THE UNIVERSITY OF CALGARY

TEACHING THE CENTRAL INTENTIONAL STRUCTURE FOR TRANSFER

by

LISE MONIQUE GODBOUT

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- Technology 0710
- Tests and Measurements 0288
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LANGUAGE, LITERATURE AND LINGUISTICS
- Language
  - General 0679
  - Ancient 0289
  - Linguistics 0290
  - Modern 0291
- Literature
  - General 0401
  - Classical 0294
  - Comparative 0295
  - Medieval 0297
  - Modern 0298
  - African 0316
  - American 0591
  - Asian 0305
  - Canadian (English) 0352
  - Canadian (French) 0355
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PHILOSOPHY, RELIGION AND THEOLOGY
- Philosophy 0422
- Religion
  - General 0318
  - Biblical Studies 0321
  - Clergy 0319
  - History of 0320
  - Philosophy of 0322
- Theology 0469

SOCIAL SCIENCES
- American Studies 0323
- Anthropology
  - Archaeology 0324
  - Cultural 0326
  - Physical 0327
- Business Administration
  - General 0310
  - Accounting 0272
  - Banking 0770
  - Management 0454
  - Marketing 0338
- Canadian Studies 0385
- Economics
  - General 0501
  - Agricultural 0503
  - Commerce-Business 0505
  - Finance 0508
  - History 0509
  - Labor 0510
  - Theory 0511
- Folklore 0358
- Geography 0366
- Gerontology 0351
- History
  - General 0578
  - Ancient 0579
  - Medieval 0581
  - Modern 0582
  - Black 0328
  - African 0331
  - Asia, Australia and Oceania 0332
  - Canadian 0334
  - European 0335
  - Latin American 0336
  - Middle Eastern 0333
  - United States 0337
- History of Science 0585
- Law 0398
- Political Science
  - General 0615
  - International Law and Relations 0616
  - Public Administration 0617
- Recreation 0814
- Social Work 0452
- Sociology
  - General 0626
  - Criminology and Penology 0627
  - Demography 0938
  - Ethnic and Racial Studies 0631
  - Individual and Family Studies 0628
  - Industrial and Labor Relations 0629
  - Public and Social Welfare 0630
  - Social Structure and Development 0700
  - Theory and Methods 0344
- Transportation 0709
- Urban and Regional Planning 0999
- Women's Studies 0453

THE SCIENCES AND ENGINEERING

BIOLOGICAL SCIENCES
- Agriculture
  - General 0473
  - Agronomy 0285
  - Animal Culture and Nutrition 0475
  - Animal Pathology 0476
  - Food Science and Technology 0359
  - Forestry and Wildlife 0478
  - Plant Culture 0479
  - Plant Pathology 0480
  - Plant Physiology 0817
  - Range Management 0777
  - Wood Technology 0746
- Biology
  - General 0306
  - Anatomy 0287
  - Biostatistics 0308
  - Botany 0309
  - Cell 0379
  - Ecology 0329
  - Entomology 0353
  - Genetics 0369
  - Limnology 0793
  - Microbiology 0410
  - Molecular 0307
  - Neuroscience 0317
  - Oceanography 0416
  - Physiology 0433
  - Radiation 0821
  - Veterinary Science 0778
  - Zoology 0472
- Biophysics
  - General 0786
  - Medical 0760

EARTH SCIENCES
- Biogeochemistry 0425
- Geochemistry 0996
- Geodesy 0370
- Geology 0372
- Geophysics 0373
- Hydrology 0388
- Mineralogy 0411
- Paleobotany 0345
- Paleoecology 0426
- Paleontology 0418
- Paleozoology 0985
- Palynology 0427
- Physical Geography 0368
- Physical Oceanography 0415

HEALTH AND ENVIRONMENTAL SCIENCES
- Environmental Sciences 0768
- Health Sciences
  - General 0566
  - Audiology 0300
  - Chemotherapy 0992
  - Dentistry 0567
  - Education 0350
  - Hospital Management 0769
  - Human Development 0758
  - Immunology 0982
  - Medicine and Surgery 0564
  - Mental Health 0347
  - Nursing 0569
  - Nutrition 0570
  - Obstetrics and Gynecology 0380
  - Occupational Health and Therapy 0354
  - Ophthalmology 0381
  - Pathology 0571
  - Pharmacology 0419
  - Pharmacy 0572
  - Physical Therapy 0382
  - Public Health 0573
  - Radiology 0574
  - Recreation 0575
  - Speech Pathology 0460
  - Toxicology 0383
- Home Economics 0386

PHYSICAL SCIENCES
Pure Sciences
- Chemistry
  - General 0485
  - Agricultural 0749
  - Analytical 0486
  - Biochemistry 0487
  - Inorganic 0488
  - Nuclear 0738
  - Organic 0490
  - Pharmaceutical 0491
  - Physical 0494
  - Polymer 0495
  - Radiation 0754
- Mathematics 0405
- Physics
  - General 0605
  - Acoustics 0986
  - Astronomy and Astrophysics 0606
  - Atmospheric Science 0608
  - Atomic 0748
  - Electronics and Electricity 0607
  - Elementary Particles and High Energy 0798
  - Fluid and Plasma 0759
  - Molecular 0609
  - Nuclear 0610
  - Optics 0752
  - Radiation 0756
  - Solid State 0611
- Statistics 0463

Applied Sciences
- Applied Mechanics 0346
- Computer Science 0984
- Engineering
  - General 0537
  - Aerospace 0538
  - Agricultural 0539
  - Automotive 0540
  - Biomedical 0541
  - Chemical 0542
  - Civil 0543
  - Electronics and Electrical 0544
  - Heat and Thermodynamics 0348
  - Hydraulic 0545
  - Industrial 0546
  - Marine 0547
  - Materials Science 0794
  - Mechanical 0548
  - Metallurgy 0743
  - Mining 0551
  - Nuclear 0552
  - Packaging 0549
  - Petroleum 0765
  - Sanitary and Municipal 0554
  - System Science 0790
- Geotechnology 0428
- Operations Research 0796
- Plastics Technology 0795
- Textile Technology 0994

PSYCHOLOGY
- General 0621
- Behavioral 0384
- Clinical 0622
- Developmental 0620
- Experimental 0623
- Industrial 0624
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Théâtre 0465

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Généralités 515
Administration 0514
Art 0273
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Commerce 0688
Économie domestique 0278
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Éducation préscolaire 0518
Éducation sanitaire 0680
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Enseignement bilingue et multiculturel 0282
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Enseignement primaire. 0524
Enseignement professionnel 0747
Enseignement religieux 0527
Enseignement secondaire 0533
Enseignement spécial 0529
Enseignement supérieur 0745
Évaluation 0288
Finances 0277
Formation des enseignants 0530
Histoire de l'éducation 0520
Langues et littérature 0279
Lecture 0535
Mathématiques 0280
Musique 0522
Orientation et consultation 0519
Philosophie de l'éducation 0998
Physique 0523
Programmes d'études et enseignement 0727
Psychologie 0525
Sciences 0714
Sciences sociales 0534
Sociologie de l'éducation 0340
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Langues
- Généralités 0679
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- Linguistique 0290
- Modernes 0291

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- Généralités 0401
- Anciennes 0294
- Comparée 0295
- Médiévale 0297
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- Anglaise 0593
- Asiatique 0305
- Canadienne (Anglaise) 0352
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- Latino-américaine 0312
- Moyen-orientale 0315
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- Slave et est-européenne 0314

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Philosophie 0422
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- Généralités 0318
- Clergé 0319
- Études bibliques 0321
- Histoire des religions 0320
- Philosophie de la religion 0322

Théologie 0469

SCIENCES SOCIALES

Anthropologie
- Archéologie 0324
- Culturelle 0326
- Physique 0327

Droit 0398
Économie
- Généralités 0501
- Commerce-Affaires 0505
- Économie agricole 0503
- Économie du travail 0510
- Finances 0508
- Histoire 0509
- Théorie 0511

Études américaines 0323
Études canadiennes 0385
Études féministes 0453
Folklore 0358
Géographie 0366
Gérontologie 0351
Gestion des affaires
- Généralités 0310
- Administration 0454
- Banques 0770
- Comptabilité 0272
- Marketing 0338

Histoire
- Histoire générale 0578
- Ancienne 0579
- Médiévale 0581
- Moderne 0582
- Histoire des noirs 0328
- Africaine 0331
- Canadienne 0334
- États-Unis 0337
- Européenne 0335
- Moyen-orientale 0333
- Latino-américaine 0336
- Asie, Australie et Océanie 0332

Histoire des sciences 0585
Loisirs 0814
Planification urbaine et régionale 0999
Science politique
- Généralités 0615
- Administration publique 0617
- Droit et relations internationales 0616

Sociologie
- Généralités 0626
- Aide et bien-âtre social 0630
- Criminologie et établissements pénitentiaires 0627
- Démographie 0938
- Études de l' individu et de la famille 0628
- Études des relations interethniques et des relations raciales 0631
- Structure et développement social 0700
- Théorie et méthodes. 0344
- Travail et relations industrielles 0629

Transports 0709
Travail social 0452

SCIENCES ET INGÉNIERIE

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Agriculture
- Généralités 0473
- Agronomie. 0285
- Alimentation et technologie alimentaire 0359
- Culture 0479
- Élevage et alimentation 0475
- Exploitation des pâturages 0777
- Pathologie animale 0476
- Pathologie végétale 0480
- Physiologie végétale 0817
- Sylviculture et faune 0478
- Technologie du bois 0746

Biologie
- Généralités 0306
- Anatomie 0287
- Biologie (Statistiques) 0308
- Biologie moléculaire 0307
- Botanique 0309
- Cellule 0379
- Écologie 0329
- Entomologie 0353
- Génétique 0369
- Limnologie 0793
- Microbiologie 0410
- Neurologie 0317
- Océanographie 0416
- Physiologie 0433
- Radiation 0821
- Science vétérinaire 0778
- Zoologie 0472

Biophysique
- Généralités 0786
- Medicale 0760

SCIENCES DE LA TERRE

Biogéochimie 0425
Géochimie 0996
Géodésie 0370
Géographie physique 0368
Géologie 0372
Géophysique 0373
Hydrologie 0388
Minéralogie 0411
Océanographie physique 0415
Paléobotanique 0345
Paléoécologie 0426
Paléontologie 0418
Paléozoologie 0985
Palynologie 0427

SCIENCES DE LA SANTÉ ET DE L'ENVIRONNEMENT

Économie domestique 0386
Sciences de l'environnement 0768
Sciences de la santé
- Généralités 0566
- Administration des hôpitaux 0769
- Alimentation et nutrition 0570
- Audiologie 0300
- Chimiothérapie 0992
- Dentisterie 0567
- Développement humain 0758
- Enseignement 0350
- Immunologie 0982
- Loisirs 0575
- Médecine du travail et thérapie 0354
- Médecine et chirurgie 0564
- Obstétrique et gynécologie 0380
- Ophtalmologie 0381
- Orthophonie 0460
- Pathologie 0571
- Pharmacie 0572
- Pharmacologie 0419
- Physiothérapie 0382
- Radiologie 0574
- Santé mentale 0347
- Santé publique 0573
- Soins infirmiers 0569
- Toxicologie 0383

SCIENCES PHYSIQUES

Sciences Pures

Chimie
- Généralités 0485
- Biochimie 487
- Chimie agricole 0749
- Chimie analytique 0486
- Chimie minérale 0488
- Chimie nucléaire 0738
- Chimie organique 0490
- Chimie pharmaceutique 0491
- Physique 0494
- PolymÇres 0495
- Radiation 0754

Mathématiques 0405
Physique
- Généralités 0605
- Acoustique 0986
- Astronomie et astrophysique 0606
- Électronique et électricité 0607
- Fluides et plasma 0759
- Météorologie 0608
- Optique 0752
- Particules (Physique nucléaire) 0798
- Physique atomique 0748
- Physique de l'état solide 0611
- Physique moléculaire 0609
- Physique nucléaire 0610
- Radiation 0756

Statistiques 0463

Sciences Appliqués Et Technologie

Informatique 0984
Ingénierie
- Généralités 0537
- Agricole 0539
- Automobile 0540
- Biomédicale 0541
- Chaleur et ther modynamique 0348
- Conditionnement (Emballage) 0549
- Génie aérospatial 0538
- Génie chimique 0542
- Génie civil 0543
- Génie électronique et électrique 0544
- Génie industriel 0546
- Génie mécanique 0548
- Génie nucléaire 0552
- Ingénierie des systèmes 0790
- Mécanique navale 0547
- Métallurgie 0743
- Science des matériaux 0794
- Technique du pétrole 0765
- Technique minière 0551
- Techniques sanitaires et municipales 0554
- Technologie hydraulique 0545

Mécanique appliquée 0346
Géotechnologie 0428
Matières plastiques (Technologie) 0795
Recherche opérationnelle 0796
Textiles et tissus (Technologie) 0794

PSYCHOLOGIE

Généralités 0621
Personnalité 0625
Psychobiologie 0349
Psychologie clinique 0622
Psychologie du comportement 0384
Psychologie du développement 0620
Psychologie expérimentale 0623
Psychologie industrielle 0624
Psychologie physiologique 0989
Psychologie sociale 0451
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ABSTRACT

The purpose of this present study was to examine the effectiveness of an intentional instruction programme for training and transfer effects. The programme was devised to train a group of academically at-risk 4 1/2- to 5 1/2-year-old kindergarten children to understand human intentionality (i.e., that action is motivated by mental states). Instruction was offered in the narrative domain and transfer was examined in 3 conceptually related tasks (i.e., the Definition of Feelings task, the Mother's Motivation task, and the Empathic Cognition task). A second dimensional instruction programme served as a control. It was designed to train children's conceptual understanding of numbers (i.e., the Number Knowledge task) and transfer to 3 other conceptually related tasks (i.e., the Money Knowledge task, the Time Telling task and the Balance Beam task). Results indicated that the intentional instruction programme promoted a significant gain in children's ability to conceptualise human action as stemming from mental states in a narrative format (the Story Telling task) and transferred to two of the 3 conceptually related tasks. No change occurred in these children's performance on the dimensional tasks. Similarly, the dimensional instruction programme promoted a significant gain in children's ability to conceptualise numbers (Number Knowledge task) and this knowledge transferred to 2 of the 3 conceptually related tasks. No change was noted in the children's performance on the intentional tasks.

It was concluded that these developmentally based instruction programmes are effective in promoting conceptual change in the broad domains of dimensional and intentional reasoning with groups of academically at-risk kindergarten children.

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The successful completion of one's graduate studies is never a solitary achievement. The continued efforts of family and friends, and the support staff and professors here at the University of Calgary can be found reflected in every chapter of this thesis. More specifically, I would like to acknowledge and thank:

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TABLE OF CONTENTS

LIST OF TABLES

Page

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Research interest in transfer is nearly a century old. This search for an understanding of if, and how, we can apply acquired knowledge from one subject domain to another, or from a lower-ordered intellectual ability to a higher-ordered one, has puzzled researchers despite their varied approaches to this topic of interest. This variance in approach can be traced to historical trends in psychology as well as to educational perspectives.

Amongst the first psychologists to examine the concept of transfer was Thorndike. The belief in the "Doctrine of Formal Discipline" was prevalent in the early 20th century and was at the basis of educational programming of the day. Thorndike strongly disagreed with this concept and found no evidence that formal training in such subjects as Latin and Geometry would discipline the mind and thus positively influence learning in other subject areas. From his research, Thorndike presented a theory of transfer which was much more limiting in scope and focused on the common elements shared by the subject domains within which transfer was considered possible (Singley & Anderson, 1985).

As more information became available through continued research on this topic, challenges to the resulting learning theories were continuous. The Gestaltists challenged Thorndike's findings by arguing that transfer occurred when an understanding of something is well structured in a person's mind and this understanding is then transposed in much the same manner a melody is transposed or played in a different key. This could easily be undertaken by someone who had a firm understanding of the junctional relations between the musical notes, but virtually impossible for an associationist looking for similar

notes (Singley & Anderson, 1989).

The Behaviourist tradition also influenced the study of transfer by promoting the concept of programmed instruction. Programmed instruction involved the decomposition of a learning task into a hierarchy of skills to be mastered sequentially. This altered the focus of transfer study to vertical transfer (transfer between lower-ordered and higher-ordered skills) as opposed to the lateral transfer more generally examined (Singley & Anderson, 1989).

A more recent shift in the field of cognitive science has been the focus on information processing, which has allowed researchers to examine the problem solving aspects of learning. In the study of transfer, its influence has been noted in attempts to teach children the general foundation of problem solving approaches, to emphasise the thinking processes during the problem solving activity, to increase appreciation of the role of tools and concepts in solving problems, and ultimately to enhance children's problem solving capabilities and subsequently, the effectiveness of their educational experience (Rubenstein, 1980).

Despite these varied approaches and increasingly specific and detailed attempts at researching this topic, evidence to support the existence of knowledge transfer has been minimal at best (Simon, 1980; Singley & Anderson, 1989). However, its appeal remains constant. Acknowledging the fact that unlocking the mysteries of knowledge transfer could dramatically alter the philosophical and practical approaches of our educational system has encouraged educational, developmental and cognitive psychologists to persist.

Newell and Simon (1972) have suggested that a comprehensive theory of cognition must eventually address the concept of transfer. Once a theory can account for learning and performance across several tasks, the next logical means to examine the theory would be to test for transfer. Should positive

results be achieved, they would offer strong support for the theory.

Case's (1985, 1992) Neo-Structuralist theory of cognitive development is currently attempting to meet this challenge. Thus far, the theory can account for children's learning and performance across a wide variety of tasks. At the heart of this theory is the hypothesis that as children develop, their continued improvement on these tasks is due to the construction of executive control structures. The structures allow children to make sense of the world that surrounds them by influencing the way in which children conceptualise and assimilate information, and subsequently how they will use this information to achieve the goals they set for themselves. Similar control structures develop into general conceptual structures that are central in shaping a child's understanding of a specific domain of knowledge and its related subject areas. For instance, various tasks which require quantitative analysis, such as money knowledge and time telling, can be considered to have the same conceptual underpinnings which in turn are represented in a child's mind by a common conceptual structure, in this case the central dimensional structure. This central dimensional structure is responsible for children's understanding of dimensional concepts by allowing them to reference one or more mental number lines when problem solving. An analogous structure is believed to exist which underlies the different strands of social development such as empathic cognition and understanding of a mother's motives. This structure is termed the central intentional structure. It allows for intentional reasoning by establishing a causal relationship between the external world of actions and the internal world of mental states.

Case and his colleagues have thus far demonstrated that the training of the central intentional structures has positively influenced middle class children's performance on other distinct but conceptually related tasks,

indicating that the knowledge has transferred from one situation to another without specific instruction in the tasks in question (Case & McKeough, 1990). Similar results were found when training the central dimensional structures with children at-risk for academic failure (Case & Griffin, 1990a), although such training of the central intentional structure with this population has demonstrated considerable less transfer of knowledge (Case & Griffin, 1990b).

