of developmentalism, there is now much more widespread

acknowledgement that children's social relationships and adaptation, and hence "needs" are culturally as much as biologically constituted" (p. 78). This in part explains the shift from studying an individual in a "disembedded context" or in isolation to studying an individual in an "embedded" social/cultural context.

Bronfenbrenner also contributed to the change identified above for example he viewed the work of mainstream developmental psychology as "the science of strange behaviour of children in strange situations with strange adults for the briefest possible periods of time" (Bronfenbrenner 1979, p. 19). Consequently he postulated that children where possible should be studied in their natural ecology. In support of this he offered an ecological systems model of development. In Bronfenbrenner's model he re-conceptualised the child's ecology as "a multi-layered set of nested and interconnected environmental systems all of which influence the developing child but with varying degrees of directness" (Greene 1994, p. 356). Hence this model (which will be elaborated on below) accommodates the social and cultural contexts in which the child develops. The ideas delivered by Vygotsky and Bronfenbrenner have liberated among developmental psychologists a cognisance of the importance of comprehending the relationship of the child to his or her social and cultural context. Consequently this has been reflected in contemporary research endeavours.

Resulting from the discussion above it's apparent that children do not develop in a vacuum. Although the family is the principal context in which human development takes place it is but one of several settings in which developmental processes can and do occur (Bronfenbrenner 1986). In his ecological systems model of development Bronfenbrenner (1979) acknowledges that the developing person's environment consists of multiple layers of influence. Of significance to Bronfenbrenner's conceptualisation of the environment is the feature of "interconnectedness" between the layers of influence. At the core of this model is the "micro-system" in which the developing person actually participates. Bronfenbrenner recognises settings beyond this immediate microsystem, for example the mesosystem "comprises the linkages and

processes taking place between two or more settings containing the developing person" (Bronfenbrenner 1989, p. 227). A third level of influence, the exosystem refers to the "linkage and processes taking place between two or more settings, at least one of which does not ordinarily contain the developing person, but in which events occur that influence processes within the immediate setting that does contain that person" (Bronfenrenner 1989, p. 227). Finally the "macrosystem" refers to "consistencies in the form and content of lower-order systems that...exist at the level of the subculture or culture as a whole". In a revised discussion of some of his conceptions detailed in his 1979 monograph, Bronfenbrenner (1989) revealed that in a "micro-system paradigm, the developing person is viewed as an active agent who inevitably plays some part in any developmental process taking place in the micro-system" (p. 238).

In some respects it may be suggested that Bronfenbrenner's ecological approach is reflected in what Super and Harkness (1986) identify as a "developmental niche". This developmental niche is a theoretical framework concerned with the development of children in a cultural context and promotes the integration of the specific disciplines of anthropology and developmental psychology from which it originated. At the centre of the niche is the individual child surrounded by three major subsystems. *Subsystem 1*, involves the physical and social settings in which the child lives, *Subsystem 2*, consists of the culturally regulated customs of childcare and childrearing and *Subsystem 3*, involves the psychology of the caretakers. In combining this concept of "developmental niche" and Bronfenbrenner's ecological approach, Woodhead (1996) asserts that children may be depicted as growing up in the context of the family micro-system and the pre-school micro-system.

The following literature review concentrates on the "micro" culture of the early years settings as experienced directly by the child. To date much research has been done at the microsystem level of the early years classroom and a great deal has been written about creating classroom environments that enhance the development of young pre-school-aged children. For example Kontos & Keyes (1997) used an ecobehavioural approach as a method of understanding the classroom environment by describing the ecology and examining the

interactions that occur between the ecology and children's behaviour (Carta & Greenwood 1985, Greenwood & Carta 1987). In this approach Kontos and Keyes suggest that the behaviours of interest are "typically those that are linked to positive developmental outcomes" (p. 3). Specifically, these researchers examined important contextual features of early childhood classrooms (child activities, adult-child interactions, social context of activities and interactions) that accompany complex play with peers and objects and those that accompany complex interactions by teachers with children. The contextual features outlined by Kontos and Keyes (1997) represent "critical aspects of children's classroom experiences" (p. 5). Such features may be similarly referred to as process elements of the classroom environment in that they represent the dynamic processes between the child and the activities they are engaged in and the dynamic processes between the child and the other individuals in the setting.

Process elements in addition to structural elements of the early years classroom have been a major concern of those researchers investigating the quality of early years services. In many studies, quality of early childhood care and education services has been frequently conceptualised in terms of process quality and structural quality of the early years classroom. At this stage it is important to introduce the broader concept of quality as identified in the context of early years services. This may contribute in an effort to ground the notion of investigating structural and process elements of the early years classroom within an ideological base.

2.2. The Concept of Quality

The concept of quality has evoked much debate and research within the area of early childhood care and education. Moss (1994), argued that the concept of quality is inherently subjective and relative. Woodhead (1996) reflects this stance but also states that "quality is not arbitrary" (p. 91). It appears that the very nature and diversity of the concept of quality automatically poses difficulties in its conceptualisation and in its definition. Such diversity is particularly evidenced by Farquhar (1990) who proposes that quality may be viewed from a range of perspectives. Farquhar identified a number of these perspectives, the cognitive development perspective, the government/regulatory

perspective, the social service perspective and the parent perspective. Additionally Farquhar (1990) suggested four more perspectives recognisable from the literature including the child perspective, the staff perspective, the social policy funding perspective and the cultural perspective. The child development perspective has emerged from the literature as the most popular with researchers and is also reflected in the research reported herein. This perspective is "concerned with the potential effects of children's experiences in an early childhood programme on their intellectual, physical and motor, social and psychological development" (Farquhar 1990, p. 20).

Accounting for such a variety of perspectives it is realistic to acknowledge Woodhead's notion that "defining quality in early childhood programmes is not a once and-for-all process. Negotiation and renegotiations are continuous" (Woodhead 1996, p. 42). He outlined a three dimensional framework for examining the quality of early childhood programmes incorporating indicators (input, process and outcome), stakeholders (children, parents, staff, research investigators etc.), and beneficiaries (society, families etc.). The advantage of such a framework is the fact that it recognises that in order to attempt the process of defining quality the perspectives of all those with a vested interest in the area must be accommodated. Such an idea resembles what Pence and Moss (1994) have identified as an "inclusionary approach" to quality. This approach is based on "participation by a broad range of stakeholders and recognition of values, beliefs and interests underpinning definitions" (p. 173). In this respect researchers have equal opportunity to contribute in the process of defining quality.

As mentioned researchers have conceptualised quality in either structural or process terms (Howes and Hamiliton 1993). Howes and Smith (1995) define process quality as "the child's experiences in care" (p. 383). Structural elements of the classroom context refer to "regulatable aspects" such as adult-child ratio, group size and teacher characteristics including education and training in early childhood education. These features of the early years classroom ecology "are usually selected by researchers because of their presumed or proven relationship with certain child outcomes" (Moss 1994).

Goelman and Pence (1987a, 1987b) have identified the importance of considering both structural and process dimensions of home-based care and centre-based care for young children. In their model of early childhood settings Harms and Clifford (1993) have also recognised the significance of both these dimensions as important in determining "the ultimate quality" of the experiences of children in a particular setting. The diversity of research into the structural and process features of quality in early childhood classrooms suggests that childcare centres are heterogeneous by nature (Howes & Hamilton 1993). From this it is apparent that the structural and process elements of the microsystem of the classroom warrant investigation as a means of distinguishing the influence that this setting has on the developing child

The aim of this section is to outline the relevant structural and process features of the classroom microsystem, their interrelationships and their contributions to 4-yr. old children's development as represented by the pertinent literature.

2.3. Structural Elements of the Early Years Setting.

Structural elements of the classroom environment are those variables "assumed to indirectly affect the child" (Burchinal, Roberts, Nabors and Bryant 1996, p. 606). These regulatable variables are "concrete and easily measured" (Howe & Jacobs 1995, p. 133) and include adult-child ratio, group size and teacher training these have been referred to as the "iron triangle" structural variables (Phillipsen, Burchinal, Howes and Cryer 1997). Phillipsen et al (1997) have also suggested that these variables are influenced by "government regulations, centre policies and economic climate" (p. 282). From this perspective structural elements are legislatively feasible.

Adult-child Ratio.

Adult-child ratio is regarded as an important structural feature based on the assumption that adults "mediate children's contact with the social and physical world" (Phillips & Howes 1987, p. 5). Hence ratio is expected to have an influence on children because it is thought that, as the number of children an adult cares for increases, the opportunity for interaction between the adult and each child will be less (Howes & Hamilton 1993).

Howes, Phillips and Whitebook (1992) studied the quality (Structural and Process) of centre-based childcare and children's social development. In their sample of pre-school (37-52 months) classrooms they found that when nine or more children were cared for by one adult, at least 50% of the children were in classrooms rated as inadequate in caregiving according to the Early Childhood Environment Rating Scale, (ECERS) (Harms & Clifford 1980). Similarly when eight or more children in pre-school groups were cared for by one adult, at least 50% of the children were in classrooms rated as inadequate in activities (ECERS). Howes et al (1992) suggested that "licensing standards for ratios do make a difference in the quality of care provided for children" (p. 458). This suggestion was reinforced by the fact that the more stringent Californian ratio standard of 1:8 for pre-schoolers was associated with higher levels of appropriate caregiving than the Federal Interagency Day Care Requirements (FIDCR) standard of 1:9. The variability in quality of care associated with adult-child ratio as illustrated in Howes et al study emphasises the sensitive nature of the child care setting. This is also stressed in Burchinal et al (1996) study of the quality of centre child care and infants language and cognitive development. These researchers found that infants in classrooms that met the American Public Health Association (APHA) and the American Academy of Paediatrics (APA) standard ratio of 1:3 demonstrated substantially better communication skills than infants in classes that did not meet this standard ratio.

Similarly, the Bermuda Study (Phillips, Scarr & McCartney 1987) investigated the effects and dimensions of quality for 166 children from 3-5 years old in nine centres. Their findings illustrated that parents rated children in programmes with fewer children per staff member as more considerate however, caregivers rated these children as anxious. Regarding children's performance on intellectual and language development measures adult-child ratio emerged as a primary influence. Children in centres with better adult-child ratios received higher scores in standardised language measures and on communication assessments.
A lower adult-child ratio is associated with more elaborated play (Bruner 1980) and higher frequencies of peer interaction and fantasy play (Field 1980). Children experiencing high ratios have been observed to engage in more wandering, more peer interactions and show less optimal social adjustment

(Howes 1988, Howes & Olenick 1986, Whitebook et al 1989). From the studies discussed it may be assumed that adult-child ratio has an affect on children's experiences within the classroom environment and subsequently on their development.

It is however important to recognise that certain studies have shown adult-child ratio to be a non-significant predictor of children's development. For example Dunn (1993) found that adult-child ratio was not a predictor of children's development, when entered into a hierarchical multiple regression equation. From the research it appears that a number of studies have demonstrated the structural element of adult-child ratio to be a significant predictor of children's development while others don't support such a claim.

Group Size.

Research has suggested that group size may be a more relevant element of the classroom context than adult-child ratio for preschool aged children (Howes and Hamilton 1993). When adults worked with smaller groups of preschool-aged children more frequent teacher-child and peer interactions occurred (Howes & Rubenstein 1985) and children were observed to engage in innovative, cooperative, task-oriented and socially competent behaviours (Clarke-Stewart 1987, Clarke-Stewart & Gruber 1984).

Howes et al (1992) found in their study of 414 children (ages 14-54 months), that at least 50% of the children were in classrooms rated as inadequate in caregiving when 20 or more children were in pre-school groups. Likewise when 19 or more children were in pre-school groups at least 50% of children were in classroom rated as inadequate in activities. A curvilinear relationship was observed between group size and developmentally appropriate activities in pre-school classrooms, in that fifty per cent or more of children in classrooms with group size of 7 or smaller were also in classrooms rated as inadequate in activities. These researchers in addition found that children were more likely to experience developmentally appropriate activities in pre-school classrooms with 18 or less children, as opposed to children in classrooms exceeding this

standard. These findings highlight that this structural element of the classroom makes a difference to the quality of care experienced by the children.

Hence group size is a cogent structural variable in terms of enhancing children's classroom experiences and their cognitive development. For example smaller group size was related to greater cognitive gains (Clarke-Stewart 1987; Roupp, Travers, Glantz and Coelen 1979) and more elaborate fantasy play. Incidentally Howe & Jacobs (1995) found group size and caregiver training to be the strongest predictors of positive child outcomes.

Teacher Training.

The key factor in terms of training according to Howe and Jacobs (1995), tends to be "specialised, extensive training in early education at post-secondary level" (p. 136). For example it has been demonstrated that childcare workers who have specialised training in early childhood education provide more stimulating and developmentally appropriate environments and appear to be more knowledgeable about child development than untrained or poorly trained workers (Arnett 1987). More specifically specialised education and training was shown to be a strong predictor of positive classroom interactions, verbal communication skills, cooperative behaviour and cognitive abilities (Field 1980; Howes & Rubenstein 1985; Roupp et al 1979; Smith & Connolly 1981). Such research promotes the notion that teacher/caregiver training may have a direct impact on children's daily experiences and activities in the classroom. A number of studies have identified specialised training with good quality childcare. For example Howes (1983) found that caregivers in centres and family day care homes with more child related training engaged in more social stimulation and responsiveness than other caregivers. In keeping with the studies above Dunn (1993) showed how the "distal quality variables" identified as predictors of children's development were measures describing the caregiver as opposed to the more frequently identified predictors of adult-child ratio and group size. In relation to training, caregivers with higher levels education were more likely to have college-level work in a child related major or to have majored in early childhood education/child development. Hence when caregivers' level of education, caregiver's centre experience and ECERS score

were entered into the third step of the hierarchical regression equation they significantly increased the prediction of children's development after the effects of child/family variables and centre selectivity were removed. Therefore Dunn showed for her sample that caregiver's education, particularly a major in early childhood education/child development was a positive predictor of children's cognitive development.

The structural characteristics of adult-child ratio group size and teacher training have attracted much attention from researchers in the area of early childhood care and education. One of the main reasons for this interest may be the fact that such research contributes in directing the discussions of policy-makers. Some studies have failed to show significant associations between some regulatable features and children's development (Kagan and Newton 1989, Whitebook et al 1990). However where associations have been demonstrated they consistently show higher ratios, smaller groups and better trained and educated staff as predictors of positive child development.

2.4. Process Elements of the Early Years Setting.

In order to achieve a holistic investigation of the early years classroom it is important to look at the process elements of such an environment. This point was argued by Harms & Clifford (1993) who suggested that structural variables "do not capture important aspects of the processes/interactions in the setting" (p. 489), these can only be measured through observation (McCartney et al 1982). Therefore in a study of the early years classroom environment it is necessary to include process elements which may be obtained through observation. Bronson (1994, p. 22) suggests that classroom observations dispense with the problems associated with testing young children in formal situations and "allow assessment of the natural flow of behaviour and integration of social-emotional and cognitive functioning".

Process elements of the early childhood classroom ecology may be depicted as those, which are directly related to children's experiences in such settings. These variables require interpretation and thus are more difficult "if not impossible to regulate" (Howes et al 1992, p. 450). Research has demonstrated

that some of the important aspects of children's classroom experiences to consider include the activities in which the children are engaged, their interactions with teachers and the social context of those interactions and activities (Helburn 1995; Howes & Smith 1995; Kontos & Wilcox-Herzog 1997b).

Child Activities.

Data relating to children's activities in the classroom are considered to be of importance as they provide clues to the type of cognitive and social demands that are placed on them (Rubin, Fein and Vandenberg 1981, Hadeed & Sylva 1995; Kontos & Wilcox-Herzog 1997b).

Early childhood educators influenced by Piagetian perspectives have focused on the nature of the activities offered to children in early years classrooms. One aspect of Piaget theory centres on the fact that both the operations and structures of the mind are constructed from the actions of the child on the world. Davis (1991) argues that the emphasis on the child's own direct experiences transfer into "the need for children's own direct involvement in learning" (p. 19). From an educational perspective Davis suggests that children "should be given concrete experiences and that they should be able to discover things for themselves" (p.19). In keeping with Piaget's stage theory pre-school-aged children fall into the Pre-operational period, the prime indicator of which is the acquisition of language and concepts. According to Boehm (1983) assessment of pre-school children's understanding of basic concepts in terms of identifying and producing concept labels "provided cues as to their concept and language acquisition" (p. 158). Boehm refers to the term basic concepts as involving "the child's ability to make relational judgements, either among objects, persons or situations, or in reference to a standard" (p. 145). She recognises how the ability to make such relational decisions is necessary at the pre-school level in order to:

1. follow instruction (Justin, go to the front of the line);
2. comprehend stories ("When the dog was frightened, she hid under the bed")

describe situations or events with others ("I went to bed early because I was tired")

3. facilitate communication with others ("I want the long rope")
   describe thoughts and feelings ("My friend moved far away")

(Boehm 1983, p. 146)

One of the main concerns of early years educationalists is the provision of developmentally appropriate activities for children in this age group. Professionals involved in the National Foundation for Educational Research project, The Educational Needs of Four Year Olds, stressed that "activities must be appropriate to the needs of the individual child" (Cleave & Brown 1991). This stance has been previously issued in the USA by the NAEYC's Developmentally Appropriate Practice Guidelines (Bredekamp 1987). The concept of developmentally appropriateness hinges on the two dimensions namely age appropriateness and individual appropriateness. Bredekamp (1987) believes that age appropriateness requires an appreciation and knowledge of the notion that "there are universal, predictable sequences of growth during the first 9 years of life" (p. 2). In relation to individual appropriateness she explains the importance of recognising the fact that "each child is an unique person with an individual pattern and timing of growth" (p. 2). Specific to cognitive development for 4-5 year olds the guidelines for appropriate practice suggest that "children develop an understanding of concepts about themselves, others, and the world around them through observation, interacting with people and real objects, and seeking solutions to concrete problems" (Bredekamp 1987, p. 56). While expanding on the core ideas of the Bredekamp (1987) edition, Bredekamp & Copple (1997) modified edition is explicit about the importance of the social and cultural context in considering the appropriateness of practices. Attending to the concept of "cultural specificity" Woodhead (1996) proposed to fuse Developmentally Appropriate Practice (DAP) with the equally important principle of Contextually Appropriate Practice (CAP). The emergent hybrid is "PACED – Practice Appropriate to the Context of Early Development" (p. 69), Woodhead argues that it builds on universal features of children's development while respecting contextual variations.

A number of studies are based on the Piagetian ideas that children's cognitive development can be observed through the complexity of their activity with objects. For example Howes and Smith (1995) recognise that "increasingly complex play is assumed to represent increasingly complex cognitive activity" (p. 389). These researchers revealed that children's cognitive activity could be predicted by positive interactions with teachers as well as by their participation in creative activities (e.g. block, dramatic play, open-ended art activities). Similarly Kontos and Keyes (1997) demonstrated that complex (constructive and dramatic) play with objects was most probable in dramatic play activities and least probable in activities classified as "other". The "other" category as identified from a pilot study represented the less frequently engaged in activities of books, blocks, sand/water, sensory, computer, music and science inquiry. The activities most heavily used included art, dramatic play and manipulatives. Hadeed and Sylva (1995), and Sylva, Roy and Painter (1980) have classified children's activities as high (art, constructive play and structured materials) moderate (manipulatives) and low yield (gross motor play and games) in terms of cognitive "stretch" concentration and perseverance. Sylva et al argue that high yield activities "provide for the child to act at his intellectual best" (p. 63). Additionally these activities all possess a definite goal structure and usually involve "materials that provide real-world feedback" (Sylva et al 1980, p. 63). In a sense such tasks stretch the mind. The moderate yield activities do not necessarily require a goal structure, and children may benefit from such activities in aspects that are non-intellectual. For example these activities which are less goal-oriented may provide opportunities for "conversations and learning about social conventions" (Sylva et al 1980, p. 64). The low yield group of activities, rarely demonstrate goal structure or planning.

Kontos and Wilcox-Herzog (1997b) examined the contributions of activity settings, teacher behaviour, contact with peers and teachers to children's cognitive and social competence. Children's cognitive competence was estimated from their competent interaction with objects (constructive and dramatic play) while their social competence related to their competent behaviour with peers (simple social and reciprocal interactions). These

researchers found that children's cognitive competence was positively related to participation in high yield activities, with age controlled.

Irish researchers have used the Target Child Observation Schedule (1977; modified by Jowett 1981) to facilitate the analysis of children's behaviour. Horgan (1987) in her study of Junior Infant classes found that children engaged in activities 1-12 (e.g. Gross motor, physical movement, scale version toys, social play) for approximately one-fifth of their time, the majority of which did not pose a challenge to them. Horgan (1995) found that Junior Infant classes in Gaelscoileanna (Irish medium schools) spent 5% more of their time in highly challenging 1-12 activities as opposed to their Junior Infant counterparts in Primary schools. Moreover Douglas (1993) demonstrated that children in Community Play groups engaged in activities 1-12 for over half of their time, but only one third of this represented high cognitive challenge. Highly challenging behaviour was observed under the 3R's categories (e.g. looking at books, writing, counting skills) for example Dunlea (1993) found in Montessori classrooms that almost one-fifth of the total time was accounted for by these activities. Junior Infant classes in Gaelscoileanna contained 13% of these activities (Horgan 1995) as opposed to 9% in standard Junior classes (Horgan 1987). These studies emphasise the heterogeneous nature of activities children engage in early childhood settings.

The discussion above regarding child activities in the early years classroom signifies the importance of such activities for children's cognitive development. Therefore it is easy to understand why Kontos and Keyes (1997) stressed child activity as one of the important contextual features of the early childhood classroom ecology.

Social Context.

The element of social context has gained much attention with the increased popularity of the "sociogenic" traditions incorporating the work of G.H. Mead (1934) and Vygotsky (1934/1962). From this cognitive development "is treated as essentially a social-cultural product" (Light & Perret-Clermont 1991, p. 137). Vygotsky's constructivist theory, focuses on the social interactional origins of

development suggesting that children's cognitive activity is enhanced from their experiences in socially structured activities with adults and peers (Vygotsky 1978). According to Vygotsky educational environments for children must utilise the Zone of Proximal Development (ZPD). The ZPD is identified as a "dynamic region of sensitivity to learning experiences in which children develop guided by social interaction" (Rogoff 1991, p. 68). As such from the concept of ZPD development is viewed as a social activity, parallel to Vygotsky's ZPD, Wood, Bruner and Ross (1976) introduced the term "scaffolding" to describe the process by which an adult assists a child in a task that is beyond his/her capacity.

The social configuration of children's activities in the classroom can take various forms. For example a child may be engaged in an activity alone, with an adult (with or without peers) or with peers (with or without an adult). Kontos and Wilcox-Herzog (1997b) observed the social context of children's activity during free play in a bid to investigate whether the sheer presence of a teacher (with or without peers) or the presence of peers (without a teacher) was more strongly related to children's competence. They found through multiple regression analyses that the presence of teachers was a consistent (and negative) predictor of both cognitive and social competence and the presence of peers was only related to social competence. Regarding implications for practice Kontos and Wilcox-Herzog suggest, that in order for early childhood classrooms to promote children's cognitive and social development, teachers need to be "attentive to the type of activities they select for free play and to the potential of those activities for contact with peers as opposed to adults" (p. 260). This is an interesting suggestion considering for example the importance that Vygotsky places on the interaction of children with adults. However some researchers have focused on the idea of peer collaboration. For example Perret-Clermont (1980) found that children who participated in interaction sessions (pairs and small groups) demonstrated significantly more pre-to-post-test progress on a conservation of liquid task than control subjects who worked alone did. Light and Perret-Clermont (1991) comment that these and other similar findings may be interpreted in terms of "socio-cognitive conflict", in that in the peer interaction situation the child is faced with "alternative and conflicting

solutions" which reveal to him/her factors, which the child might have otherwise, overlooked.

In another study Kontos and Keyes (1997) illustrated how complex interactions with objects were highly probable in dramatic play activities and when a teacher was present in art activities. Complex interaction with peers wasn't frequent but was most probable when children were with one child or with a group of children. These findings show how influential social context can be depending on the activity in which the children are engaged in.

In the Oxford Pre-school Research Project, Sylva et al (1980) identified the importance of the social settings in the early years classroom. Their results revealed that for children aged 3.5-5.5 yr. the proportion of complex play activity was low amongst children on their own and the highest proportion of challenging play occurred while children were in pairs. It is of interest to note that older children (4.5-5.5 yr.) achieve their highest levels of play when in the company of adults, whereas younger children (3.5-4.5 yr.) demonstrate higher proportions of challenging play when in child-child pairs or parallel to others. From these findings Sylva et al argue that a "child's social participation is not only the 'classroom' for acquiring interpersonal skills it is also the scene of his most complex and creative thought".

Smith and Connolly (1980) demonstrated that adult presence initiates more adult interaction and longer activity spans, this leads to the assumption that children may be more likely to receive guided participation with objects (Kontos and Wilcox-Herzog 1997). Bennett & Kell (1989) identifying the work of Vygotsky and Bruner suggested that it is through interactions with more knowledgeable others that a child's learning potential is realised. In accordance with such theorising it may be suggested that the social context of children's activities in the classroom can have an impact on their potential to learn and subsequent development.

2.5. Structural and Process Elements: Relationship and Development.

The research described reveals firstly that structural features influence process features of the classroom environment. Secondly, these structural and particularly process contextual features have an affect on children's development. These relationships have been identified by a number of commentators. For example, Howe and Jacob (1995) in their model of child care outline the relationship between licensing/regulation, teacher training, childcare quality and child developmental outcomes. In this model, regulation (structural) and teacher training (structural) are depicted as being equally important and the "former has a direct impact on the latter" (p. 132). Subsequently it is proposed that regulation and teacher education have a direct impact on the quality of care which has a direct impact on child outcomes. Quality of care in this model relates to a global dimension that incorporates the total day care environment including activities, equipment, programme, atmosphere, teacher-child interactions, tone etc. Similarly Howes et al's (1992) investigation of social competence supported their pathways from regulatable to process quality to relationships with teachers to relationships with peers. Their analysis suggested that the influence of regulatable quality (adult-child ratio, group size) on social competence with peers was mediated through process quality (appropriate caregiving, developmentally appropriate activities) and through children's relationships with adults and peers rather than directly influencing peer competence. Additionally, these researchers reported that the influence of process quality was mediated through children's relationships with adults and peers, as opposed to directly influencing peer competence.

The relationship between structural and process elements in early years classrooms was also demonstrated by Phillips, Howes and Whitebook (1992) in their study of childcare centres in five American states. For example centres located in States with more stringent childcare regulations tended to provide higher quality care (as assessed with appropriate caregiving and developmentally appropriate activity scales) than did centres located in States with relatively lax regulations. These researchers believe the linking State regulatory stringency to quality of care has direct implications for efforts to upgrade childcare regulations and quality provision. This is particularly

significant when taking cognisance of the notion that process elements of the classroom are difficult to regulate. Hence the relationship between the regulatable features and the process features becomes even more important.

2.6. Maternal Education and Children's Cognitive Development

In a number of studies investigating the influence of structural and process variables of early childhood settings on children's development, variables representative of the child's family background have also been included. The most popular variables used as proxies for family background are parental education and scoio-economic status. Bronfenbrenner (1986) views parental education as an important variable to include in an "ecological systems model". He argues that parental education precedes the formation of the family and the birth of the child therefore it "provides an index of social background, separately for each parent that is unlikely to be influenced by subsequent family processes and therefore can be interpreted primarily as unidirectional in it's effects" (p. 736). In addition Bronfenbrenner suggests that education can be an "important source for parents' conceptions of the nature and capacities both of the child and of the parent at successive stages of the child's life" (p. 736). It appears from this that parental education is to an extent independent of the family as it existed prior to the family unit, however at a covert level it effects both parents' potential and consequently the potential of their offspring. For these reasons the variable mother's education was used as a proxy for the child's family background in the present study. In her study of childcare quality, family background and children's cognitive development Kontos (1991) showed mother's education to be one of the three family background variables to be a positive predictor of children's cognitive development.

Overall the ecology of the early childhood classroom is evocative of a dynamic setting for children to experience. Such dynamism is supported by the structural and process features of this microsystem, their relations and interrelations which are subsequently available to the child either directly (Process) or indirectly (Structural). Corresponding with the view that the early childhood classroom is an important microsystem in which children develop and that children are active agents within this system, it may be assumed that the structural and process

elements of such a system influence children's development through various means. The research reported in this thesis investigates the child in the microsystem of the early years setting. However it is important to recognise that this investigation is embedded in the broader cultural context of early childhood education in Ireland.