The purpose of this study was to address this issue by testing the utility of a new instruction programme geared toward this particular population of children. The current instruction programme was designed to train and develop children's representational abilities in order to facilitate their ability to conceptualise the process of human interaction in terms of underlying desires, wants, and judgments. Broadly defined, the steps deemed necessary for the development of an instruction programme for training the central intentional structures involved:

1) making the students aware of their current cognitive structures (representations) of a particular task,
2) providing the students with a mnemonic to free up valuable memory space and help bridge the gap to the next developmental level in the hierarchy,
3) providing guided and independent practice in the task using the mnemonic as guide, and
4) integrating the new structure by gradually phasing out the mnemonic.

At the outset of the instruction, the children were introduced to the concept that they represent what they see in the world. By the mid-way point of the instruction, the children were presented with the notion that perspective, time and changing conditions could alter and influence their representations as well as the representations of others. At this point, the children were able to ascribe

the characters in a story, mental representations which changed over the course of an event. During the final stage of the instruction programme, the children were encouraged to tell stories which represented the changing mental states of the protagonist as being based in wants and desires.

It was anticipated that enhancing the children's representational abilities during the training of their central intentional structures would promote a greater understanding of intentional action. This understanding of various influences on people's representations of events is believed to have formed the basis of a conceptual understanding of human interaction, which in turn influenced their conceptual understanding in various social domains. The goal of this study was to effect transfer of knowledge by gearing instruction towards the central intentional structures, with a focus placed on the children's representational abilities.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

The History of the Study of Knowledge Transfer

Philosophical and theoretical approaches to transfer of learning, by both psychology and education, have gone through many changes in the past century. Despite these varied approaches to its study, evidence supporting the existence of knowledge transfer is tenuous (Singley & Anderson, 1989; Simon, 1980). By way of a brief review, research conducted by associationists has indicated that individuals need to be informed of the common elements between the presented tasks before they can successfully transfer knowledge (Weisberg, DiCammillo, & Phillips, 1978). The usefulness of skill hierarchies to promote transfer, a technology based on an associationist philosophy, has, however, resulted in limited success. Questions as to whether this is due to a misguided approach or to the researchers' inability to appropriately design a skill hierarchy remain unanswered. (Singley and Anderson, 1989). Gestaltists, who proposed that transfer of knowledge would be promoted in situations where insight was gained by an understanding of the structural relations of a problem, have recently examined this subject area using analogical problem situations. The research has thus far resulted in a lack of evidence for transfer unless the subjects were initially informed of the analogous relationships, or when extremely obvious surface and structural similarities were apparent (Reed, Ernst & Banerji, 1974; Holyoak & Koh, 1987).

For Piaget, the intellectual structures that underlay children's cognitive development from infancy to adulthood were very general and unified in nature and therefore far-reaching in application. They were thought to apply across a wide range of conceptual skills, resulting in a "structure of the whole"

perspective that provided the means to identify sequential developmental milestones in children's thinking abilities and classify their problem solving skills according to developmental stages. Yet further research into this claim resulted in low intertask correlations and variations in children's abilities across tasks, that is, decalage, and cast doubt on the idea that intellectual development was integrated and unified at each stage of development.

The information processing approach to the study of knowledge acquisition has successfully increased our understanding of children's thinking processes during problem solving activities; unfortunately, teaching general problem solving skills in the hope of improving children's performance across tasks has thus far provided more questions than answers, though the research continues (Newell, 1980). More recently, though, theorists who study children's problem solving abilities from the information processing approach have been able to determine more specifically what children are able to achieve in certain tasks, and at what point in their development. Although research has indicated that the children's abilities do not consistently conform to Piaget's guidelines, age-related processing capacities have been noted across tasks and are related to overall increasingly complex thought processes demonstrated during critical developmental junctures.

Case's Theory of Cognitive Development

Case (1985, 1992) has proposed a Neo-Structuralist theory of cognitive development which integrates the Piagetian approach with the more recent research findings provided by the information processing approach to developmental psychology. Thus far, Case's theory has been able to account for learning and performance across many tasks, and has begun to examine the prospect of knowledge transfer within the guidelines of his theory. In this

theory, children's representational and problem-solving abilities develop in a hierarchical fashion; that is, the cognitive structures children use to represent a problem situation, their desired objective, and the means by which they will achieve this objective are integrated into more comprehensive and effective structures as they mature. These structures are called the executive control structures and can be thought of as the individual's mental blueprints for dealing with problem situations. They are believed to undergo transformation through a universal sequence of stages. This process is hypothesised to progress in a stage-like fashion, which permits the characterisation of children's thinking at successive points in their development.

Four stages have been delineated throughout childhood and adolescence: 1) the sensorimotor stage (1 month to 1 1/2 years) during which the child becomes aware of the world and learns to interact with sensory objects or motor actions; 2) the relational stage (1 1/2 to 4 years) during which the child develops a greater understanding of the relationships between these objects and actions; 3) the dimensional stage (4 to 10 years), where, at the onset, children begin to represent what they see along certain dimensions (e.g., seriation) and towards the end of this developmental stage are able to consider several dimensions at a time from 2 perspectives; and 4) the vectorial stage (10 to 18 years) during which the ability to reason in abstract form develops. Each stage, in turn, has 3 substages termed *unifocal coordination*, *bifocal coordination* and *elaborated coordination* which consolidates, thereby serving as the basic building block of the next stage of development. These substages can be differentiated by the number of elements an individual can represent and remember, as well as by the means in which organisation of these elements is achieved. (See Figure 2.1). As can be seen, individual progress through each substage of development parallells an increase in processing

capacities, allowing for greater levels of structural integration to occur in a hierarchical fashion. The means by which the individual relates to problem situations can therefore be considered more elaborate and effective since a greater number of variables are acknowledged and accounted for.

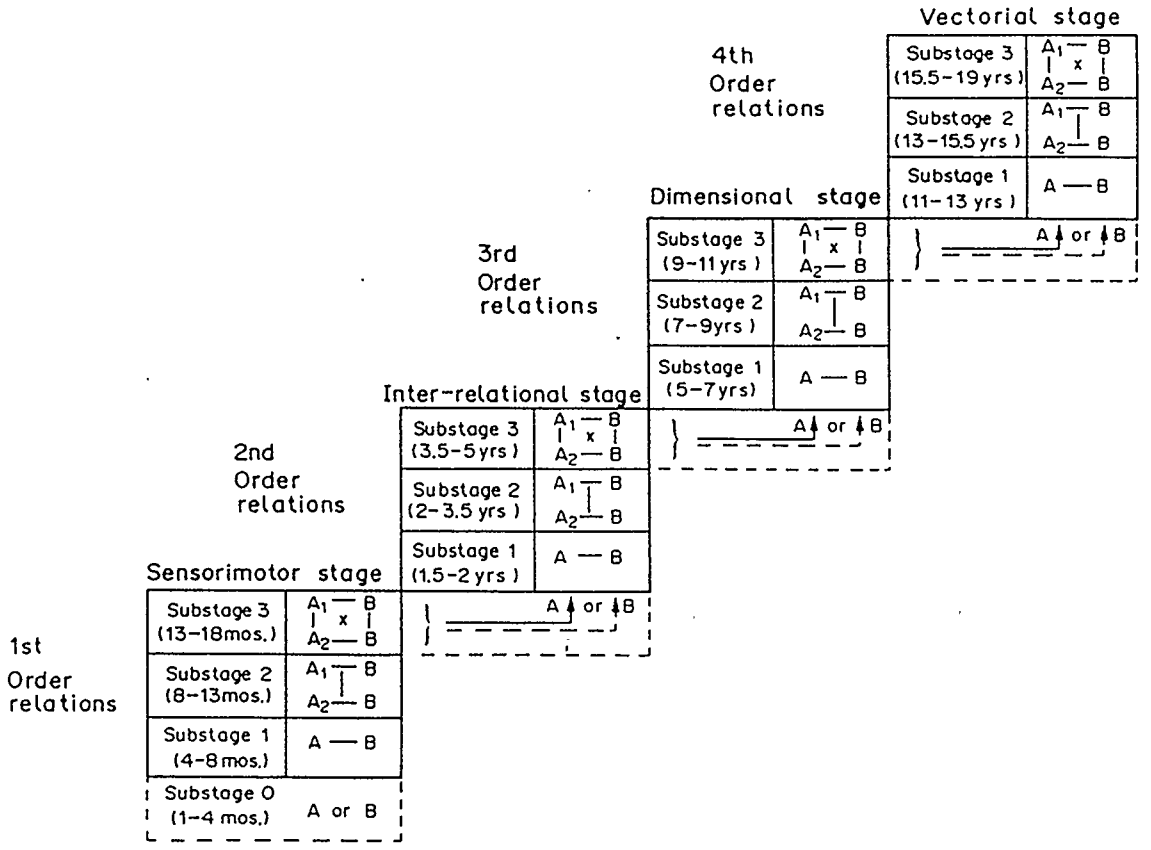


Figure 2.1: A structural outline of the hierarchical integration of the substages and subsequent stages of Case's Neo-Structuralist theory of cognitive development.

An example of this development in quantitative understanding can be found in Marini's (1992) examination of the Balance Beam task from the Neo-Structuralist perspective. Marini asked children to predict the resting position of a bar on a balance beam where the number of weights and the distance from the fulcrum varied. (See Figure 2.2). Results indicated that 4-year-old children

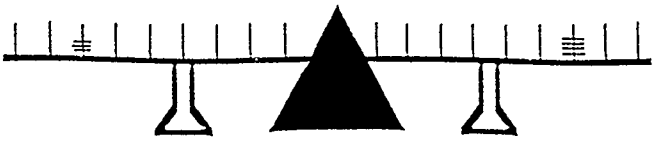
(substage 0) were generally successful only when gross differences existed between the number of weights on each side (e.g., 7 on one side, 1 on the other). When children's performance is analyzed more specifically, we notice that, although 4-year-old children are able to count, they do not use counting as a means to quantify objects. Since children at this substage of development can hold only 1 unit in their short term storage space, 4-year-olds can only compare the 2 relative amounts of weights in a polar fashion or practice their counting string (A or B). Six-year-olds (Substage 1), though, can hold 2 units in their short term storage space and can therefore use their counting abilities in a means-end fashion to compute relative amount (A and B). They were, therefore, often able to determine the difference by counting the weights on each side, (e.g., 6 on one side, 5 on the other). Eight-year-olds (Substage 2) took into account the the distance from the fulcrum as well as the number of weights (e.g., 5 weights at a distance of 5 pegs versus 5 weights at a distance of 6 pegs). Their abilities are somewhat more sophisticated in that they can count and retain identical amounts of weights (A and B1), then redirect their attention to counting the distance of the weights from the fulcrum on each side (A and B2). These three distinct pieces of information can be retained as 3 separate units (i.e., counting weight units, counting distance units, and judging relative amount) in their short term storage space. Ten-year-olds (Substage 3) were generally able to elaborate on this ability (e.g., 5 weights at a distance of 6 pegs versus 3 weights at a distance of 10 pegs). During the final substage, 10-year-old children can hold 4 units in their short term storage space, therefore, they can count 2 different weight quantities (A2) and take each weight quantity's distance from the fulcrum into account (B2), an elaboration of the abilities demonstrated by the 8-year-old children.

Certain cognitive functions can be identified in each substage, as they are

Sample Items

Item 1 (Level 0)

Item 3 (Level 1)



Item 5 (Level 2)

Figure 2.2: Illustrated sample items from Marini's (1992) Balance Beam task for Levels 0, 1, and 2 of substage development.

limiting in nature and must be actively attended to and effectively managed before they can be integrated into the more complex structures of the following substage. They include *short term storage space*, *executive processing space*, and *operating space*. By its very nature, short term storage space limits the complexity of the relationships to be coordinated in the executive control

structures by limiting the number of schemes and the amount of information individuals can retrieve and activate. The size of this short term storage space is 1, 2, 3 and 4 at substage 0, 1, 2, and 3 respectively. The first substage is termed substage 0 because, even though it is a building block produced from the successful integration of cognitive skills from the previous stage of development, it is not a part of this stage's dimensional thinking which occurs when children's ability to quantify objects, while demonstrating an understanding of the meaning of numbers, becomes apparent. An individual's executive processing space reflects the greatest number of independent schemes which can be considered simultaneously while working towards a set goal that requires a final decision making process. Within this cognitive function is operating space which is devoted exclusively to the activation of new schemes applicable to the problem situation (Case, 1985, 1992).

For hierarchical integration of the cognitive structure to occur, the operating efficiency of these cognitive functions must increase. The children's operational efficiency, experience in the problem area, and maturation are all factors which contribute to an increase in the level of functioning and allow the individual to retrieve and evaluate potential schemes for goal attainment with much less effort (i.e., the structure consolidates). Progress to the next substage of development is then possible.

The Central Dimensional Structure

Children's development in a variety of content domains has been found to follow the above pattern. These include (but are not limited to): counting ability, knowledge of money, and time telling ability (Griffin, Case & Sandieson, 1992). In the Number Knowledge task, 4-year-olds were able to judge quantities of objects by comparing relative amounts, whereas 6-year-olds conceptualised

them along one dimension using their counting abilities with numbers 1 to 9 (ones). Eight-year-olds demonstrated bidimensional thought by working with computational problems using numbers up to 99 (tens), and 10-year-olds elaborated upon their bidimensional abilities by increasing their computational abilities into the hundreds. (See Table 2.1 for sample items).

Similar progression was noted in the Money Knowledge task. Four-year-olds tended to conceptualise in polar terms by noting that greater amounts of coins meant more money, regardless of the denomination of coins used

Dimensional Tasks

Age Groups	Number Knowledge	Money Knowledge	Time Telling	Balance Beam
4 years: Conceptualises a problem in polar terms.	A pile of 5 chips has "more" than a pile of 2 chips.	Pile of 8 pennies is worth "more" than a pile of 2 pennies.	One minute is a short time.	A little on this side versus a lot on that side.
6 years: Conceptualises problems along one dimension.	Can determine that the number 8 comes after number 7.	A dime is worth more than a nickel because "that means 10 cents."	Can read o'clock times on the face of a clock.	Can count the weights on each side to determine which side has more.
8 years: Bidimenen-sional thought possible	Addition and subtraction of 2 digit numbers is possible. 54 + 12 = 66.	Can quantify dollars and cents $60 - $45 = $15.	Can integrate hours and minutes to determine shorter time periods.	Counts weights and their distance from the fulcrum to determine the heavier side.
10 years: Elaborated bidimensional abilities	Addition and subtraction of numbers>100. 127 + 235= 362	Can compute the total of several dollars and cents.	Can compare time values: 1hr. +30 minutes is equal to 90 minutes.	Elaborate integra-tion when consi-dering distance from the fulcrum and weights.

Table 2.1: Examples of children's abilities and responses at various levels of development within the Dimensional Stage to 4 dimensional tasks.

(i.e., 5 pennies are worth more than 1 dime). Six-year-olds, on the other hand, demonstrated dimensional thought by indicating that the denomination of money used had meaning (i.e., 1 quarter is worth more than 4 nickels). Bidimensional thought was expressed in 8-year-olds by their ability to quantify both dollars and cents, whereas 10-year-olds elaborated on this skill by computing several dollars and cents (See Table 2.1 for sample items).

In the Time Telling task, 4-year-olds judged time in polar terms as well, whereas 6-year-olds judged time in a dimensional fashion in either hours or minutes. Eight-year-olds could coordinate hours and minutes, a bidimensional thinking ability, and 10-year-olds elaborated upon this ability. Examples of children's responses in these tasks are provided in Table 2.1.

Due to the quantifying nature of these 4 tasks, an understanding of dimensionality was believed necessary to solve all of the problems presented in Table 2.1. Structurally, the processing of information in the executive control structures for each of these tasks was very similar in nature, leading to the development of a more general conceptual structure, namely a central "dimensional" structure for these quantitative tasks. Case (1985) defines this central conceptual structure as a system of nodes and relations critical to intellectual growth since it allows a child to apply a continually expanding knowledge of a concept to a broad number of domains. In Figure 2.3, a graphic representation of the cognitive structure believed to govern 6-year-old children's understanding is presented. At each extreme are synonymous terms related to the "a little versus a lot" differentiation as expressed when dealing with various dimensional tasks such as the Time Telling and Balance Beam tasks. Four-year-old children can generally assess relative amounts in this polar fashion. Six-year-olds, on the other hand, have developed the ability to differentiate this relative difference more specifically by conceptualising a

mental number line and its quantitative features. At the top of this figure is the cultural representation of number in its proper sequence. The second line in this figure represents the quantitative increase of 1 object at each numerical step up or down the number line. At the bottom of this figure is the size of the set of objects relative to this quantitative change. Therefore, in the average 6-year-old mind, the number one represents one tangible object and forms a set of 1. A step up to the next number in the number line is matched to the addition of one more object which increases the set to 2 objects. This structure allows the child to understand the meaning of numbers and the consequence of incrementing or decrementing a number by 1. The central "dimensional" structure, therefore, is responsible for the children's ability to integrate "dimensional" concepts into their problem-solving abilities in related subject domains such as number knowledge, money knowledge, time telling and balance beam.

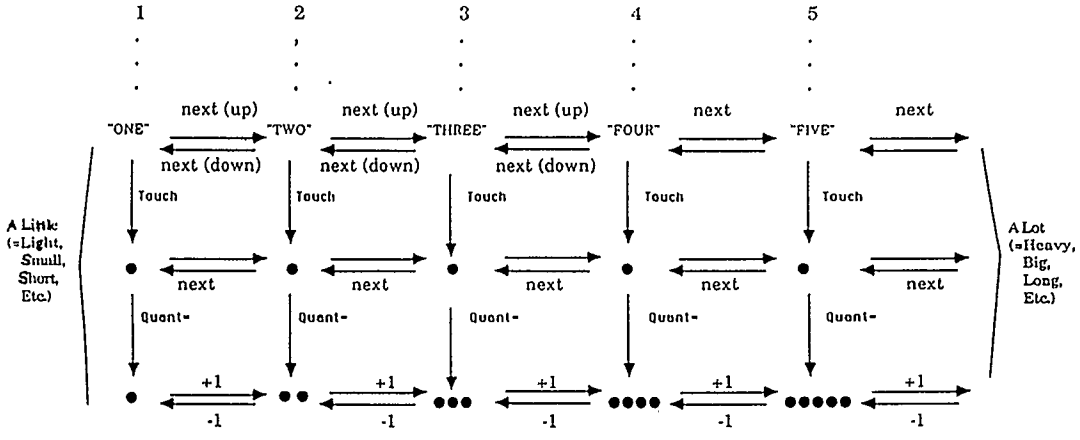


Figure 2.3: Cognitive structure underlying 6-year-old's numerical understanding .

Questions were then raised as to whether training children's abilities to conceptualise numbers in a more meaningful fashion would increase their quantifying skills and positively influence their ability to solve problems in domains requiring quantitative thought. This led to the investigation of the effects of training the central dimensional structure. An instruction programme was developed and utilised in a 2 year study entitled "Rightstart: An Early Intervention Program for Insuring that Children's First Formal Learning of Arithmetic is Grounded in Their Intuitive Knowledge of Number" conducted jointly in California and Massachusetts (Case & Griffin, 1990a). This study was based on the assumption that children who were at-risk for early school failure in arithmetic would not have developed the central dimensional structure to the extent that their peers had. They hypothesised that by providing these children with the experience which would foster the development of the structure and thus provide a conceptual understanding of number, their ability in arithmetic in grade one would improve.

The 5-year-old children in the California study were presented with 6 quantitative tasks. These tasks included: 1) the Number Knowledge task which assessed the children's conceptual understanding of the use and meaning of numbers; 2) the Balance Beam tasks in which the children were presented with a conventional balance beam with interchangeable weights on each side and asked which side they thought would go down when the number of weights and the distance from the fulcrum varied; 3) the Birthday Party task in which the children were asked to assess which of 2 children would be happier about the number of marbles they received at a birthday party while considering the number of marbles each child desired; 4) the Distributive Justice task in which the children were asked to judge the extent of reward 2 children should receive from the teacher based on the number of days they worked and the number of

cards produced for some sick children; 5) the Money Knowledge task which assessed the children's conceptual understanding of money, specifically coins and paper money; and 6) the Time Knowledge task which assessed the children's conceptual understanding of time telling and time discrimination. Those children whose responses to the Number Knowledge task demonstrated difficulty in understanding the concept of numbers were included in the instruction group. After 40 sessions of instruction, these children were post-tested. Results indicated that, in contrast to their high SES (socioeconomic status) peers, many low SES children at-risk for future math failure had yet to consolidate a conceptual understanding of numbers, but with an instruction programme geared toward this construction, could be helped to do so. When the children had acquired a conceptual understanding of numbers, this new knowledge was generalised to other quantitative tasks. This transfer of knowledge was noted to occur in related dimensional domains requiring quantitative thought, though not to other non-quantitative tasks.

This investigation was repeated in Massachusetts with a greater population sample, but using only the quantitative measures. Once again, many low SES students were found to be at-risk for future math failure despite several months of exposure to numbers by a kindergarten teacher. The children who participated in the instruction programme were given 40 instruction sessions and were found to have increased their conceptual understanding of numbers and transferred this understanding to the other 5 quantitative tasks. The training of the central dimensional structure for a greater understanding of the concept of number appeared to play a pivotal role in helping children at-risk for academic failure to conceptualise and perform in other subject areas requiring quantitative analysis.

The Central Intentional Structure

The central dimensional structure is not the only central conceptual structure hypothesised to influence the way in which information is assimilated and considered within a child's mind. Other non-quantitative domains needed to be taken into account to support this theoretical perspective on development. Therefore, social domains requiring interpersonal interaction were also investigated from a Neo-Structuralist perspective by Case and his colleagues (1992). They have suggested that in order to understand interpersonal interaction, a child needs to conceptualise the intentions of a person's actions; more specifically, the motives governing human action need to be understood as stemming from someone's desire for a specific outcome. This understanding of human action as driven by internal mental states such as drives or wants, feelings or plans encompasses for Case the concept of intentional action (Case, 1992). The central conceptual structure believed to guide the development of this ability to conceptualise the social interaction is the central "intentional" structure. In Figure 2.4, the hypothesised central intentional structure is represented as it governs a causal relationship between the external world of action and the internal world of mental states when a 6-year-old successfully resolves a problem situation. As Figure 2.4 shows, an intentional action, occurring in the external world, provokes an internal response. If the external state is negative, it is experienced as ego distonic internally (State A), depicted as  . A new internal state (B), a plan (depicted as ), leads to an attempt to change the situation in the external world. An outcome, typically positive, yields a final internal state (C), depicted as  .

Several tasks developed and analysed according to the Neo-Structuralist perspective were considered as reflective of intentional action. An example supporting this perspective can be found in the work of McKeough (1992). She

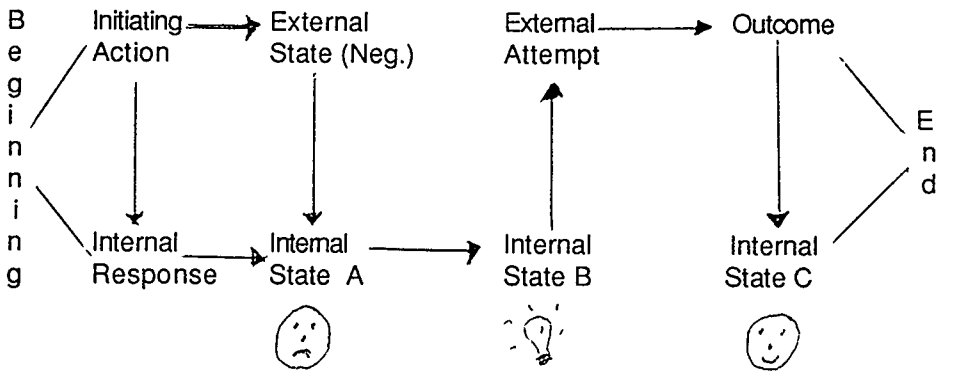


Figure 2.4: Central Intentional Structure: hypothesised to underlie success on a task involving analysis of the role of an actor's feelings, desires and/or intentions, in determining his response to a problem situation.

presented middle class children aged 4, 6, 8 and 10 years with a task that required children to tell a story about a child who had a problem they wanted to solve. McKeough found that children's story-telling abilities improved from stories that contained a script (4-year-olds) to a plot that contained a problem and a resolution (6-year-olds). Older children elaborated the problem solving portion of the story by integrating failed attempts (8-year-olds) or further integrating complicating events and interventions (10-year-olds).

The 4-year-old scripts were action-based (e.g., "Once I'm playing with my daddy with --- with a ball and it go in the street.) whereas the 6-year-olds made reference to desires and feelings in their problem - resolution stories (e.g., "There once was a girl that didn't know how to read. She went to school and she asked her teacher, 'May I try to read?' And the teacher gave her an easy to read book. And then she started to try and read it and then she could read the whole book.") Eight- and 10-year-olds elaborated on the 6-year-old story structure by adding complicating events and interventions.

When examining the children's responses to this task, a general structural form in children's thoughts at different ages appeared. At 4 years of age,

children based their responses in action events or sequences, yet by the age of 6 years, children were referring to mental states. The conceptual structure proposed to underlie the generation of a typical 6-year-old story such as the story example above is presented in Figure 2.5. In the example story, we see the initiating event of a child unable to read. The narrator refers to the mental state of knowing, or more specifically, not knowing how to read, a situation promoting a sad mental state (sad face). The child responds to this mental state by thinking of an idea to remedy the problem (light bulb). Here the narrator talks of asking the teacher for an easy to read book. The outcome is the achievement of learning to read (happy face). The initiating scenario and subsequent denouement of the story reflects intentional action on the part of the main character in that an initial mental state derives a responding action to change the mental state to resolve the problem within the story. This feature of intentionality differentiates the 6-year-old story from a 4-year-old story of sequential events.

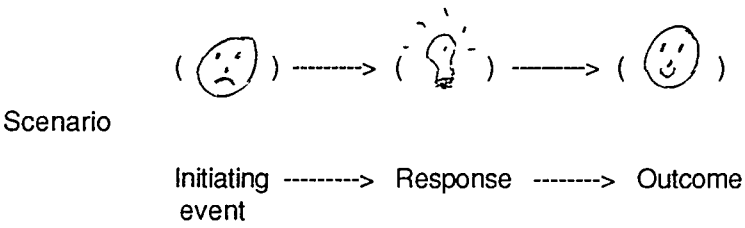


Figure 2.5: The conceptual structure hypothesised to underlie the generation of a 6-year-old prototypic story.

A similar difference has been reflected in the work on story telling conducted by Bruner (1986). He discussed how imbuing experience with meaning is imperative in story telling. In his work, he differentiated between the "landscape of action", an external world of physical states and action, and the "landscape of consciousness", an internal world of feelings and mental states.

This distinction appears to reflect the difference between 4- and 6-year-old children's response to the task where, in general, only children aged 6 years demonstrated an understanding of behaviour as driven by internal mental states.

Three other tasks developed and analysed according to the Neo-Structural perspective were also considered to be reflective of intentional action. As with the dimensional tasks, an increase in short term storage space was found to parallel an increase in the children's ability to solve problems in the following tasks (herein referred to as intentional tasks): definition of feeling terms, understanding a mother's motives, and empathic abilities. The Definition of Feelings task (Griffin, 1992) asked children aged 4, 6, and 8 years to define feeling terms such as happy and sad to determine the children's understanding of the genesis of these emotions. In general, 4-year-old children referred to an action event as the source of the feelings (e.g., "Happy means having a puppy") whereas 6-year-olds made additional reference to mental states or social judgment (e.g., "Sad means you were being bad and your mommy spanked you"), and 8-year- olds tended to include an action event and two distinct internal responses, (e.g., "'Being good' means I'm doing what I'm supposed to do, like helping my Mom, and I'm not fighting or anything I'm not supposed to do").

The Mother's Motives task (Goldberg-Reitman,1992) involved presenting the children with a comic strip depiction of situations in which a mother would be required to provide care and protection for her child. The purpose of this task was to assess the children's understanding of the mother's motives in these situations. Generally, 4-year-olds limited their responses to simple one-step actions which referred to the story based event (e.g., "Because the house is on fire"); 6-year-olds made reference to the mother's wants/not want or

likes/dislikes (e.g., "Because the Mommy doesn't want the girl to get burnded"); and 10-year-olds tended to refer to a more abstract notion of the role of the mother (e.g., "Because she cares about her and does not want her to get hurt").

The Empathic Cognition task (Bruchkowsky, 1992), involved assessing 4-, 6- and 10-year-old children's abilities to deduce the feelings experienced by a young girl in both a happy and sad situation as presented through the medium of video clips. (e.g., a child and friend playing with the child's dog in the park and the dog subsequently being hit by a car). Four-year- olds referred to the action sequence of the story in explaining the source of the feelings (e.g., "Because her dog died"), whereas 6-year-olds referred to feeling states (e.g., "Because her dog died and she will miss him"). Ten year olds tended to focus on two or more mental states to explain the girl's feelings, thus elaborating on the 6-year-old responses (e.g., "Because her dog died, and she really loved him, and still really misses him 'cause he was her best friend").

Across all four studies, a consistent pattern was noted in children's responses. Between the ages of 4 and 6 years, the children moved from providing responses based on action events or sequences (landscape of action) to providing responses based on mental states and social judgments (landscape of consciousness). Considering the possibility that a central intentional structure was at the base of this conceptual shift, Case and McKeough (1990) investigated the possibility that increasing children's level of narrative competence by one substage would transfer to their ability to conceptualise intentionality in the related domains (i.e. the meaning of feelings, their understanding of their mother's role, and their empathic responses to peers). Using comic strip depictions of 4-year-old children's narratives combined with careful instruction and a mnemonic to represent the protagonist's internal mental state, McKeough attempted to bridge the gap

between the "landscape of action" to the "landscape of consciousness" for these 4-year-old children.

It was anticipated that the 4-year-old children who could compose narratives at the 6-year-old level once the intervention was complete would also be able to complete the other tasks at a 6-year-old level, referring to the "landscape of consciousness" versus the "landscape of action" in their responses to the intentional tasks. Compared to the control group, the experimental group composed of 4-year-old middle-class children were able to produce narratives at a level generally found in 6-year-olds and also demonstrated transfer to the other intentional tasks.

This study was repeated in California (Case & Griffin, 1990b) using 5- and 6-year-old academically at-risk children of a low socioeconomic status. One group was composed of 9 Hispanic children and the other consisted of 10 children of mixed racial origins. Using the same procedure as in the previously mentioned study, the instruction failed to produce the sought after transfer. Although the children who had previously produced narratives at a 4-year-old level were able to produce narratives at a 6-year-old level (and in some cases 8-year-old level), transfer occurred in only one of the three tasks, the one devised to measure children's understanding of feeling terms. The question of how to account for this failure to transfer arises. Other than a change in the location of the study, the differences between the successful and unsuccessful transfer instruction groups included socioeconomic level, ethnic origin and academic performance; that is, the children were considered to be academically at-risk.

One way to attempt to answer this question is to examine the work related to how children come to understand mental states and human intention. If children cannot adequately conceptualise the "how" and "why" of human

interaction, it may be that they are unable to understand that an event may be represented in a variety of ways by different people. A greater understanding of what these representational abilities entail can be found in the current research of "children's theory of mind".

Children's Theory of Mind

This theory is based on the premise that even young children are becoming aware of the distinction between the world and of mental representations of the world, allowing them to see themselves and others as beings who hold mental states such as thinking, believing, doubting and pretending. This development transcends the simple addition of knowledge to the child's repertoire. It reflects a change or development in the child's understanding of this knowledge and is believed to influence children's performance in a wide range of tasks.

Among the first proponents of the "theory of mind" approach of understanding children's increasing abilities to conceptualise the functioning of the human mind is Flavell. Flavell originally described 3-year-old children's abilities as limited to their understanding that another person may or may not be in a position to see or hear something (Flavell, Everett, Croft & Flavell, 1981). Children at this level have also demonstrated an ability to perceive projective size changes in an object in a global fashion such as bigger or smaller, but cannot understand the relationship between distance and the projective size of an object even though the perceptual information necessary for this understanding was readily available (Pillow & Flavell, 1986). Flavell (1988) has explained that these children realise that they are "cognitively connected" to things in the external world in a variety of fashions. They understand that by seeing, hearing, touching or feeling something they can become cognitively connected to it at a given point in time.

By 4 1/2 years of age, children are considered more advanced developmentally in that they are able to go one step further and understand that circumstances and perspectives can affect an object's appearance. They have, for example, the ability to judge the effect of distance on the visual perceptibility of an object (Flavell, Flavell, Green & Wilcox, 1980), to understand the relationship between an object's projected size and its relationship to distance, and to understand the relationship between an observer's line of vision and an object's projective size (Pillow & Flavell, 1986). These findings supported the notion that at Level 1, children notice changes in the appearance of an object but do not have an understanding of systematic relationships concerning these objects until the age of 4, when the Level 2 knowledge develops. For example, Flavell and his colleagues (1981) presented children with a task developed by Masangkay et. al. (1974) in which a picture of a turtle was placed horizontally on a table between the experimenter and the child so that it appeared upside down to one of them and right side up to the other. The child was then asked to indicate which orientation the experimenter perceived. Three-year-old children were found to perform quite poorly on this task, a Level 1 performance only, whereas 4-year-old children's performance was nearly perfect, indicating Level 2 capabilities.

Further examination into the possible implications of these Level 1 - Level 2 distinctions led Flavell and his colleagues to investigate its potential role in explaining other interesting shifts in children's abilities which occur at or about 4 years of age. One such research topic was the appearance - reality distinction.

Flavell, Flavell and Green (1983) hypothesised that an individual's understanding of someone's perceptual experience of appearance was influenced by that individual's knowledge of visual perception. Therefore, they

investigated the abilities of children aged 3 to 5 years of age to distinguish between what an object appears to be and what it is in reality. This was done by examining children's perceptions of an object's physical properties, its identity, its presence versus its absence, and its actions. Using a rock painted to look like an egg, an imitation pencil made of rubber, a Charlie Brown puppet covered with a white cloth to give it a ghost-like appearance and a white index card placed under a pink piece of transparent plastic, the children were queried as to what the objects looked like and what it was "really, really". Half of the children were exposed to its appearance form first, the other half to its reality form first.

Results indicated that 4-year-old children were more successful at differentiating between the appearance and the reality of the objects than the 3-year-olds who experienced very little success. The 5-year-old children, on the other hand, barely made any mistakes at all in their distinctions. Of the young children who erred, they erred by mistaking both appearance for reality and reality for appearance. Task experience was found to have no significant effect on task performance with new objects.

Flavell (1988) asserted that children experiencing difficulty with this task could not cope with "mutually contradictory" mental representations. They could not understand the difference in context between two representations, that is, a "context" and a representation of it. Flavell suggested that Level 1 thinking cannot appreciate that one object can be both a "real" object and an "apparent" object; whereas Level 2 thinkers can understand that the object has a "perceptual face" but can be a "representation" of another object as well. This conceptually parallells Flavell's initial definition of Level 1 and Level 2 distinction of visual perception. The major similarities between the visual perception tasks and the appearance - reality distinction tasks appears to be in

the question of how the children are representing the task situations, and the maturational limitations involved.

Perner (1991) developed this notion further by identifying a developmental sequence of how children come to think about the mind as representational. He hypothesised that at about 1 year of age, children have a single updating model of representation, which allows them to deal with real situations only. Perner terms this the *primary* level of representation. For example, when a child sees his reflection in the mirror, he does not understand that what he sees is his reflection. To recognise his reflection, the child would need to be able to hold at least two models at once -- one model to represent himself, and one model to represent his reflection. This ability to work with multiple models is believed to emerge during the second year of life and is termed the *secondary* level of representation. At this level, the child can distinguish himself from the reflection in the mirror and can enjoy "pretending" since he can understand that a pretend situation is different and distinct from a real one. This ability, however, is situation based, meaning the child can perceive key characteristics of a situation. This does not necessarily mean that the child has been able to conceptualise that she was the result of a representation. For instance, a child can recognise that a drawing of a horse represents a drawing of a horse (likely a real live horse from somewhere), but not necessarily representing someone's specific understanding (representation) of a horse.

By 4 years of age, another shift is hypothesised to occur where children begin to understand that mental states can represent what someone is thinking about. Children, at this point, will not only have the ability to represent multiple models, but also begin to grasp the concept that psychological states are dependent on other mental states and their representational underpinnings, producing a greater understanding of how mental states govern behaviour.

Children's varied uses of the word "think" within different contexts have offered researchers the means to investigate the mental states which account for misrepresentations such as "believing" and "assuming", and for intentional manipulation of these states for the purpose of deceiving and lying. Observational studies examining 2- and 3-year-olds' uses of the verb "to think" have found that its use has been mainly as an expression of uncertainty. Not until they are older do children seem to refer to the term "thinking" as a misconception about reality (e.g., I thought it was real). To use the verb "to think" in a way which would report a misconception of reality, the ability to metarepresent would need to be present. The same can be said with terms such as "dream" and "imagine". This is possible for many 4-year-olds, for they not only have models of reality, but also have models of hypothetical situations. They can understand metarepresentations, that is, a representation of a representation as a representation. They can distinguish between what is represented and as what it is represented. For example, children can now begin to understand that each person may have a different interpretation of an event and what it represents. In essence, the child can begin to represent that a representation has an interpretation, and that alternate interpretations are possible.