Chapter 3

Structure and Provision of Early Childhood Care and Education Services in Ireland

The Structure and Provision of Early Years Education in Ireland.

Recently the increased interest in the provision of early childhood services in Ireland has been remarkable. A melange of factors in present day Irish society in association with international trends regarding children's rights have contributed to this interest. The current state of the early childcare services has prompted attention from various government departments leading to a number of national reports and initiatives. The most recent of which include; The Commission on the Family Report, *Strengthening Families for Life* (Department of Social, Community and Family Affairs 1998), the *Report on The National Forum for Early Childhood Education* (Department of Education and Science 1998) and The Expert Working Group on childcare report *The National Childcare Framework* (Department of Justice, Law Reform and Equality, 1999). The upsurge in such publications consolidates the importance that the Government has attributed to early childhood services and realises the critical role that such services play in supporting the social and economic dimensions of Irish society.

The central aim of this chapter is to present the current status of early years services in Ireland. This will firstly involve a brief examination of some of the social and economic factors, which have contributed to the heightened demands for such services and secondly a description of the structure and provision of early years services incorporating relevant policy initiatives.

3.1. Factors contributing to the demand for childcare services.

The evolution of a number of social and economic changes within Irish society has placed increased pressure on the need for an "all-embracing" approach to the provision of early childcare services. A number of these changes are briefly outlined below.

a) Employment Patterns

One of the dominant factors influencing the acute demand on childcare is the increased participation of women in the workforce. This is particularly reflected in recent statistics, by the upward trend in female employment rates. For example in 1991 female labour force participation was 33.4% whereas it has increased to 42.5% in 1997 (ICTU Submission to National Forum 1998). An important aspect of women's involvement in the labour force as identified by the Expert Working Group (1999) is "the increase in participation of mother's especially in the last decade" (p. 2). This is revealed through the 1996 Labour Force Survey, which indicated that 42% of younger mothers (those with children under 15 yr. of age) are in employment as opposed to 24% of older mothers (those with children older than 15 yr. of age). Such an increase in the level of mothers' participation in the workforce undoubtedly has a proportionate impact on the demand for childcare services.

b) Equal Opportunities

The dilemma between staying at home childminding or participating in the work force is one which is predominantly faced by mothers as opposed to fathers. The personal difficulties experienced when confronted with such a dilemma in addition to the cost and availability of childcare services, inhibits many mothers from working outside the home. In keeping with this, the employer (IBEC) and trade union (ICTU) representatives at the National Forum for Early Childhood Education (1998), recognised a profound need to extend early childhood care and education provision to "facilitate women's right to work outside the home and counteract skill shortages in the labour force" (Report on the National Forum, 1998, p. 12).

This principle has been represented in the EU Employment Guidelines for 1998 and involved the commitment by each Member state to the "adequate provision of good quality care for children and other dependants in order to support women's and men's entry and continued participation in the labour force" (National Forum 1998, p. 12). From an Irish perspective the Expert Working Group on childcare was established under the "Partnership 2000" agreement which stated that " childcare is clearly an important issue in promoting equality

for women, especially in promoting equal opportunities in employment" (Partnership 2000, par. 5.6). It is thought that the proposed Expert Working Group's National Framework on childcare (1999) will offer a means for the gradual attainment of equality in the work place by achieving equal access for women to education, training and employment.

The commitment both at international and national level to equal opportunities has prompted much action and focused much attention on the increasing demand for childcare services in Ireland.

c) *Rights of the Child*

The rights and needs of the child as expressed in the UN Convention on the Rights of the Child are central to the provision of childcare services. The National Framework on childcare (1999) endorses the UN Convention on the Rights of the Child and states that "a right of access for every child to quality childcare in a safe and secure environment where he/she is respected and accepted, should be guaranteed regardless of the status of the child or of his/her parents" (p. 44). This statement is particularly potent when considering the fact that the proportion of the population living in poverty has increased and the disturbing revelation that the child population has been disproportionately affected by this increase. For example, the proportion of Irish children living in households with incomes under half the national average rose from 16% in 1973 to 26% in 1987 (Nolan & Farrell 1990).

The "relative financial burden" on households with children has also been examined in a specific study *The Cost of a Child : A report of the Financial Cost of Child Rearing in Ireland* (Carney et al 1994). This study demonstrated how Social Welfare allowances for child dependants were found to be below what would be needed to provide for a child at a basic level, without even considering pre-school education. It may be suggested that the children of individuals at this level of economic status do not have equal access to childcare services when compared to those from a higher economic status. The issues of socio-economic disadvantage attracted much attention at the National Forum for Early Childhood Education. It was recognised by the contributors that early

intervention programmes "should be available to young children who are at risk of educational failure for reasons of socio-economic disadvantage" (National Forum 1998, p. 74).

3.2. The Structure of Early Childhood Care and Education Services.

Prior to discussing the structure and provision of early childhood services in Ireland it is important to explain the dual nature of these services.

It is appropriate to stress that the term "early education" incorporates both the care and educational components of the services provided. Hayes and O'Faherty with Kernan (1997) argued that these education and care components of early childhood services are by their nature inseparable. Ball (1994) supports this view in stating that "the seamless web linking education and care is a key feature of best practice" (p. 28). Observed practice however suggests that an artificial divide between care and education "exists in the field of early education" (Hayes et al 1997, p. 10). This "divide" is further evidenced within the terms of the Child Care Act (1991), wherein responsibilities regarding pre-schools are under the charge of the Minister for Health. Section 50 of the Act states that the Minister may consult with the Minister for Education on the educational concerns of provision governing preschooling.

Moss (1994) argues that the difficulty of the apparent education/care division lies in the use of different terminology – "day-care", "childcare", "pre-school" and "nursery education" as these terms raise problems reflecting and encouraging a fragmented way of thinking about provision for young children and their carers. The Expert Working Group tackled the problem of terminology by defining the term childcare as "day-care facilities and services for pre-school children and school-going children out of school hours" (p. xxii). The services which under the umbrella of this definition include "services offering care, education and socialisation opportunities for children to the benefit of children, parents, employers and the wider community" (Expert Working Group 1999, P. xxiii).

In Ireland compulsory schooling extends from ages 6 to 15 years. In reality however findings of a national survey of childcare arrangements in Ireland undertaken by the Economic and Social Research Institute (ESRI) for The Commission on the Family Report (1998) showed that 49% of 4 year olds and 99% of 5 year olds attend primary school. Concerning this issue the Department has stated "since children are entitled to enter school from age 4 years much of what is considered preschooling in other countries is already incorporated in the primary school system in Ireland" (Primary Education Review Body 1990 p.72). Hayes et al (1997), define early education as referring to services for children 0-6 years "that is to children before compulsory school age". The care of children under compulsory school age has been described as a "two tier system" (National Forum 1998, p. 20) with the Department of Health taking responsibility for children from 0-3/4 years and the Department of Education and Science taking responsibility for children in the 3-5 years age bracket. Children in the middle of this age group those between 3-4 years may come under the guidance of either of the departments.

3.3. The Provision of Early Childhood Care and Education Services.

Early childhood care and education services in Ireland are heterogeneous in nature, in that provision may be Public or Private and ranging from sessional to full-day facilities.

Public Sector Provision

The public Sector provision comprises of pre-schools grant-aided by the Department of Health. The 1970 Health Act empowers this Department through the regional health boards to provide grants to a number of nurseries for children in families who are considered to be "at risk" through social and economic disadvantage.

The Department of Education also provides early years services within the Public sector. The role of this department concerns the provision of primary education and support for certain pre-school services (Hayes et al 1997).

As mentioned previously the majority of Irish four and five year olds are in early primary school education. In this setting children are often exposed to large group sizes exceeding 20 children. For example, a survey of Junior Infant teachers reported in the INTO (1995) discussion paper on Early Childhood Education, revealed that 9% of teachers had class sizes of less than 15 pupils, 23% had 16-20 pupils, 26% had 21-25 pupils, 24% had 26-30 pupils, 15% had 31-35 pupils and 3% had 36+ pupils. Such proportions were also illustrated by Hayes et al (1997) in that the average group size experienced by four-year-olds in primary schools was approximately 26 children. The National Forum (1998) suggested that a reduction in the size of infant classes is of critical importance and recommended a maximum of 20 children per class for Junior and Senior infants.

Qualified primary school teachers teach four-year-old children in primary schools. Their training consists of a three-year B.Ed. Degree, which qualifies them to teach children from 4-12 years. In addition some primary school teachers may also have a post-graduate diploma in Education or the older National Teacher Qualification. In terms of training the National Forum identified a need for reform and renewal in the training for early childhood education. Hayes et al found that practically all primary teachers in their sample had access to and had had attended a variety of teacher training courses. In addition to this the majority of these primary teachers reported that "they had not received additional training in areas such as motor development, psychology of primary education, cognitive development, motivation for learning and readiness skills". (Hayes et al 1997, p. 36).

For four-year-old children attending primary school there is a National curriculum, (Curaclam Na Bunscoile 1971) the principles of which are centrally based upon Piagetian perspectives. It's aims are to develop all aspects of the child through a child centred, integrated approach to the various curricular areas (INTO1995). Since 1991 the NCCA (National Council for Curriculum and Assessment) has been involved in the development of a revised curriculum for primary schools. In it's submission to the Forum for Early Childhood Education (1998), the NCCA outlined that a curriculum for infant classes

should incorporate the principle of constructivism, a high level of interaction with teachers and with other children and close co-operation and interaction between the school and home.

In fulfilling it's supportive role the Department of Education is involved in a number of early education intervention projects for young children considered to be disadvantaged. These include;

- The Rutland Street Project established in 1969 to cater for 3-5 year olds living in a disadvantaged area of Dublin city (Kellaghan & Greaney 1992).

- Partial funding for the development of pre-school services for Travellers. These pre-schools have been operating since 1984 and between 1994 and 1998 they have increased in number from 18 to 56 respectively.

- The Early Start Programme initiated by the Minister for Education and Science in 1994. It consists of a on-year pre-primary school programme for 3 year old children in designated disadvantaged areas. In 1998 the programme was operating in 40 primary schools catering for a maximum of 1,680 children.

Private Sector Provision

It has been argued that "in the absence of State subsidised early childhood services the vast majority of parents who require services for their children have to turn to the private sector" (Hennessy & Hayes 1997, p. 213). The demand for childcare services has invariably expanded. For example, Hennessy and Hayes (1994) found that over 75% of a sample of children starting primary school had experienced out-of home childcare and the majority of these had attended playgroups. Private sector provision takes a variety of forms and includes the following:

(a) Playgroups

Playgroups offer care and education to children aged 3 to 5 years predominantly on a sessional basis (upto 3.5 hr a session). The majority of these are run in private homes while the remainder are community based. The Irish Pre-school and Playgroups Association (IPPA) established in 1969 offers training support and advice to parent and childcare providers.

(b) Naionarai

An Comhchoiste Reamhscolaiochta Teo, established in 1978, organises and supports a system of Irish language playgroups, the Naionrai. These provide a sessional service for 3 to 5 year old children. In June 1998 there were 254 Naionrai in Ireland, 89 of which were located in the Gaeltacht areas.

(c) Montessori Schools

Montessori schools provide a part time pre-school service for children aged 3-6 years using primarily the Montessori Method. There are approximately 500 Schools/Pre-schools in Ireland registered with AMI Teacher Association and St, Nicholas Montessori Society of Ireland.

(d) Steiner Kindergarten

There are 12 kindergartens in Ireland registered with the Irish Steiner Kindergarten Association. These community-based settings provide childcare on a sessional or full day care basis and follow the educational principles of Rudolf Steiner.

(e) Nurseries/Crèches

Nurseries provide group care for children aged from 3 months to school going age. The National Children's Nurseries Association (NCNA) was formed to co-ordinate and support childcare providers offering full day-care for young children and their families. In July 1998, there were approximately 400 nurseries providing for approximately 13,000 children between 0 and 6 years, registered as affiliated members of the NCNA. An increasing number also offer out of school care for older children.

(f) Childminder/Family Day-care

Hennessy and Hayes (1994) found that childminders and relatives were the most common types of service for children with working parents. This is supported by the results form the ESRI survey by the fact that for children aged 0-1 years, 12.5% are cared for in the childminder's own home, 5.1% are at home with a non-relative and 4.7% are at the relatives home. For children aged 2-3 years 10.1% are at the childminder's home, 1.9% are at home with a non-relative and 3% are at the relatives home. Finally for children aged 4 years the survey showed 4.2% of these children are cared for at the childminder's home, 1.5% at the home with a non-relative and 2 % were minded in the relative's home (The Commission of the Family Survey 1998). Information on the number of childminders is emerging but is not very complete.

(g) Parent and Toddler Groups

Parent and Toddler Groups are small informal groups, which offer play opportunities for children and support and companionship for their parents. Frequently there are linked to other forms of provision such as playgroups, schools and clinics.

3.4. Child Care Pre-school Regulations

The Pre-school services as outlined above are regulated in accordance with the Child Care (Pre-school Services) Regulations 1996. The introduction of the Regulations arose from the Child Care Act, 1991 (Part VII). The Department of Health and Children is the department with the responsibility for implementing the regulations. Hence there is a "statutory duty on health boards to secure the health, safety, and welfare and to promote the development of pre-school children attending pre-school services" (Expert Working Group on childcare, 1999, p. 22). The regulations require service providers to notify their local health board in writing of their service. Section 55 (1) of the Act places an onus on the health boards to inspect pre-school services and allows them to provide if deemed necessary information, advice, guidance or support. In addition to carrying out inspections of pre-school services, health boards are obliged to provide an information service to the public on the availability of pre-school services.

Even though the Regulations impact across a wide diversity of childcare services for children aged 0-6 years there are the following exemptions;

1. *the care of one or more pre-school children undertaken by a relative of the child or children or the spouse of such relative*
2. *a person taking care of one or more pre-school children of the same family and no other such children (other than the person's own such children) in that person's home*
3. *a person taking care of not more than three pre-school children of different families (other than the person's own such children) in that person's home (Section 58, Child Care Act, Part VII).*

In terms of children's experiences of ratios in pre-school services according to the Child Care Pre-school Services Regulations (Department of Health 1996) it is recommended that for sessional services for children 0-6 years the ratio should be 1:10 with a second adult present on the premises at all times. For full day care the recommended ratio for children aged 0-1 years is 1:3, for children aged 1-3 years it is 1:6 and for children aged 3-6 years it is 1:8. In the case of childminders the regulations specify that a childminder should look after no more than six children aged under 6 years and no more than three of these should be under one year. Hayes et al found, in pre-schools the average group size was 15 with on average an adult-child ratio in pre-schools of 1:7 (data was collected preceding the regulations).

With regard to training there is a voluntary register for playgroups and a growing register for nurseries however it has been difficult to ascertain the level of training of those in such services. Hence pre-school and playschool teachers may or may not have received formal training. In keeping with the diversity in service provision such diversity is also evidenced in the training courses available. The Expert Working Group on childcare (1999) reported the deliverance of approximately 90 courses in 28 centres including Vocational Educational Colleges (VEC's), third level institutions (i.e. Dublin Institute of Technology, University College Cork, Community Colleges etc.)private organisations, voluntary organisations, and in FAS (National Training and Employment Authority) centres and FAS approved community locations.

These courses range from ten day introductory courses to degree courses offered by the Dublin Institute of Technology and University College Cork.

3.6. Co-ordination of Services – future Developments

To complete this chapter it is critical to mention the developments that have been made in respect to future co-ordination of services. It has been stated that one of the main stumbling blocks in the development of early educational services has been the absence of "a national policy to co-ordinate early childhood services" (Hayes et al 1997, p. 10). Co-ordination is recognised as being of paramount importance in the development of quality early childhood services. Hayes (1995) suggests that "co-ordination is essential to ensure equality of access to early education services" (p. 19) and it is "necessary to ensure standards and regulation" (p. 19). The Commission on the Family also identified "the need for greater co-ordination of the development of service across government departments and their agencies, and the voluntary and the community sector, and with parents and private sector" (Commission on the Family 1998).

Many of the contributors to the National Forum on Early Childhood Education emphasised the necessity for a single co-ordinating agency. It was proposed that an Early Years Development Unit (EYDU) be established as the "key co-ordinating agency" (National Forum 1998, p.29). The Forum looked upon co-ordination as preserving and accommodating "flexibility and diversity of approaches while promoting high quality" (p. 33).

The Expert Working Group (1999) has developed an integrated seven-year strategy for the development of the wider childcare sector. This incorporates a selection of measures which "addresses both the supply and demand side of childcare"(p. xxv). One of the most valuable results of the Expert Working Group has been the unfolding "of a shared value base" producing 12 Principles which will" guide and inform policy formation and implementation" (p. 44). These 12 Principles may be grouped under the following headings, 1) needs and rights of children, 2) equal opportunities and equality of access and participation, 3) diversity, 4) partnership and 5) quality.

Both the workings of the National Forum on Early Childhood Education (1998) and the Expert Working Group on childcare (1999) illustrate a very strong effort in firstly, identifying the problem issues regarding co-ordination and policy concerns and secondly, at proposing a body/bodies to co-ordinate services. Incidentally, it would be anticipated that these initiatives would incorporate methods of evaluation and re-evaluation in order to ensure the maintenance and indeed the improvement of quality in childcare services.

To summarise, from an ecological systems model (Bronfenbrenner 1979) the systems which do not contain the developing child (i.e. the exosystem and the macrosystem) but which have an influence on the developing child's early years "microsystem" have been described in this chapter. For example economic and social factors have impacted on the early years microsystem as seen from the increased demand on Public and Private sector provision. In turn the microsystem has been affected by the government Departments that have responsibility for the individual Public and Private services. At this macro-level issues relating to co-ordination strategies resulting from the recent government initiatives (National Forum 1998, National childcare Strategy 1999) are envisaged to have a greater impact on the developing child's early years microsystem.

Chapter 4

Rationale for the Present Study

Rationale for the Study.

4.1. Context of the Study

Early years services in Ireland are separated into two very distinct sectors. Hence the current early years context in which this study is grounded comprises of, Public Sector and the Private Sector services. The structure and provision of services have been outlined in the previous section. In the Public Sector the majority of four-year olds attend infant classes in primary schools governed by the Department of Education and Science with a minority attending pre-school services grant-aided by the Department of Health and Children. On the other hand in the Private Sector four year olds attend a variety of pre-school settings e.g. playgroups, crèches, Montessori schools, which are regulated by the Department of Health and Children. This study has the advantage of investigating four year old children attending services provided either by the Public Sector or the Private Sector thereby supplying a broad view of the early years services in Ireland at present.

This study has evolved from the Window on Early Education in Ireland: The First Report of the IEA Preprimary Project (Hayes, O'Flaherty with Kernan 1997), and draws from the same national database. This database provided an abundance of rich information, which merited further investigation and analysis in the shape of this thesis.

4.2. Description of Present Study.

The aim of the piece of research reported herein is to investigate the relationships between specific structural and process elements of the primary school and pre-school settings attended by four-year-old children and their cognitive development. This involves the secondary analysis of features of the Child Observation data, the Teacher Questionnaire data and the Child Developmental Status data collected in Phase 2 of the IEA Preprimary Project.

The **Structural elements** refer to regulatable aspects of the setting, these are "concrete and easily measured" (Howes & Jacob 1995, p. 133). For the purpose of this study they include;

- Group size (Child observation data)
- Adult-child ratio (Child observation data)
- Teacher Training (Teacher Questionnaire)

The **Process elements** refer to the actual experiences of children in the setting, these are prone to interpretation and as such are difficult "if not impossible to regulate" (Howes et al 1992, p. 140). They include;

- Child activities i.e. Preacademic and Expressive activities (Child observation data)
- Social context of the activity i.e. adult and children present, only adult present and only children present (Child Observation data).

Children's **cognitive development** was measured using the IEA Cognitive development instrument, which assessed children's competence in spatial relations, time and quantity.

4.3. Research Objectives and Hypotheses.

From the research reviewed the following objectives and hypotheses have emerged.

Objective 1

To investigate the influence of group size, adult-child ratio and teacher training on children's cognitive development.

The following hypotheses relate to this broad objective.

Clarke-Stewart (1987) found that smaller group sizes were related to greater cognitive gains

H1

The smaller the group size the better children will perform on the cognitive development measure.

Phillips, Scarr & McCartney (1987) demonstrated that children in centres with better adult-child ratios received higher scores on intellectual development.

H2

The higher the adult-child ratio the greater children's cognitive development score.

Dunn (1993) found that children in classrooms with a teacher who had a child-related major made higher cognitive development scores.

H3

The greater the number of months training the adult in the setting has the greater children's cognitive development performance.

The final hypothesis relates to the structural elements overall power in predicting children's cognitive development.

H4

Small group size, higher adult-child ratio and greater number of months training would be significant predictors of children's cognitive development.

Objective 2.

To investigate the influence of child activity and the social context of children's activities on their cognitive development.

Kontos & Wilcox-Herzog (1997) found that children's cognitive competence was positively related to participation in "high yield activities" (Sylva, Roy & Painter 1980).

H5

Children's participation in preacademic activities and expressive activities should have an influence on their cognitive development.

In keeping with Vygotsky's constructivist theory, suggesting that children's cognitive activity is enhanced from their experiences in socially structured activities with adults and peers.

H7

A positive association between children's cognitive development and when a child is, alone with an adult or with an adult and children.

The final hypothesis investigates the predictive value of the process elements regarding children's cognitive development score.

H8

Children's activities and the social contexts to be significant predictors of children's cognitive development score.

Chapter 5

Methodology

Methodology.

5.1. Original Sample - IEA Phase 2 Sample

The sample for this study consisted of 361 children and originated from the IEA Phase 2 sample of 396 children. The IEA Phase 2 sample was achieved by selecting the educational settings on the basis "that 20% or more of 4 year olds in Ireland attended such settings" (Hayes, O'Flaherty with Kernan 1997). In keeping with this criterion the two main settings that emerged included the pre-school settings and the infant classes in primary schools. A list of all the National schools in the State (1992) was attained from the Department of Education from which 55 schools were randomly selected. The information used for selecting pre-school settings was made up from material received from the Association of Montessori Ireland (AMI), Montessori directory, An Comhchoiste Reamhscolaiochta Teo, the Irish Pre-school Playgroups Association (IPPA) and St. Nicholas Montessori Society. Additionally a list of pre-schools throughout the State that received grant aid in 1992/93 through the Department of Health or the Department of Social Welfare or the Department of Education was complied. Fifty-four pre-schools settings were randomly selected from the data collected through the above sources. In order to achieve the sample of children a list of eligible children in any particular class was given to the data collector. From this each child was assigned a number "1" to "n". As described by Hayes et al (1997) "the random numbers were used to generate a whole number within the range of available children and it was the children with the randomly-selected whole number who became the sample" (p. 17). Prior to data collection the parents of the randomly selected children in each of the settings were contacted via post detailing the nature of the IEA Preprimary Project and requesting written consent to allow their child to participate in the project. Once parental permission was received the data collector returned to the school to begin data collection.

5.2. Study Sample

Due to incomplete observation and cognitive development data a total of 35 children were excluded, resulting in the present sample of 361 children from 47 primary school settings and 45 pre-school settings. Of the total sample 179 children (86 male and 93 female) were found in the pre-school settings. The average age of these children was 4 years 4 months. A total of 182 children (94 male and 88 female) were found in infant classes in primary school settings and their average age was 4 years 9 months.

Three hundred and sixty one mothers of the participating children were also involved in the study. In addition 45 pre-school teachers (mean age = 39 years) and 47 primary school teachers (mean age = 41 years) provided data.

5.3. Measurement Instruments

The data set of the present study has been constructed from the original data set of Phase 2 of the IEA Preprimary Project. Therefore information regarding the structural elements (group size, adult-child ratio and teacher training), the process elements (child activity and social context) and children's cognitive development status were extracted from four different sources from Phase 2 of the IEA Preprimary Project. These include;

1. Child Observational records (Appendix A)
2. Provider Survey (Teacher) (Appendix B)
3. Parent Interview (Appendix C)
4. Child Cognitive development Measure (Appendix D)

These measures were designed by the National Research Committees involved in the early stages of the IEA Preprimary Project under the direction of the International Co-ordinating Committee (ICC). Ireland did not participate in the design or piloting of these measures as it was not involved in the IEA Project at that time.

Child Observation Schedule

The observers used the Target Child Observation technique in Phase 2 of the IEA Preprimary Project. The focus of the observation was 4 target children in each setting.

Each Target Child was observed for at least 20 minutes per day over a period of two days. Each of the 20 minutes was divided into two 10-minute periods positioned at two different times of the child's day. A total of 80 observation episodes for each child were recorded. The observer used the timed interval method of observation. For this method the observer wrote a brief description of the target child's activity and indicated the accompanying social context, once every 30 seconds (Hayes, O'Flaherty with Kernan 1997). The number of children and adults in the group were also recorded.

Coding – Child Activities

The child activities that were recorded by the observer were coded according to a list of child activity categories that was drawn up by the ICC (IEA 1992, High/Scope 1992). This list of categories was taken from three sources;

1. Recommendations about children's activities in the Setting/Process subgroup Report (High/Scope 1989).
2. The activities described in the Oxford Pre-school Research Project (Sylva, Roy, & Painter 1980).
3. The Classroom Snapshot activities section of the Stanford Research Institute (SRI) Pre-school Observation Instrument (1977).

A list of activity categories was compiled and is outlined in Table 1 below.

Table 1. Child Activity Coding Categories

Major Child Activity Categories	Component Activities
a) **Physical Activities**	Gross Motor Fine Motor
b) **Expressive Activities**	Dramatic/Imaginative play Arts and Crafts Music
c) **Preacademic Activities**	Reading Storytelling/Language Writing Number/Math Concepts Physical Science/Environment Social Science/Environment Others
d) **Religious Activities**	
e) **Media-related Activities**	
f) **Personal/Social Activities**	
g) **Expressions of Emotion**	Positive Negative
h) **Child Helper Activities**	Domestic activities Economic activities
i) **Transitional Activities**	
j) **Accidents**	
k) **No active Engagement**	
l) **Others/Miscellaneous**	

For the purposes of this study the author focused on the Expressive activities category and the Preacademic activities category.

Coding – Social Context

The ICC also suggested that the social context of the child's activity be coded in the following manner;

Alone
With another child
With another child and adult
Small group (2-6 children)
Small group with an adult
Large group (7 or more children)
Large group with an adult
With an adult
Group Response
Insufficient information

For the purposes of this study the author modified the above and recoded these categories into the social context categories listed below:

Adult and children present	=	With another child with an adult
		Small group with an adult
		Large group with an adult
Only adult present	=	With Adult
Only children present	=	With another child
		Small group
		Large group

In relation to the ***structural elements*** the Child Observational Record provides information on the ***group size*** and the ***adult-child ratio.*** For the ***process elements*** Observational Record provides data on children's **expressive**

activities and **preacademic activities** and also on the ***social context*** of children's activities in the setting.

Provider Survey (Teacher).

The provider survey was administered to the teacher who worked with the sample at each of the settings. The questionnaire examined the following:

Teacher characteristics

Enrolment characteristics

Materials and equipment available

For the purposes of this study the author only included in the data set the data relating to the structural element of ***teacher training***, that is the number of months training that the teachers had completed.

Parent Interview

The Family Background Interview looked at a number of areas including;

Child's present caretaking situation

Household description

Family background

Of these the information of interest to the author was the number of years of education that the child's mother had completed.

Cognitive Development Measure.

The Cognitive Development Measure was administered to the target child in each of the settings. It assessed the children's performance in the areas of ***spatial relations, quantity and Time.*** The ICC compiled the cognitive measure by selecting test items which were piloted and by selecting items from a variety of standardised tests i.e. the Manual for Assessment of Nursery Education (1978), the Boehm Test of Basic Concepts (1969) and the Bracken Basic Concept Scale (1984). Goodwin and Goodwin (1993) identified the Boehm Test of Basic Concepts as a "readiness test". Such tests "focus on a child's current achievement and performance rather than on a child's developmental potential" (Meisels 1989a, p. 7). The Bracken Basic Concept Scale (1984) has

also been termed as a "readiness-oriented measure" (Goodwin and Goodwin 1993, p. 7) which seeks to assess the mastery of readiness concepts (Langhorst 1989). With regard to the reliability of IEA cognitive development measure the Kuber-Richardson reliability was calculated to be KR-20=.91 and KR-21=.87, this indicates that the measure has high internal reliability.