The ability to metarepresent is believed necessary for children to understand situations where misrepresentation has occurred "because the child has to mentally represent that, say, a false statement about reality has an interpretation (described situation) that is at odds with reality (its referent situation)" (Perner, 1991, p. 90). Wimmer and Perner (1983) investigated this hypothesis by looking at children's difficulty in remembering their own mistakes in a situation where the mistake was incurred out of ignorance. Their rationale for this study is based on the logic that young children should be incompetent

at reconstructing a mistaken claim about a real situation if they have no understanding that a statement can misrepresent reality. This takes the Flavell, Flavell & Green (1983) appearance - reality distinction study one step further and investigates young children's understanding of their false belief in that particular type of situation.

In their study, children aged 3 and 4 years were presented with a box of chocolates and were then questioned as to its contents by a curious puppet. All the children replied that it contained chocolates. When the box was opened, they were surprised to find a toy car instead of chocolates in the box. The children were then queried as to what they had originally told the puppet the contents of the box were. Results indicated that very few of the 3-year-old children were able to say that they had originally said the box contained chocolates, whereas most of the 4-year-olds answered the question correctly. These results remained constant even when experimental conditions were altered to take into account a lack of memory maturation on the part of most 3-year-old children and were consistent with Perner's position that metarepresentational abilities develop during the fourth year of life. Had the 3-year-old children succeeded in this task, it would have indicated a metarepresentational capacity to separate <u>what</u> they described, the referent, from what they described it <u>as being</u>, that is, its sense. In order to recognise that their original statement was believed to be true at the time, and then to be able to realise that their original belief was false, metarepresentational abilities are needed since they must understand that they misdescribed the reality from what it truly was. Only at this point could children have demonstrated an understanding of misrepresentation for what, in essence, it is.

This representational deficit which prevents 3-year-olds from understanding a misrepresentation also extends to situations where

attributions of false beliefs to others is called for. For example, in a study conducted by Perner, Leekam, and Wimmer (1987), children aged 3 to 9 years were subjected to a false belief task presented as a story acted out with dolls and toys. In the story, a child places some chocolate in a cupboard then leaves to play. During the child's absence, the chocolate is inadvertently relocated to another cupboard. The subjects of the study were then asked where the child would look for the chocolate when he returns. As expected, 3-year-olds were unsuccessful in attributing a false belief to the protagonist in the story. This ability began to emerge in the 4-year-old age group, with greater percentages of success in this task parallelling age development. The researchers concluded that the 3-year-old children were not able to entertain alternate representations of the world simultaneously; that is, they were not able to represent the true-to-life conditions of the location of the chocolate while holding a representation of the child's false belief of the chocolate's location.

Subsequent studies were conducted to further support the representational deficit theory used to account for these findings (Perner, Leekam, & Wimmer, 1987; Perner & Wimmer, 1985). When experimental conditions were controlled for 1) memory considerations, 2) implicit expectations of common-sense assumptions, and 3) potential misinterpretation of the test question, results remained consistent with the previous findings.

Astington and Gopnik (1989, 1991) examined these studies and proposed that the metacognitive abilities which allow children to distinguish between appearance and reality, and to understand false belief at about the same point in development may be based in the development of children's ability to understand representational change; that is, it may be more accurate to not only consider how these children are representing their world, but to also consider how they are dealing with the changes in their representations. For

example, at 3 years of age, children are considered to have beliefs about what they see, based on their representations of the world. As these representations change, so do their beliefs. Yet children aged 3 years do not appear to realise that their beliefs have changed, suggesting that they have no understanding of representational change. This difficulty also seems linked to their ability to attribute false beliefs to others (Perner & Wimmer, 1985) or to recognise the appearance - reality distinction (Flavell, Flavell & Green, 1983). With respect to representational change, these three abilities could be expressed as " 'I used to think X but now I know Y'; similarly false belief could be expressed 'He thinks X but I know Y'; and the appearance-reality distinction could be expressed 'It looks like X but really it's Y' " (Astington & Gopnik, 1989 p. 193).

To further investigate the development in children's understanding of representational change, Astington and Gopnik (1989) examined children's abilities to distinguish appearance from reality, to recognise their false belief and to attribute a false belief to another. The researchers began by presenting a control test to ensure that the children who failed the test did so due to an inability to recall their earlier mistaken belief. When this task was completed, the selected children, aged 3, and 5 years of age, were also presented with a Smarties box. They originally thought it contained Smarties but were shown that it held pencils. The children were then asked the following questions: "When you first saw the box, before we opened it, what did you think was inside it?", followed by a forced choice "Did you think there were pencils or did you think there were Smarties inside it?" The children were then asked, "X (name of a child) hasn't seen inside this box. When X comes in and sees it, when X sees the box, what will he think is inside it?" A similar procedure was conducted using a sponge which looked like a rock (Flavell et. al., 1983) to examine the appearance - reality distinction.

Results indicated significant age effect on all three types of questions which concerned the subject's own belief, the belief of others and the appearance - reality distinction. Data concerning the subject's own belief indicated that in general 3-year-olds believed that their initial belief about an object was what it was eventually shown to be, whereas 5-year-olds were able to report their original wrong impressions. This indicated that a development in the understanding of representational change was occurring between the ages of 3 and 5 years. The same age effects were also found in the false belief and appearance - reality tasks, supporting the findings from these tasks in the experiments conducted by Perner et. al. (1987) and Flavell et. al. (1983).

Unlike the results in Perner, Leekam and Wimmer's (1987) study, Astington and Gopnik study found that attributing a false belief to another (recognising that someone else's belief may be different from our own) was less difficult a task than understanding a change in one's own belief. More children correctly answered the question concerning the other child's potential belief than there were who correctly answered the question about their own previous belief.

Representation and Intentionality

Research in the development of the child's theory of mind has indicated that critical developmental milestones in the area of representational abilities occur in children between the ages of 3 and 6 years. During this time, children generally acquire a firm grasp on their representational abilities. They begin forming beliefs by representing what they see, and develop the ability to understand that their beliefs can change due to the fact that their representations have changed. These changing representations can be due to several factors, but the critical element is that representational change can be recognised.

Representational and metarepresentational abilities are critical in allowing children to make sense of the world around them. They affect their understanding of physical objects, but also of human behaviour. Although a child needs to be able to make sense of an event, an occurrence, the child also needs to acknowledge that other players in the event itself are representing the event in their own way. Only a child who has developed an understanding of external influences on representations, and of the possibility of representational change, can adequately interpret people's understanding of events. This interpretation must therefore include representations of human mental states, which will require a representation of the behaviour and of the genesis of the behaviour, namely intentional thought. Therefore, the ability to understand the effects of various influences on representations is necessary to interpret human action. The ability to understand that people take a metaposition to these representations is necessary to interpret intentional action.

The ability to represent one's world influences one's interpretation of that world in many general ways. This knowledge is central to the development of perspective taking abilities and an understanding of social interaction. It's importance is therefore great. The implications of these representational abilities are far-reaching, particularly since they are central to the overall ability to conceptualise human interaction and its underlying intentional states.

Purpose of the Study

The overall purpose of the present study was to investigate how young children who are experiencing academic difficulty can be helped to develop an understanding of intentionality. Specifically, the goal was to train the intentional knowledge in one content domain (i.e., training task) and to test for transfer in

conceptually related domains. Children identified as at-risk for academic failure were placed into either a control group or a treatment group. The treatment group (Intentional Group) received the instruction programme geared towards the central intentional structure, whereas the control group (Dimensional Group) received a previously established instruction programme geared toward the central dimensional structure. All children were pre- and post-tested using tasks measuring their abilities in both quantitative and social domains. The rationale for this experimental design was to create a situation where development in two of the children's central conceptual structures could be determined, then to train one of the structures for a developmental shift to the next level of development, and finally post-test the children again in the two conceptual domains. Once this was completed, a comparison of the pre- and post-test scores would permit an examination of the developmental shift and the extent of knowledge transfer, and further establish the domain constraints of the central conceptual structures examined.

Hypotheses

Hypothesis 1a) It was hypothesised that there would be a significant difference between the pre- and post-test scores on the Number Knowledge task (i.e., training task) for the children in the Dimensional Group who received the instruction programme aimed at the central dimensional structures. No such difference was predicted for the group of children who received the intentional training.

Hypothesis 1b) It was hypothesised that there would be a significant difference between the pre- and post-test scores on the transfer tasks; that is, the Money Knowledge task, the Time Telling task, and the Balance Beam task for the children in the Dimensional Group who received the instruction programme

aimed at the central dimensional structures. No such difference was predicted for the group of children who received the intentional training.

Hypothesis 2a) It was hypothesised that there would be a significant difference between the pre- and post-test scores on the Story Telling task (i.e., training task) for the children in the Intentional Group who received the instruction programme aimed at the central intentional structures. No such difference was predicted for the group of children who received the dimensional training.

Hypothesis 2b) It was hypothesised that there would be a significant difference between the pre- and post-test scores on the transfer tasks; that is, the Definition of Feelings task, the Mother's Motives task, and the Empathy Cognition task for the children in the Intentional Group who received the instruction programme aimed at the central intentional structures. No such difference was predicted for the group of children who received the dimensional training.

CHAPTER III

METHODOLOGY

The present study investigated the training and transfer effects of two types of instruction programmes, namely, dimensional (or "number line") instruction and intentional (or "story line") instruction. Instruction procedures served as controls for each other.

Subjects

Initially, 17 male and 12 female children aged 4 1/2 to 5 1/2 years of age were recruited from 5 schools in a large urban centre in Western Canada. These schools were located in low income areas and were identified by District administrators as "high needs" (i.e., students in these schools experience greater than average academic and social difficulties, a greater than average percentage of families are headed by single female parents, and there is a higher than average incidence of mid-year school transfer). The children were enrolled in Early Childhood Services classes in the 5 schools. A 4 step selection procedure was used. First, the instruction programmes were briefly outlined to the teachers who were then asked to nominate children considered to be at-risk for academic failure in either number knowledge (dimensional instruction) or narrative knowledge (intentional instruction). English as a Second Language students and children with mental handicaps were excluded. Second, a Parental Consent Form (Appendix A) was sent to the parents of the children nominated. Of the 63 parents to whom the consent form was sent, 52 forms were returned, an 82.5 % return rate. Third, the children whose parents or guardians signed the Parental Consent Form were seen individually and were given the Information and Arithmetic subtests of the

Wechsler Preschool and Primary Scale of Intelligence - Revised (1989). The children who did not achieve a mean scaled score between 4 and 8.5 were subsequently screened out. The children's mean scaled scores on the Information subtest of the Wechsler Preschool and Primary Scale of Intelligence - Revised was 7.33, whereas the mean scaled score on the Arithmetic subtest was 7.03. Technically, these scores place the sample in the upper limits of what has traditionally been termed the "educable mentally handicapped" range of ability. However, given that teachers were asked to eliminate students with mental handicaps, it is presumed that this score is more indicative of environmental and social factors associated with low performance than with organically-based handicaps.

The fourth step in the subject selection procedure consisted of presenting individual children with a series of 8 tasks, 4 "dimensional" tasks and 4 "intentional" tasks. These tasks are described in detail in the immediately following section. This final procedure consisted of two sub-procedures: a) those used in selecting the dimensional instruction group and b) those used in selecting the intentional instruction group.

a) dimensional instruction group: The children who achieved at a 6-year-old level in more than 2 dimensional tasks were screened out of the dimensional instruction group. The remaining children were then presented with the intentional tasks.

b) intentional instruction group: The children who achieved at a 6-year-old level in more than 2 intentional tasks were screened out of the intentional instruction group. The remaining children were then presented with the dimensional tasks.

Briefly, the total sample consisted of 29 children who were a) identified by their teacher as academically at-risk in the domain of instruction, b) given

parental permission, c) functioning in the low avarage range of ability, and d) functioning below an age-appropriate level according to the developmental norms established for the dimensional and intentional tasks. Due to the above selection criteria and to the constraints of the existing school programme, random assignment to instruction groups was not possible.

A total of 16 children were assigned to the dimensional instruction group. The mean age of the children participating in this instruction programme was 5.49 years. The size of the group was dictated by the number of children per school who were participating in the study. The group size ranged from 3 to 5 children per group. Three more children were subsequently removed from the study for 3 separate reasons: due to severe behaviour problems, family moving away, and to the programme interfering with an intervention programme designed by the school psychologist working with the child in question. Thirteen children completed this phase of the study.

A total of 13 children were assigned to the intentional instruction group. The mean age of the children participating in the instruction programme was 5.21 years. Again, the size of the group was dictated by the number of children per school who were participating in the study. The group size ranged from 2 to 4 children per group. Two more children were subsequently removed from the study, one due to severe behaviour problems and the other due to the family moving away. Eleven children completed this phase of the study.

Assessment Instruments

Wechsler Primary Preschool Scale of Intelligence - Revised

To further support teacher nomination of at-risk children, the Information and Arithmetic subtests of the Wechsler Preschool and Primary Scale of Intelligence - Revised (WPPSI-R) were administered. These subtest were considered to be general measures of children's arithmetic and language

abilities, as well as offering a standardised measure of general intellectual abilities.

Dimensional Tasks

Four tasks measuring children's logico-mathematical abilities were used. For each of these tasks, 4 separate developmental levels were established in a hierarchical fashion according to Case's Neo-Structuralist theory of cognitive development. Distinction between these levels of performance is grounded in the level of sophistication used to conceptualise the task demands. A 4-year-old level of performance would therefore be conceptually less advanced than the 6-year-old level, which in turn would be conceptually less advanced than the 8-year-old level. The 10-year-old level of performance would be the most advanced conceptually within this stage of development. The 4 tasks were as follows:

1) Number Knowledge Task (Griffin, Case, & Sandieson, 1992): This task investigated children's counting ability. Items at the 4-year-old level evaluated children's perceptual configurations such as "a lot" or "a little", whereas items at the 6-year-old level measured the ability to seriate numbers, that is, the realisation that higher numbers have a higher value (e.g., 9 was greater than 7). Items at the 8-year-old level measured the ability to seriate numbers along two dimensions, which involved a shifting of focus from one dimension to the other. Addition and subtraction of two digit numbers are thus possible (e.g., 54 + 12=66). Items at the 10-year-old level measured the coordination of these abilities in a more integrated fashion, allowing for addition and subtraction with numbers greater than 100 (e.g., 127+235=362). (See Appendix B1 for test questions and scoring criteria.)

2) Money Knowledge Task (Griffin, Case, & Sandieson, 1992): This task

investigated children's understanding of money. Items at the 4-year-old level examined children's tendency to conceptualise coins by choosing coins larger in area as being worth more (e.g., a nickel is worth more than a dime), while items at the 6-year-old level examined 6-year-olds' ability to pay greater attention to the face value of money (e.g., a dime is worth more than a nickel since 10 is worth more than 5). Items at the 8-year-old level examined children's ability to quantify both dollars and cents (e.g., $1 and 10 cents plus $1 and 10 cents equals $2 and 20 cents.), and the 10-year-old level items examined their ability to compute the total of several dollars and cents, even when expressed in an integrated fashion (i.e., $9.34). Developmental similarities in the children's responses in these two tasks are evident. As they progress through the substages, the children move from global or polar thought (e.g., a little or a lot), to unidimensional thought (e.g., counting along a single number line), to bidimensional thought (e.g.,seriating along two number lines), to elaborated bidimensional (e.g., integrated use of two number lines). (See Appendix B2 for test questions and scoring criteria.)

3) Time Telling Task (Griffin, Case & Sandieson 1992): This task examined children's time telling abilities. Items at the 4-year-old level examined children's ability to read patterns on the face of the clock and judge events according to an amount of time (e.g. a long time versus a short time). Items at the 6-year-old level assessed their ability to read "o'clock" times and determine which was earlier or later (e.g., 3 o'clock was earlier than 4 o'clock), whereas 8-year-old level items examined their ability to integrate hours and minutes (e.g. One hour and 50 minutes is a shorter time period than 2 hours and 1 minute). Ten-year-old level items required a general ability to read analogue clock times by computing the 3 variable of "hours", "minutes by five" and "minutes by one" and compare time values (e.g., 1 hour and 30 minutes is the same as 90

minutes). Once again developmental trends in the children's responses are evident. As they progress through the substages, the children move from global or polar thought at 4 years of age, to unidimensional thought at 6 years, to bidimensional thought at 8 years,. and finally to elaborated bidimensional thought at 10 years of age. (See Appendix B3 for test questions and scoring criteria.)

4) Balance Beam Task (Marini,1992): This task asked children to predict the resting position of a bar on a balance beam where the number of weights and the distance from the fulcrum were varied. As described in the literature review, developmental levels are evident in the children's response and follow the same conceptual progression as in the 3 previously mentioned tasks. (See Appendix B4 for test questions and scoring criteria.)

Intentional Tasks

Four tasks measuring children's social understanding were used. As in the dimensional tasks, 4 separate developmental levels, established in a hierarchical fashion, can account for children's performance. These tasks were devised according to Case's Neo-Structuralist theory of cognitive development. Distinction between these levels of performance is grounded in the level of sophistication used to conceptualise the task demands. The intentional tasks were as follows:

1) Storytelling Task (McKeough, 1992): This task requested 2 stories from the children. The children were initially asked to tell a story about a happy child and a kind old horse. The second requested story was about a child who had a problem she/he wanted to solve. This task was described in greater detail in the literature review. Briefly, however, a developmental progression is noted in the stories children produce in response to this task. Four-year-old children

produced action based scripts, whereas 6-year-olds presented a script which had a problem-resolution format in which intentional thought was acknowledged by referring to the characters' mental states. These mental states underlay the characters' actions. This intentional format was elaborated upon by 8- and 10-year old children, initially by incorporating a series of complicating events or unsuccessful attempts at resolving the story problem, then later by further integrating these into a more elaborate story line. (See Appendix C1 for test questions and scoring criteria.)

2) Definition of Feelings Task (Griffin, 1992): This task asked children aged 4, 6 and 8 years of age to explicitly define the feeling words of "happy", "sad", "good" and "bad". It further inquired as to what was happening when these feelings occurred and where these feelings came from. In general, 4-year-old children referred to an action event as the source of the feelings (e.g., "Happy means a birthday party") , whereas 6-year-olds made additional reference to mental states or social judgment ("'Being bad' means you just do something wrong, that's all. Like being mean to your little sister"). This shift marked the construction of intentional thought. Eight-year-olds tended to include an action event and two distinct internal responses, (e.g., "'Being good' means I'm doing what I'm supposed to do, like helping my Mom, and I'm not fighting or anything I'm not supposed to do"). (See Appendix C2 for test questions and scoring criteria.)

3) Mother's Motivation Task (Goldberg-Reitman ,1992): This task analysed children's social representations through a girl's understanding of her mother's motives in mother-daughter interaction using comic strips to depict situations of protection, physical care, and nurturance. After each presentation of script, the children were asked what the mother's behaviour would be in response to the event (e.g., a child falling off a roof) and to provide an explanation as to why

she acted as she did. Generally, 4-year-olds limited their responses to simple one-step actions which referred to the story-based event (e.g., "Because she falls off"); 6-year-olds made reference to the mother's wants/not want or likes/dislikes, that is, her intentionality (e.g., "Because she has to get down - she doesn't want her to hurt herself"); and 10-year-olds tended to refer to a more abstract notion of the role of the mother (e.g., "Because she cares about her and does not want her to get hurt"). (See Appendix C3 for test questions and scoring criteria.)

4) Empathic Cognition Task (Bruchkowsky ,1992): This task examined children's empathic responses to peers by presenting video-taped vignettes depicting happy and sad situations designed with a similar internal structure depicting a salient event (e.g., a child and friend playing with the child's dog in the park and the dog subsequently being hit by a car) and one emotional reaction (e.g., the child crying on her mother's shoulder while expressing difficulty in believing her dog is dead and how much she will miss him). The children are then queried as to how they felt when watching the vignettes and were then asked to speculate how the protagonist felt and why she felt as she did. In general, 4-year-olds referred to the action sequence of the story in explaining the source of the feelings (e.g., "Because her dog died"), whereas 6-year-olds referred to feeling states (e.g., "Because her dog died and she will miss him"). Ten-year-olds tended to focus on two or more mental states to explain the girl's feelings, thus elaborating on the 6-year-old responses (e.g., "Because her dog died, and she really loved him, and she really misses him 'cause he was her best friend"). (See Appendix C4 for test questions and scoring criteria.)

Procedure

Dimensional Instruction

The dimensional instruction programme used in this study was designed to train young children's central conceptual structures to the point where the concepts and necessary skills required for success in grade 1,2, and 3 arithmetic could be readily accessible to the children. The concepts and skills were taught in the sequential order in which they are generally believed to be acquired, that is, progressing from hands-on concrete materials to a more symbolic representation, and were presented through the medium of games. The mnemonic devised for use as a memory aid in this instruction programme was the mental number line. Children were seen an average of 4 days a week for approximately 20 minutes of instruction using the dimensional instruction programme for 34 days (mean of groups). All instruction was done by the researcher.

At the outset of the instruction programme, the children were taught the sequence of numbers from 1 to 5, and from 5 to 1, and they were then asked to demonstrate this understanding by predicting which number preceded or followed a given number. The children were then introduced to the concept that numbers have a one-to-one correspondence to objects and that each number maps onto a set of objects. The children were then taught that this number representing a set of objects could change and go up or down the number line when one object was added or removed from the set. Once this was understood, the children were asked to begin predicting the results of decrementing or incrementing a set by one.

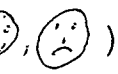
As the instruction programme progressed, children gained experience in matching numbers to sets of objects, and then in matching quantitative assessments of less and more between these sets of objects. They were also

given enough practice to conceptualise that moving up or down the number line meant that a set had been decremented or incremented by 1.

Approximately half way through the instruction programme, this knowledge was generally solidified when the numbers 1 to 5 were involved. The second half of the instruction programme was devoted to repeating this learning process with the numbers 1 to 10, and solidifying and phasing out the number line. By the end of the instruction programme, the children in general demonstrated the ability to map numbers onto a set of objects and knew that relative quantities of these sets could be assessed and compared, and that each number up or down the number line sequence reflected an increment or decrement by 1 for numbers ranging from 1 to 10. Lesson plans for the instruction programme are available in Case and Griffin (1990a).

When the instruction programme was completed, the children were seen individually and post-tested using the dimensional and intentional tasks.

Intentional Instruction

The Intentional Instruction programme used in this study was designed to train young children's central conceptual structures to conceptualise people's behaviour as stemming from desires, wants and needs, thereby advancing their original action-based perspective on human behaviour to a perspective based in the "landscape of consciousness". As in the dimensional instruction programme, the concepts were taught in the sequential order in which they are generally believed to be acquired, followed a concrete to abstract progression, and were presented through the medium of games. The mnemonic devices used as a memory aid in this instruction programme represented mental states and were as follows: () thinking of an object or an event, () feeling happy or sad, and () having an idea. Children were seen an average of 4

days a week for 20 minutes of instruction using the intentional instruction programme for 32 days (mean of groups). All instruction was done by the researcher.

During the first half of the instruction programme, a "thinking cloud" crown was used to introduce and develop the concept that people hold representations and reflections of what they see in their world. The children were then taught that these representations can change over time and under certain conditions, and that other people can hold different representations for a variety of reasons. This was done by sequentially introducing conditions in which representational changes can occur. These included conditions in which 1) a point of reference has an effect on how an object was represented; 2) additional information provided over the course of an event changes an understanding of an object; 3) misinformation can cause an object to be misrepresented (appearance - reality distinction); and 4) lack of information could cause a person to form a misrepresentation (false belief). These variations on a representation of an object were reinforced by presenting similar tasks using various items, and were finally applied to simulated life events.

In the second half of the instruction programme, a story telling task depicted in comic strip form was used as a medium to continue working with the concept of representations. The stories themselves were initially presented as representations, as "thought of" stories. Representations were then attributed to the characters in the stories as they followed discrete but related events. A plot structure was then introduced by using the happy and sad face symbols within the thinking clouds to represent the mental states of the characters. The thinking cloud mnemonic was then phased out and only the new symbols were used consistently as mnemonics. During this time, the children practised

building story plots which began with the main characters experiencing a problem which made them sad, and then thought of an idea to remedy the problem and were subsequently happy with the problem resolved. The mnemonics were used to highlight the interconnectedness between the action sequence and the mental states in the story and were gradually phased out. By the end of the instruction programme, the children were able to tell, without mnemonic support, a problem - resolution story in which reference to the protagonist's mental states was made. Lesson plans for the entire instruction programme are presented in Appendix D.

When the instruction programme was completed, the children were seen individually and post-tested using the 4 intentional and dimensional tasks.

CHAPTER IV

RESULTS

Introduction

In the present study, kindergarten children identified as at-risk for academic failure were assigned to two different groups. The dimensional group, acting as a control group, received the previously established dimensional instruction programme, whereas the intentional group received the intentional instruction programme. Both groups of children were pre- and post-tested with 4 quantitative tasks and 4 social tasks. It was hypothesised that the dimensional groups' performance on the Number Knowledge task would improve due to an increase in ability to conceptualise numbers as a result of the dimensional instruction programme, and subsequently an improvement in the dimensional groups' performance on the other 3 quantitative tasks would be demonstrated due to this increase in ability to conceptualise numbers. Similarly, it was hypothesised that the intentional groups' performance on the Story Telling task would improve due to an increased ability to conceptualise intentional action as a result of the Intentional instruction programme. This increase in understanding would subsequently increase the intentional groups' performance on the other social tasks.

A MANOVA followed by a repeated measures MANOVA was used to analyse the data. The 4 dimensional tasks tests and 4 intentional tasks tests were dependent variables. The 2 independent variables were Group and Time; specifically, the dimensional and intentional groups, and the pre-and post-testing conditions. The alpha level for all analyses was set at .05.

The purpose of the first MANOVA was to determine if there were any differences between the dimensional and the intentional groups before they

were subjected to their respective instruction programmes. The purpose of the repeated measures MANOVA was to extrapolate any indication that:

1. the group of children who received the dimensional instruction programme, a) increased their task performance on the Number Knowledge task in the post-test condition as a result of receiving the dimensional instruction programme, and b) the increase in ability to conceptualise numbers, as a direct result of this instruction, transferred to the other dimensional tasks, namely, the Money Knowledge task, the Time Telling task, and the Balance Beam task; and

2. the group of children who received the intentional instruction programme, a) increased their task performance on the Story Telling task in the post-test condition as a result of receiving the intentional instruction programme, and b) the increase in ability to conceptualise social interaction, as a direct result of this instruction, transferred to the other intentional tasks, namely, the Definition of Feelings task, the Mother's Motives task, and the Empathic Cognition task.

Initially, the results of the MANOVA will be reported. Subsequently, the results of the repeated measures MANOVA will be reported in the following sequence: 1) with regards to the multivariate results relevant to the hypotheses; and 2) with regards to the univariate results relevant to the hypotheses.

Inter-rater reliability was examined on 25% of the children's pre-and post-test responses across all tasks with the 2 raters agreeing on the scores given to 98.6% of the responses.

Pre-test Group Differences

Results of the MANOVA conducted on the dimensional and intentional groups' pre-test scores on the dimensional and intentional tasks indicated a significant difference between each group's overall performance on the pre-test tasks. Wilks Lambda approximate F 5.81, $F(8, 15) = .24$, $p < .05$. More

specifically, results of the F-Tests indicated that a significant between-group difference was found in their performance on 3 tasks; the Money Knowledge task, with $F(1, 22) = 4.99$, $p < .05$, the Story Telling Task, with $F(1, 22) = 41.64$, $p < .05$, and the Mother's Motivation Task, with $F(1, 22) = 11.92$, $p < .05$.[1]

Multivariate Analysis

The multivariate analysis indicated a main effect for Time, Wilk's Lambda $F(4, 19) = 24.99$, $p < .05$, although no main effect for Group was noted, Wilk's Lambda $F(4, 19) = 1.13$, $p > .05$. The results indicated a significant Group by Time interaction (Wilk's Lambda $F(4, 19) = 9.74$, $p < .05$), indicating a significant difference between the 2 groups' performance on the dimensional tasks across the pre- and post- test scores.

Similar results were found from the multivariate analyses involving the intentional tasks. That is, a main effect for Time was indicated, Wilk's Lambda $F(4, 19) = 8.72$, $p < .05$, whereas the Group MANOVA did not indicate a main effect, Wilk's Lambda $F(4. 19) = 1.87$, $p > .05$. As well, a Group by Time interaction indicated a significant difference between the 2 groups' performance on the intentional tasks across the pre- and post-test scores; Wilk's Lambda $F(4, 19) = 17.89$, $p < .05$. A differential performance emerged as a function of the pre-- and post-test condition and the initial assignment of subjects to group membership. The means and standard deviations for the dimensional and the intentional groups' pre- and post-test scores on the 4 intentional and 4 dimensional tasks are presented in Table 4.1.

Univariate Analysis

Since the critical analysis for the present study involved a Group by Time

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1. Recall that for both instruction groups, teachers were asked to nominate children at-risk for academic failure in the specific subject area of instruction.

DIMENSIONAL GROUP:	Pre-test Condition		Post-Test Condition	
Dimensional Tasks	Mean	Std Dev	Mean	Std Dev
Number Knowledge	4.38	2.26	8.92	2.06
Money Knowledge	3.08	1.61	6.31	1.44
Time Telling	3.15	1.34	5.69	1.55
Balance Beam	2.61	1.26	4.08	1.04
Intentional Tasks				
Story Telling	2.31	0.48	1.77	0.93
Definition of Feelings	2.85	0.80	2.77	0.73
Mother's Motivation	3.76	0.60	3.62	0.77
Empathic Cognition	3.25	0.87	2.77	0.60

INTENTIONAL GROUP:	Pre-test Condition		Post-Test Condition	
Dimensional Tasks	Mean	Std Dev	Mean	Std Dev
Number Knowledge	5.54	1.81	6.36	1.91
Money Knowledge	4.36	1.12	4.27	1.27
Time Telling	4.18	1.54	5.73	1.34
Balance Beam	3.09	0.94	3.19	1.17
Intentional Tasks				
Story Telling	0.63	0.81	3.73	0.47
Definition of Feelings	2.64	0.67	2.91	0.94
Mother's Motivation	2.91	0.70	3.82	0.75
Empathic Cognition	2.55	0.93	3.73	0.60

Table 4.1: The means and standard deviations for the dimensional and the intentional groups' pre- and post-test scores on the 4 intentional and 4 dimensional tasks.

interaction, only the univariate analysis results for Group by Time will be reported. Results will be reported in a sequence guided by the hypotheses.

Dimensional Training Effects

For more fine grained results, univariate analysis of variance was done for each of the 8 dependent measures. For the dimensional tasks, these included the Number Knowledge, the Money Knowledge, the Time Telling and the Balance Beam tasks. Results of the F-tests for the Number Knowledge task was $F(1,22) = 19.21$, $p < .05$ indicating that there was a significant difference between the pre- and post-test scores on the Number Knowledge task for the children in the dimensional group who received the instruction. (See Figure 4.1).

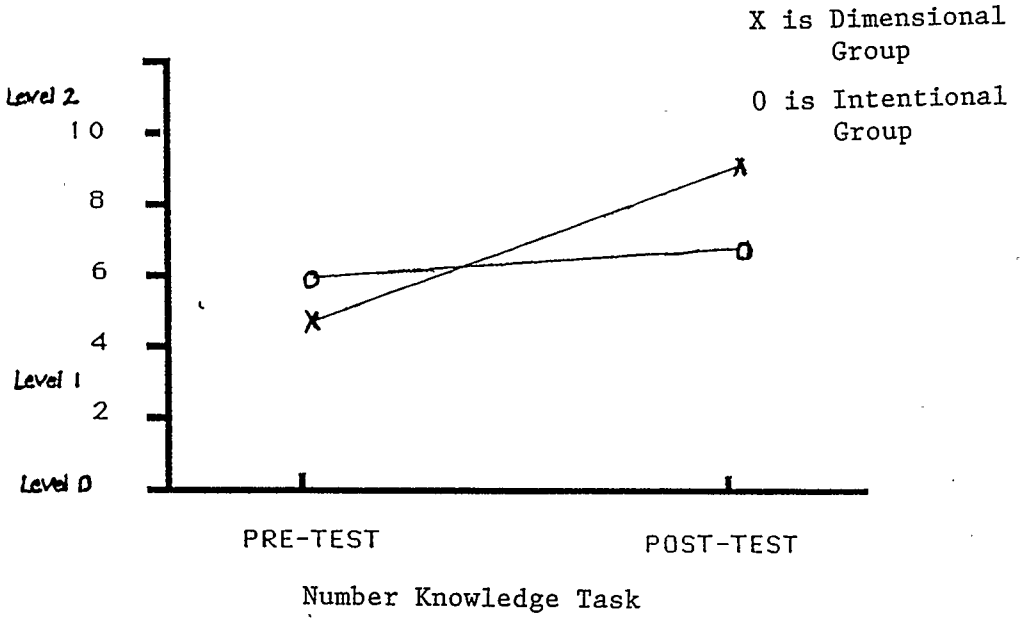

Figure 4.1. Mean pre- and post-test results for the dimensional and intentional groups on the Number Knowledge task.

Results of the F-tests for the remaining 3 dimensional tasks were $F(1,22) = 21.52$, $p < .05$ for the Money Knowledge task, $F(1,22) = 1.50$, $p > .05$

for the Time Telling task, and $F(1,22) = 4.78$, $p < .05$. for the Balance Beam task, indicating that the difference between the pre- and post-test scores for the Money Knowledge and Balance Beam tasks were significant at an alpha level of .05. (See Figures 4.2 and 4.3).

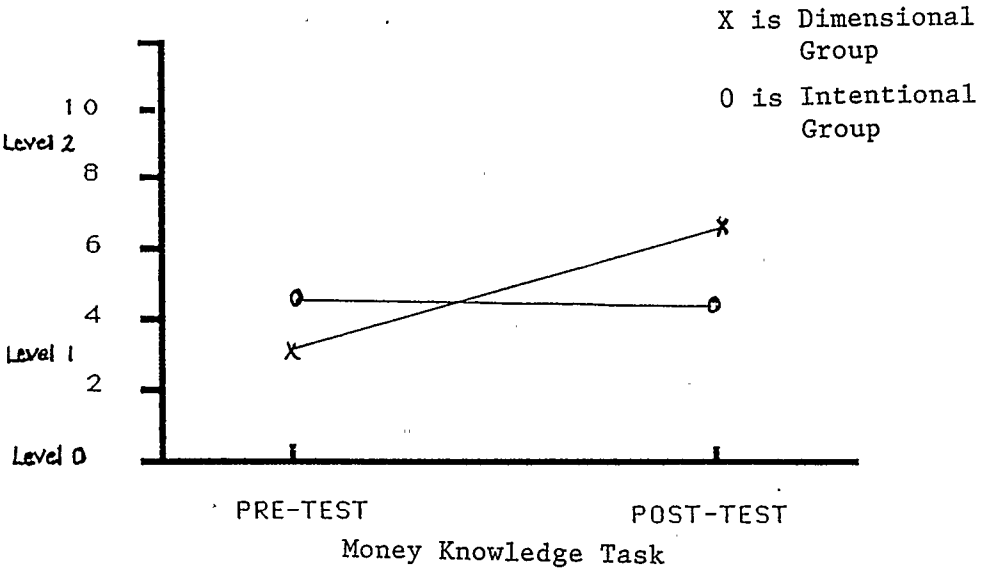

Figure 4.2. Mean pre- and post-test results for the dimensional and intentional groups on the Money Knowledge task.

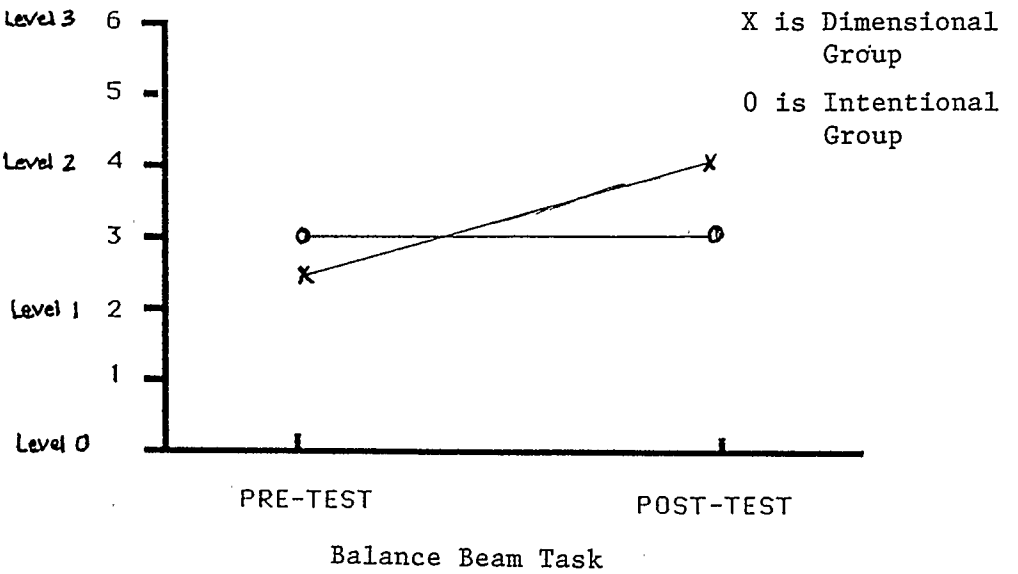

Figure 4.3. Mean pre- and post-test results for the dimensional and intentional groups on the Balance Beam task.