Spatial Relations.

The spatial relations section of the cognitive development measure consists of two distinct parts involving different types of responses from the child. In the first part (11items) the child is required to perform an action in response to the test question. For example the data collector showed the child a toy and asked him/her to place it in a particular position or location – under the chair, behind the chair. For the second part (28 items) the child was asked to indicate which one of a set of pictures fitted the description provided in the test question. For example the child may have been asked to "point to the jar that is between the spoons".

Quantity

For the quantity assessment (15 items) the data collector instructed the child on what to do through a series of questions and picture cards. For example the child was asked to "Look at the plates of cupcakes. Point to the plate that has a few cupcakes....Point to the plate that has a few cupcakes".

Time

The time assessment (8 items) involved the child being asked what day of the week it was and if he/she could name any other days. The child was asked a series of questions about some pictures. For example "look at these pictures. Show me the picture of night.... the picture of night" or "Look at the shoes. Show me the new shoes ...the new shoes".

The total number of points that a child could achieve in the cognitive development assessment was a raw score of 57 points.

Chapter 6

Results

Results

This chapter consists of two sections, ***Section 6A*** presents the analyses of the pre-school data while ***Section 6B***, presents the analyses of the primary school data. It was deemed necessary to perform separate analysis on the pre-school data set and on the primary school data set, as both settings differ from each other in their structure and function. For example in infant classes in primary schools children are taught by qualified primary school teachers who have completed a 3 –year Bachelor of Education degree programme. This allows them to teach 4 to 12 year olds. Such teachers follow the Department of Education, Primary School Curriculum (Curaclam Na Bunscoile 1971). The first sections of this curriculum are those that affect children between the ages of 4-5 years. As regards class sizes an INTO survey (1995) of Junior Infant teachers reported teachers having between 8 and 39 children in their classrooms. It was found that 42% of these had more than 26 students in their classes with 3% having class sizes of greater than 36 children. Children in pre-school settings have very different experiences to those in infant classes in primary schools. For example the Child Care (Pre-school services) Regulations (1996) recommend that class sizes should not exceed 20 children, however in the case of this study the IEA preprimary data collection preceded the regulations. The level of training that teachers have received in these settings varies considerably in that some teachers may hold a 3 year Diploma in Early Childhood Care and Education while others may not have completed any formal training. Incidentally these teachers do not follow a national curriculum as none exists for this pre-school level.

The differences outlined above are clearly illustrated in Table 2, which shows the descriptive statistics for the structural variables of group size, adult-child ratio and teacher training for both the Primary school and Pre-school settings.

Table 2. Descriptive statistics for Structural variables for Pre-school and Primary School settings.

	Pre-school Settings	Primary School Settings
Group Size		
Mean	13.64	26
SD	4.57	5.31
Range	4-24	13-35
Adult-child ratio		
Mean	1:6	1:21
SD	.008	.18
Range	1:2 – 1:13	1:8 – 1:33
Teacher training (in months)		
Mean	27.08	32
SD	16.17	9.25
Range	1-60	12-60

Specific differences are illustrated for the group size variable in that the mean number of children in a group in the pre-school settings is approximately 14 whereas it is 26 for the primary school settings. Similarly, the adult-child ratio variable differs markedly between these settings with a mean of six children per adult observed in the pre-schools compared to a mean of 21 children per adult in the primary school setting. Additionally it is apparent from Table 2, that the variable of teacher training is homogeneous in nature for the primary school sample (i.e. SD 9.25) however for the pre-school sample this variable is heterogeneous in nature (i.e. SD 16.17).

Even though the Primary school sample is homogeneous in terms of teacher training and curriculum (Curaclum Na Bunscoile 1971) compared to the Pre-school sample, it is of interest to note that the same can not be said of the group size and adult-child ratio variables. For example the standard deviations for

these structural variables are greater for the Primary school settings as opposed to the Pre-school settings. This may be partially due to the fact that in certain Primary school classrooms in Ireland it is common to have mixed group classes for example Junior infant groups may be mixed with Senior infant groups thus causing variable group sizes.

In light of the discussion above it would be inappropriate and misguiding in terms of statistical investigation to attempt to analyse both of these settings in a single set of data as opposed to two separate data sets.

In order to test the hypotheses four sets of analyses were performed. The statistical analyses for both sections take the following format.

1. ***Descriptive analyses,*** that described the structural and process elements for the sample of pre-school and primary school settings.

2. ***Correlation analyses,*** that described the simple associations between structural and process variables and children's cognitive development.

3. ***Stepwise Regression analyses,***

- that investigated the contribution of the structural variables in predicting children's cognitive development

- that investigated the extent to which the process variables predicted children's cognitive development.

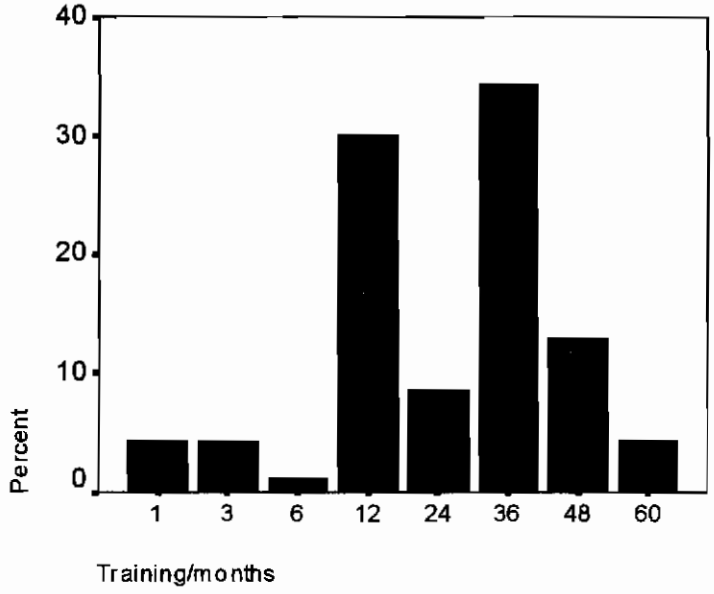
Stepwise regression is a variation of the forward solution in that, "predictor variables are entered one at a time but can be deleted if they do not contribute significantly to the regression when considered in combination with newly entered predictors" (Hinkle, Wiersma & Jurs 1998, p. 505).

6A – Pre-school analysis.

6A.1. Descriptive analyses of Structural variables.

Descriptive statistics for the structural variables of group size, adult-child ratio and teacher training are shown in Table 2. For this sample of pre-school settings, the group size ranged from 4 to 24 children in a group. The mean number of children observed in a group was 14 children. Regarding the adult-child ratio variable, the number of children per adult ranged from 2 children to approximately 13 children with an average of six children per adult. Finally for the structural variable of teacher training the minimum level of training was one month while the maximum level of training was five years. The average level of training recorded was 2 years and 3 months. Figure 1, shows that 34% of teachers had 3 years training and 30% had 1 year of training.

Figure 1. Pre-school teacher training frequency distribution



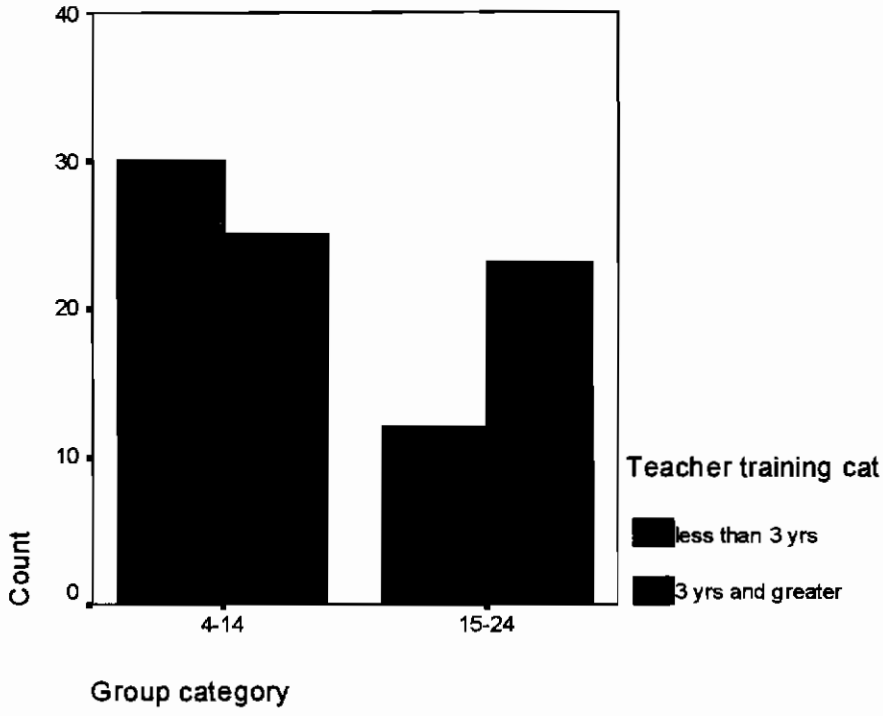
To describe the structural variables in more detail a number of crosstabulations were performed on the data. The first crosstabulation focussed on group size and teachers training the results of which are illustrated in Figure 2. For the purposes of the crosstabulation group size was divided into 2 categories based on the average group size for the sample i.e. 14 children. The first category consists of settings with a group size on or below the average, that is settings

with 4 to 14 children in the group. The second category consists of settings with a group size greater than the average, that is settings that have between 12 and 24 children in the group. Due to the distribution of frequencies for group sizes this was the most appropriate method of creating two group size categories in order to obtain categories of approximately equal proportion. Teacher training was divided into two categories, the first category consists of teachers who have completed less than 3 years training, and the second category consists of teachers who have completed 3 years of training or more. The 3 year period was selected as a means of developing two teacher training categories as the median of this variable for this sample of pre-school teachers is 3 years of training.

In Figure 2, it appears that in settings with group sizes ranging from 4 to 14 children 30 teachers have less than 3 years of training while 25 teachers have either 3 years or more. In the larger group sizes ranging from 15 to 24 children, 23 teachers have 3 years training or more compared to 12 teachers who have less than 3 years of training.

This crosstabulation illustrates that relative to the group size categories a greater proportion of teachers in the larger group sizes have greater levels of training. For example 34% of teachers in settings with larger group sizes ranging from 15-24 children have less than 3 years of training while 66% of teachers in these settings have 3 years training or more.

Figure 2. Crosstabulation – Group size & Teacher Training in Pre-schools



6A.2. Descriptive analyses of the Process Variables

A summary of the descriptive statistics for the process variables of child activity and social context is shown in Table 3. For this sample of pre-school settings the mean number of times that children were observed in preacademic activities was 10 (out of a possible 80). Hence children spent on average approximately 13% of their time in preacademic activities.

In relation to expressive activities the mean number of times children were observed in expressive activities was 15, so children spent an average of 19% of their time in expressive activities.

Table 3. Description of process variables for Pre-schools.

Process elements	Mean	SD	Range
Child activity			
Preacademic	10	12.01	0-54
Expressive	15	12.45	0-51
Social context			
Adult and children present	57	17.70	1-80
Only adult present	17	14.95	0-61
Only children present	.13	1.35	0-18

Overall as expected for the child activity process variable children in pre-school settings were observed more frequently in expressive activities (M=15) as opposed to preacademic activities (M=10).

The original social context variables of *"with an adult and a child"*, *"with an adult and a small group of children"*, and *"with an adult and a large group of children"* were recoded into ***"adult and children present"*** category. Like wise the variables of *"with a small group of children"*, *"with a large group of children"* and *"alone with another child"* were recoded into the ***"only children present"*** category. Therefore the three social context variables include; (1) **an adult and children present** (2) **only an adult present** and (3) **only children present.**

With regard to the observed social contexts of children's activities, Table 3 illustrates that the average number of times that children were observed in the ***presence of both an adult and children*** was 57 (out of a possible of 80). A total of 10 children (6%) were observed in this social context for the entire observation period. Children were observed an average of 17 times ***alone with an adult***. Alternatively, children were not frequently observed ***with only children present*** (M=.13) for example only one child was observed with children only for the maximum of 23% (18 times) of the observation period.

Due to the fact that the variables of children's age and mother's education and the dependent variable of children's cognitive development are included in the following analyses, a description of these variables is required. Table 4 presents the descriptive statistics for these variables.

Table 4. Description of Children's age, Mother's education and Children's cognitive development for Preschools

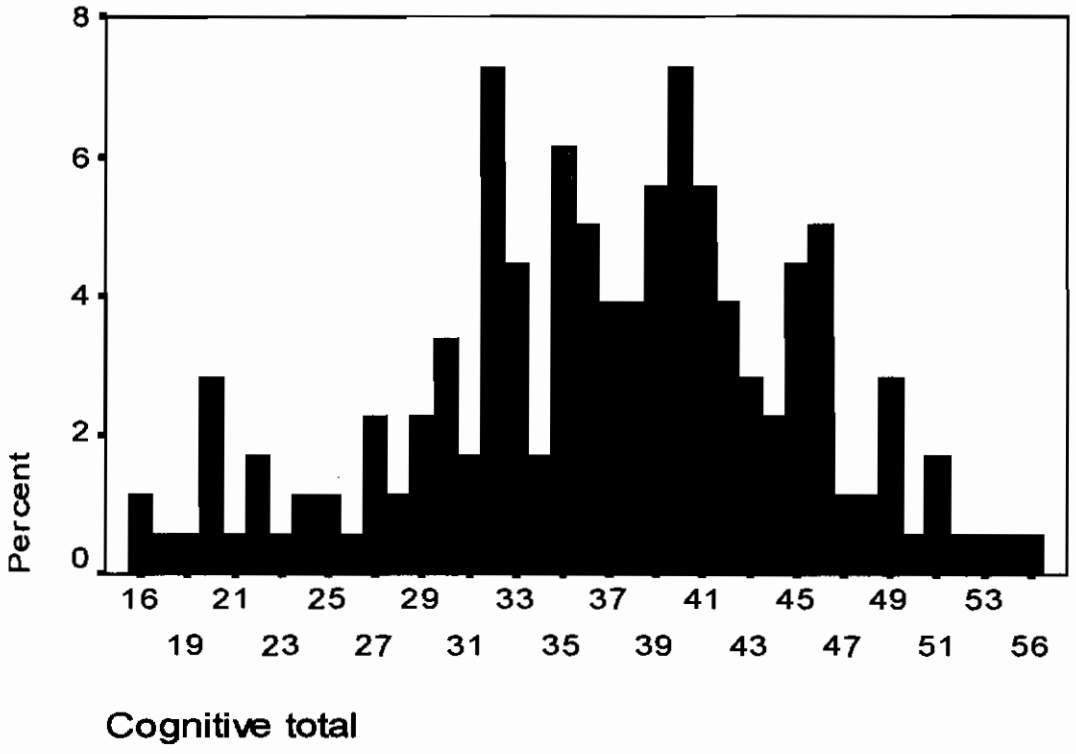
	Mean	SD	Range
Children's age/months	52	4.17	37-65
Mother's education/yr.*	13	14.97	3-26
Cognitive development score**	37	8.14	16-56

* Number of years of education mother has completed

** Cognitive development raw score out of a max. of a raw score of 57.

The average age of the children in this sample of pre-school settings is 4 years, 4 months. The average number of years of education completed by the sample of mother's is 13 years. Therefore among this sample of mothers having completed primary and secondary level education was most common. Two mothers (1.2%) completed the minimum of 3 years while 1 mother (.6%) completed 26 years of education. Children's mean raw score on the cognitive development measure was 37 out of a possible 57 points.

Figure 3. Percentage frequency distribution for Pre-school's cognitive development score



As seen from the percentage frequencies in Figure 3, 4% of children scored the average of 37 and 54% scored above it. Two children (1.1%) scored the minimum of 16 while one child (.6) scored the maximum of 56 for this sample.

6A.3. Correlation analyses of Structural variables and Children's cognitive development score.

Table 5, outlines the Pearson-product correlations between the structural elements, children's age, mother's education and children's cognitive development score. This correlation analysis explores the relationship between group size, adult-child ratio and teacher training and children's cognitive development (Objective 1).

Table 5. Correlation between Structural variables, Children's age, Mother's education and children's cognitive development for pre-schools.

	Adult-child ratio	Group Size	Teacher Training	Children's Age	Mother's education
Group size	-.55**				
Teacher train.	-.30**	.37**			
Children's age	-.05	.06	.23*		
Mother's ed.	-.00	.02	-.26*	-.02	
Cog. Score	-.08	.16*	-.02	.14	.38**

* $p<.05$

** $p<.01$

The correlations of particular interest are those between group size, adult-child ratio, teacher training and children's cognitive development score. Surprisingly, these correlations were very low and the only one that was of significance was the correlation between group size and children's cognitive development score, $r= .16$, $p<.05$. Hypothesis 1, purposes that the smaller the group sizes the better children will perform on the cognitive development measure. Hence, a negative relationship between group size and children's cognitive development score was expected. However in this sample of pre-schools the reverse emerged in that, as the group size increased so too did the children's cognitive development score.

An interesting trend that may explain this phenomenon is the positive correlation between teacher training and group size $r=.37$, $p<.01$. This indicates that as the group increased in size so to did the level of teacher's training. Hence in larger groups teachers had a greater level of training this was also evident from the descriptive analysis as represented in figure 2 previously.

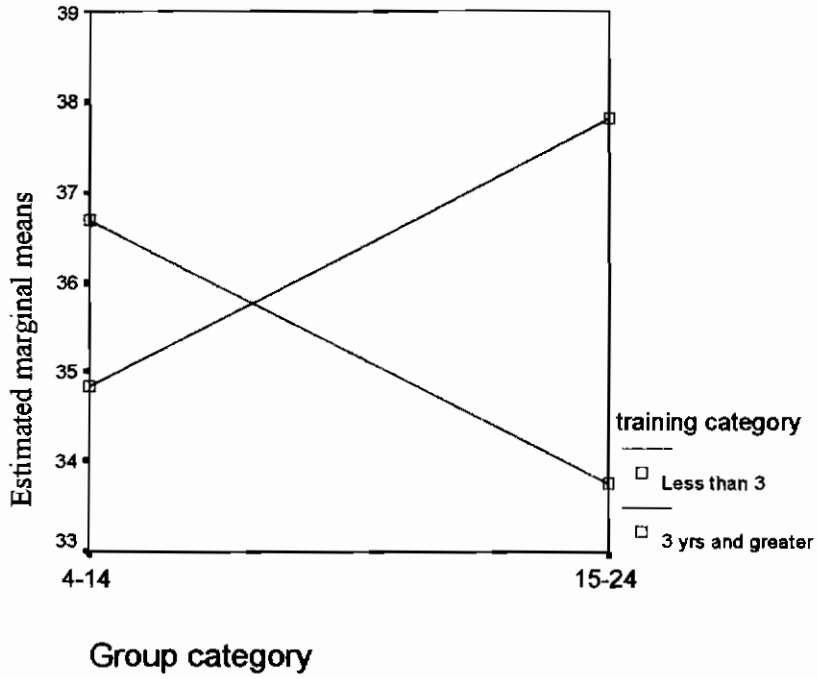
To investigate the nature of the relationship between group size and teacher's training a 2x2 analysis of variance (ANOVA) was performed, the results of which are shown in Table 6.

Table 6. Summary 2x2 ANOVA

Source	Type III SS	df	MS	F	Sig
Group size	6.507E-03	1	6.507E-03	.000	.992
Teacher train.	24.537	1	24.537	.392	.533
Grp *Train	176.058	1	176.058	2.813	.097
Error	5383.241	86	62.596		
Total	122731.0	90			
Corrected total	5568.456	89			

This shows that independently neither group size $F(1,86) = .000$, $p < .05$, nor teacher training $F(1, 86) = .392$, $p < .05$, has an effect on children's cognitive development score. An interaction effect between group size and teacher training $F(1,86) = 2.813$ $p < .1$ is evident. Figure 4, illustrates the plot of the significant interaction, this demonstrates that children in smaller groups with teachers with less than three years of training have a higher mean cognitive score than children in larger groups with the same level of training. Also children in smaller groups with teachers with 3 years of training or more have a lower mean cognitive score compared to children in larger groups with teachers with the same level of training. Such an interaction effect illustrates how important a higher level of teacher training is especially in larger group sizes ranging from 15 to 24 children.

Figure 4. Plot of interaction effect.



Hypothesis 2, expected adult-child ratio to have a positive association with children's cognitive development score. For example it was predicted that the higher the adult-child ratio the greater children's performance on the cognitive development measure. However no such positive association was observed ($r = -.08$) in this sample.

For hypothesis 3, a positive association between the level of teacher's training and children's cognitive development was expected. That is children in settings with teachers having a greater level of training were expected to perform better on the cognitive development measure. Again the correlation between teacher training and children's cognitive development was not significant ($r = -.019$). This may be explained in terms of the interaction effect between group size and teacher training as described previously. For example in the larger groups ranging from 15 to 24 children, children illustrated a greater level of performance on the cognitive development measure when the teachers had 3 years of training or more, as opposed to when teachers in such settings had less than 3 years of training.

The correlation analyses of the structural variables and children's cognitive development score results in an unexpected positive association between group size and children's cognitive development ($r = .16$ $p<.05$). In contrast adult-child ratio and teacher training did not show the expected positive associations with children's cognitive development level.

As expected a positive correlation between mother's education and children's cognitive development level $r = .38$, $p<.01$, emerged. There is no significant association between children's age and their cognitive development score.

6A.4. Correlation between Process variables and Children's cognitive development

Table 7, show the Pearson-product correlations between the process variables and children's cognitive development score. The correlations of particular interest are those that investigate the influence of the process variables on children's cognitive development (Objective 2). Table 7, shows that of the 5 correlations between child activity, social context and children's cognitive development score, 3 are of significance, however these correlations are very low. They include the correlation between children's cognitive development score and preacademic activity ($r = -.15$, $p< .05$), the correlation between children's cognitive development score and ***adult and children present*** ($r = .15$ $p<0.05$) and the correlation between cognitive development total and ***only adult present*** ($r = -.15$, $p<.05$). The correlation between children's cognitive development score and preacademic activity ($r= -.15$, $p<.05$) suggests that the greater the amount of time children were observed in preacademic activity the lower their score on the cognitive development measure. It's important to recognise that the correlation is very low. The correlation between children's cognitive development score and the social context of ***adult and children present*** ($r= .15$, $p<.05$) illustrates that the greater the amount of time that children spent in the presence of an adult and children the greater their cognitive development score. Finally the correlation between children's cognitive development score and the scoial context of ***only adult present*** ($r= -.15$, $p<.05$) suggests that children who spent a greater amount of time with an adult scored lower on the cognitive development measure.

Hypothesis 5, expected a positive association between children's performance on the cognitive development measure and their participation in preacademic and expressive activities. However no such association emerged for this sample of children. In contrast a negative association between children's score on the cognitive development measure and their participation in preacademic activities was found ($r = -.15$, $p<.05$). This correlation was very low but suggests that the more time children spent in preacademic activities the lower their cognitive development score.

Hypothesis 6, which expected a positive association between children's cognitive development score and when a child is either ***alone with an adult*** or ***with an adult and children.*** The correlation between children's cognitive development score and the social context of ***only adult present*** ($r = -.15$ $p<.05$) is surprisingly negative but is very low, it suggests that children who spent more time ***alone with an adult*** had a lower cognitive development score. Supporting this hypothesis is the correlation between ***adult and children present*** and children's cognitive development, $r = .15$ $p<.05$. This suggests a positive relationship between children's cognitive development score and when they are in the presence of both children and an adult. The fact that this social context is the most popular in this sample of pre-school children is favourable considering this correlation

Table 7, shows a number of interesting correlations which even though are not relevant to Objective 2, are of importance for their descriptive value. For example a significant negative correlation exists between expressive activity and the social context of ***adult and children present*** ($r = -.16$, $p<.05$), whereas a positive correlation is reflected between expressive activity and the social context of ***only adult present*** ($r = .18$ $p<.05$). This suggests that when children were observed participating in expressive activities they were more likely to be alone with an adult than in a group of children with an adult

Table 7. Correlations between Process variables and Children's cognitive development.

	Expressive Activities	Preacademic activities	Adult & children present	Only adult present	Only children present
Preacademic	-.25**				
Adult & children	-.16*	.01			
Only adult present	.18*	-.02	-.78**		
Only children	-.06	.05	-.01	-.06	
Cognitive total	.06	-.15*	.15*	-.15*	.12

* $p < .05$

** $p < .01$

6A.5. Stepwise Regression analysis – Prediction of Cognitive development from the Structural variables.

The next step in the analysis is to examine the relative contributions of group size, adult-child ratio, teacher training, mother's education and children's age to the prediction of children's performance on the cognitive development measure, using stepwise regression procedure. For this stepwise procedure group size, mother's education and children's age were entered as predictors with children's cognitive development score as the dependent variable. The structural variables of adult-child ratio and teacher's training could not be entered into the regression as they have very low correlations with cognitive development i.e. $r = -.08$ and $r = -.02$ respectively. Table 8, shows the values for the multiple correlation coefficient (R), the coefficient of determination (R2) and the standardised regression coefficient (ß).

Table 8. Stepwise regression of Structural variables, Mother's education Children's age and Children's cognitive development for pre-schools

Model	R	R^2	ß
1. Mother's education	.44	.19	.44
2. Mother's education	.54	.29	.40
Group size			.31

For this stepwise procedure group size, teacher training, mother's education and children's age were entered as predictors with children's cognitive development score as the dependent variable. The procedure resulted in mother's education being the only predictor entered in Model 1. From this $R^2 = .19$ which indicates that 19% of the variance in the cognitive development scores can be attributed to mother's education. As $F(1,74) = 17.674$, $p<.05$, this Model 1 ($R=.44$) is

statistically significant. Also, mother's education (β= .44) is a statistically significant (t= 4.204 p<.05) contributor to children's cognitive development score.

For Model 2 of the stepwise regression, group size was entered along with mother's education. For this Model R^2=.29, this demonstrates that the predictors mother's education and group size account for 29% of the variance in children's cognitive development scores. The inclusion of the predictor group size increased R^2=.19 in Model 1 (mother's education) to R^2=.29 in Model 2 (mother's education and group size). This increase of approximately 0.10 indicates that the inclusion of group size accounts for an additional 10% of the variance in cognitive development scores. In Model 2, both mother's education (β=.40 with t=3.957 p<.05) and group size (β=.31 with t=3.144 p<.05) are significant contributors to the regression model where mother's education contributes a greater proportion of variance.

Hypothesis 4, predicted that group size, adult-child ratio and teacher training would be significant predictors of children's cognitive development scores. However the stepwise regression procedure reported above indicates that of the structural elements only group size emerged as a significant predictor of children's performance on the cognitive development measure. Therefore children of mothers with a greater level of education and who were in larger groups performed better on the cognitive development measure.

6A.6. Stepwise Regression analysis – Prediction of Cognitive development from the Process variables.

The aim of this section of the analysis is to investigate the extent to which the process variables predict children's performance on the cognitive development measure. In light of the correlation analysis the following predictors were entered into the stepwise regression procedure, preacademic activity, adult and children present, only adult present, mother's education and children's age. The

dependent variable entered was the cognitive development score. Table 9, shows the values for the multiple correlation coefficient (R), the coefficient of determination (R^2) and the standardised regression coefficient (β).

Table 9. Summary of Stepwise Regression of Process variables, Mother's education, Children's age and cognitive development score.

Model	R	R^2	ß
1. Mother's education	.40	.16	.40
2. Mother's education	.43	.19	.40
Children's age			.14

Model 1 of the stepwise regression procedure demonstrates that mother's education is the only predictor entered. Therefore only 16% (R^2=.16) of the variance in children's development scores is attributed to mother's education, this regression (R=.40) is statistically significant as $F(1,160)= 30.817$ $p<.05$. As in Section 3, mother's education (β= .40 with $t=5.551$ $p<.05$) emerged as a significant predictor of children's performance on the cognitive development measure. In Model 2 of the stepwise regression children's age was entered in addition to mother's education, therefore 18% (R^2=.18) of variance in the cognitive development score may be attributed to mother's education and children's age (children's age accounted for an additional 2%). Model 2 with R=.43, is also a statistically significant regression as $F(2,159)= 17.654$ $p<.05$). In relation to the significance of the individual predictors, mother's education (β=.40 with $t=5.637$ $p<.05$) and children's age (β=.14 with $t=1.982$ $p<.05$) are statistically significant predictors of children's performance on the cognitive development measure. Mother's education is a stronger predictor than children's age.