The difference between the pre- and post-test scores on the Time Telling task was not significant. This suggests that the knowledge gained from the dimensional instruction programme was transferred to the Money Knowledge task and the Balance Beam task, but not to the Time Telling task.

Intentional Training Effects

The univariate analysis for the 4 intentional tasks included the Story Telling, Definition of Feelings, Mother's Motivation, and Empathic Cognition tasks. With regards to Story Telling task, the result was $F(1,22) = 61.36$, $p < .05$, indicating that there was a significant difference between the pre- and post-test scores on the Story Telling task for the children in the intentional group who received the instruction programme aimed at the central intentional structures. (See Figure 4.4).

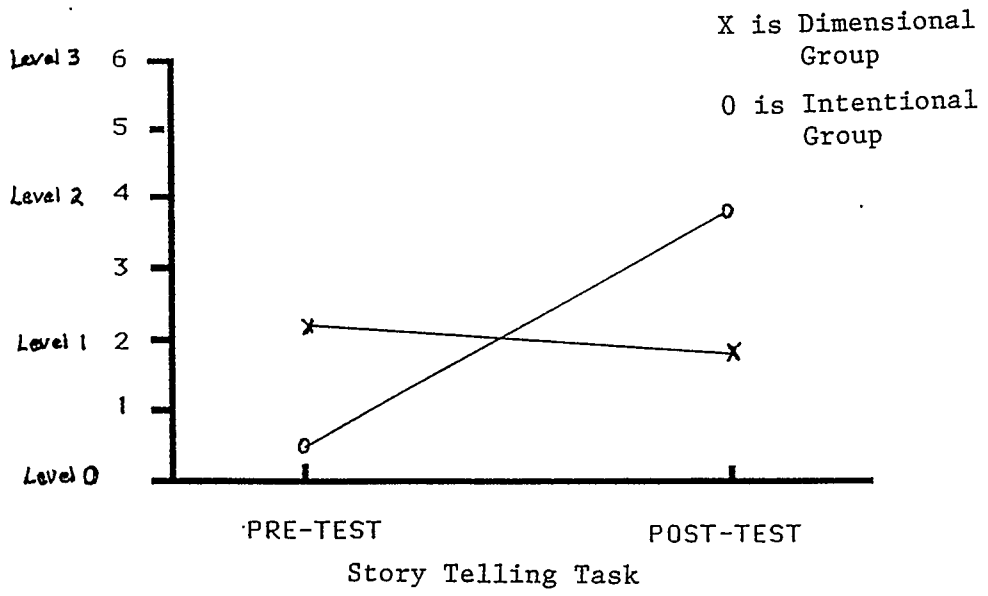

Figure 4.4. Mean pre- and post-test results for the dimensional and intentional groups on the Story Telling task.

Results of the F-tests for the remaining 3 intentional tasks were F (1,22) = 2.15, $p > .05$ ($p=.157$) for the Definition of Feelings task, F (1,22) = 7.96, $p < .05$ for the Mother's Motivation task, and F (1,22) = 10.24, $p < .05$ for the Empathic Cognition task, indicating that the difference between the pre- and post-test scores for the Mother's Motivation task and the Empathic Cognition task were significant. (See Figures 4.5 and 4.6). This suggests that the knowledge gained from the intentional instruction programme was transferred to the Mother's Motivation and Empathic cognition tasks, whereas the difference between the pre- and post-test scores for the Definition of Feelings task was not significant, suggesting that transfer of knowledge to this task did not occur.

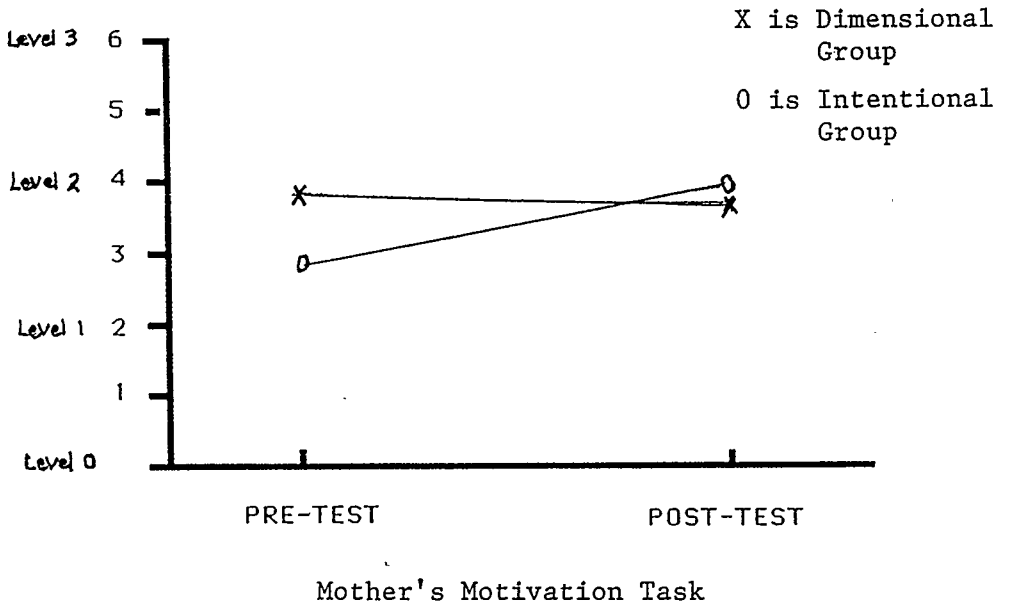

Figure 4.5: Mean pre- and post-test results for the dimensional and intentional groups on the Mother's Motivation task.

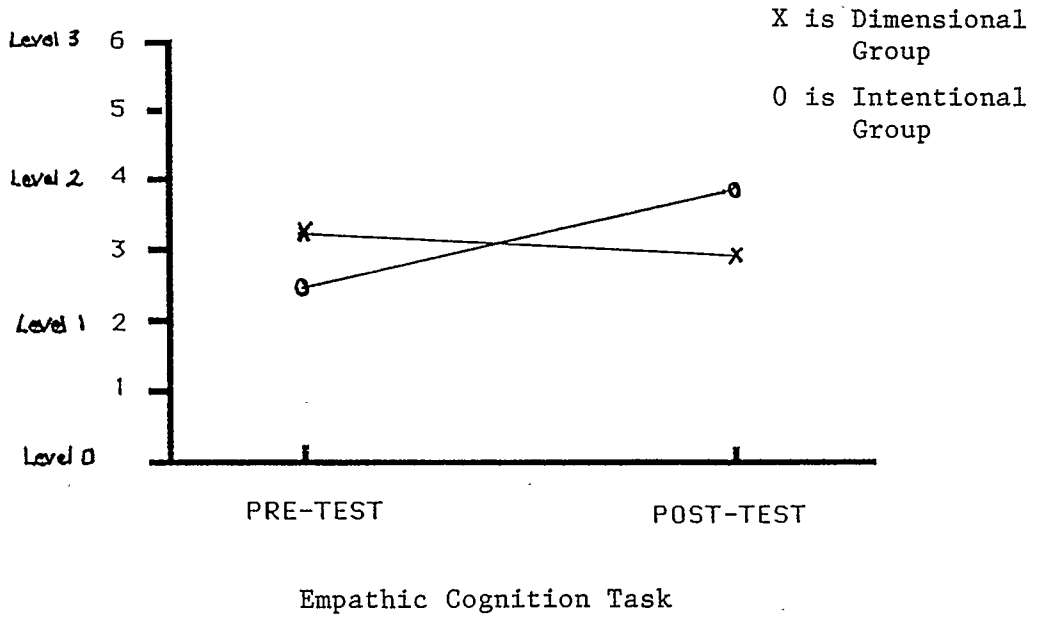

Figure 4.6: Mean pre- and post-test results for the dimensional and intentional groups on the Empathic Cognition task.

CHAPTER V
DISCUSSION

The primary purpose of this study was to examine the effectiveness of an instruction programme devised to train academically at-risk kindergarten children in the central intention structure in the narrative domain and to test for transfer to three other conceptually related tasks. As a control, a programme of instruction in the central dimensional structure was offered to a group of academically at-risk children, training them in number knowledge and testing for transfer to 3 conceptually related quantitative tasks. The prediction was that the training would effect conceptual change within the domain of instruction.

Hypothesis 1: Training and Transfer Effects of the Dimensional Instruction

The results of the present study clearly demonstrated the benefits of specifically training children's understanding of the number line. Further, the training was shown to transfer to conceptually related tasks, lending support for the notion of a central dimensional structure. This is consistent with Case's (1992) proposal that an underlying conceptual understanding as guided by the level of complexity of the central dimensional structure is governing their achievements in these tasks.

Pre-test Performance

Prior to receiving the instruction, the dimensional group achieved, on average, a 4-year-old level of performance across the dimensional tasks, that is, the Number Knowledge, Money Knowledge, Time Telling and Balance Beam tasks. In general, children's performance was consistently limited to an

ability to compare relative amounts in a polar fashion. Since they are as yet unable to conceptualise numbers along a mental number line, the children are relying on the preceding level of conceptual understanding to solve these problems; hence their use of polar reasoning.

Number Knowledge Gains

When the children had completed the dimensional instruction programme designed to improve their quantifying abilities to a 6-year-old level, a developmental shift was noted in their problem solving abilities in the Number Knowledge task, confirming the first hypothesis of this study. Previous to the dimensional instruction programme, the children demonstrated a 4-year-old level of understanding by either practising their counting string when counting 4 poker chips, or by determining that a pile of 5 poker chips "had more" than a pile of 2 poker chips "because it was higher". Nonetheless, Level 1 abilities generally escaped them. Despite their ability to count 4 poker chips, they could not determine which of numbers 4 or 5 was bigger. Subsequent comparison of the pre- and post-test scores on this task indicated, on average, that the children doubled their scores in this task, indicating a significant progression to the next substage of development. This progress is evident when examining the children's responses to the task questions. Where they had previously relied on polar reasoning to determine relative amounts in the Number Knowledge task, the children were counting objects and comparing the products of that counting activity. They were no longer guessing if the number 9 was bigger than the number 7. When presented with such questions, often the children would look up to the ceiling and appear to follow a mental number line with their mind's eye as they explained that "9 comes after 7. See! 1-2-3-4-5-6-7-8-9!" Numbers seemed to have a tangible quality they could follow and

apply in a quantifying nature consistent with a 6-year-old level of achievement. Of the Level 1 questions which produced the greatest difficulty, one asked children to determine the number of chocolates they would have if 3 chocolates were added to the 4 they already had. Previous to the experience with the dimensional instruction programme, the children would often guess "3" or "4" or say they didn't know in response to the question. In the post test condition, when the children erred, they most often erred by only 1 number and responded with the number 6. This suggests that the children were able to move up their mental number lines by 2 units only when computing the response. Although the response was inaccurate, conscientious attempts in the right direction were made. This is a definite sign of progress, indicating that the dimensional instruction programme was quite effective in developing a conceptual understanding of number addition.

Transfer of Number Knowledge

Significant concurrent progress was also noted in relation to two transfer tasks, the Money Knowledge and Balance Beam tasks. The nature of children's responses in the post-testing condition indicated a 6-year-old level ability to use counting in a means-end fashion when problem solving in these tasks, a strong indication that the ability to conceptualise numbers has transferred to this subject area. On the Money Knowledge task, children's level of performance also doubled, placing most of the children solidly within the Level 1 substage. Previous to the instruction programme, when asked which of a bunch of 2 versus 8 pennies was worth more, the children would pick the pile of 8 pennies and state that "it has more" or more elaborately "Because that one's got 2....but all of those are the biggest mountain!" Yet when a task question requiring a conceptual understanding of the meaning of numbers was

asked of the children, they were unable to demonstrate such an understanding. For instance, children were unable to take note of the numerical difference between a 5 dollar, 2 dollar and 1 dollar bill when asked which was worth the most. They appeared to guess or picked one of the 3 bills for a variety of reasons other than quantitative in nature, such as choosing the 1 dollar bill "because it was green". After the instruction programme, they were identifying the 5 dollar bill as having the greatest value because "that has a 5 on it and that's only a 2 and a 1". One observation worthy of note in this task was the children's response to the question of which was worth more, a dime or a nickel. Several of the children would look very closely at the 2 coins in the hopes of finding a number to indicate the coin of greater worth. Unfortunately , they would often focus on the number identifying the year of production and naturally, because of the coins in question, their responses were inaccurate. This appears to represent a lack of experience with the medium of money as opposed to an inability to quantify along the dimension of the number line. This should come as not surprise since a lack of enriching experience can be common among at-risk children and the topic of money is not a subject covered in the ECS curriculum.

A significant change between the results of the pre- and post-test scores on the Balance Beam task can also be accounted for by an increase in children's ability to quantify the weights used in this task. Previous to the children's exposure to the dimensional instruction programme, responses to the task questions were indicative of a 4-year-old level of achievement characterised by polar thought. The children would determine which side was heavier by choosing the side that "had more" as opposed to "a little bit". Post-testing responses, however, indicated that children were demonstrating their ability to count the weights along the number line dimension in justifying their

responses. More children were able to clearly distinguish between 6 weights on one side of the fulcrum and 7 weights on the other. Of interest, though, was the fact that several children were not given credit for their correct responses to Level 1 tasks due to the fact that they would estimate the number of weights on each side of the fulcrum by simply doing a visual scan, despite a definite ability to count them. In all but one case, they were accurate. These children in question were the strongest of the students to undertake the dimensional instruction programme, and may therefore be exhibiting such a strong basic conceptual ability to understand the numbers 1 to 10 that they could notice a minor difference in the number of weights and feel confident enough to estimate. The performance of 2 children was approximated to an 8-year-old conceptual understanding of this task; that is, they showed some indication of noting the effect of "distance from the fulcrum".

Progress in the Time Telling task was, however, slight and not significant. It is possible that, as in the nickel versus dime question in the Money Knowledge task, these types of questions require experience in the medium. It is also possible that the questions in this task are not adequate measures of the children's abilities in this subject domain. For example, in the pre- testing condition, when the children were queried as to whether a 4 o'clock arrival was early or late when a predetermined time of 3 o'clock had been set, they offered a variety of curious responses such as "you took too long to put make-up on your face!" or "Because it's dinner time". In the post testing condition, their responses once again focused on less curious, but nonetheless irrelevant information such as the distance from the school to their house, or they would be confused by the terms "early" or "late". This later type of confusion was strikingly similar to the interchanging of the words "before" and "after" by the children when working on the Number Knowledge task. When attempting to

explain that 5 was bigger than 4, they would say it was "because 3 comes after 4 and 4 comes after 5!" although conceptually they understood that the opposite was the reality. In summary, however, a comparison of the pre- and post-test performance across tasks showed clear training and transfer effects in the dimensional domain.

In contrast, no change was evident on the intentional tasks. The dimensional group's pre-test performance on the intentional tasks ranged between the 4- and 6-year-old levels. Subsequent to the dimensional instruction programme, their level of achievement for the intentional tasks on average remained the same, suggesting that training the central dimensional structures had no effect on the central intentional structures.

Instructional Programme Observations

The children's experience of the dimensional instruction programme during its implementation varied, with approximately 4 of the 13 children improving in a consistent steady fashion, 4 students experiencing a great deal of difficulty throughout, and the remaining 5 students experiencing mild to moderate difficulty in grasping the concepts of numbers. A high absentee rate appeared to be a factor in the children's progress. Half of the children who experienced the greatest difficulty were those who missed 15 to 35% of the instruction sessions. Whenever possible, these children, along with the other 2 children experiencing the greatest difficulty were offered additional instruction time. The other two children who were not chronically absent had specific characteristic which may have contributed to their difficulty. One child was born so prematurely that she remained under hospitalised care for over 2 years. These children have been shown to be at risk for academic difficulties (Jeary, 1990). The second child, a child identified as a concern for academic failure in all

subject areas, appeared to experience serious memory difficulties on all scholastic tasks, with little scholastic achievement reported by his teacher throughout the school year. Despite these difficult conditions, the children nonetheless demonstrated an increase in task performance across all of the dimensional tasks. For instance, prior to instruction, one child's counting string began at the number 2, proceeded to number 6, then went haphazardly throughout the teens. Quantifying relative amounts was impossible. Yet when the instruction programme was completed, the child could quantify up to 6 objects and use this ability in a means-end fashion. Although the child could not demonstrate consistent 6-year-old abilities in the tasks, he could identify numbers up to 10, understand that each number mapped onto one object (up to 6 objects) and determine relative amounts by counting them as long as the objects did not surpass the number 6. Relative to the other children's progress, this may seem quite minimal, but considering the child's difficulty in learning and his starting point in the programme, this progress is quite impressive.

Hypothesis 2: Training and Transfer Effects of the Intentional Instruction

Similar support for the domain specificity of central conceptual structures was noted in pre- and post-test results for the intentional group. A developmental shift was noted in the intentional tasks when the intentional instruction programme was complete, whereas the children's achievement in the dimensional task remained the same on the pre- and post-tests. This finding suggests that training the central intentional structures affects only the tasks which reflect intentionality and does not influence the conceptual abilities in other domains. Thus, results from the effects of the intention instruction programme offer support for Case's theory of cognitive development.

Pre-test Performance

The mean score on the Story Telling task in the pre-test condition for children in the Intentional group reflected a very low 4-year-old level of thought, although results on the other 3 dimensional tasks were solidly at that level.

Gains in Story Knowledge

In the pre-test condition of the Story Telling task, many of the children refused to attempt to tell a story. Those that did offered very brief stories either just below or barely within the 4-year-old level such as:

"A man who was riding a horse, and the horse got killed."

A dramatic improvement was noted after the intentional instruction programme. The children, on average, performed at the 6-year-old level, and were able to present a "made-up" story with a problem-resolution plot in which the story character's behaviour was conceptualised as stemming from their mental states. Two children were even able to perform at the 8-year-old level on this task. For instance, a boy in the pre-test condition told this story low 4-year-old level story:

> "A girl....and a boy...and...a kind old horse. They got mad at each other. That the end"

After the instruction programme, the child's 8-year-old story reflected a bifocal problem-resolution plot and the character's experience of representational change within her mental states:

> "Once upon a time there was a girl she was playing with her toys and...um...she asked her mom if she could go outside... to play in the snow. But her mom said no. And then she was very sad. And, and she had to play, so she asked her mom if she could go outside and she said yes. She jumped in the snow and she was having fun and she had an idea and she jumped in the snow and she feeled happy."

These results suggest that the instruction programme was very successful in its initial intent (i.e., training an intentional-action narrative structure), supporting the second hypothesis of the study.

Transfer of Story Knowledge

Similar abilities to conceptualise intentionality were evident in the related 3 intentional tasks, two of which were statistically significant. Subsequent to the intentional instruction programme tasks responses to the Mother's Motivation task were on average solid 6-year-old responses indicative of an understanding that the mother would offer care and protection to her child because "she's (child) drowning.... she (mother) doesn't want to miss her.", as opposed to a pre-test 4-year-old response indicative of an understanding of behaviour which is action based ("because water's in her eyes."). Further, 2 of the children who had originally demonstrated a 6-year-old level of achievement in this task during the pre-test condition were able to conceptualise intentionality in the task at an 8-year-old level as demonstrated by such responses to the question of why a girl put her sister's head under water as "'Cause she was rude...She was rude and she wanted to do it; she didn't do it by accident." Surprisingly, one child who had previously demonstrated a 4-year-old level of ability to conceptualise this task demonstrated an 8-year-old level of ability after the intentional instruction programme.

Similar results were found in the Empathic Cognition task. Before instruction, the children on average appeared to conceptualise the girl's experience of sadness as stemming from the fact that "her dog got runned over", a typical, action based, 4-year-old conceptual ability. Once the children's central intentional structure was trained, the children's responses, on average, reflected a more sophisticated understanding of intentionality as indicated by

their responses which dealt with the girl's mental states as a source of her sadness at the death of the dog "because she liked him" or because the girl realises that "she'll never see him again...she'll miss him." As in the Mother's Motivation task, 2 of the children who had previously been able to conceptualise this task at a 6-year-old level during the pre-testing condition were subsequently able to conceptualise intentionality at an 8-year-old level. For these children, the girl was sad when the dog died "cause the dog was her best friend....cause the girl loved the dog.....she was feeling bad because she was feeling sad all the time, 'cause the dog died." This response indicates an understanding of the source of the mental states and their consequences. As well, 2 children who had previously demonstrated the beginnings of a conceptual shift from a 4-year-old to a 6-year-old level of understanding of this task produced responses indicative of an 8-year-old level of understanding.

It is interesting to note that in these 2 tasks, the conceptual abilities of the children increased dramatically to an 8-year-old level when only a 6-year-old understanding had been anticipated. It is possible that the intentional instruction programme not only promotes the initial conceptualisation of behaviour as stemming from mental states, but may also promote its continued development. These results support Case's contention that by training the relevant central conceptual structures, understanding of the basic concepts in question should influence performance on tasks within the domain influenced by the targeted central conceptual structure.

Transfer of knowledge to the third task, the Definition of Feelings task, was minimal. Slightly less than half of the children developed from a 4-year-old understanding of feeling terms (i.e., "happy" being action based such as "having a birthday party"), to a 6-year-old level (i.e., "happy" as stemming from a mental state of "wanting to play with someone, and getting a friend"). One

reason for this lack of significant transfer may be the nature of the instruction programme itself. The intentional instruction programme was based mainly in the Story Telling task, with the story line being the eventual medium for expressing representational change. Responses to the Definition of Feelings task does not require any sort of story line to express mental states or changes to these mental states and may therefore not promote such reference. This task may potentially lend itself to responses that are paradigmatic in nature. The paradigmatic mode of response to experience is for Bruner (1986) one of the two modes that we use to provide greater meaning to life experience. This mode promotes a more logico-scientific approach and its conceptions are more categorical, as opposed to the narrative mode which deals with human intention and action. Should the Definition of Feelings task promote responses that are paradigmatic in nature, the intentional instruction programme may not, in essence, be conducive to such distant transfer. Thus, in this study, training of the central intentional structure promoted transfer of knowledge to 2 of the 3 relevant intentional tasks. This contention is further supported by the fact that the intentional group's performance on the dimensional task remained relatively the same after the intentional instruction programme, thereby indicating that training the central intentional structures had no effect on the performance of tasks believed to be governed by the central dimensional structures.

Instructional Programme Observations

During the Intentional Instruction Programme, the children, on average, progressed at a consistent pace. One group in particular experienced difficulty. This group consisted of 3 boys who exhibited behaviour problems on a regular basis, which made the group's attention span during the instruction quite short

in duration. During the implementation of the programme, a great deal of time was spent on managing behaviour and preventing the children from manipulating one another into disagreeable circumstances. In addition, several children were repeatedly absent. Together, these factors caused them to have difficulty in keeping up with the other groups.

One other child, in another of the groups, consistently demonstrated a great deal of variability in her understanding of the concepts being taught. For example, on one day, she would appear to readily grasp the lesson's objectives, but by the following day, this understanding of the concepts required for success in the tasks seemed well beyond her grasp.

Other than occasional behavioural management requirements, the instruction programme progressed at a consistent rate for the rest of the children. Their response to the lessons which focused on their representational abilities was enthusiastic, and they derived great pleasure out of their initial conceptual understanding of representational change as deriving from being "tricked" into thinking something and then realising that they had been tricked.

One important catalyst for promoting the children's interest, participation and group interaction was a particular puppet. This puppet was initially used to facilitate the presentation of the lessons, but also to provide children with the opportunity to further understand the concept of others holding representations. For instance, the false belief tasks which had originally "tricked " them were given to the poor unsuspecting puppet, much to the delight of the children. This also provided the instructor with the means to examine children's understanding of others' false beliefs. The puppet had been scheduled out of the instruction programme when the story telling aspect of the programme had begun. However, the children insisted on having the puppet remain a part of

the group and its presence was therefore reincorporated into the instruction programme. Interestingly enough, its presence facilitated the introduction of stories and provided a good model as the initial story teller. After the puppet told the first story and began the story in the group story, the children who had originally been verbally reticent participated more readily.

Relation to the Literature

Previous use of an instruction programme geared toward the central intentional structures with average, middle class children was successful in achieving a developmental shift from a 4-year-old level of achievement in the Story Telling task to a 6-year-old level of achievement with subsequent similar results in 3 conceptually related tasks, indicating knowledge transfer (Case & McKeough, 1990). This particular instruction programme focused on making children aware of their current means of representing a story (a script of related events), and subsequently provided training with a mnemonic to represent mental states in a problem resolution story format until the mnemonic was no longer needed. Although successful in its purpose with average middle class children, when used with children at-risk for academic failure, this programme was not as successful at promoting transfer of knowledge.

The critical difference between this current intentional instruction programme and the previous instruction programme geared towards the central intentional structure is the initial focus on the children's representational abilities. Current research in the area of children's developing "theories of mind" indicates the critical nature of children's ability to develop representational abilities to effectively understand the world which surrounds them. These research findings were taken into account when the intentional instruction programme was modified for the at-risk population of children. The

fact that this population had previously not responded as favourably to the first instruction programme as did the average middle class population suggested that an even more basic conceptual ability had not been adequately addressed. It was hypothesised that this basic conceptual ability was the ability to effectively represent social interaction. For this reason, representational abilities became the initial focus of the intentional instruction programme. As the results indicate, the at-risk population of 5-year-olds responded favourably to initial training of their fundamental representational abilities before proceeding to the training of their ability to represent changing mental states within the story telling format. In the current intentional instruction programme, the children's 4-year-old representational abilities were solidified and then enhanced to a 5-year-old level.

In the current literature, it is generally held that children's ability to understand representational change begins at a about 4 years of age when they are hypothesised to develop metarepresentational abilities, thereby allowing them to begin to understand that people take a metaposition to their representations and can entertain multiple representational models at once. They can therefore begin to understand that people can hold false representations, have representations that change over the course of an event, and that people have mental states associated with the events. Further development in these representational abilities allows children to begin to understand that these mental states can also change over time. An effective means of representing these potential representational changes in mental states is through the use of stories. Within the Story Telling task (McKeough, 1992), we see 6-year-old children producing stories with a problem-resolution plot in which children use the notion of mental states. They are sad about the problem, formulate a plan and become happy. The desire for change is

expressed in the plan effecting a change from initial sadness to happiness. An understanding of representational change is necessary for children to produce such stories reflective of changes in mental states. The story telling medium is therefore well suited to training children to conceptualise intentionality in social interaction, as this ability is based in the ability to understand that representations can change over the course of an event, and that mental states which govern human interaction can also change over the course of a social event.

Limitations

Certain experimental design and statistical considerations need to be noted. Specifically, certain facets of the selection criteria and subsequent influences on group characteristics are important, as well as the number of children involved in the study.

The number of children involved in this study precludes generalisation to the population of at-risk children in the general population.

Selection procedures for inclusion in the study were specific to the targeted population. The school from which the students were pooled were from inner city schools recognised by the school board as having a high number of at-risk students and identified as "high needs schools". More specifically, the first selection procedure was undertaken by asking the classroom teacher to identify students at-risk for academic failure who could potentially benefit from the instruction programme assigned to that potential group. Therefore, teachers for the students receiving the dimensional instruction programme took into account the nature of the instruction programme the students would receive and selected students they considered at-risk for academic failure, particularly in the area of arithmetic. Similarly, teacher identification of at-risk

students who were to receive the intentional instruction programme focused on at-risk students who were particularly at-risk for failure in the area of language arts. These factors would likely explain the statistically significant difference found between the two groups' performance on the pre-test scores of the Story Telling , Money Knowledge and Mother's Motivation task. Alternatively, though, significant differences between the 2 groups' performance on the Money Knowledge and Mother's Motivation tasks was slight and might not have been significant had the number of subjects in the study been greater.

Another selection criterion consisted of the children achieving a 4-year-old level or less on 2 of the 4 tasks measuring the conceptual understanding of the domain in which they would receive instruction. Specifically, a 4-year-old level of achievement or less on 2 of the 4 dimensional tasks for the group receiving the dimensional instruction programme and a comparable level of achievement on 2 of the 4 intentional tasks for the group receiving the intentional instruction programme was required. The purpose of this criterion was to include the children who were achieving within the overall 4-year-old range of conceptual ability within the domain under instruction. This degree of stringency was not applied to the pre-tests in the non-instructed domain, although children were generally functioning below the 6-year-old level.

This difference in the Story Telling pre-test task scores may also be explained by the greater number of Native Canadians in this Intentional Group. Although several of the children may have been able to conceptualise a 4-year-old level story, they did not demonstrate this ability despite encouragement and prompts. It should be noted that this was the first year of public education for these Native Canadian students and verbal reticence was also noted over their previous 2 to 5 months of class attendance. This unfamiliar cultural setting, which may in essence be perceived and

experienced as different from their home environment, likely contributed to their verbal reticence. As well, this instruction programme was characterised by a heavy language component. Facility with "school language" could easily compromise the ability to describe their understanding of intentionality.

For their part, the children experiencing behaviour problems would, without explanation simply refuse to attempt the Story Telling task, except for one child whose effort focused exclusively on an action-packed rendition of Teenage Mutant Ninja Turtles.

Implications

Educational Implications

The implications of this research may positively affect the educational services available to young children who are at risk for academic failure, by supporting the identification of children suspected of being at-risk for academic failure and by offering an additional means of intervention. Traditionally, children aged 4 to 6 years are assessed for "readiness" skills to determine their cognitive preparedness for the educational system they are about to enter. Should difficulties become apparent, direct instruction may be delayed until the "readiness" skills deemed necessary develop naturally with maturation. Currently, it is becoming evident that we can offer a certain degree of help to the children who are experiencing difficulty crossing this maturational barrier, allowing them to acquire a solid knowledge base which will ensure greater success in dealing with the academic foundations they will acquire during their elementary school years.

Theoretical Implications

Additional benefits of this research include a greater understanding of the structural organisation of knowledge and its developmental changes. By

achieving success in generating transfer of knowledge to tasks which share no common surface features but which share underlying conceptualisations and cognitive operations, we are moving one step closer to understanding what is involved in learning. The development of educational curricula which are based on the training of central conceptual understanding of cognitive operations could result in a more integrated curriculum and, consequently, increased competence in a wider range of scholastic tasks.

Directions for Future Research

Implications for future research include further examination of the intentional and dimensional instruction programme for inclusion into the ECS curriculum, particularly in the schools identified as having a higher concentration of academically at-risk children. As well, the efficiency of these instruction programmes need to be examined with children identified as experiencing other learning difficulties such as mental handicaps and specific learning disabilities in the areas of arithmetic and language arts.

Further research into children's theories of mind as they relate to their abilities to conceptualise and represent information relevant to the school curriculum may further enhance the intentional instruction programme as well as play a key role in the development of other interventions for the at-risk population. Specifically, the use of narrative mode of thought (Bruner, 1990) in conjunction with theory of mind research merits further investigation.

More specific to the intentional instruction programme, further research would be needed to clarify one finding in particular. This finding of interest was the extent of development from the 4-year-old level of achievement to the 8-year-old level in either the Story Telling, Mother's Motivation or Empathic Cognition task for 4 of the children in the intentional group. Although this may

indicate the strength of the instruction programme itself, it may also reflect the effects of verbal reticence or the limited effectiveness of the tasks for extrapolating childen's actual abilities. A possible means of assuring that the children's abilities have been well assessed in these tasks might involve assessment procedures that occur across time, such that the children gradually become familiar with the researcher.

Summary

In summary, in this study, kindergarten children considered to be at-risk for academic failure participated in one of two instruction programmes designed to train their central conceptual structures in either the dimensional domain (number line) or the intentional domain (story line). All children were presented with 4 intentional tasks and 4 dimensional tasks in the pre- and post-test conditions. As hypothesised, the children who participated in the intentional instruction programme demonstrated significant gains in their ability to conceptualise human action as stemming from mental states within a narrative context and further demonstrated transfer of this acquired knowledge to 2 of the 3 conceptually related tasks. Similar results were found with the children who participated in the dimensional instruction programme. These children demonstrated significant gains in their ability to conceptualise numbers, and transferred this knowledge to 2 of the 3 other conceptually related tasks. Knowledge gains were not noted in the domains which received no instruction. These findings support Case's proposal that central conceptual structures underlie children's abilities in certain conceptually related subject domains, and that by training these structures, children experiencing difficulties in these subject domains can be helped to improve their conceptual understanding. The findings offer promise for improved means of intervening on the behalf of

children experiencing difficulties learning, as well as for restructuring educational curricula for a greater focus on children's conceptual structures.

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APPENDIX A

PARENTAL CONSENT FORMS

January 25, 1992

Dear Parent(s),

I am a graduate student studying School Psychology at The University of Calgary working under the supervision of Dr. Anne McKeough. I am writing to invite your child to participate in a study which tests the utility of 2 instructional programmes designed to help children with 1) mathematically based skills, and 2) the skills which help children understand the behaviour of others.The children from (Name of School) who participate in the study will be a part of this second instructional programme. This utilises a story-telling format assisted by drawing and puppetry.

The children who participate in the study will be seen individually in two sessions of approximately 20 minutes for an initial assessment. Following this, qualified children will be seen for 30 half hour sessions where they will be assigned to one of the instruction programmes. Finally, each child will be seen individually in two post-test sessions to determine the impact of the instruction. All sessions will be audiotaped and will be conducted by me during regular class hours. Every effort will be made to determine the most appropriate time for the study. Your child may withdraw at any point in the study.

Should you require any more information, please contact me at 282-8919 in the evening.

If you wish to have your child to participate in this study, please sign the permission slip below and return it to your child's classroom teacher.

Thank you for considering my request.

_____ _____

Lise Godbout, Graduate Student, U. of C.

Dr. Anne McKeough, Ph. D.

I agree to permit_____ to take part in the instruction study conducted by Lise Godbout under the supervision of Dr. Anne McKeough.

Date:_____

Child's Date of Birth: _____

Parent's (Guardian) Signature:_____

Please print child's name: _____

First Last

APPENDIX B

TEST QUESTIONS AND SCORING CRITERIA FOR THE 4 DIMENSIONAL TASKS

1. NUMBER KNOWLEDGE TASK:

Task Description

Materials

7 red counting (poker) chips
7 blue counting (poker) chips
7 circles (cardboard)
7 white counting (poker) chips
8 triangles (cardboard)
Triangle with numbers 5-top angle, 6-lower left angle, and 2-lower right angle
Triangle with numbers 21-top angle, 25-lower left angle, and 18-lower right angle

Task Description

Children were asked if they could count from 1 to 10. This item served as a warm-up. The wording for this questioning was specified on a testing sheet, and the examiner marked the child's answers directly onto the score sheet. Transcription of the tape was not necessary. The children were presented with all the questions in the 3 levels. The test items were as follows:

Level 1:

Item #1: "I'm going to show you some counting chips [show mixed array of 3 red and 4 blue chips]. Count the blue chips and tell me how many there are."

Item #2: "I'm going to give you a chip and then I'm going to give you 2 more [do so]. How many do you have altogether?"

Item #3: "I'm going to show you two piles of counting chips [show 2 stacks, one with 5 white chips, the other with 2]. Which pile has more? How can you tell?"

Level 2:

Item #4: "Here's some circles and triangles [show mixed array of 7 circles and 8 triangles]. Count the triangles and tell me how many there are."

Item #5: "If you had 4 chocolates and someone gave you 3 more, how many chocolates would you have altogether?"

Item #6: "What number comes right after 7?"

Item #7: "What number comes 2 numbers after 7?"

Item # 8a: "Which is bigger, 5 or 4? Why? [If child is reticent or answers "Because", ask "How can you tell?"]

Item # 8b: "Which is bigger, 7 or 9? Why?" [If child is reticent or answers "Because", ask "How can you tell?"]

Item # 9a: "Which is smaller, 8 or 6? Why?" [If child is reticent or answers "Because", ask "How can you tell?"]

Item # 9b: "Which is smaller, 5 or 7? Why?" [If child is reticent or answers "Because", ask "How can you tell?"]

Item #10: [Present visual array of triangle with numbers 5, 6, 2.] "Which number is closer to 5? [point to 5] Is it 6 or 2?" [point at each number in turn]

Level 3:

Item #11: "How much is 54 + 12?"

Item #12: "Which is bigger, 69 or 71?" [If the response is correct, ask "Why?" followed by "How can you tell?" if necessary.]

Item #13: "Which is smaller, 27 or 32?" [If the response is correct, ask "Why?" followed by "How can you tell?" if necessary.]

Item #14: [Present visual array of triangle with numbers 21, 25, 18.] "Which number is closer to 21? [Point to 21] Is it 25 or 18?" [Point at each number in turn]

Scoring Criteria

Items were scored as pass (1) or fail (0) directly from the score sheets. To compensate for chance, children had to answer correctly and justify their response with a dimensional qualitative explanation on both 8a and 8b, and on both 9a and 9b to be awarded Items #8 and #9 in Level 2. A dimensional qualitative explanation would demonstrate an understanding of numbers as indicative of a particular quantity, and that this quantity increases or decreases in a consistent manner up and down a number line. (i.e., "Because numbers go 1,2,3,4,5,6,7,8....", "Because I can count, I was counting.", and "Because 8 is a little number, and 6 is a littler number.") The same criteria were applied to

items #12 and #13 in Level 3. Consideration to children's occasional inability to differentiate "before" and "after" was given and children were not penalised. As well, children who refused to provide justification for their responses to Items #8 and #9, but who responded correctly to all 4 questions, were given credit.