Regarding Hypothesis 7, which predicted that children's activities and the social context of activities to be significant predictors of children's cognitive development score, no such association was found. This was undoubtedly the case as the process variables were not entered into the regression dur to the relatively weak correlations found between the process variables and children's cognitive development scores. Consequently, the stepwise regression above demonstrates that only mother's education and children's age were significant predictors of children's cognitive development score.

The analysis specific to Objective 1, *to investigate the influence of group size, adult-child ratio and teachers training on children's cognitive development,* may be summarised as follows. Firstly, the correlation analysis (Section 2.1) showed a surprising positive relationship between group size and children's cognitive development score. Therefore children in larger groups of between 15 to 24 children scored on average better than children in groups with 4 to 14 children. As suggested this may be in part explained by the interaction effect between group size and teachers training. Secondly, neither adult-child ratio or teacher training demonstrated the expected positive associations with children's cognitive development score. Similar to these correlation analyses, the stepwise regression results (Section 3) showed group size to be a significant (unexpected positive) predictor of children's cognitive development score in addition to mother's education. Overall, Objective 1 analysis suggests that group size is the only structural element that has an influence (positive) on children's cognitive development score, for this sample of pre-school children.

The results for Objective 2, *to investigate the influence of child activity and the social context of children's activities on children's cognitive development,* are as follows. Firstly, the correlation analyses (Section2.2) showed an unexpected absence of a significant correlation between expressive activity and children's cognitive development score. Similarly, the negative association between children's preacademic activity and their cognitive development score was not expected. This finding suggests that those observed for greater periods of time in preacademic activities scored lower on the cognitive development measure. Secondly, in relation to the social context variables a negative correlation

emerged between children in the presence of only an adult and their cognitive development score. However a positive correlation emerged between children observed in the presence of both children and an adult and their level of cognitive competence. Therefore in this sample those children who were observed in the presence of an adult and their peers scored higher on the cognitive development measure than those children who were observed alone with an adult. The stepwise regression results (Section 4) illustrated how none of the process elements were entered into the stepwise procedure, therefore these elements did not appear to be significant predictors of children's cognitive development score.

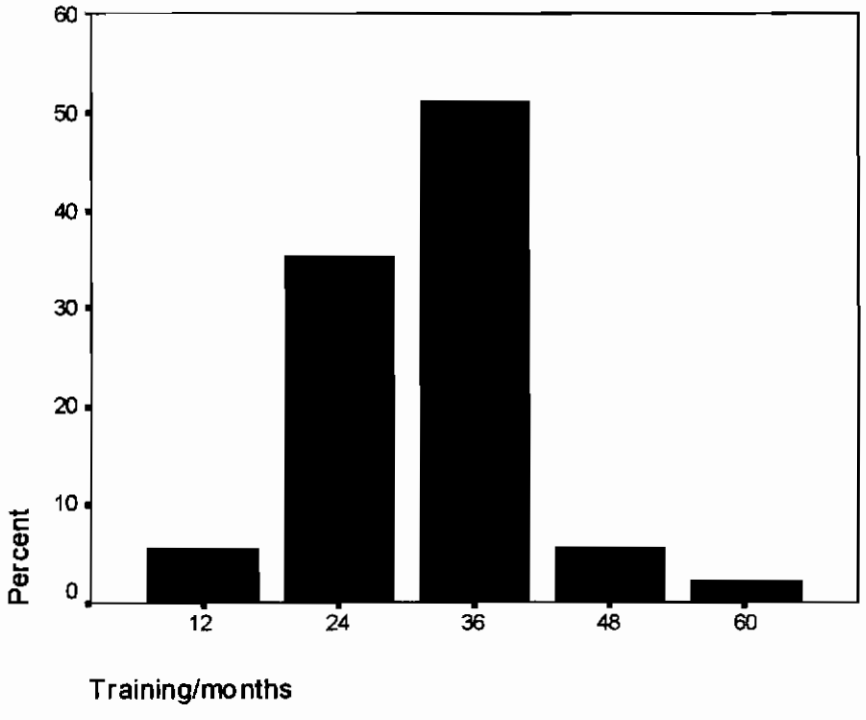
6B – Primary School Analysis

This section outlines the results of the analyses of the sample of primary schools and follows the same statistical format as that used in Section A.

6B.1. Descriptive analyses of Structural variables.

A summary of the descriptive statistics for the structural variables of group size, adult-child ratio and teacher training are outlined in Table 2. For this sample of primary school settings the average group size observed was 26 children and group sizes ranged between 13 and 35 children. Regarding the variable of adult-child ratio, this ranged from 8 children to 33 children per adult, with an average of approximately 21 children per adult. For the final structural variable of teacher training the average number of months training for this sample of teachers in primary schools was 32 month. Figure 5, shows the frequencies for the number of months training that the teacher had completed.

Figure 5. Primary school teacher training frequency distribution.



From this, 50% of teachers had 3 years training, 4 teachers (2.2%) had the maximum of 5 yrs training while 10 teachers (almost 6%) had completed the

minimum of 12 months of training. As expected for this sample of primary school settings the 3 year degree in primary education is most common.

6B.2. Descriptive analyses of the Process variables.

Table 10 shows the descriptive statistics for the process variables of child activities and the social contexts of children's activities. In this sample of school settings, children were observed an average of 23 times (out of a possible 80) in preacademic activity. Hence on average children spent 30% of the period participating in preacademic activities.

Table 10. Description of Process variables for Primary schools.

Process variables	Mean	SD	Range
Child activity			
Preacademic	23	13.68	0-64
Expressive	10	9.53	0-48
Social context			
Adult and children present	66	12.31	12-80
Only adult present	6	7.59	0-32
Only children present	.03	.18	0-1

As regards the expressive activity the mean number of times that this sample of children was observed in this activity was 10 (out of a possible 80). One child was observed spending a maximum of 60% of his/her observation time in expressive activity. It's obvious that these primary school children were spending more time in preacademic activities than in expressive activities whereas the reverse was true for the sample of pre-school children (see Table 2).

From Table 10, it appears that the most frequent social context in which children were observed in was in ***the presence of an adult and children.*** The average number of times that this sample of children was observed in the context of ***an adult and children*** was 66 (out of a possible of 80). A total of 12 children (almost 7%) were observed for the entire observation period in this social context. Children were not frequently observed ***alone with an adult*** as on

average children only spent 21% of their time in this social context. Similarly children were rarely observed in the ***presence of other children without an adult present*** (e.g. M = .033).

Overall the most frequently observed social context for this sample of primary school children was in the presence of both an adult and children. This fact was also demonstrated in the sample of pre-school children (Table 3), therefore it appears children participating in whole group or large group activity for the majority of the time.

As the variables of mother's education, children's age and the dependent variable of children's cognitive development score are required in the following analyses a summary of their descriptive statistics are illustrated in Table 11.

Table 11. Description of Children's age, Mother's education and Children's cognitive development for primary schools.

	Mean	SD	Range
Children's age/months	57	3.25	49-71
Mother's education/yr.*	12	2.79	6-21
Cognitive development score**	42	7.64	11-56

* Number of years of education mother has completed

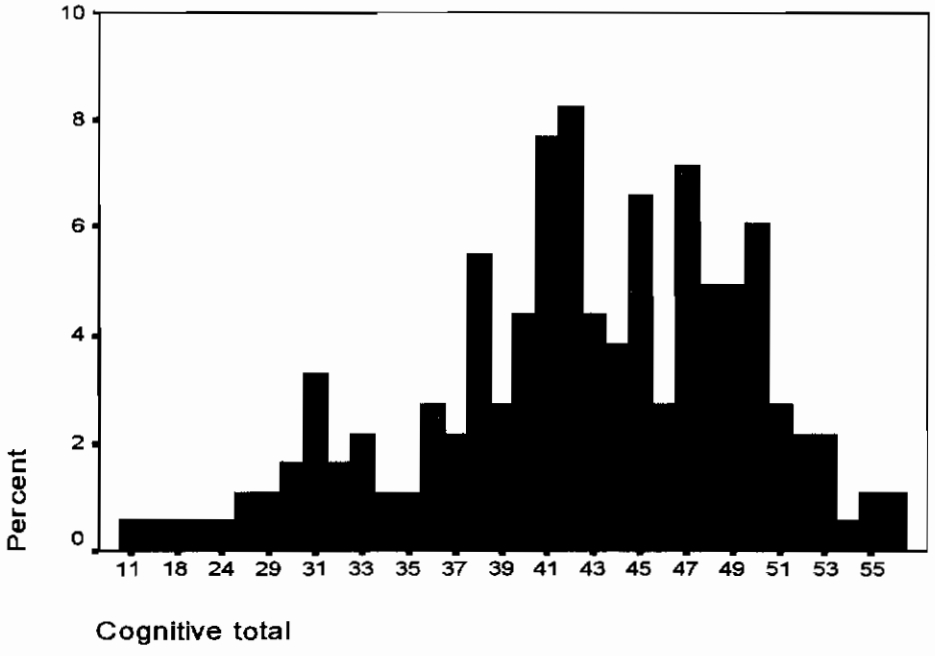
** Cognitive development raw score out of a max. raw score of 57 points.

The average age of this sample of primary school children is 4 years 9 months. The ages range from 4 years 1 month to 5 years 11 months, 10% of this sample are 5 years and over. The average number of years education that mothers of these children have completed is 12, one mother had the minimum of 6 years of education and one mother had the maximum of 21 years of education.

As regards children's cognitive development the average score was 42 points out of a possible 57 points. Figure 6, shows the frequencies for children's

cognitive development scores. A total of 92 children (51%) scored above the average, one child scored the minimum of 11 points while 2 children scored a maximum of 56 points.

Figure 6. Percentage frequencies for cognitive development score for primary schools



6B.3. Correlation analyses of Structural variables and children's cognitive development.

Table 12, represents the Pearson-product correlations between the structural variables, mother's education, children's age and children's cognitive development score. Such analyses prompts the investigation of the relationship between group size, adult-child ratio, and teacher's training and children's cognitive development score (Objective 1).

Table 12. Correlation between Structural variables, Children's age, Mother's education and children's cognitive development for primary schools.

	Adult-child ratio	Group size	Teacher training	Children's age	Mother's education
Group size	-.52**				
Teacher train.	-.04	.04			
Children's age	-.19	-.04	-.06		
Mother's ed.	.08	.15*	.08	.02	
Cog. Score	-.21**	.00	-.11	.23**	.04

• $p<.05$, ** $p<.01$

Specific to objective 1 and corresponding hypotheses, the correlations of interest include those between group size, adult-child ratio, teacher training and children's cognitive development. As for the pre-school sample these correlations are very low, and the structural variable of adult-child ratio was the only one of the three structural variable that demonstrated a significant correlation with children's cognitive development score ($r = -.21$, $p<.01$). No significant association was found between children's cognitive development score and group size ($r= .00$) and teacher training ($r =-.11$). Therefore, hypothesis 1, which expected a negative association between group size and children's cognitive development score, was not supported.

For hypothesis 2, a positive association was expected between adult-child ratio and children's cognitive development score. Hence as the ratio increases (1 adult to a smaller number of children) it is predicted that this would have a positive influence on children's cognitive development. However the opposite emerged for this sample of primary school children, as the correlation between adult-child ratio and children's cognitive development score was negative ($r = -.21$, $p<.01$). This suggests that as the adult-child ratio increased children's cognitive development scores decreased. Therefore children in settings with one adult to a large number of children scored better on the cognitive development measure than those children in settings with 1 adult and a smaller number of children.

Hypothesis 3, predicted a positive association between the level of teacher's training and children's cognitive development score, however no such association emerged (r = -.11). The fact that the majority of teachers had 3 years of training and this sample of teachers reflected a very homogenous group in terms of the number of months training they had completed may contribute to such a finding.

Table 12, shows a significant correlation between children's age and their cognitive development scores. This suggests that older children in the sample scored higher on the cognitive development measure than younger children.

6B.4. Correlation between the Process variables and Children's cognitive development.

Table 13, represents the Pearson's– Product correlations between the process variables and children's cognitive development score. The correlations of note include those investigating the association between child activity and the social contexts of the child's activity and children's cognitive development (Objective 2). The correlations are very low and there are no significant associations between the process variables and children's cognitive development score.

Hypothesis 5, predicted a positive relationship between expressive and preacademic activities and children's cognitive development. Therefore children who spent a greater amount of time in expressive and preacademic activities were expected to score higher on the cognitive development measure. No such association emerged between preacademic and expressive activity and children's cognitive development as r = .11 and r = .03 respectively.

Hypothesis 6, expected the social contexts of being ***with an adult and children*** and ***being alone with an adult*** to have a positive association with children's cognitive development. However for this sample of primary school children this expected association was not evident between the social contexts of ***adult and children present*** and ***only children present*** and children's cognitive development , r = .03 and r = -.07 respectively.

Table 13. Correlations between Process variables and Children's cognitive development.

	Expressive Activities	Preacademic activities	Adult & children present	Only adult present	Only children present
Preacademic	-.36**				
Adult & children	.05	.17*			
Only adult present	-.02	-.16*	-.64		
Only children	-.10	.06	-.07	-.00	
Cognitive total	.11	.03	.03	-.07	.02

* p< .05

**p<.01

From the discussion above it appears that the hypotheses relevant to Objective 2, yield no support in this sample of primary school children. Table 13, does reveal two significant correlations of interest. For example there is a significant positive correlation between the social context of ***being with an adult*** and children children's participation in preacademic activities r = .17, p<.05. In addition there is a negative relationship between the social context of being ***alone with an adult*** and preacademic activity (r = -.16, p<.05). This suggests that the children with an adult and children were more likely to be involved in preacademic activity as opposed to those children observed just in the presence of an adult.

6B.5. Stepwise Regression Analysis – Prediction of Cognitive development from the Structural variables.

The next level of analysis is the stepwise regression procedure. This procedure will look at the contribution of the structural variable of group size, adult-child and teacher training to children's cognitive development score. As the predictor variables should be highly correlated with the criterion variable- the cognitive development score, the correlations presented in Table 12 have implications for the regression procedure. Even though the correlations were very low the predictors adult-child ratio, children's age and teacher training were entered along with the dependent variable of children's cognitive development score. Table 14 shows a summary of the stepwise regression results.

Table 14. Summary of Stepwise regression of Structural variables, Mother's education, Children's age and cognitive development score.

Model	R	R^2	ß
1. Child's age	.24	.06	.24
2. Child's age	.29	.09	.22
Adult-child ratio			-.18

From Table 14, it appears that the variable of children's age was the only selected for Model 1. In this Model R^2=.06, therefore only 6% of the variance in a child's cognitive development score is attributed to the age of the child. As $F(1,165) = 10.44$, $p<.05$, this model ($R = .24$) is statistically significant. The predictor child's age ($\beta = .24$) is a significant contributor ($t = 3.185, p<.05$) to children's cognitive development score. In Model 2, adult-child ratio was added to the child's age (teacher training and mother's education excluded) this resulted in R^2 increasing by 3% to $R^2 = .09$. Therefore 9 % of the variance in children's cognitive development score could be attributed to the child's age and the adult-child ratio in the setting. Model 2 ($R = .29$) is statistically significant as $F(2, 164) = 7.94$, $p<.05$. As regards the individual predictor variables, child's age ($\beta = .22$) is a significant positive predictor ($t = 2.887$, $p<.05$) of children's cognitive development score. Adult-child ratio ($\beta = -.18$) is a statistically significant negative predictor ($t = 2.33, p<.05$) of children's cognitive development score.

Hypothesis 4, predicted that group size, adult-child ratio and teacher training would be significant predictors of children's cognitive development scores. However the stepwise regression procedure demonstrated that adult-child ratio was the only structural variable that emerged as a significant predictor (negative) of children's cognitive development. Surprisingly this negative association between adult-child ratio and children's cognitive development score suggests that children in settings with a small adult-child ratio (a greater number of children to one adult) scored better on the cognitive development measure.

6B.6. Stepwise Regression Analysis - Prediction of children's cognitive development from the Process variables.

The final analysis looks at predicting children's cognitive development score from the process variables, using the stepwise regression procedure. The correlation analyses of the process variables suggests that no process variable

may be entered in the regression, children's age and mother's education were entered along with children's cognitive development score as the dependent variable. Table 15, shows the results of this stepwise regression.

Table 15. Summary of Stepwise regression of, mother's education, children's age and cognitive development score.

Model	R	R^2	ß
1. Child's age	.23	.05	.23

Table 15, shows that of the three predictors only child's age was entered into the stepwise regression. This model (R = .23) is statistically significant as F(1,180) = 10.379, p<.05). As R2 = .05, then 5% of the variance in children's cognitive development score is attributed to children's age. This predictor (β=.23) makes a significant contribution to children's performance on the cognitive development measure (t = 3.22,p<.05). Therefore older children in this sample of primary school children are more likely to score higher in the cognitive development score.

In relation to Hypothesis 7, which predicted that preacademic and expressive activities and the social contexts of children's activities would be significant predictors of children's cognitive development score. As mentioned previously, based on the correlations between preacademic activity, expressive activity, social contexts and children's cognitive development, the process variables were not entered into the stepwise regression thus the hypothesis could not be supported.

To summarise the findings specific to objective 1, to *investigate the influence of group size, adult-child ratio and teacher training on children's cognitive development score*. Firstly, the correlation analysis revealed that of the

structural variables the only significant association found was between adult-child ratio and children's cognitive development. This relationship was negative ($R = -.21$, $p<.05$) and suggests that the lower the adult-child ratio observed in a setting the higher the cognitive development score . The other significant correlation appeared between children's age and the cognitive development score ($R = .23$, $p<.05$). As the correlation analyses revealed very low correlations it was anticipated that the power of the regression in predicting children's cognitive development scores would be low. For example children's age (Model 1) accounted for only 6% ($R^2 = .06$) of the variance in children's cognitive development score and Model 2 (children's age and adult-child ratio) accounted for only 9% of the variance. Therefore emerging from the analyses is the fact that the structural element of adult-child ratio had a negative influence on children 's cognitive development score in this primary school sample, while the variables of group size and teacher training had no influence.

In regard to Objective 2, which focused on *investigating the influence of child activity and the social context of children's activities on their cognitive development.* The correlation analysis revealed no associations between process variables and children's cognitive development score. This in addition to the lack of variance for these variables had repercussions for the regression analysis in that no process variable could be entered. Therefore only children's age emerged as a significant predictor of children's cognitive development.

Chapter 7

Discussion

Discussion

7.1. Summary of Findings

The main findings of this study are summarised as follows, firstly the structural variable of group size was found to be a negative predictor of pre-school children's cognitive development. In contrast the other structural variables of adult-child ratio and teacher training are not associated with cognitive development for this sample of pre-school children. In relation to the sample of primary school children the structural variable of adult-child ratio emerged as a negative predictor of children's cognitive development. No associations were found between the structural variables of group size and teacher training and primary school children's cognitive development.

The findings specific to the process variables reveal an unpredicted negative relationship between preacademic activity and pre-school children's cognitive development. No association was found between the process variable of expressive activity and children's cognitive development for the pre-school sample. In terms of social contexts for pre-school children a negative association was demonstrated between the social context of "only an adult present" and children's cognitive development. Contrary to this, a positive association emerged between the social context of "with an adult and children" and children's cognitive development. For the primary school sample no associations were found between the process variables and children's cognitive development. Hence for both the pre-school sample of children and the primary school sample of children the regression analyses revealed none of the process variables to be predictors of children's cognitive development. The results summarised above will be discussed fully in the following text. This discussion will revolve around the research hypotheses but will also encompass the implications of such findings for future research in the field of early childhood education in Ireland.

7.2. Relations between Structural variables and Children's cognitive development

Contrary to expectations there was relatively little support for the hypotheses involving the structural variables and children's cognitive development.

Group Size

In contrast to the expected negative association between group size and children's cognitive development, the pre-school sample of children demonstrated a positive relationship. Therefore those children observed in larger classes (15 – 24 children) performed on average better on the cognitive development measure than children in smaller groups of between 4 to 14 children. This finding is in opposition to a number of studies, which support the view that smaller group sizes appear to facilitate positive developmental outcomes for children (Phillip & Howes 1987). However, coinciding with this study some researchers have not found support for the above view. For example Dunn (1993) in her study of proximal and distal features of day care quality and children's development was unable to identify group size as a predictor of children's development. It is also of interest to note that Howes et al (1992) revealed a curvilinear relationship between group size and developmentally appropriate activities, in that 50% or more of children in pre-school classrooms with group sizes of seven or smaller were also in classrooms rated as inadequate in activities. This suggests that when group sizes fall below a certain level, which in the case of the Howes et al study was seven or less the desired influence of smaller group size, is no longer evident.

The studies above unveil a complex picture of the effects of group size. There does appear to be a partial level of agreement among studies associating certain aspects of children's social development and larger group sizes. For example Clarke-Stewart and Gruber (1984) in their study of children in sessional and full-time day care centres, found that children in larger classes although less sociable with peer and adult strangers did better on tests of social knowledge and were less likely to behave negatively toward the unfamiliar peer in the assessment. These findings and those discussed previously emphasise the fact

that the influence of group size is not uniform in nature, in that it's effects are variable with respect to different aspects of children's development.

In the present study an interesting interaction emerged between group size and teacher training for the pre-school sample. This interaction demonstrated that children in smaller groups of between 4 to 14 children with teachers who had less than 3 years training scored on average higher on the cognitive development measure, than those children in larger groups of 15 to 24 children with teachers with the same level of training. It appears from this finding that the expected negative relationship between group size and pre-school children's cognitive development is present but only through it's interaction with the structural element of teacher training. This interaction is of importance as it suggests that it may be perhaps a little naïve to endeavour to investigate structural variables of the early years classroom in isolation from each other. Instead a more inclusive and holistic approach may prove to be more fruitful in relation to research. Such a holistic approach may also be more favourable in terms of regulating structural variables emphasising the fact that not only group size should be regulated and monitored but also equal emphasis should be placed on the level of teacher training.

Up to this point the discussion about group size has addressed this structural variable in the pre-school sample. In regard to the primary school sample no association between group size and children's cognitive development was found. This suggests that for this sample of primary school children group size is not a predictor of children's cognitive development. Despite this result group size has been presented as an influential element of children's classroom experiences in primary schools. For example Glass & Smith (1978) in a meta-analysis comparing 77 studies on their effects of class size found significant effects in 14 studies. These researchers concluded that "as class size increases, achievement decreases....The difference in being taught in a class of 20 versus a class of 40 is an advantage of 10 percentile ranks" (p. i). This meta-analysis study attracted a number of critiques. Slavin (1989) meta-analysis of a smaller number of 8 studies used more rigorous inclusion criteria. Slavin demonstrated that substantial reductions in class size usually have a positive but small effect

on achievement. He claimed however that class reductions appear to have important effects on teacher and pupil variables more so than as a means of augmenting achievement. This is supported by Smith and Glass (1980) comparing the same 77 studies (Glass & Smith 1978) on attitudinal and instructional differences. For example these researchers argued with empirical support that "teachers feel better and feel they perform better in smaller size classes" (p. 150). They also showed that the effects of small classes were positive for pupils and more so for pupils under 12 years of age.

The structural variable of group size has also received attention in the Irish primary schools. For example, in an INTO (1995) discussion paper on Early Childhood Education a survey involving Junior Infant teachers showed that they had between eight and thirty-nine children in their classrooms. Given the fact that the majority of schools in the sample were small 68% of junior classes were mixed with other classes and of these 29% were mixed junior and senior infant classes. As thirty-seven was the maximum class size for single classes and thirty-six for two consecutive classes in the 1994/1995 school year, it was apparent that some classes "were in breach of maximum class size" (p. 125). Class size appeared as a major concern in relation to the implementation of a child centred, activity based curriculum, in that 70% of the 252 teachers that participated stated that class size posed the greatest obstruction in the practice of the 1971 Department of Education Primary School Curriculum.

The fact that the structural variable of group size emerges as a positive predictor of children's cognitive development in the pre-school sample, and illustrates an interaction effect with teacher training, but shows no such effects for the sample of primary school children is intriguing. It may be suggested that the pre-school sample is more heterogeneous in nature and this is especially true for the level of teacher training. On the other hand in the primary school sample this variable is more homogeneous in nature, with the majority of Primary school teachers having completed the Bachelor degree in Education. Alternatively a possible explanation for the findings above may be the fact that parents chose the pre-school settings that their children attended. Therefore it may be plausible to suggest that there may be some sort of selection bias in operation.

For example if parents had concerns about their child's development they may choose a pre-school setting with a smaller group to offset such concerns.

Teacher Training

For the present sample of pre-school children the structural variable of teacher training did not emerge as a predictor of children's cognitive development. However, as mentioned previously a significant interaction was revealed between group size and the level of teachers training. Specifically, this interaction demonstrated that children in larger groups of between 14 to 25 children and with teachers who had completed 3 years or more of training performed better on the cognitive development measure compared to children in larger groups with teachers who had completed less than 3 years of training. This finding may indicate that the somewhat unfavourable influences of larger groups may be diminished by a teacher who has a greater level of training as opposed to a teacher who may have little training. Dunn (1993) argued this same point, for example she stated that "it may be that regardless of other features of the day care environment (group size, ratio) a well-trained caregiver can make an important difference in children's day care experiences" (p. 190). In her study she found "caregivers child-related major" to be a positive predictor of children's development demonstrating how specialised training at college level may have a positive impact on children who attend day care services.

In the study reported herein the structural variable of teacher training was addressed with regard to the number of months training the teachers completed. A fruitful exercise may have been the inclusion of the level of specialisation of this training (e.g. Certificate, Diploma, Degree). One of the central debates identified relating to the element of teacher training as Phillips and Howes (1987) suggest is "whether the sheer amount of education or the substance of the education is the more potent predictor of good quality care" (p. 7). Clarke-Stewart and Gruber (1984) found that caregivers' formal education and knowledge of child development were associated with higher social and cognitive competence in children attending family day care homes. In contrast to this these researchers found that children in centres with more highly trained

staff were shown to be less independent and socially competent than children in centres with less highly trained staff.

In the primary school sample no association was evident between teacher training and children's cognitive development. This may be due to the fact that the level of variability in the number of months training completed by teachers was minimal. This was the case as the majority of primary school teachers have completed a 3 year Bachelor degree in Education. Interestingly Irish primary school teachers (Junior Infant teachers) have recognised the importance of specialised training particularly in the area of child development. In the INTO (1995) survey only 39% of the teachers had attended inservice courses specifically on infant/early childhood education. With regard to inservice training, 55% of teachers stated a preference for training in child development (social, emotional, psychological and personal) while 47% showed an interest in language development. This illustrates how teachers themselves recognise the importance of additional specialised training regarding child development issues in a bid to expand and build on their knowledge base in order to provide quality early years education.

Adult-child Ratio

The structural variable of adult-child ratio was not found to be associated with children's cognitive development in this sample of pre-school children. Even though this finding is unexpected it is consistent with Dunn's (1993) findings. In her study Dunn was unable to identify the element of adult-child ratio as a predictor of children's development. It has been argued by Howes and Hamilton (1993) that "the influence of adult-child ratio seems especially important in the social realm" (p. 327). This may in part explain the present finding, as the area of development investigated was children's cognitive development as opposed to their social development. For example one aspect of Howes et al (1992) study investigated the influence of adult-child ratio on children's social development. Their study demonstrated through pathway analysis that adult-child ratio influenced the level of caregiving (process quality) and developmentally appropriate activities (process quality) which influenced whether children were securely attached to teachers. Consequently

securely attached children were more competent with peers. Therefore from these findings Howes et al concluded that the effect of "regulatable quality" that is adult-child ratio on social competence with peers "is mediated through process quality and through children's relationships with adults and peers rather than directly influencing peer competence" (p. 457).

Contrary to the pre-school sample, the primary school sample demonstrated an unpredicted negative association between children's cognitive development and the structural element of adult-child ratio. This suggests that as the adult-child ratio increased the children's performance on the cognitive development measure decreased. The average ratio in this sample of primary schools was one adult to 21 children approximately, with this number of children present in a group it may put an emphasis on teachers to alter their teaching styles (Blatchford & Mortimore 1994). Therefore as in primary schools the teaching programmes tailored to cope with such relatively large adult-child ratios may be structured presenting children with teacher-directed and intellectually demanding experiences in the classroom. Such a regime may have positive influences on certain aspects of children's cognitive development. In the case of this study children's competence in the domains of spatial relations, time and quantity were positively influenced.

Some researchers have shown that large adult-child ratios do not necessarily have a negative influence on children's development this has particularly been observed for pre-school aged children as opposed to younger children. For example Clarke-Stewart and Gruber (1984) found children in classes with a greater number of children per adult to be more co-operative with peers and adults in assessment than children in classes with fewer children per adult. As Clarke-Stewart (1987) concludes a high adult-child ratio "that supposed *sine qua non* of high quality child care is not necessarily a predictor of better outcomes for pre-school children" (p. 37). This statement suggests that this structural element may perhaps be more influential in settings which accommodate younger children as opposed to pre-school aged children. Howes and Hamilton (1993) also made the same point in their discussion of structural elements and children's cognitive development. This may explain why no

association between adult-child ratio and children's cognitive development was found in the sample of pre-school children.

The influence of adult-child ratio in early years setting does demand attention. For example as Clarke-Stewart (1987) comments "with too many children to care for, the caregiver's interactions with each child are likely to become brief and cursory". As the behaviour of the adult influences the experiences of the children such reduced adult-child interaction time may have unfavourable effects on particularly children's social and language development and their cognitive development. The importance of adult-child ratio as a determinant of children's classroom experiences has also been recognised by the European Commissions Childcare Network (ECCN) in the EU Quality Targets (1996). The Network argue that setting conditions for staffing aims to "create conditions which will maximise or enhance the quality of relationships between adults and children, between children themselves and between the adults working in or making use of the service". Adult-child ratio has been recognised as an important factor in providing the conditions outlined above so much so that the Network has proposed the following targets for adult-child ratio;

- 1 adult :4 places for children under 12 months
- 1 adult: 6 places for children aged 12-23 months
- 1 adult: 8 places for children aged 24-35 months
- 1 adult: 15 places for children aged 36-71 months.

The investigation herein reported that the average adult-child ratio in the pre-school sample was approximately 1:12. This is within the target of 1:15 for children aged 36-71 months.

7.3. Relations between Process variables and Children's Cognitive Development

The process variables of the classroom setting as defined in this study were not found to be strongly associated with children's cognitive development. This was particularly evident from the very weak correlations found between the

process variables (i.e. child activity, social contexts) and children's cognitive development.

Child Activity

In the pre-school sample the expected positive associations between preacademic and expressive activities and children's cognitive development was not found. Surprisingly a negative relationship emerged between children's cognitive development score and their participation in preacademic activities. Therefore those pre-school children observed more frequently in preacademic activities scored lower on the cognitive development measure. This finding may reflect certain aspects of the teachers' organisation of the classroom activities. For example in the case where a child is poor at preacademic skills a responsive teacher may deem it necessary for that child to spend a greater proportion of their time at this activity. This may to some extent explain the unexpected findings.

These findings contrast with Sylva et al (1980) theory about children's activities and their level of "cognitive stretch". For example Sylva et al postulated that activities such as the "three R's" (e.g. preacademic activities), music and art (expressive activities) "lead the rest in the opportunity they provide for the child to act at his intellectual best" (p. 63). Consequently such activities were deemed to a category of activities labelled as "high-yield activities" in terms of cognitive stretch, concentration and perseverance. The category of expressive activity in the study reported herein in addition to music and art also contained Imaginative/Dramatic play, which has been categorised by Sylva et al as "moderate-yield activities".

A number of studies have demonstrated a positive relationship between children's participation in "high-yield" activities and their cognitive competence. For example, Kontos and Wilcox-Herzog (1997b) found that children's cognitive competence was positively related to children's participation in "high-yield" activities. It is important to recognise that the manner by which Kontos and Wilcox-Herzog measured cognitive development is markedly different to the method used in the present study. Specifically

Kontos and Wilcox-Herzog defined cognitive competence as the level of children's interactions with objects during free play. The fact that children's competent interactions with objects have been demonstrated to correlate with standardised measures of cognitive ability in young children (Dunn 1993, Howes & Stewart 1987) supports the use of this method as a developmental outcome indicator. The study reported herein used a different approach and as such any comparisons that may be attempted between these studies may prove cumbersome.

The findings for the primary school sample of children demonstrated that neither preacademic activity nor expressive activity had a positive relationship with children's cognitive development. For similar reasons to those outlined above, these findings are also unexpected for the primary school children. For both the primary school children and pre-school children the fact that preacademic activities and expressive activities thought to be cognitively challenging were not found to be predictors of children's cognitive development, evoke a number of questions. Would the use of a different cognitive measure have made a difference to the findings? The cognitive development measure used in this study focuses on children's competence in spatial relations, time and quantity. It could be argued that these domains of cognitive ability alone are not enough to create the expected relationships between preacademic and expressive activities and children's cognitive development. The use of Kontos and Wilcox-Herzog (1997b) technique involving children's interactions with objects during play as an indicator of cognitive competence may be a more favourable alternative for future research. As McCartney et al (1982) conclude "measures of those aspects of development that are most likely to be affected by the group experience with nonparental adults and nonsibling peers should be preferred" (p. 127).

Another methodological factor, which may have influenced the results, was the manner by which children's observed behaviours were coded. For example the preacademic activity category consists of the following behaviours coded as reading, storytelling/language, writing, number/math concepts, physical science/environment and social science/environment. It may be worthy to

suggest that coding behaviours into the larger category of preacademic activity render such a category ineffective in predicting children's cognitive development. Alternatively, the component behaviours may have been more sensitive in predicting children's cognitive development. The fact that the individual frequencies for the component behaviours were too low to enable statistical analysis and this necessitated the formation of the larger categories of preacademic and expressive activities. An increase in the observation periods may have accommodated this alternative.

Social Context.

In the case of the primary school sample no association was found between children's cognitive development and the social contexts of "adult and children present" and "only adult present". The argument about the appropriateness of the cognitive development measure as described in relation to the child activities may also be relevant in the context of this finding.

In the pre-school sample children who were observed more frequently alone with an adult scored lower on the cognitive development measure. This finding is consistent with that of Kontos and Wilcox-Herzog (1997b). In that the presence of teachers was negatively related to children's cognitive development. However it is important to stress that in these researchers' investigation cognitive competence was measured through children's interactions with objects during free play. In the context of free play activity this finding is not unusual as a number of play researchers have heralded the notion that the benefits of play accumulate from their interactions with peers and objects rather from their interactions with adults (Rubin et al 1981). It is noteworthy to point out that children were not necessarily observed during free play periods in the present study. One suggestion as to why children who were observed alone with an adult scored lower on the cognitive development measure may be the fact that these children were "weaker" than the others in the class. Therefore such children would have required more frequent one-to-one tuition as opposed to the other more competent children in the setting.

As predicted a positive association was found between children's cognitive development score and when they were in the presence of both children and an adult in the pre-school settings. This illustrates that children do indeed benefit from being in a social context in which their peers and an adult are present. Essentially this context is that of a group situation. Even though the interactions taking place between the individuals in the group were not addressed in this study, it would be an interesting line of inquiry to pursue considering the positive finding.

In keeping with Vygotskian ideology this group of children with an adult is a social context in which children have the opportunity to develop. As Gartan (1992) states "the processes of mental growth depend on and acknowledge social contexts and influences" (p. 87). Vygotskian theory places much emphasis on these "processes of mental growth" for example Vygotsky (1978, p. 64) argued that "....we need to concentrate not on the product of development but on the very processes by which higher forms are established. These processes are social in origin and nature and are peculiarly human".

At a more detailed level it is difficult to apply aspects of Vygotsky's theorising to the group situation. This is because much significance has been placed on the advantages of the interactions between a child and an adult and/or a child and a more competent peer in terms of the existence of the "Zone of Proximal Development" (ZPD). Typically, Vygotsky's ZPD has been defined as the "distance between the child's actual developmental level and her potential level as seen when a child is solving problems in interaction with an adult or a more competent peer" (Gartan 1992, p. 95). It is important to note that creating a ZPD requires more than just putting an adult and a child together. In order for the child to function as an independent agent he/she must rely on an adult or a more capable peer "for outside regulation of task performance" (Tharp & Gallimore 1991, p. 48). The level of external regulation that the child requires in order to perform the activity depends on "the child's age and the nature of the task" (Tharp & Gallimore 1991, p. 48).

The difficulties described above with incorporating Vygotsky's "social constructivist perspectives" on cognitive development with early years education have been identified by a number of commentators. One such difficulty concerning Vygotsky's approach is the ease with which this perspective allows theoretically-based critiques of the larger context of teaching (Bruner 1984), while "highlighting some of the limitations under which teachers normally work" (Seifert 1993, p. 19). For example in the investigation reported herein the most popular social context in both the primary and pre-school settings was when children were in the presence of other children and an adult (i.e. a group). This social context does not lend itself very successfully to the ideas of learning and development expressed by Vygotsky especially when considering the creation of the ZPD within the learning environment. Consequently it has been argued by Seifert (1993, p. 19) that "the socially determined constraints of modern schooling" may limit the appeal of Vygotsky's approach to children's learning and development.

The inability of the process variables in this present study to predict children's cognitive development is disappointing. However it does raise the issue of investigating more effective ways of researching these elements of the classroom setting. For example the inclusion of the process variables which focus on the adult in the setting may prove to be a formidable research step. This may be particularly true as a number of researchers have shown how positive attentive caregiver interactions with children are associated with positive outcomes in all developmental domains.

7.4. Mother's Education and Children's Cognitive Development.

Even though the influence of mother's education on children's cognitive development was not the focus of this study it was never the less important to include this variable. Consequently for the pre-school sample of children the level of mother's education emerged as a positive predictor of children's cognitive development no such relationship emerged for the primary school sample of children. This is consistent with Kontos (1991) findings in that mother's education was found to be one of three family background variables to be a positive predictor of children's cognitive development. Howes and Stewart

(1987) suggest that the strategy of investigating the relationships between family characteristics and quality characteristics (i.e. structural and process elements) may be more effective in predicting children's development than either family or quality characteristics alone. Therefore from this perspective the inclusion of other family background variables such as martial status, income, age etc. in this study may have been a productive exercise.

7.5. Conclusion - Directions For Future Research.

- The study reported herein is limited to the "microsystem" of the child's pre-school or primary school setting, therefore it is to an extent "microanalytic" in nature. It has been argued by a number of commentators that child care programmes do not operate in isolation and "child care is simply part of the child's milieu" (Clarke-Stewart 1987). This has had direct implications for research in that there is now a "shift towards investigating the joint effects of child care and family environments" (Howe and Jacobs 1995). Investigations of this kind which would incorporate both the child's pre-school/primary school "microsystem" and the family "microsyetem" are termed as "mesosystem models" of research. Hayes (1999) argues that such mesosystem models of research also refer linkages with various professionals who are involved in the childcare sector. Bronfenbrenner (1993) states that a mesosystem "comprises the linkages and processes taking place between two or more settings containing the developing person". A study based on the mesosystem model could prove to be beneficial in the present Irish context.

  The recurring issue of assessing young children's cognitive development in early years research had been identified in this discussion. The measurement used in this present study was designed for use in an international High/Scope – IEA comparative research "Quality of Life" study. The fact that Ireland had no involvement in the design and piloting of the instrument may question it's sensitivity for Irish four-year old children.

- At a general level a number of researchers have become aware of the concerns relating to the fairness of instruments used with young children. These concerns are most frequently presented in terms of test bias. Goodwin and Goodwin (1993) have argued that issues regarding bias are widespread most have "centred on language and cultural, ethnic and gender; others however have extended to socioecenomic status and age". An alternative to instruments which may be prone to test bias is perhaps techniques which involve observing children's interactions with objects to assess their cognitive development. This technique was used successfully by Kontos and Wilcox-Herzog (1997b). Future research may utilise this method of assessment and even strive to develop and elaborate on such methods.

- The investigation reported herein only concentrated on the number of months training that the teacher in each setting had completed. Numerous studies have reinforced the view that teachers with a greater level of training have a positive influence on children's development. An advantageous alternative in this study may have been to include the levels of specialisation (i.e. Certificate, Diploma, Degree etc.). This would coincide with the present trend in research, which focuses on the actual substance of teacher training as opposed to the mere amount. The benefit of further research into teacher training appears to be two-fold. At one level such research offers empirical; evidence which may guide and focus the content of teacher training courses. At another level it may stimulate regulation initiatives specifying the minimum level of training required in order to work in early years settings. The Child Care Regulations (1996) do not provide teacher training standards, this may account for the level of heterogeneity observed for the teacher training variable in the sample of pre-school settings (Table 2, p. 55).

- One of the main research concerns in the field of early education is the diverse nature of the educational settings. Such diversity was recognised in this study, for example the first level of distinction exists between four-year

olds attending primary school settings and pre-school settings. The primary school settings were found to be homogeneous however the pre-school settings were characteristically heterogeneous in nature. It is of paramount importance that future research respects such diversity. For example in studies associating child development outcomes to children's early education experiences researchers must be sensitive to nonrelated settings in order to refrain from misleading overgeneralisations.

- As educational settings are recognised as complex social systems it is therefore necessary to incorporate an "inclusionary approach" to their assessment. Hence in order to capture the dynamism of such settings in a constructive manner it is necessary to opertionalise a variety of assessment approaches. Future studies while remaining focused on their research objectives need to use a number of assessment techniques simultaneously. For example this may involve combining global measures of the setting's overall quality with more specific observations of adult/child interactions and child/child interactions in addition to qualitative techniques. Research of this kind has been completed on numerous occasions in America, however it is somewhat limited in the Irish context.

To conclude the study reported herein might have raised more issues than it has resolved, in particular the unexpected associations between structural variables and children's cognitive development and the lack of associations between process variables and children's cognitive development. These unresolved issues are important in their own right in that they reflect the complexity and diversity of early childhood education settings in Ireland. It is anticipated that research of this kind, which investigates the impact of the structural and process elements of early education environments on children's cognitive development, will guide future research in this area. Therefore it may be possible with increased research efforts to maximise the synergy of research and policy interactions in the field of early childhood education in Ireland.

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Appendix A

Child Activities Observation Form

Child Activities Observation Form

Setting ID # _____
Observer ID # _____
ID # of child being observed _____
Sex of child being observed (*circle one*): male female
Segment # _____
Situation _____

Date of observation _____
Number of adults present _____
Number of children present _____
Project site # _____
Line # _____

Time		**Child activities**	**Social context**						**Code**
Hr	Min	Description	A	WC	2-6	7+	WA	GR	

Number of adults present _____

Number of children present _____

Situation _____

Time		**Child activities**	**Social context**						**Code**
Hr	Min	Description	A	WC	2-6	7+	WA	GR	

Appendix B

Provider Survey (Teacher)

Provider Survey

Organised Facility (Group Setting)

QUALITY OF LIFE

Phase 2

Section 2: Teacher/Caregiver Questionnaire

Part F: Teacher/Caregiver Characteristics

1. As part of our study, we are gathering information about the adults who work with the children we are observing. First, what is you age (in years)?

   _____ Age

2. What is you gender?

   If administering the questionnaire in an in-person interview, just check with the correct response without asking the question.

   1. Male 2. Female

X35. What is your race?

1. White 2. Black 3. Hispanic 4. Other, specify: _____

3. How many years have you been working with 3- to-5 year-old children?

   _____ Number of years working with 3-to-5-year –old children.

4. How many years have you been working in the setting?

   _____ Number of years working in the setting

5. How many years of full-time education have you completed?

   _____ Number of years full-time education

X36. Have you received training in child development or early. childhood/preprimary education

1. Yes 2. No ⟶ Go to F6

X36a. How many years of training in child development or early childhood/preprimary education have you had?

_____ Number of years training in child development

_____ Number of years of training in early childhood education/preprimary education.

6. Did you attend a Teacher Training Programme?

1. Yes 2. No ⟶ Go to F7

6a. At what level of education did you attend the Teacher Training Programme?

_____ Secondary education

_____ Vocational education

_____ Tertiary education

6b. How many years of Teacher Training did you attend?

_____ Number of years of teacher training

7. Are you certified or licensed?

1. Yes 2. No ⟶ Go to F8

7a. Are you certified for preprimary education?

1. Yes 2. No

7b. Are you certified for primary education?

1. Yes 2. No

8. For each of the following, indicate if you have received additional specialised training in that area, and the length of the special training:

	Brief (One day to one week)	**Long (More than one week)**
a. Social development skills	_____	_____
b. Language development in children	_____	_____
c. Motor development	_____	_____
d. Psychology primary education	_____	_____
e. Cognitive development	_____	_____
f. Development of motivation for learning in pre-schoolers	_____	_____
g. Creativity in pre-schoolers	_____	_____
h. Readiness skills	_____	_____
i. Reading and writing skills	_____	_____
j. Music and games for pre-schoolers	_____	_____
k. Science methods	_____	_____
l. Mathematics methods	_____	_____
m. Health and safety of pre-schoolers	_____	_____
n. Assessment procedures for pre-schoolers	_____	_____
o. Play and it's development	_____	_____

9. Are special play areas defined (e.g. block corner, nature corner, dress-up corner etc.) in your classroom

   1. Yes 2. No

Appendix C

Parent Interview

IEA Preprimary Project

Phase 2

Quality of Life

FAMILY BACKGORUND INTERVIEW

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Part C: Information About the Family

IWER INSTRUCTIONS: Questions C1-C10 are for the mother/female guardian's information only, (e.g. grandmother, aunt). Choose appropriate according to the respondent, (e.g. respondent may be father, mother, grandmother, etc.).

1. How many years of full-time education has the mother/female guardian completed starting with first grade?

   _____ Years

   1a. What is the highest grade or educational level that she has completed?

   _____ Highest grade (e.g. 8^{th},11^{th})

   _____ Educational level (e.g. some college, four year college degree).

X5. Has she attended a parent education or training programme?

1. Yes. 2. No ⟶ Go to 2

X5a. What was the content or subject of the programme?

_____

X5b. How many sessions did she attend? _____

X5c. Has she attended any other parent education or training programme?

1. Yes 2. No ⟶ Go to 2

IWER INSTRUCTIONS: Repeat questions X5a and X5b for each parent education or training programme the mother/female guardian attended and fill in the chart below.

X5a. Content or subject of Programme	X5b. Number of Sessions
1.	
2.	
3.	

2. Is she working now for pay?

1. Yes 2. No

C2a. Does she usually work in the home or outside the home?	**C2b. Is she retired on a pension, on permanent disability leave, a student (a homemaker), or unemployed?**
1. In home 2. Outside home	1. retired 2. Pension 3. Disability leave 4. Student 5. Homemaker 6. Unemployed **C2c. What was her last job for pay? (What did she do)** _____ _____ **C2d. Is she currently looking for work?** **1. Yes 2. No** Go to 9.

3. What is her job title? _____

4. What are her most important duties? (Probe for 2 duties)

_____

_____

5. What type of business or industry is that in? (*Please be as specific as possible - the name of the company is not enough. For example, government office, hospital, gas station, farm, department store)*

_____

6. Is she self-employed or does she work for someone else?

   1. Self-employed 2. Works for someone

7. Is this work relatively permanent, or is it temporary or seasonal?

   1. Permanent 2. Temporary 3. Seasonal 4. Other specify:

_____

_____

8. Does she currently hold more than one job?

   1. Yes 2. No

9. During a typical week, which days of the week is she away from home without *(Child's name)* for activities such as work, classes or community activities?

10. *(For each day mentioned)* During a typical week, how many hours is she away from her child on *(day of week)*?

9. Day of Week	10. Number of Hours
a. Monday	
b. Tuesday	
c. Wednesday	
d. Thursday	
e. Friday	
f. Saturday	
g. Sunday	

11. Is she currently married/ (Refers to the child's parents/guardians)

1. Yes 2. No

11a. Are you living with your spouse, is your spouse temporarily absent, or are you separated?	11b. Are you divorced, widowed or have you never been married?
1. Living with spouse 2. Spouse absent 3. Separated	1. Divorced 2. Widowed 3. Never married 11c. Are you currently living with a partner? 1. Yes 2. No →Go to 22

IWER INSTRUCTIONS: ***Questions 12-21 are for the father/male guardian's information only, (e.g., grandfather, uncle, etc.).***

12. How years of full-time education has the father/male guardian completed starting with first grade?

_____ Years

12a. What is the highest grade or educational level that he has completed?

_____ Highest grade (e.g. 8^{th},11^{th})

_____ Educational level (e.g. some college, four year college degree).

X6. Has he attended a parent education or training programme?

1. Yes. 2. No ⟶ Go to 2

X6a. What was the content or subject of the programme?

_____

X6b. How many sessions did he attend? _____

X6c. Has he attended any other parent education or training programme?

1. Yes 2. No ⟶ Go to 2

IWER INSTRUCTIONS: Repeat questions X5a and X5b for each parent education or training programme the mother/female guardian attended and fill in the chart below.

X6a. Content or subject of Programme	X6b. Number of Sessions
1.	
2.	
3.	

13. Is he working now for pay?

1. Yes 2. No

C13a. Does he usually work in the home or outside the home?	**C13b. Is he retired on a pension, on permanent disability leave, a student (a homemaker), or unemployed?**
3. In home 4. Outside home	1. retired 2. Pension 3. Disability leave 4. Student 5. Homemaker 6. Unemployed **C13c. What was his last job for pay? (What did he do)** _____ _____ **C13d. Is he currently looking for work?** **1. Yes 2. No** Go to 20.

14. What is his job title? _____

15. What are his most important duties? (Probe for 2 duties)

_____

_____

16. What type of business or industry is that in? (*Please be as specific as possible - the name of the company is not enough. For example, government office, hospital, gas station, farm, department store)*

_____

17. Is he self-employed or does he work for someone else?

1. Self-employed 2. Works for someone

18. Is this work relatively permanent, or is it temporary or seasonal?

1. Permanent 2. Temporary 3. Seasonal 4. Other specify:

_____

_____

19. Does he currently hold more than one job?

1. Yes 2. No

20. During a typical week, which days of the week is he away from home without *(Child's name)* for activities such as work, classes or community activities?

21. *(For each day mentioned)* During a typical week, how many hours is he away from his child on *(day of week)*?

20. Day of Week	**21. Number of Hours**
a. Monday	
b. Tuesday	
c. Wednesday	
d. Thursday	
e. Friday	
f. Saturday	
g. Sunday	

22. Does most of your household money come from your (you and your spouse's/partner's) work?

1. Yes 2. No ⟶ Go to 27

23. Does most of your household money come from relatives?

1. Yes 2. No ⟶ Go to 27

24. Does most of your household money come from welfare?

1. Yes 2. No ⟶ Go to 27

25. Does most of your household money come from your pension or disability?

1. Yes 2. No ⟶ Go to 27

26. Where does your household money come from?

_____

27. Approximately how much money did you receive last year, before taxes, from all sources?

_____ _____

Amount Monetary Unit

28. These are all the questions we have. Is there anything else you would like to tell us?

_____

_____

_____

Thank you for your time.

IWER INSTRUCTIONS: On the next page, read the statement of confidentiality to the parent/guardian. Sign your name, enter the date and give the letter of confidentiality to the parent/guardian for hi/her reference files.

Dear Parent/Guardian,

"We guarantee complete confidentiality. Please be assured that the data collected from this interview will not be shared with anyone who is not directly involved with the research staff and the Quality of Life Project. All data will be numerically coded and your name will not be attached to your answers or any computer or other file. Results of the study will be reported in a general, summary way""

Interviewer Signature

Date of Interview.

Appendix D

Cognitive Development Measure

IEA Preprimary Project

Phase 2

COGNITIVE DEVELOPMENT ASSESSMENT

All items in all sections of the Cognitive Development Assessment are to be administered to all children.

I. SPATIAL RELATIONS

The spatial relations portion of the cognitive development assessment consists of two distinct parts requiring different types of responses from the child. In the first part, the child will be asked to perform an action as a response to the test question; in the second part, the child will be asked to indicate which one of a set of pictures fits the description provided in the test question. Instructions for each part of the test are given below.

Items adapted from Manual for Assessment in Nursery Education. (1978) NFER Publishing Company, Windsor, UK.; Boehm Test of Basic Concepts. (1969) The Psychological Corporation, New York, New York, US.; Bracken Basic Concept Scale (1984), Charles E. Merrill Publishing Company, Columbus, Ohio, US,; Developmental Instruments submitted to the IEA Preprimary Porject by Hong Kong, 1989.

I. Action---Materials

The materials required for this test include a chair or table and a small toy animal or figurine that can stand up on it's own

I. Action---Instructions

Say to the child, "I have a toy and I am going to ask you to put it in many places". Give the child the toy and ask him/her to place it in a particular position or location as specifies in the directions given below for each individual item. For items not requiring the use of the toy, put the toy aside and

follow the directions given in the test question. Allow the child enough time to respond to each item before going on to the next.

I. Action ---Scoring Criteria

The child receives one point for each item answered correctly.

I. Action---Items

1. Say to the child, "put the toy ***on*** the chair"
2. Say to the child, "put the toy ***under*** the chair"
3. Say to the child, "put the toy ***behind*** the chair".
4. Say to the child, "put the toy ***in front*** of the chair"
5. Say to the child, "put the toy ***beside*** the chair"

Examiner: For question 6, choose the phrase which best suits the testing situation, such as "at the corner of the chair", "on the corner of the table".

6. Say to the child, "put the toy on the ***corner*** of the chair".
7. Put the toy on the chair. Say to the child "pick up the toy with your ***left*** hand."
8. Ask the child, "can you stand ***behind*** me?"
9. Ask the child, "can you bend ***forward***?"
10. Stand so that you do not face the child and say to the child "now stand ***facing*** me"
11. Have the child stand in an open space where he/she can move around freely. Ask the child, "can you walk ***backwards***?"

I. Picture selection ---Materials

The materials required for this test include one set of picture cards. Each card represents a single test item.

I. Picture selection ---Instructions

Specific directions for each item are provided below. These should be followed exactly. The key phrases in each item should be read twice with emphasis on the ***italicised*** words. (The examiner may choose to repeat questions for the child only when necessary (e.g. to be sure that the child has understood) rather than repeating every question twice as indicated in the instructions.)

Say to the child, **"I am going to show you some pictures. We are going to do different kinds of things with the pictures. Listen and do just what I say".** Present the pictures to the child, one at a time and tell the child what to do for each picture card (see below). Allow the child enough time to respond to each item going on to the next.

I. Picture selection ---Scoring criteria

The child receives one point for each item answered correctly.

12. "Look at the beads and strings. Point to the bead that has a string ***through*** it ….. Point to the bead that has a string ***through*** it."

13. "look at the squares and circles. Point to the square that has circles ***around*** it…… . Point to the square that has circles ***around*** it".

14. "Look at the jars and spoons. Point to the jar that is ***between*** the spoons … Point to the jar that is ***between*** the spoons".

15. "Look at the boys. Point to the boy who is ***nearest*** the floor… Point to the boy who is ***nearest*** the floor".

16. "Look at the boys. Point to the boy who is bending ***forward*** …. Point to the boy who is bending ***forward***".

17. "Look at the cloud and the airplanes. Point to the airplane that is ***above*** the cloud … . Point to the airplane that is ***above*** the cloud".

18. "Look at the books. Point to the book that is ***open*** ... Point to the book that is ***open***".

19. "Look at the children and chairs. Point to the child who is ***behind*** the chair ... Point to the child who is ***behind*** the chair."

20. "Look at the chickens. Point to the chicken that is ***inside*** the coop ... Point to the chicken that is ***inside*** the coop".

21. "Look at the people. Point to the person who is going ***up*** ... Point to the person who is going ***up***

22. "Look at birds and ladders. Point to the bird who is at the ***top*** of the ladder ... Point to the bird who is at the ***top*** of the ladder".

23. "Look at the dogs. Point to the dog that is ***next*** to his house ... Point to the dog that is ***next*** to his house".

24. "Look at the people and the houses. Point to the person who is going ***into*** the house ... Point to the person who is going ***into*** the house".

25. "Look at dogs and the stairs. Point to the dog that is at the ***bottom*** of the stairs ... Point to the dog that is at the ***bottom*** of the stairs".

26. "Look at the children and the water. Point to the child who is walking ***away*** from the water ... Point to the child who is walking ***away*** from the water".

27. "Look at the birds and windows. Point to the bird that is flying ***toward*** the window ... Point to the bird that is flying ***toward*** the window".

28. "Look at the people. Point to the picture where two people are walking in ***opposite*** directions... Point to the picture where two people are walking in ***opposite*** directions".

COGNITIVE DEVELOPMENT ASSESSMENT

II. QUANTITY

II. Materials

The materials required for this test include one set of picture cards. Each card represents a single test item. Items adapted from Boehm Test of Basic Concepts (1969). The Psychological Corporation, New York, New York, US; Bracken Basic Concept Scale (1984). Charles E. Merrill Publishing Company, Columbus, Ohio, US.

II. Instructions

Specific directions for each item are provided below. These should be followed exactly. The key in each item should be read twice with emphasis on the ***italicised*** words. (the examiner may choose to repeat questions for the child only when necessary (e.g. to be sure that the child has understood) rather than repeating every question twice as indicated in the instructions).

Say to the child **"I am going to show you some pictures. WE are going to do different kinds of things with the pictures. Listen and do just what I say".** Present the pictures to the child one at a time and tell the child what to do for each picture card (see below). Allow the child enough time to respond to each item before going on to the next.

II. Scoring Criteria

The child receives one point for each item answered correctly.

II. Items

1. "Look at the plate of cupcakes. Point to the plate that has a ***few*** cupcakes ... Point to the plate that has a ***few*** cupcakes."

2. "Look at the bowls of eggs. Point to the bowl that has the ***most*** eggs ... Point to the bowl that has the ***most*** eggs".

3. "Look at the bottles. Point to the one that is ***almost*** empty ... Point to the one that is ***almost*** empty".

4. "Look at the apples. Point to the apple that is ***half*** gone ... Point to the apple that is ***half*** gone".

5. "Look at the box of marbles and the groups of marbles. Point to the group that has ***as many*** marbles as the box ... Point to the group that has ***as many*** marbles as the box".

6. "Look at the pictures of bowls and spoons. Point to the picture that shows a spoon in ***every*** bowl.... Point to the picture that shows a spoon in ***every*** bowl".

7. "Look at the pictures of the gloves. Point to the picture that shows a ***pair*** of gloves.... Point to the picture that shows a ***pair*** of gloves".

8. "Look at this picture of leaves and these groups of leaves. Point to the group that has an ***equal*** number of leaves ... Point to the group that has an ***equal*** number of leaves".

9. "Look at the group of stars. Point to the group that has the ***fewest*** stars ... Point to the group that has the ***fewest*** stars".

10. "Look at the bowls. Point to the bowl that is ***full*** ... Point to the bowl that is ***full***".

11. "Look at the blocks. Point to the picture that has ***a lot*** of blocks ... Point to the picture that has ***a lot*** of blocks".

12. "Look at the circles. Point to the circle that is ***whole***... Point to the circle that is ***whole***".

13. "Look at the birds. Point to the bird that has ***nothing*** in his mouth ... Point to the bird that has ***nothing*** in his mouth".

14. "Look at the coats. Point to the coat that has ***all*** of it's buttons ... Point to the coat that has ***all*** of it's buttons".

15. "Look at the dogs and cats. Point ot the picture where the dog has ***less*** food than the cat ... Point ot the picture where the dog has ***less*** food than the cat".

COGNITIVE DEVELOPMENT ASSESSMENT

III. TIME

III. Materials

The materials required for this test include one set of picture cards, each of which represents one item in the test. Items adapted from Bracken Basic Concept Scale (1984) Charles E. Merrill Publishing Company, Columbus, Ohio, US; Developmental Instruments submitted to the IEA Preprimary Project by Hong Kong, 1989.

III. Instructions

For the first item, present the item to the child exactly as it appears below. For the remaining items, use the following instructions. Say to the child **"I am going to show you some pictures. We are going to do different kinds of things with the pictures. Listen and do just what I say".** Present the pictures to the child one at a time and tell the child what to do for each picture card (see below). Allow the child enough time to respond to each item before going on to the next. The key phrases in each item should be read twice with emphasis on the ***italicised*** words. (The examiner may choose to repeat questions for the child only when necessary (e.g. to be sure that the child has understood) rather than repeating every question twice as indicated in the instructions).

III. Scoring Criteria

For item T1, the child receives one point for each day of the week named correctly (Total possible point T1 = 7). For the remaining items the child receives one point for each item answered correctly.

III. Items

1. Say to the child, "What day is today? Can you tell me the names of the other days of the ***week***?"

2. "Look at the children and their glasses. Show me which child has ***finished*** drinking ...which child has f***inished*** drinking?

3. "Look at these pictures. Show me the picture of ***night*** ...the picture of ***night.***

4. "Look at these pictures. Show the picture of ***day-time*** ...the picture of ***daytime.***"

5. "Look at the shoes. Show me the ***new*** shoes ...the ***new*** shoes"

6. "Look at the plants. Show me which plant is ***starting*** to grow ...which plant is ***starting*** to grow"

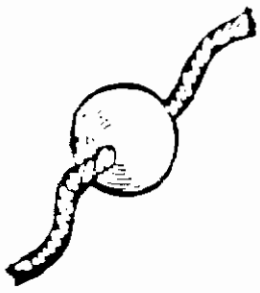
7. "Look at these pictures. Show me which one is ***morning*** ...which one is ***morning***"

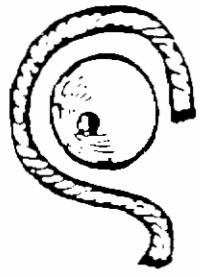
8. "Look at the children and their glasses. Show me which child drank his juice ***before*** he ate ...which drank his juice ***before*** he ate"

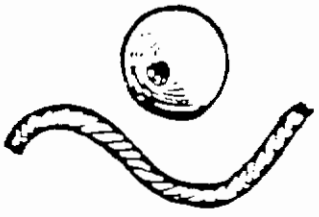
COGNITIVE DEVELOPMENT ASSESSMENT

SPATIAL RELATIONS

PICTURE SETS







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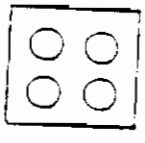

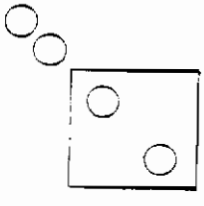

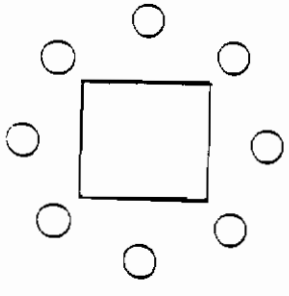

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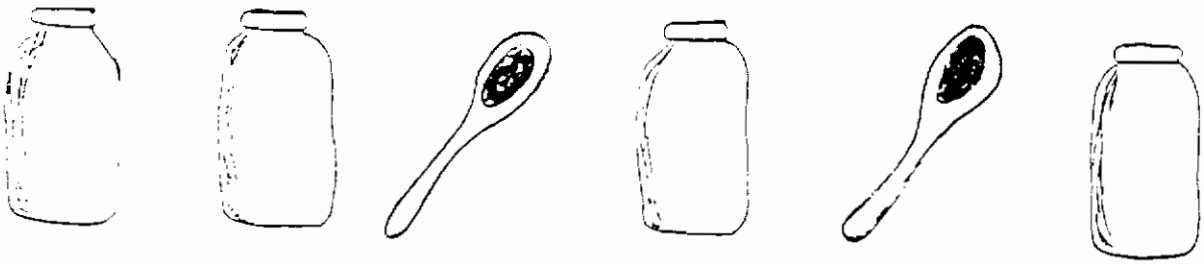

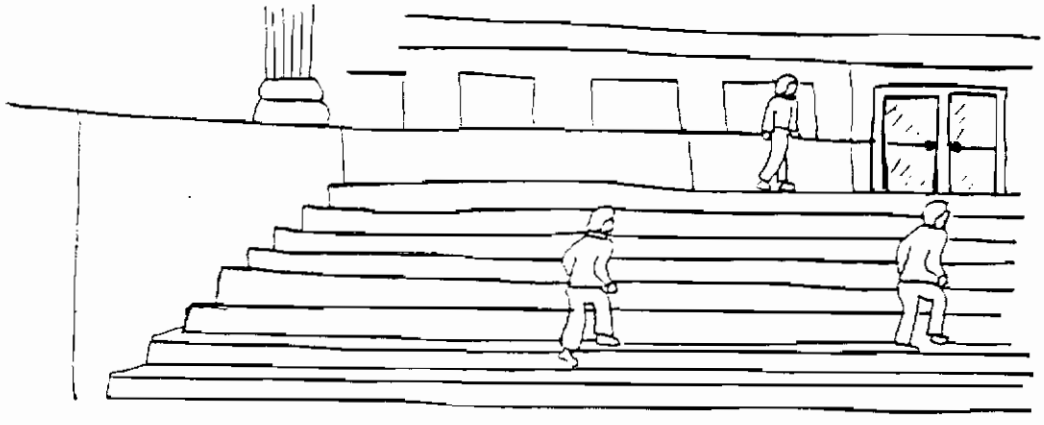

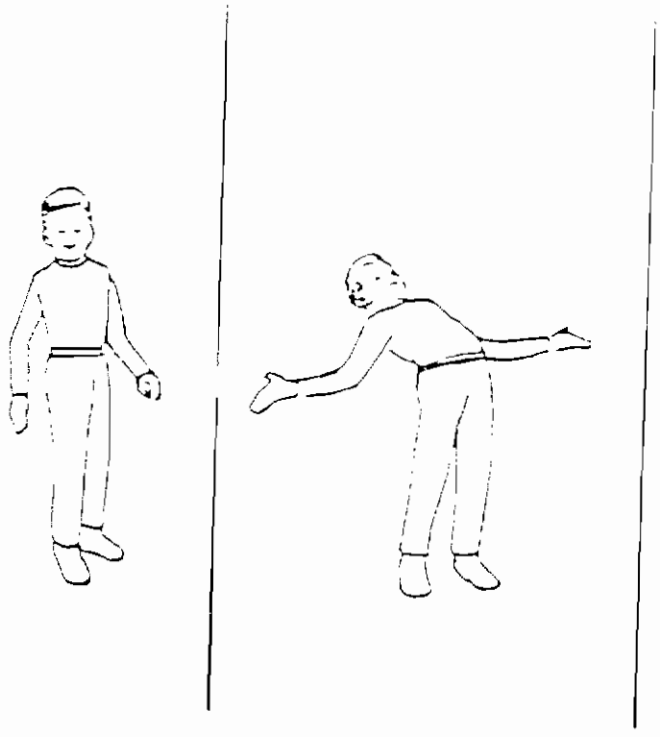

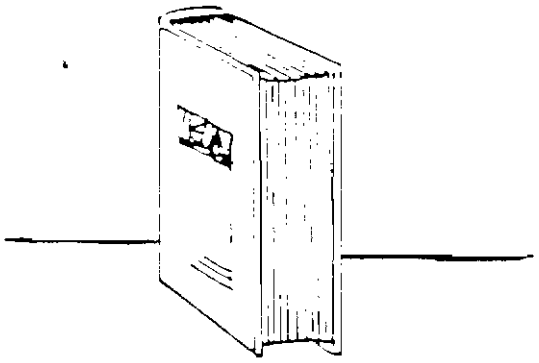

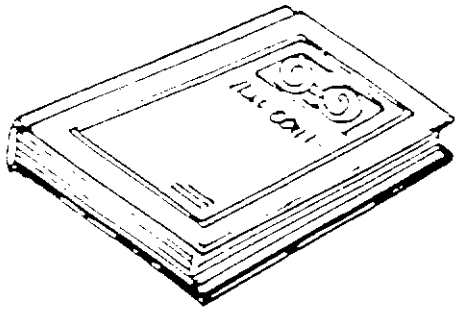

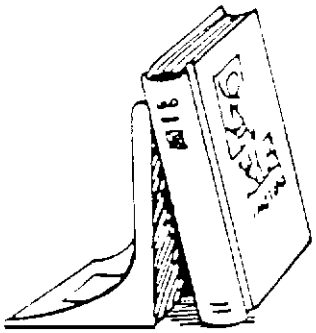

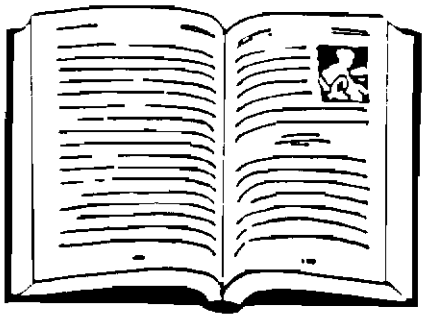

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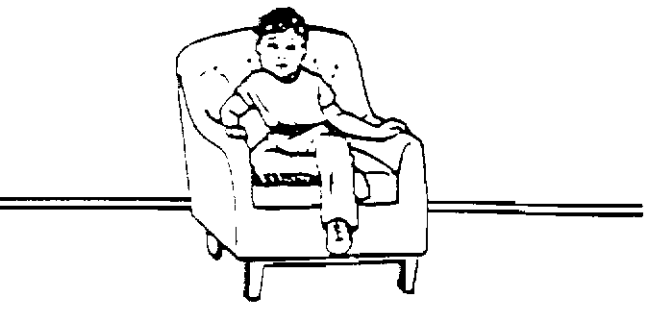

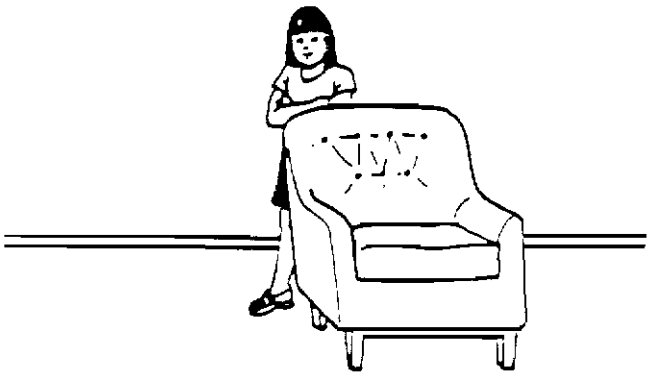

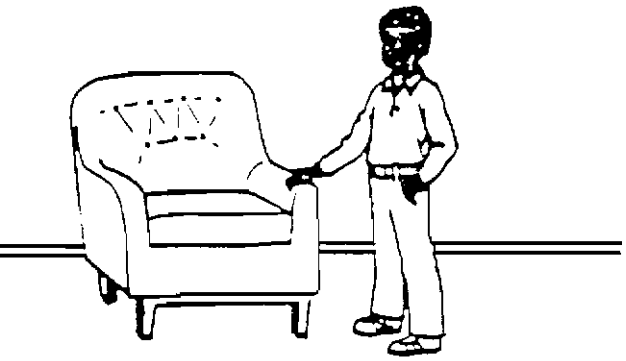

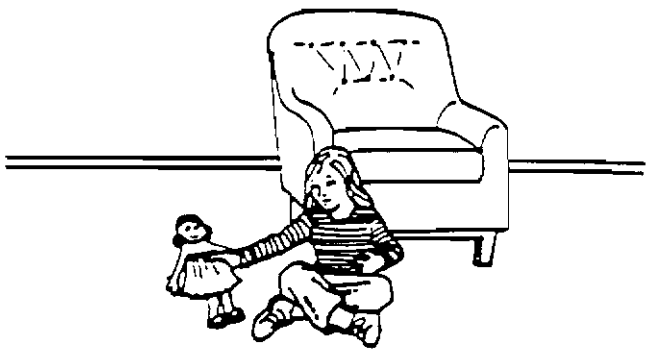

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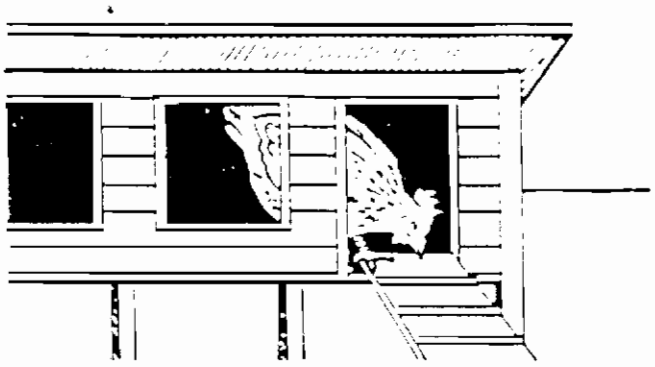

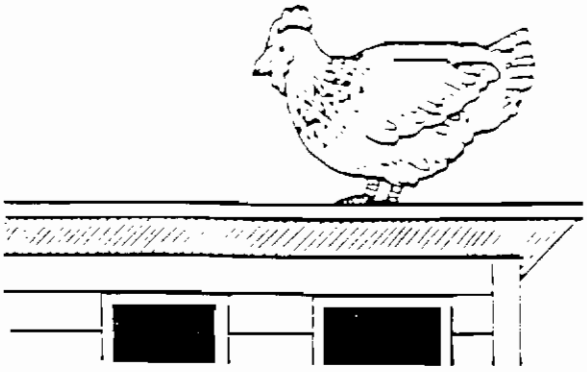

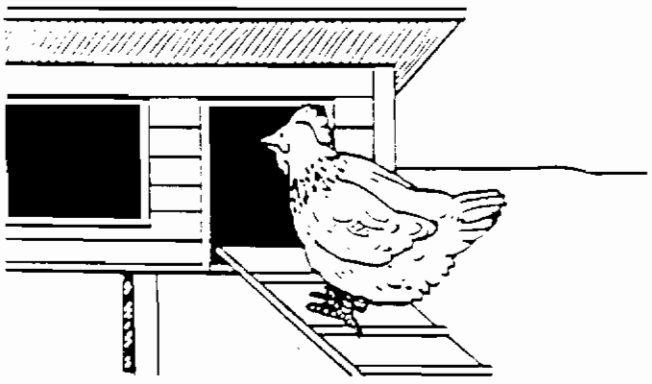

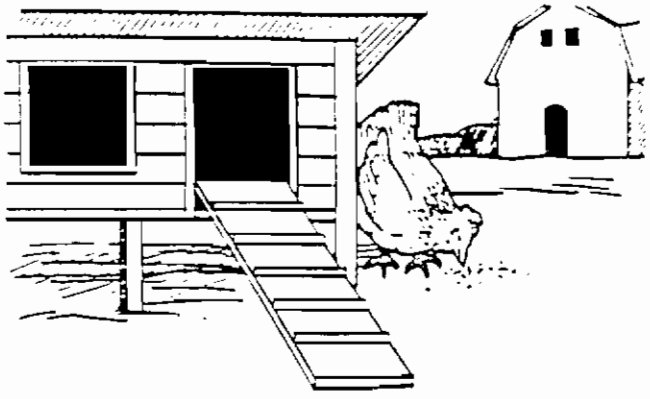

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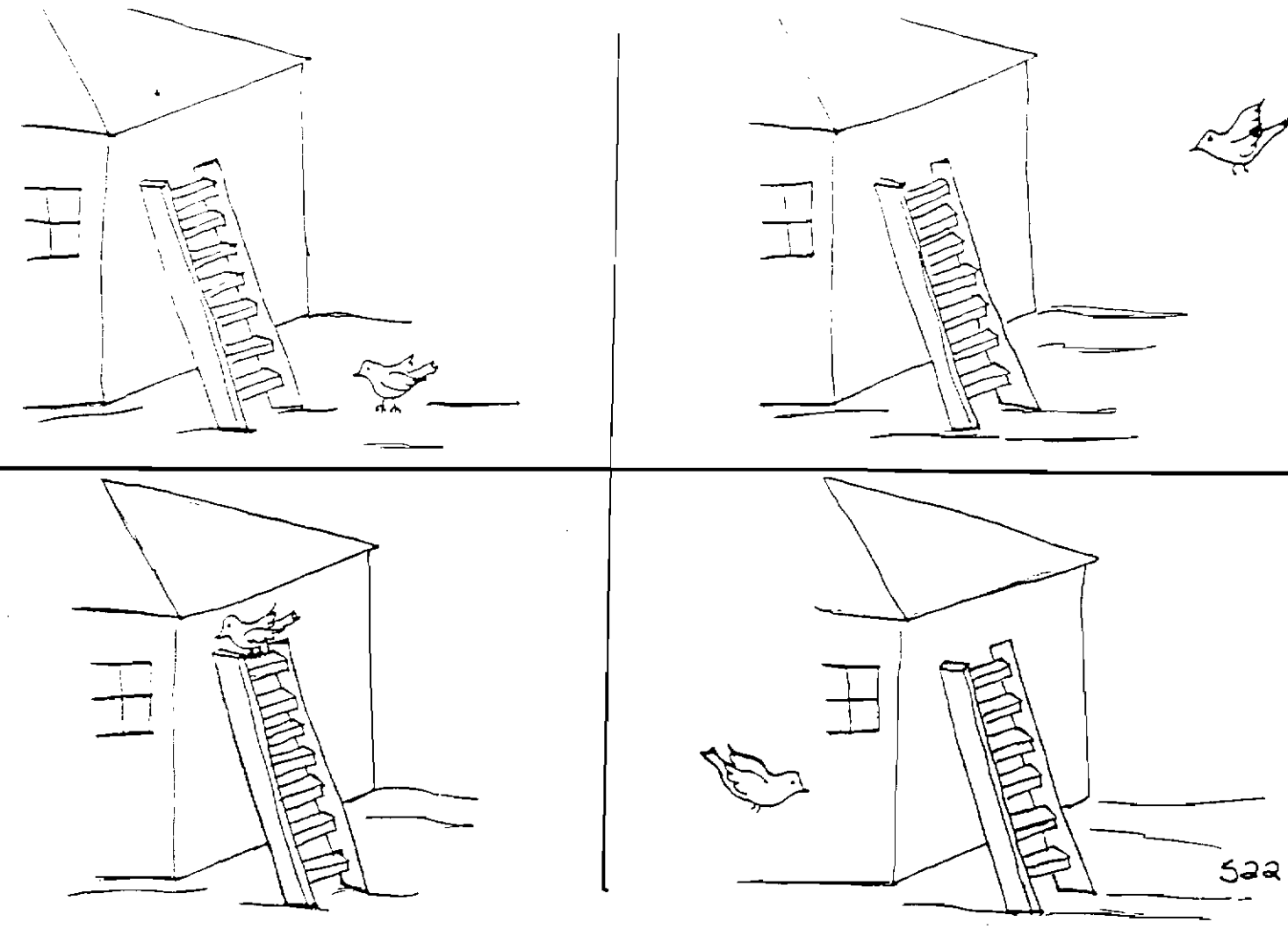
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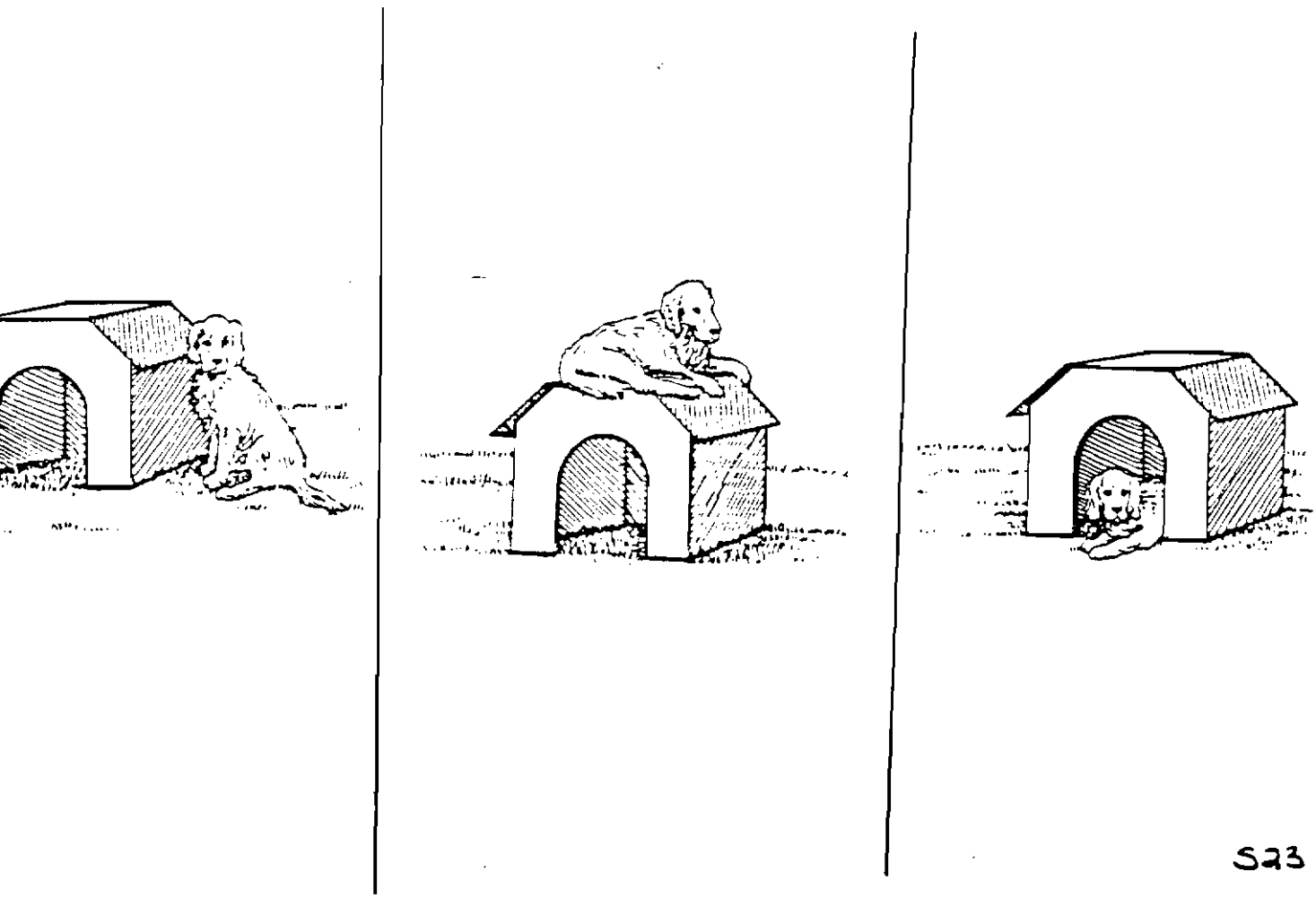
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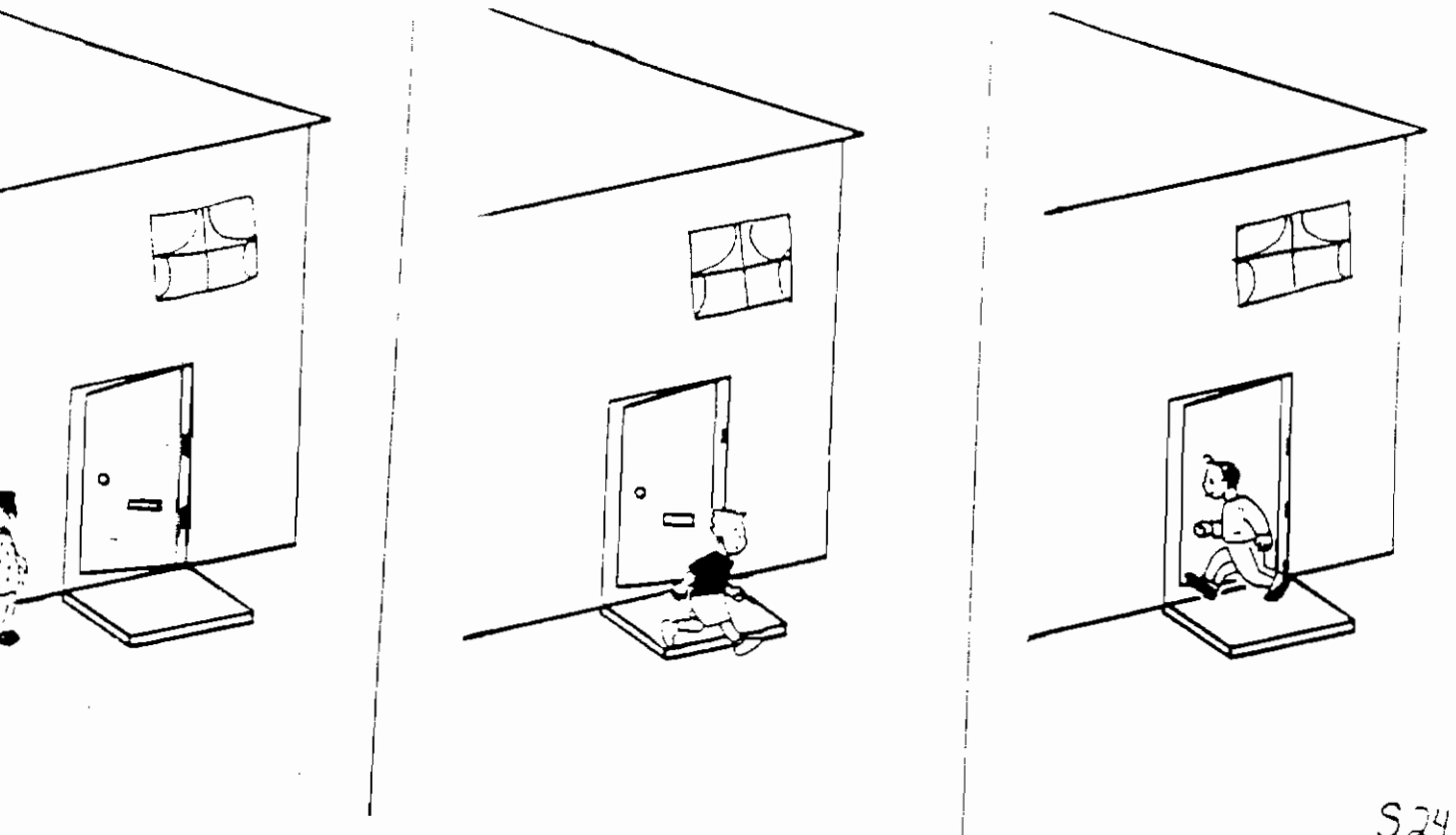

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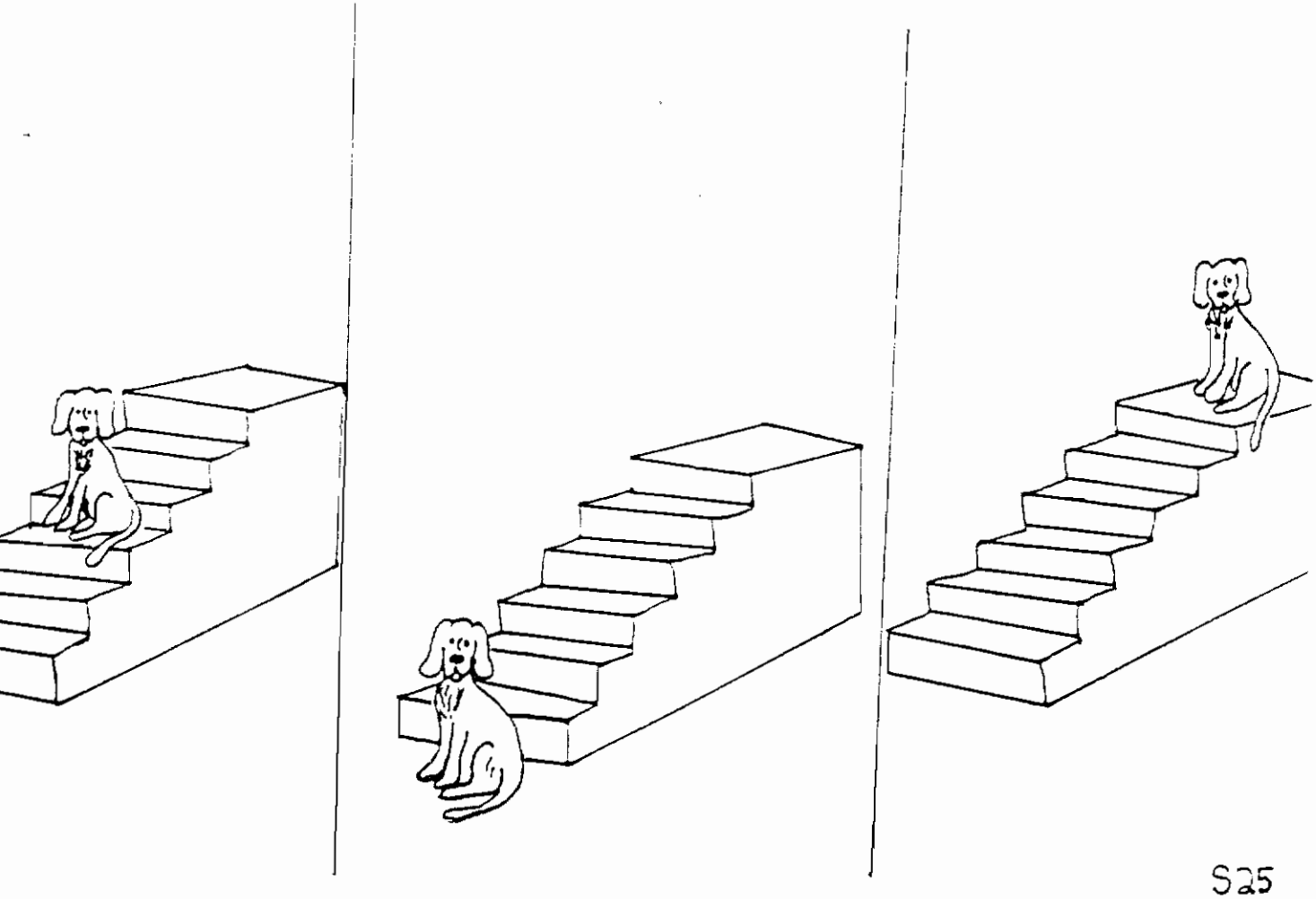

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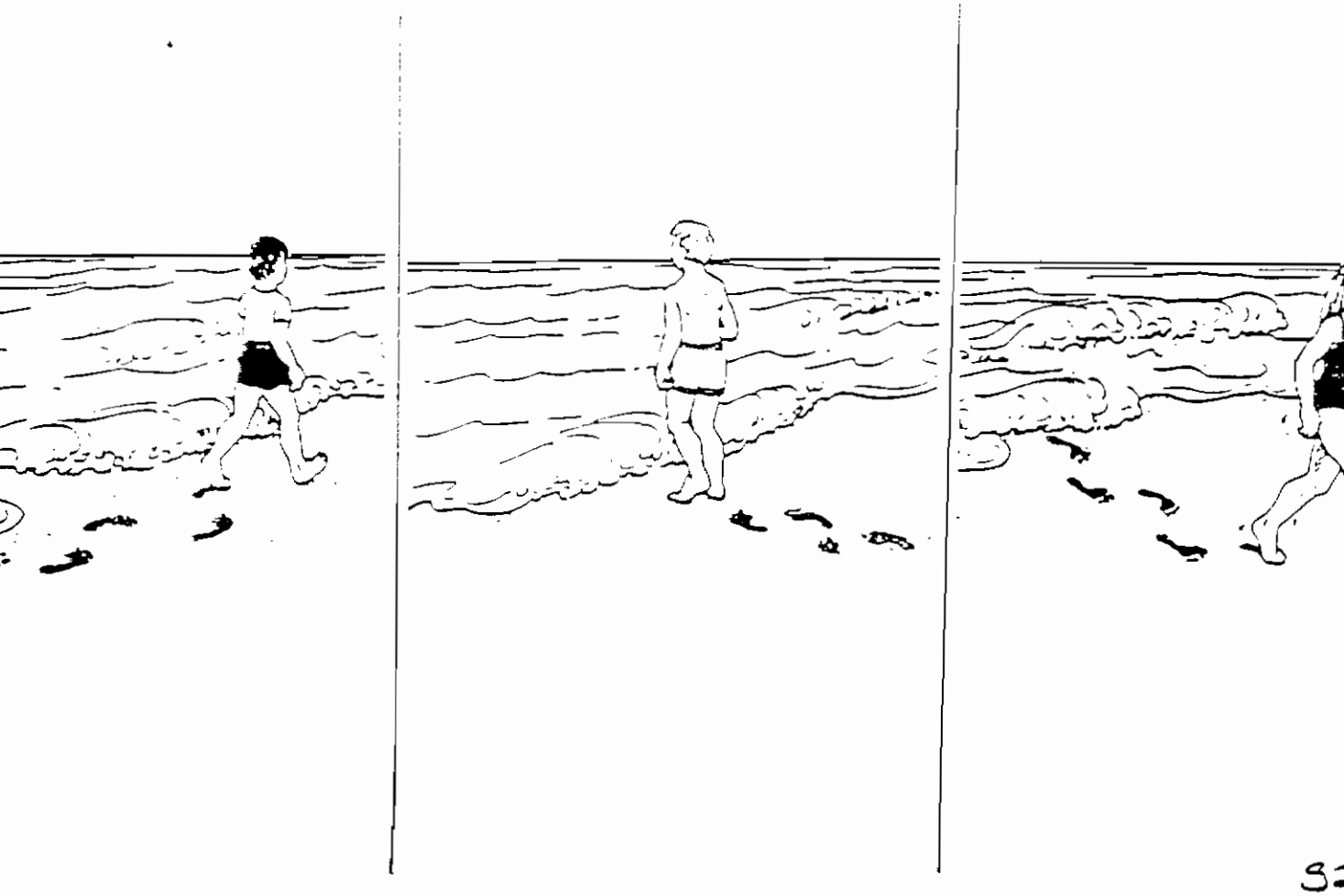

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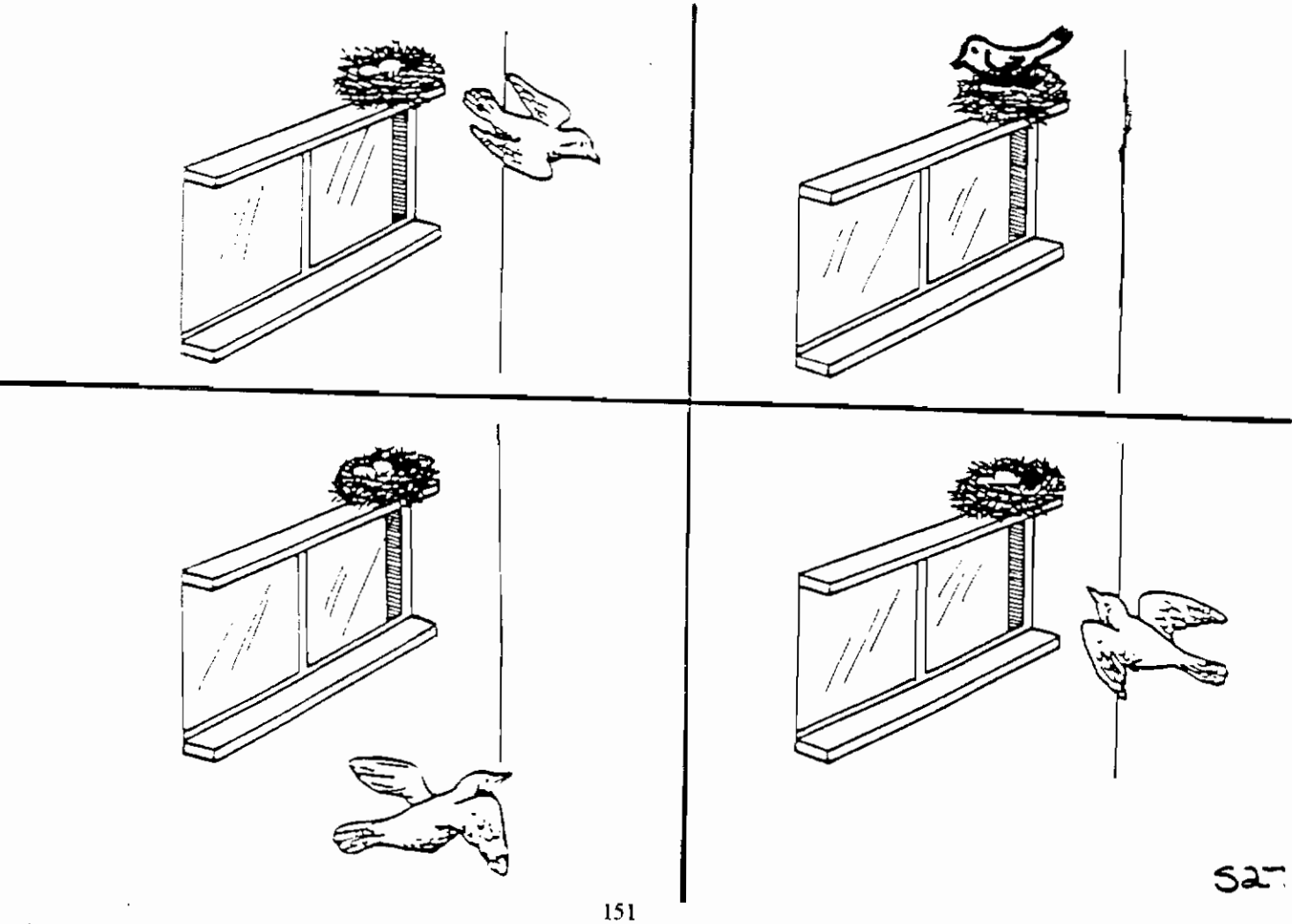

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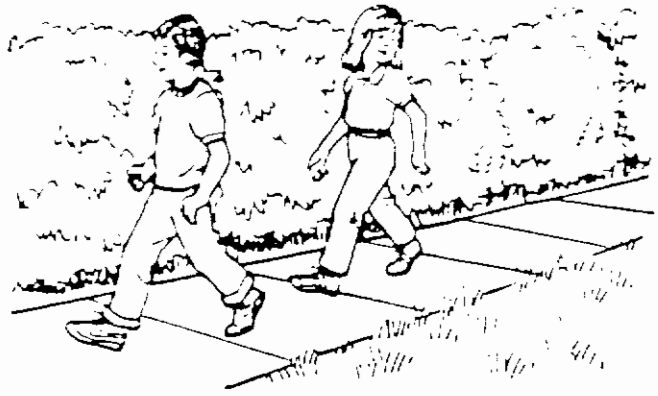

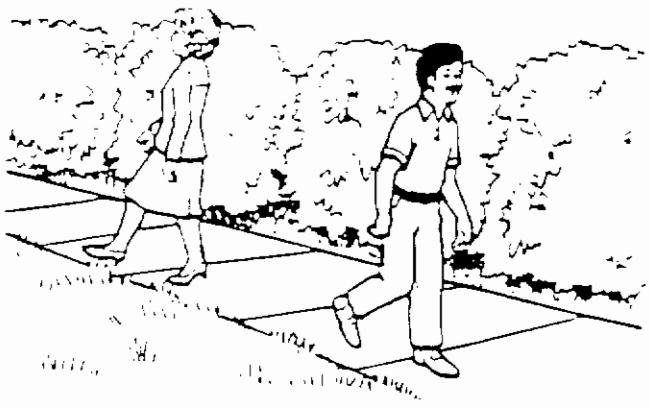

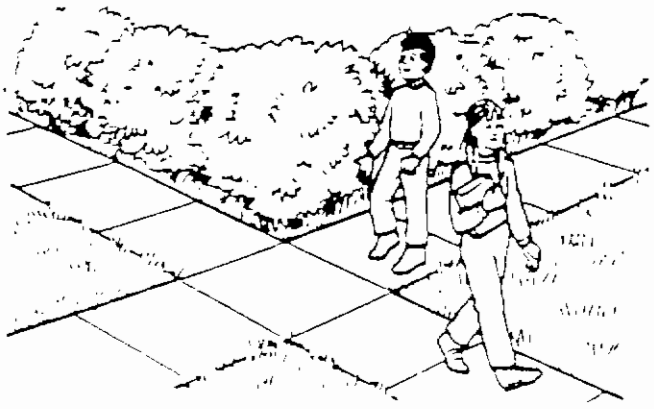

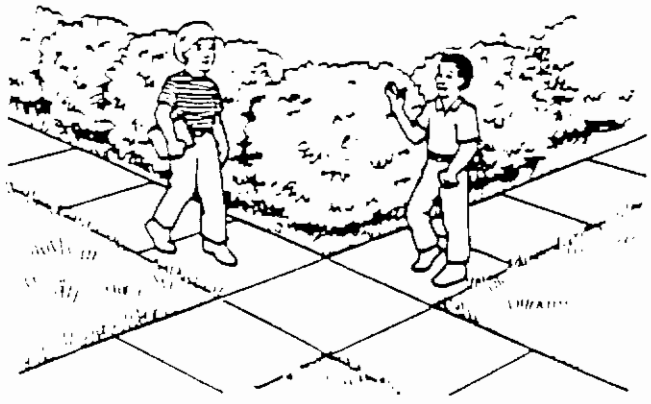

S28

COGNITIVE DEVELOPMENT ASSESSMENT

QUANTITY

PICTURE SETS

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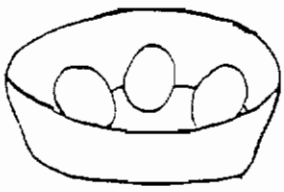

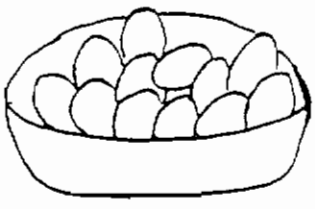

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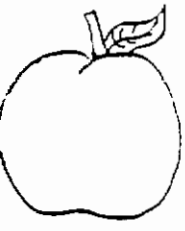
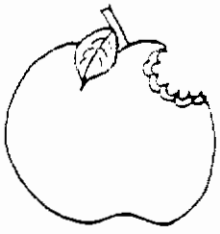
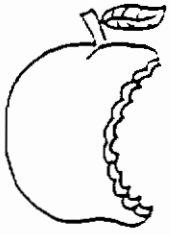


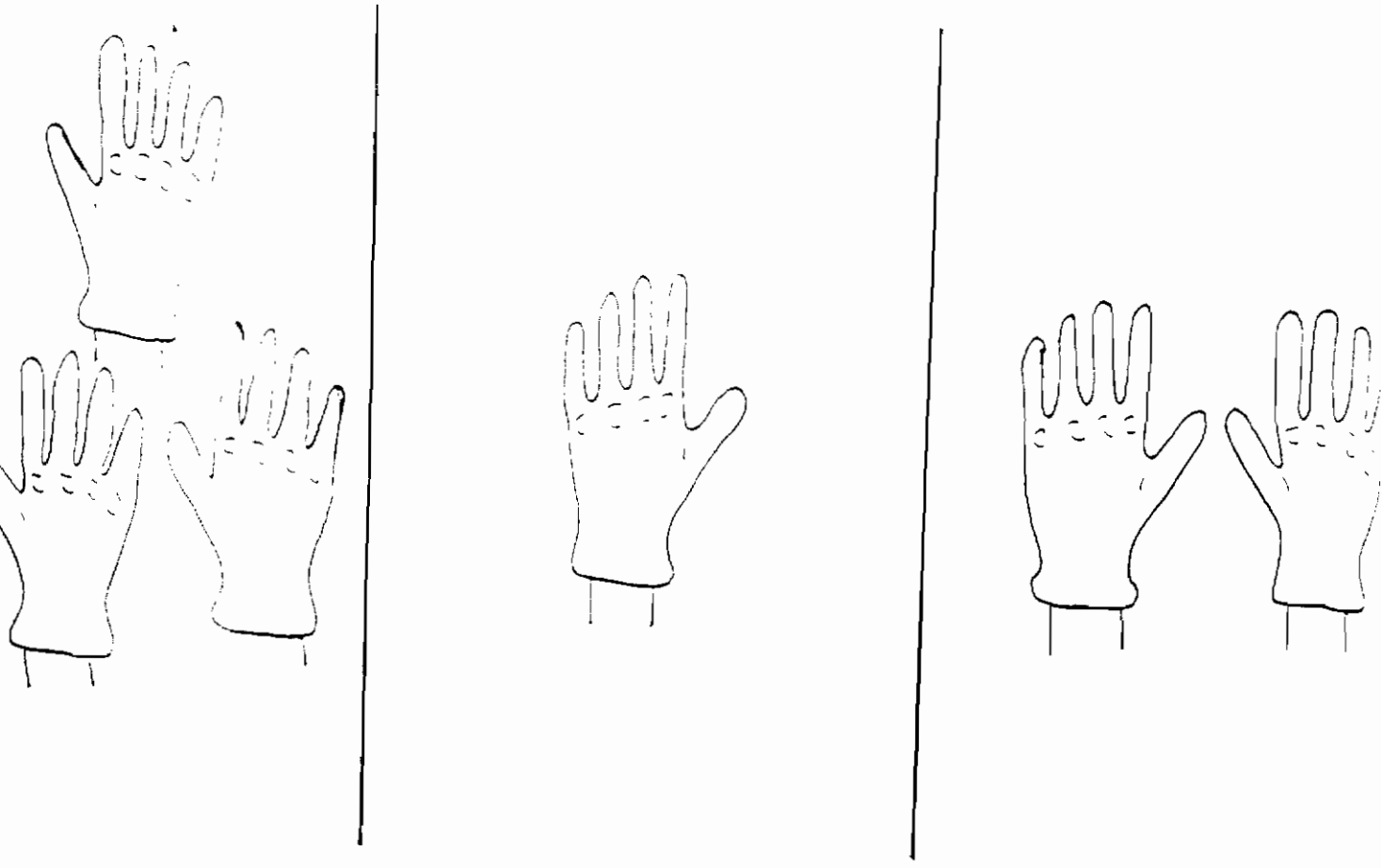




Q4

Q

Q6



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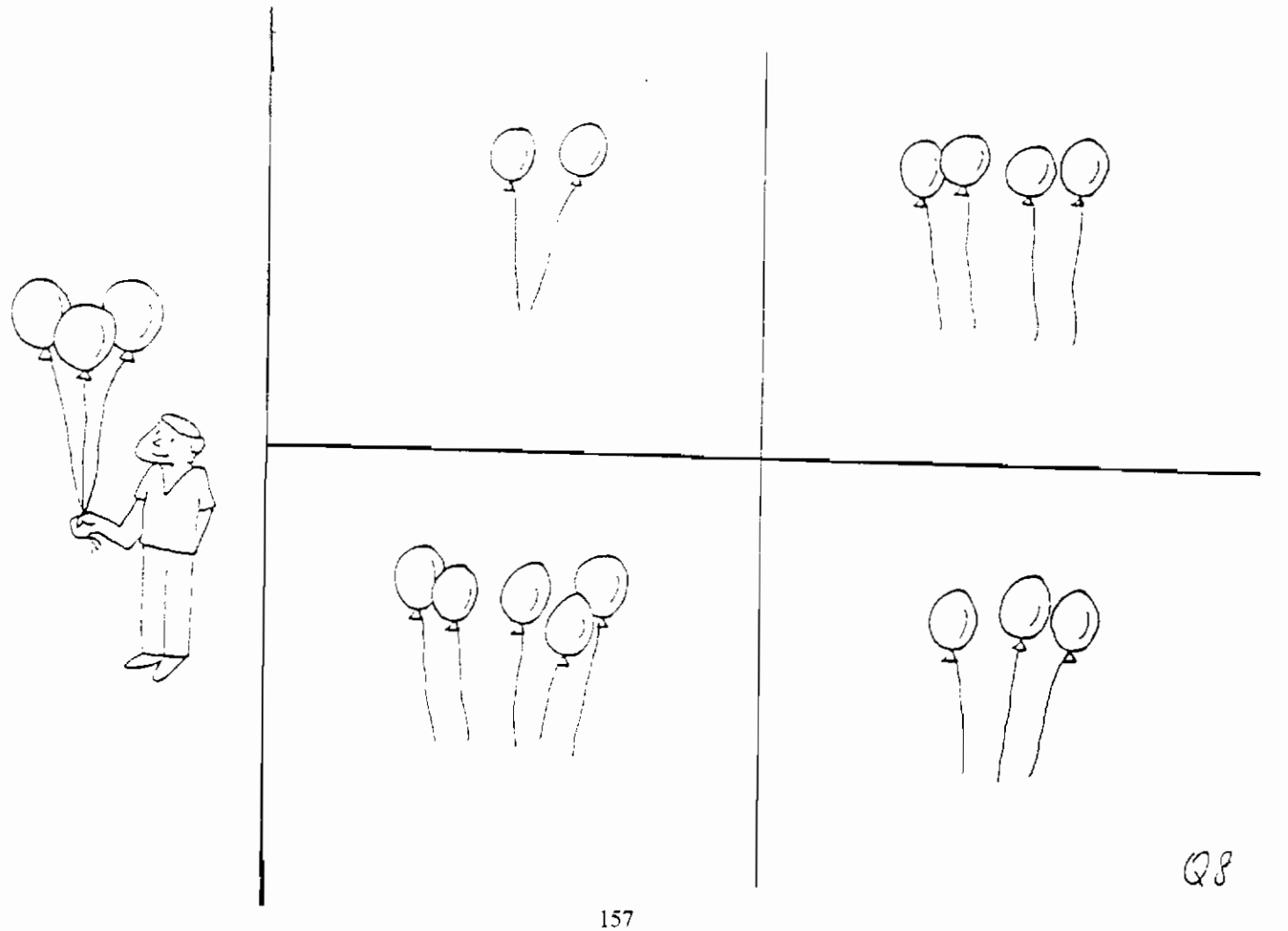

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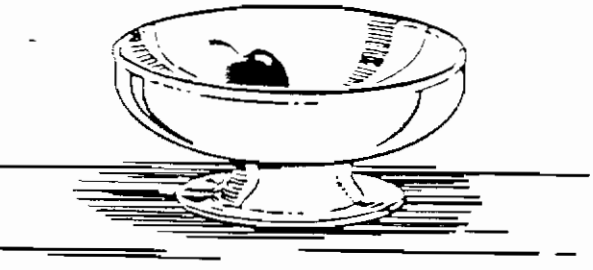

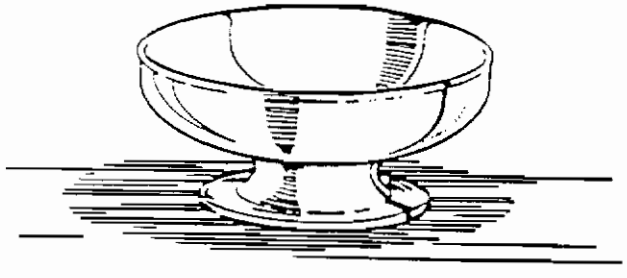

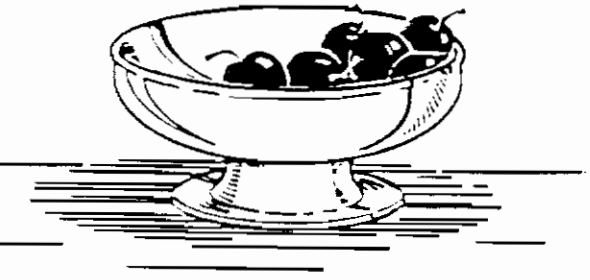

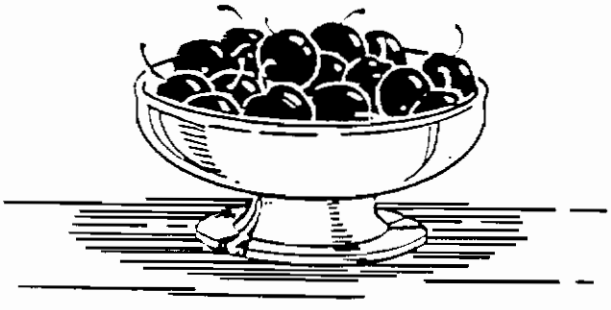

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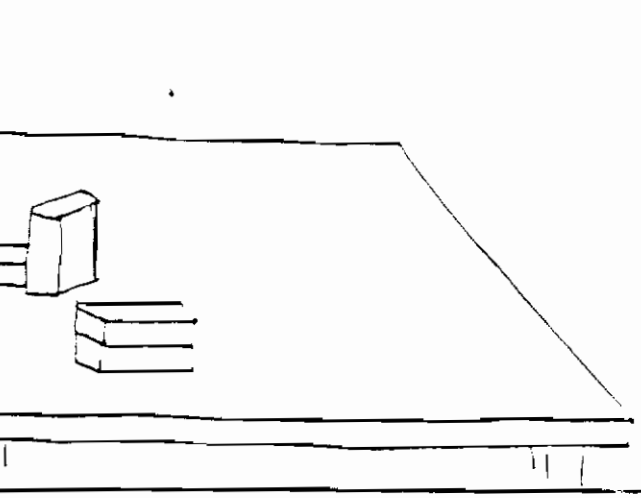

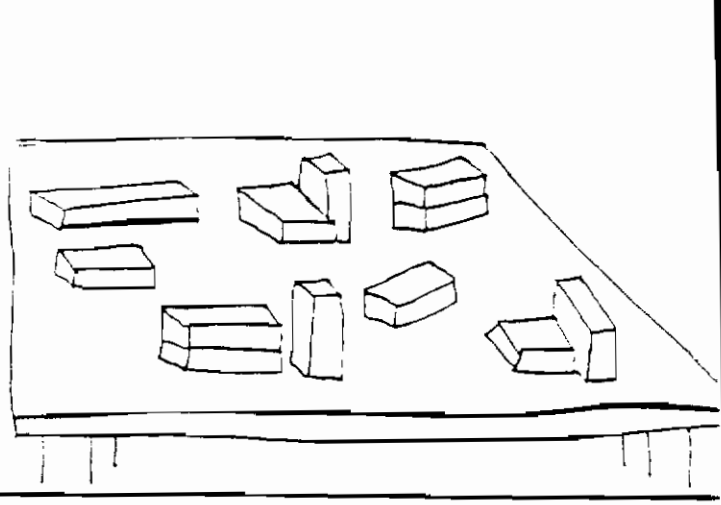

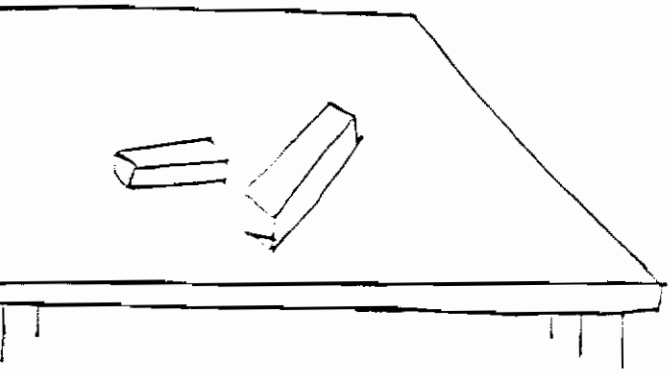

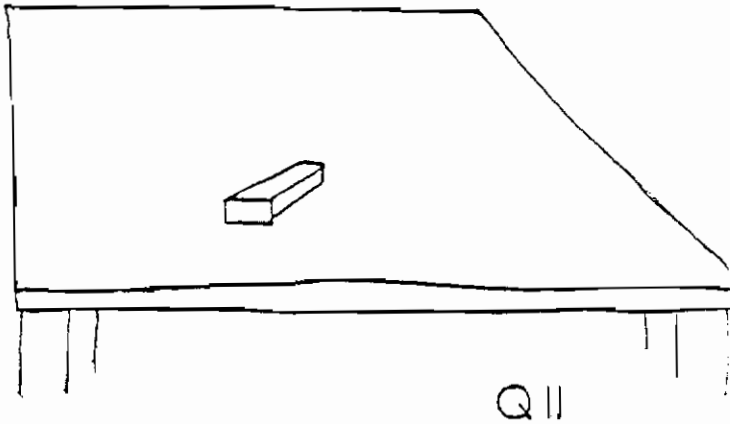

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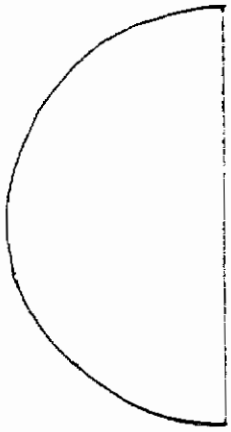

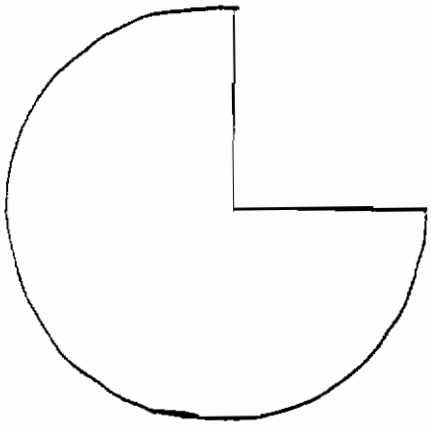

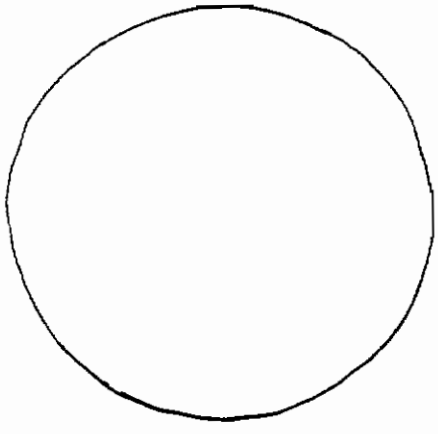

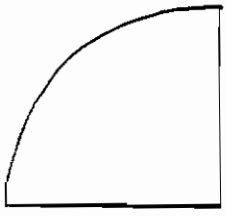

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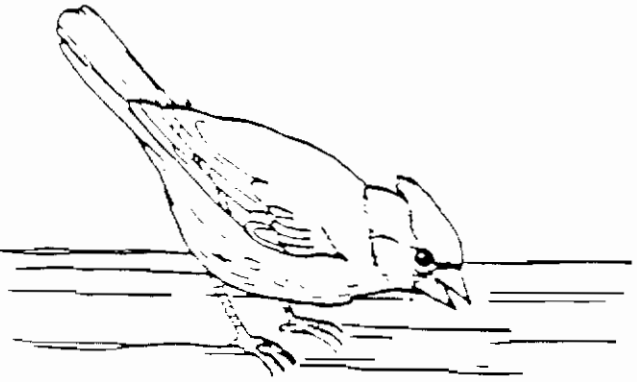

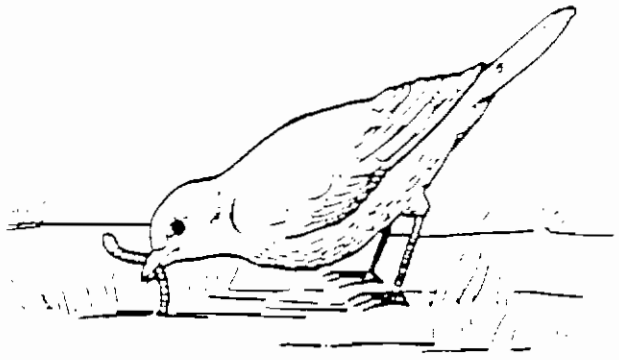

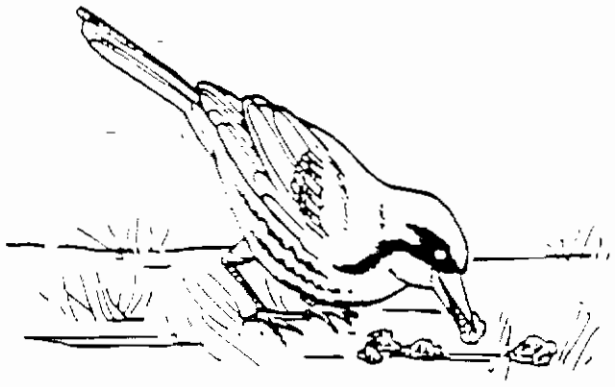

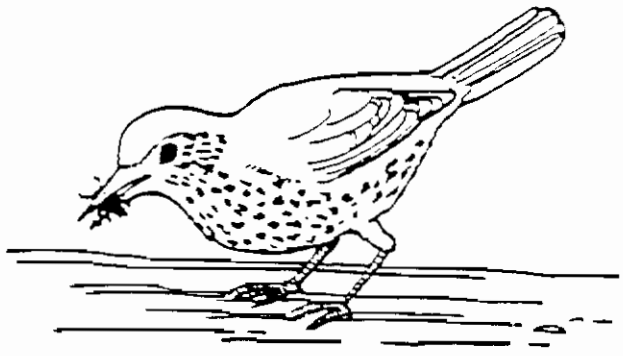

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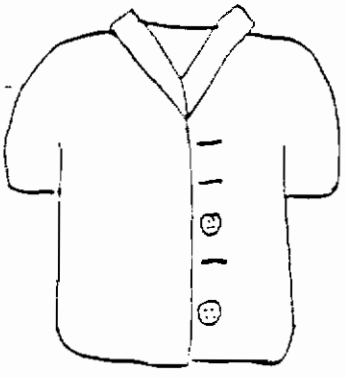

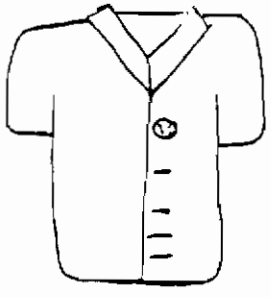

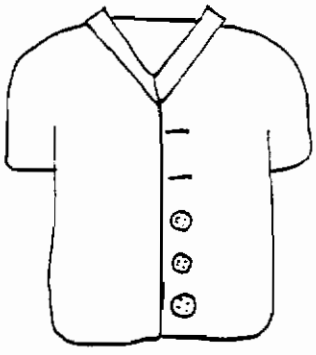

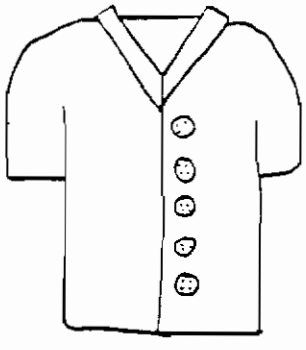

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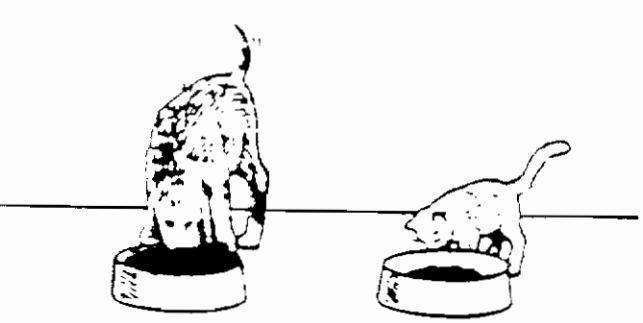
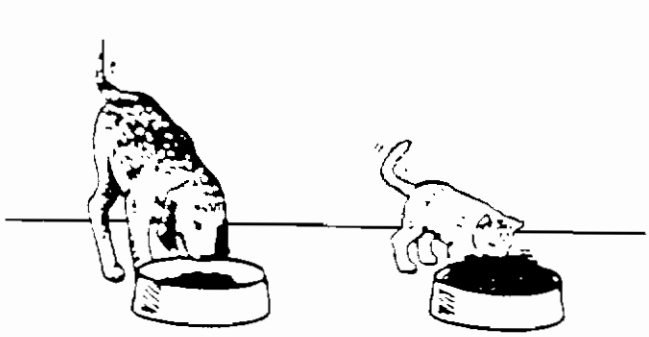
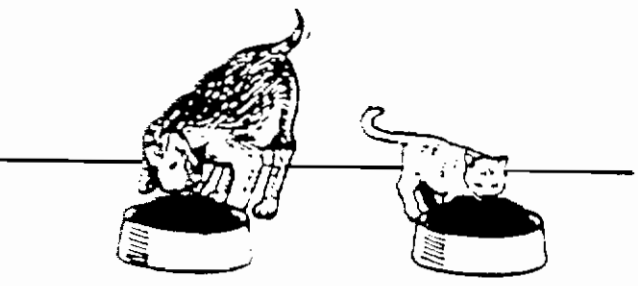
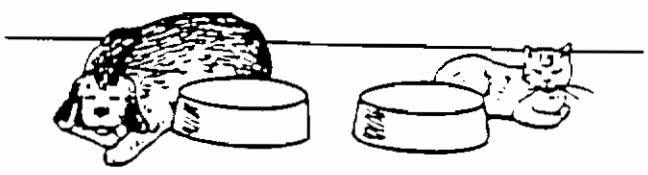




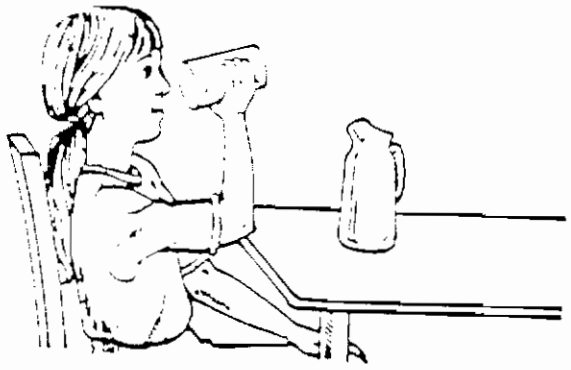


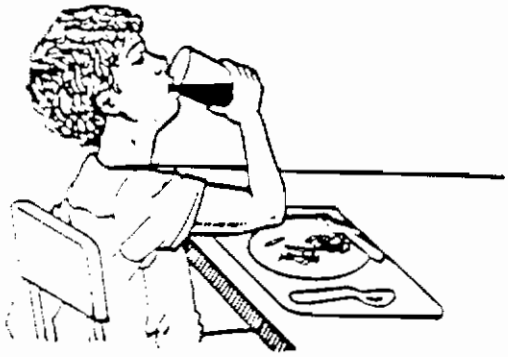


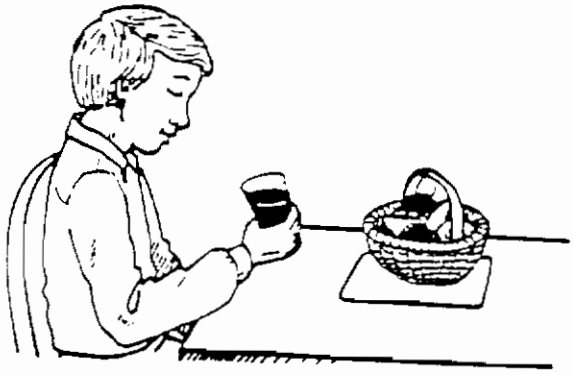
COGNITIVE DEVELOPMENT ASSESSMENT

TIME

PICTURE SETS







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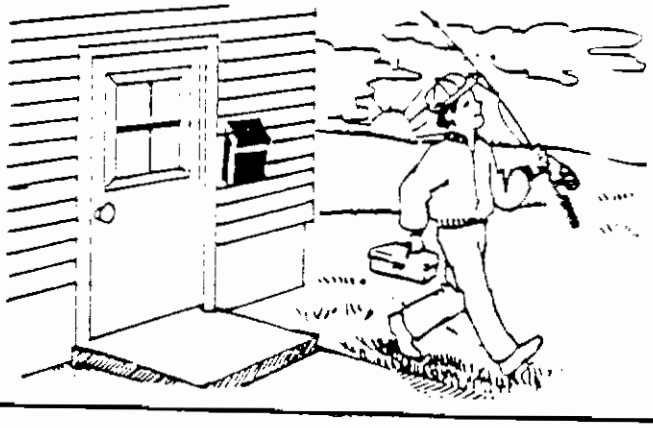

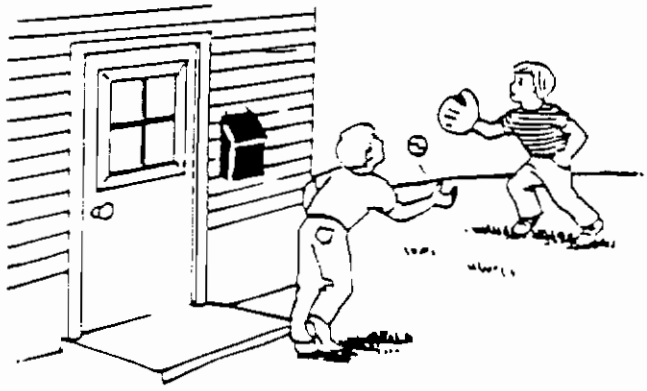

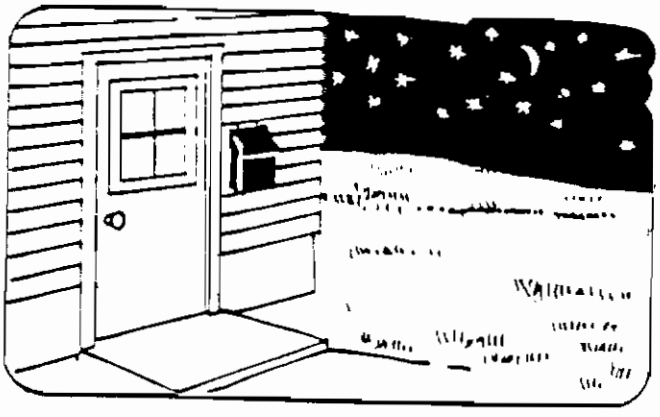

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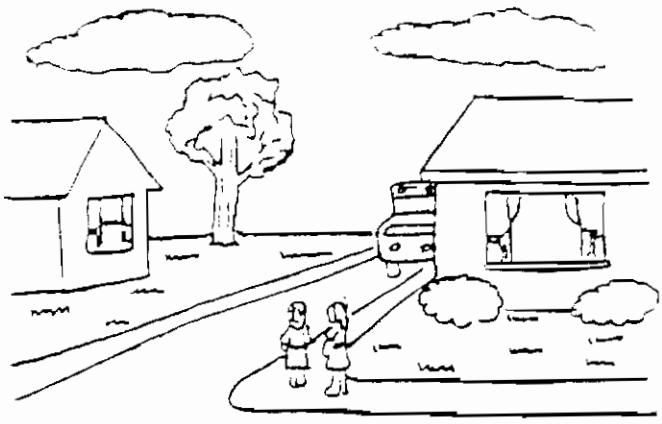

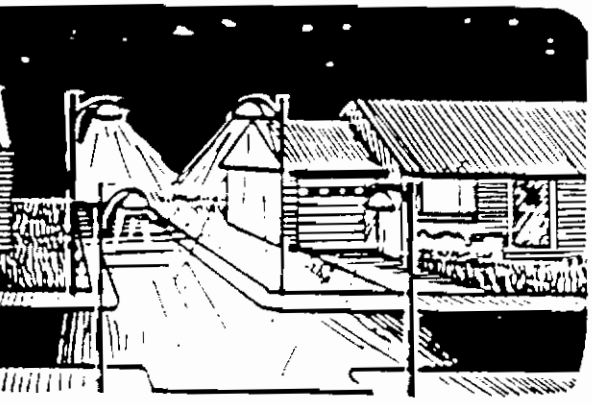

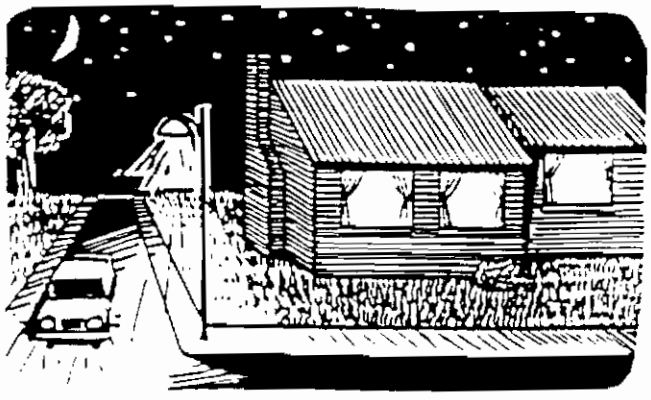

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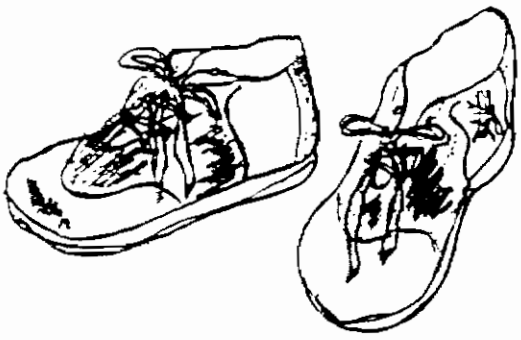

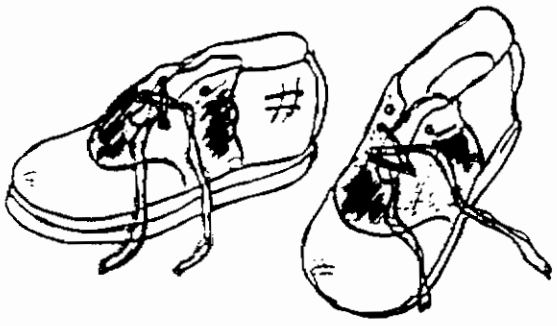

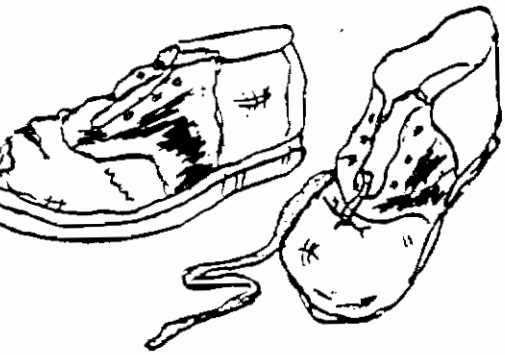

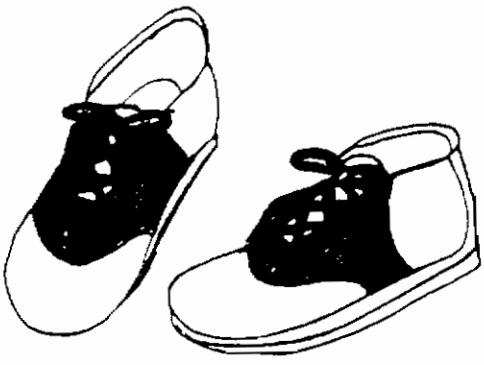

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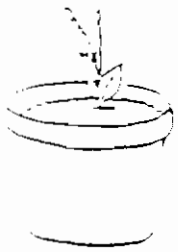

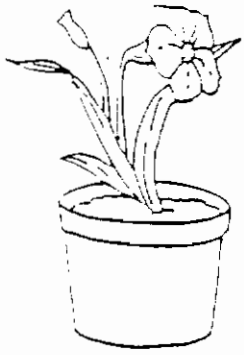

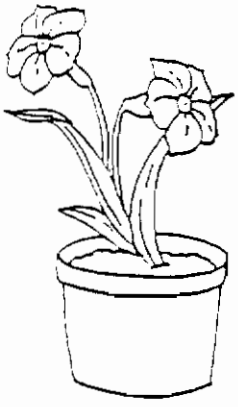

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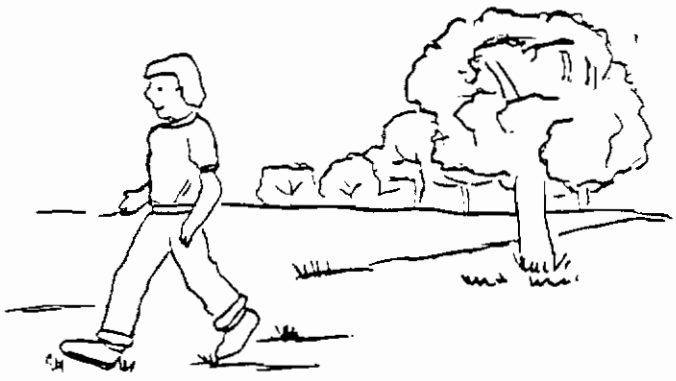

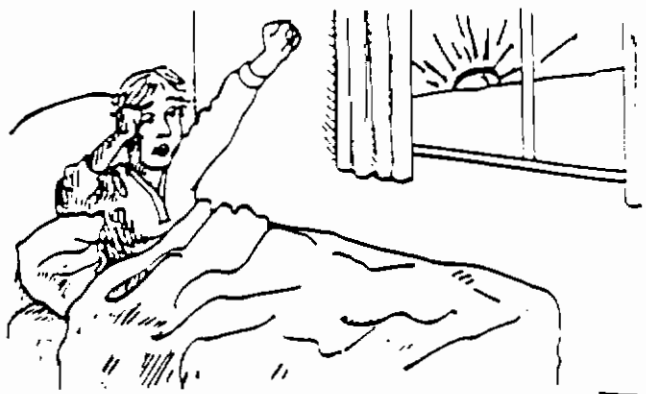

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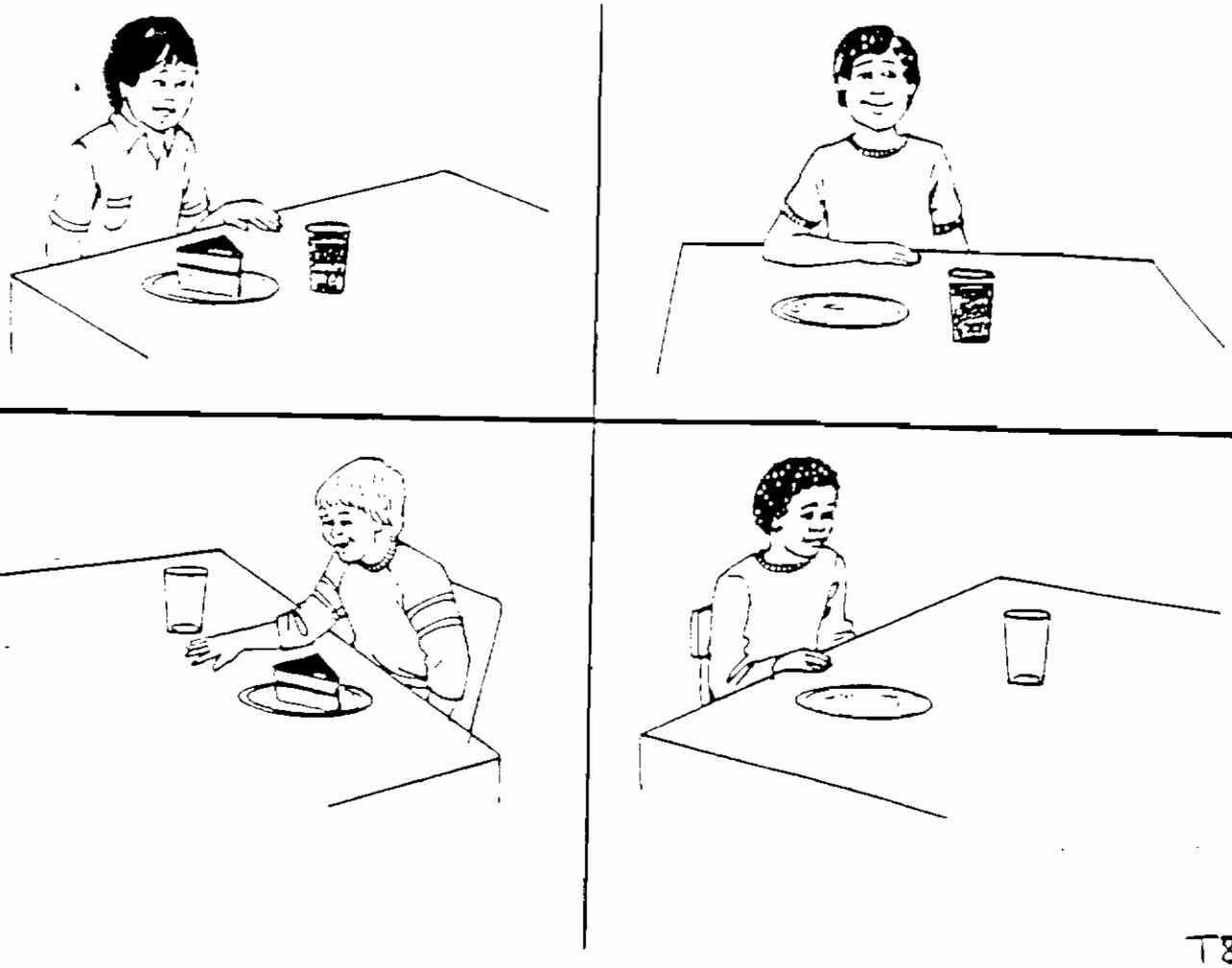

T8