2. MONEY KNOWLEDGE TASK

Task Description

Materials

21 pennies
1 dime
1 nickel
7 $1 bills
1 $2 bill
1 $5 bill
Index card with a piece of hard candy taped to it, and 5 written below
Picture of a bike with 60 written below

Task Description

The wording for this questioning was specified on the testing sheet and the examiner marked the child's responses directly onto the score sheet. Transcription of the tape was not necessary for scoring this task, but the tasks were recorded in case of questions about scoring or test administration. The children were presented with all the questions in the 3 Levels. The test items were presented as follows:

Level 1:

Item #1: "Here's one bunch of pennies, [show 2 pennies] and here's another bunch [show 8 pennies]. Which bunch is worth more? Why?"

Item #2: "Here's one set of dollars [show 5 $1 bills] and here's another set. [show 2 $1 bills] Which is worth more? Why?"

Item #3: "I'm going to give you 1 penny, [do so] and then I'm going to give you 3 more [do so]. How many pennies do you have altogether?"

Level 2

Item #4: "Now I'm going to show you some more money. [show $5, $1, $2]

Which is worth the most? Why?"

Item #5: "If I give you 6 pennies and then I give you 2 more, [no objects] how many will you have altogether?"

Item #6: "If I give you this [show $5 bill] and this [show 2 $1 bills] how much money did I give you altogether?"

Item #7: "Suppose you go to the store to buy a candy, and you want to buy this candy [show index card with real piece of candy taped to it]. This candy costs 5 cents, but you only have 4 cents. How much more money do you need to buy the candy?"

Item #8: [Show a dime versus a nickel] "Which is worth more? Why?"

Item #9: [Show a $5 bill versus a 2 $1 bills] "Which is worth more? Why?"

Level 3:

Item #10: "If I give you 25 cents and then I give you 6 more, [show no objects this time] how much have I given you altogether?"

Item #11: [Show a $5 with 1 cent versus a $1 bill with approximately 21 cents] "Which is worth more? Why?"

Item #12: "This bike costs $60. [show bike picture] You count your money and you only have $45. How much more money do you need to buy the bike?"

Scoring Criteria

Items were scored as pass (1) or fail (0) directly from the score sheets. Responses to Items #1 and #2 required a dimensional global justification (i.e.," that one has more", or "that's a whole bunch") to receive credit. Responses to Items #4, #8 and # 9 in Level 2, and Item #10 in Level 3, which had the question "Why?", were given credit only if the explanation provided included a dimensional quantitative justification. A conceptual understanding of numbers needed to be demonstrated. (e.g., "This one has a 5, and these ones only have a one.") The tendency of some children to confuse the ten "dollars" and "pennies" was taken into consideration.

3. BALANCE BEAM TASK

Task Description

Materials

Balance beam with 10 identical pegs on each side of the fulcrum
Identical metal washers to act as weights

Task Description

The apparatus was demonstrated as follows. The children were told:

"This is called a balance beam because it balances on this post in the middle. See? It's exactly the same on both sides. These things here are weights. Each one weighs the same amount. Here, hold out your hands and keep them open. I'm going to put one in each hand. See, each one weighs the same. Now, watch what happens when I put some weights on one side of the beam. [Place 3 weights on the 3rd peg on the left side while holding the beam balanced. Then let go of the beam.] See, the side with the weights on it goes down. [Remove the weights]. Now you try putting some weights on the other side. Put them on any peg you want. [Give the child 2 weights and hold the beam steady while the child puts the weights on the peg. Then let the beam go]. See, now this side goes down because this side has the weights on it."

Now, lets try something a little bit different. Let's put some weights on both sides. Let's put some weights on this side [8 weights on the fourth peg on the left side] and some on this side. [3 weights on the fourth peg on the right side. Hold the beam steady during this process]. What do you think will happen? Watch and see. [Remove the weights.] Now it's your turn. I want you to put some weights on this side [Give the child one weight and point to the left side. Hold the beam steady.] You can put them anywhere you want on this side. Now, put these weights on this side. You can put them anywhere you want on this side - but keep this bunch all together; put them all on the same peg. [Give the child five weights and point to the right side.] What do you think will happen? [Then let go of the beam.]

The test items proper were presented following this demonstration. Six items, two at each of the three difficulty levels were presented in the following order:

Level 1:	#1. 2 on left and 6 on right (2nd peg)
(4 years)	#2. 7 on left and 1 on right (3rd peg)
Level 2:	#3. 3 on left and 4 on right (7th peg)
(6 years)	#4. 7 on left and 6 on right (3rd peg)

Level 3:	#5. 4 on left (7th peg) and 4 on right (6th peg)
(8 years)	#6. 5 on left (4th peg) and 5 on right (5th peg)

Once each test item was prepared, before the beam was released, the examiner asked the children to predict what would happen by stating: "Will this side go down, or will that side go down or will it stay flat?" After each response, the children were asked, "Why do you think that will happen?" Following the discussion, the beam was released. If the response the child provided proved incorrect, the child was asked, "What happened?" followed by, "Why do you think that happened?"

All of the children were presented with all three levels of questions. The distinct scoring criteria used is outlined below.

Scoring Criteria

Each item was scored as a pass (1) or fail (0) as follows:

Level 1: Items 1 and 2 were scored as a pass if the child's prediction was correct and justified with a global assessment (e.g., "it was more" or "it's gots lots"). If the child makes a mistake, but provides an explanation along the global dimension once the mistake is evident, credit was given.

Level 2: Items 3 and 4 were scored as a pass if the child's prediction was correct and justified with a dimensional quantitative assessment (e.g., "because it had 4" or "because it has 4 and the other one has less"). Responses were also scored as correct if the child made an incorrect prediction, but provided solid reasoning which erred due only to slight miscounting of the weights (e.g., "This one has 6 and this one has 6, so it will stay flat"). As well, the children who demonstrated an ability to justify responses with a dimensional quantitative assessment in Level 3 of this task but who chose to justify their correct predictions with a global quantitative assessment (e.g., "cause I can see it" or "cause there's this much left on this one and only this much left on this one' [referring to the amount of the peg still showing on each side]) were given credit.

Level 3: Items 5 and 6 were scored as a pass if the child predicted correctly by making reference to the second, less salient task variable -- the number of pegs between the weights and the fulcrum, or the weights and the end of the beam. (e.g., "because these weights are further from the end...they are on the 3rd peg, " or "because these [weights] are on 4 and these are on 5.") Miscounting was not an issue in these examples because the pegs, unlike the stacks of metal weights, were discretely arrayed and so quite easy to count.

4. TIME TELLING TASK

Task Description

Materials

Pencil
Paper
Clock with hands which can be manipulated

Task Description

As with the Money Knowledge Task, the wording for this questioning was specified on a testing sheet, and the tester marked the child's answer directly onto the score sheet. Transcription of the tape was not necessary for the scoring of this task. The questions in all three levels were presented to the children. The items were as follows:

Level 1:

Item #1: "Which one took a long time to make?" Make 2 lines, one taking a short time, the other a long time.

Item #2: "Suppose I tell you to wait 1 minute. Will you have to wait a long time or a short time?"

Item #3: "This clock says 2 o'clock. See the hour hand is here? Now I'm going to change it." [Demonstrate in front of the child.] "Now it says 5 o'clock." [Change again to 3 o'clock, in full view of the child] "Can you tell me what time this is?"

Level 2:

Item #4: "If you wait 1 minute and then you wait 2 more minutes, how many minutes have you waited altogether?"

Item #5: "Suppose I tell you I'll come to your house at 6 o'clock. I get there at 5 o'clock. Am I early or late? Why?" [If the child responds only with "Because" or "You don't know where I live.", prompt with "How do you know?".]

Item #6: "Suppose I tell you I'll come to your house at 3 o'clock. I get there at 4 o'clock. Am I early or late? Why?" [If the child responds with just "Because." or "Cause you're always early.", prompt with "How do you know?".]

Item #7: [Show child preset clock reading 4 o'clock.] "What time is this?"

Item #8: [Show child preset clock reading 9 o'clock.] "What time is this?"

Level 3:

Item #9: "Suppose I wait in line for 30 minutes, and then I wait for another 30 minutes. How many minutes have I waited altogether?"

Item #10: "Which is longer, 1 hour and 50 minutes, or 2 hours and 1 minute?" [If the response provided is correct, ask "Why?" or "How can you tell?"]

Item #11: [Show child preset clock reading 2:15] "What time is this?"

Item #12: [Show preset clock reading 4:10] "What time is this?"

Scoring Criteria

Items were scored as pass (1) or fail (0) directly from the score sheets. For a pass on Items 5 and 6, the children's responses needed to be correct and justified with a dimensional quantitative assessment (e.g., "because 4 comes after 3, so you're late."). For Item 10 to receive a pass, the children needed to provide a correct response and justify the response by indicating that the hour had to be considered, and that 2 was more than 1.

APPENDIX C

TEST QUESTIONS AND SCORING CRITERIA FOR THE 4 INTENTIONAL TASKS

Note: All tasks were tape recorded and transcribed.

1. STORY TELLING TASK

Task Description

Task Description

Children were told: "Now, I'm going to ask you to tell me some stories. I'll give you an idea to start with and then you make up the story from you own head. Here's the first story I want you to tell. Tell me a story about a happy little boy or girl and a kind old horse. Go ahead." When the child was very reticent, the examiner began "Once upon a time....." to encourage the child. When the child completed the story, the tester continued: "That was a great story! Now, here's the second one. Tell me a story about someone about your age who has a problem they want to solve - you know - make all better. Go ahead." Once the child completed the story, the examiner said "That was a good story!"

Scoring Criteria

Stories were assigned age-typical scores according to the following criteria:

The story has a connected event sequence.
An event sequence may be defined as any
statement, or collection of statements where
the phrase "And then" could be inserted.
Therefore, the text needs to contain a least two verbs.

No = < 4 years Yes

The event sequence contains a dilemma which has consequences which are developed in some manner (final success or failure, either okay).

No = 4 years Yes

These consequences are elaborated into a *chain* of distinct multiple attempts or episodes which lead towards a conclusion. They are distinct in that each one illustrates a clearly different idea of a way to face a problem.

No = 6 years Yes = 8 years

2. DEFINITION OF FEELINGS

Task Description

Task Description

The children were asked how old they were. The examiner then said "Wow! Four (5 or 6) years old! Now you've been in ECS for a while now. You're learning lots of new things. Well, now I'm going to ask you about some things. I'm going to ask some words. The first word is happy. You're 4 (5 or 6)years old and you know what the word means."

Questions:

1: Can you tell me what it means to be happy?
2: Can it mean anything else?
3: What's happening when you are happy?
4: When you are happy, doing x (child's example), where does the happiness come from?

The same questions were posed for the word "sad".

Scoring Criteria

The score was derived for the "meaning" of the word by analysing the protocols phrase by phrase.

Meaning Scores

Age typical scores were assigned according to the following criteria:

Does the response refer to only one type of information which can be behavioural (crying, playing), feeling (glad, want [not fulfilled], mad) or judgment (good, bad, nice).

No = < 4 years Yes

Does the response refer to two types of information such as behaviour and feeling (e.g., "You're happy when you play" or "you want a toy and you get it"), behaviour and judgment (e.g., "when your brother hits you that's not nice"), or feeling and judgment (e.g., "when you're glad and your mom says "good'.").

No = 4 years Yes

Does the response refer to three types of information; behaviour, feeling and judgment (e.g., "when you don't want to eat your vegetables but your mom says you have to -- that's sad.")

No = 6 years Yes = 8 years.

3. MOTHER'S MOTIVES

Task Description

Materials

2 cartoon strips

Task Description

The children were shown a cartoon strip and told:

"You know what I have now? I have some comic strip for us to look at. In this one a little girl is swimming.... [the examiner continued to read from the cartoon, pointing at each picture in turn]. The following questions were then asked:

Questions:

1: How does the little girl feel?
2: Why?
3: Why -------? [fill in from child's response above]
4: What does the Mommy do?
5: Why?
6: Why ---------? [fill in from child's response above]
7: What is the Mommy thinking?
8: Why?
9: Why ---------? [fill in from child's response above]
10: How does the Mommy feel?
11: Why?
12: Why ---------? [fill in from child's response above]

"Good job, now in this one, a little girl is in bed....' [continued]"

After reading the second strip, the examiner asked the child the questions as outlined above.

Scoring Criteria

First, responses were assigned age typical scores according to the following criteria:

Does the child presort an event depicted in the comic strip? (e.g., "she's coughing," or "it's burning.")

No = < 4 years YES

Does the child make additional reference (1) to a character's mental state (e.g., "she wanted; she was afraid; she didn't want"), (2) to a character's knowledge of the possible consequence of the incident? (e.g., "the mom knows [thinks] she will drown"), or (3) to a character's social judgment (e.g., "should tell her to stop", "that's bad", or "she shouldn't hold her head under water".)

No = 4 years YES

Does the child make spontaneous reference (1) to a second mental state in the same statement, thereby justifying a motive with a mental state, (i.e., "Her mother want her to burn because she loves her") or (2) to a social judgment of a mental state (e.g., "she doesn't like her little sister and that's bad", or "her mom will punish her cause she doesn't want her kids to fight").

NO = 6 years.....YES = 8 years -

4. Empathic Cognition

Task Description

Materials

Video Player
Video tape of the dog scenario, followed by the birthday party scenario

Task Description

Children were told:

"Now we're going to take a look at two short videos. After we watch each one together, I'm going to ask you some questions about it to see what you thought. Okay, now, I'll turn on the first one."

Dog Scenario

At the beginning of the video, two children are in the park playing "fetch the ball" with their dog. The primary actor interrupts the game to tell her mother, who is sitting on a near by bench, what fun she is having. She looks up in horror and we see a car attempting to screech to a halt. The child tearfully reports that "the car killed Harry" and she will miss hem and she loved him.. The fill ends with the child and mother grieving over the dog's death.

Children were then asked the following questions:

Questions:

1. How does the girl in the video feel?
2. What made the girl feel _____ [fill in from Q#1]?
3. Why did _____[response Q#2] make the girl feel [response from Q#1]?
4. Did the girl feel anything else?
5. How did that video make you fell?
6. Why do you think you felt _____ [fill in from Q#5]?
7. Why did _____ [response Q#6] make you fell _____ [fill in from Q#5]?
8. Did you fell anything else?

Birthday Party Scenario

Video begins with a little girl telephoning her friend and unsuccessfully inviting her to come to play. She sighs and feels quite rejected as it is her birthday and no one seems to notice. As she announces to her mother how bored she is, a knock comes at the door and a friend bounds in with a present. The girl opens her present immediately and the two exclaim enthusiastically over it. Next, Mother arrives with a cake glowing with candles. They sing happy birthday and the girl tells them, "This is the best birthday I ever had!' and hugs her friend and Mother.

Tester asked the children the same 8 questions as outlined above.

Scoring Criteria

Age-Scores were assigned according to the following criteria:

Does the child reassert an event depicted in the video? (e.g., "The car hit him? or "The doggie for killed").
No = < 4 years

Yes

Does the child make additional reference to (1) the girl's feeling state (e.g., "She loved him" or "He was her best friend") or (2) the little girl's knowledge of the possible consequence of the incident (e.g., "She'll never be able to play with him again")?
No = 4 years

Yes

Does the child make reference to (1) a second affective state (e.g., "She's was sad (Q) because she liked her dog" or "She was happy at the beginning (Q) because she was playing with him.") or (2) to a judgment of an affective state (e.g., "She loved him a lot and she'll really miss him.")?

APPENDIX D

INTENTIONAL INSTRUCTION PROGRAMME

Intentional Instruction Programme

**Tape record all sessions for review at the end of the day to examine the children's progress.

Intentional Instruction Programme

**Tape record all sessions for review at the end of the day to examine the children's progress.

LESSON 1

Objective:
1. Realises that one forms a representation of an object.

Materials:
1. Thinking Cloud Crown
2. Several attachable laminated thought cards (blank)
3. Washable colour markers,
4. An object of choice (i.e., a stuffed animal)
5. A mirror.
6. A tape recorder
7. A supply of Plastitak (to attach thought card to the TCs)

Procedure

Task 1. Give each child a Thinking Cloud Crown (call it a Thinking Cloud when interacting with the children). Write their name on the Crown and inform them that they will be wearing their "Thinking Cloud" for the next few days. Place an object in front of the children. Have each child take a turn guessing at what it is. While the child covers his/her eyes, draw the child's answer on a laminated thought card and then place it onto the Thinking Cloud (using plastitak), explaining that it is a picture of what the child is thinking the object is. Then allow the child to look in the mirror and confirm the representation. Make any necessary changes until the child agrees it is a picture of what s/he thinks the object is (a representation of the object). Repeat the procedure until every child has a representation in their Thinking Cloud. Next, ask the children how they could stop thinking oabout X (object). "That's rignt!. Take it out of your thinking cloud." Tell the children that for the next few days, we will be using the "Thinking Cloud Crown" to show us what we are thinking about certain things. (Herein, the Thinking Cloud Crown will be identified by TC).

Task 2. Have the children think of their favourite animal. Ask each child in turn what their favourite animal is. Tell the child to close his/her eyes and think very hard about their favaorite animal. While the child is thinking of it, draw it on the laminated thought card and place the drawing onto their TC (using the plastitak). Have the child look into the mirror and acknowledge that it is a picture of their favourite animal, like the one they were thinking of. Repeat with

each child. Ask the children, "*If we want to know what "X's" favourite animal is, what do we do? That's right! Look into their Thinking Cloud!* " Have children talk about their favourite animal before they remove the animal card from their TC. Save all of the thought cards produced during the session and write the child's name on the back of the thought card. Tell the children that they must remember what was on their card for the next day.

Task 3. Repeat above procedure using 1) their favourite cartoon character or 2) their favourite Christmas or birthday present. Do both if you believe it necessary. The only difference is that this time, have the children whisper to you what their favourite cartoon character is, allowing the child's peers to wonder what it is before you place the drawing onto the child's TC. Repeat with each child.

* Remember to save the tought cards for the next lesson.

LESSON 2

Objectives:
1. Reinforce concept of having a representation of something.
2. Realises that other people may have different representations from one's own.

Materials:
1. Puppet and her Thinking Cloud Crown
2. Each child's Thinking Cloud Crown (TC)
3. Several laminated thought cards (blank)
4. All previous day's laminated thought card drawings
5. Washable coloured markers
6. A mirror.
7. A tape recorder
8. A supply of Plastitak (to attach thought cards to the TCs)

Procedure

Task 1. Place each child's Thinking Cloud Crown on their head. Ask each child in turn what they said their favourite animal was on the previous day. If the child does not remember, ask the other children if they remember what "X's" favourite animal was. If they do not remember, supply the child with the answer. Then have the child pick out their own drawn representation of their favourite animal on the laminated thought cards (prepared the previous day) and place them onto their TC as they think of their favourite animal. Have each child look in the mirror and acknowledge that it is a representation of their favourite animal. Once each child has his/her favourite animal represented in their Thinking Cloud Crown, have the children identify their peers' choices. (e.g. "X,

what was Y's favourite animal?.....Y, what was X's favourite animal?...etc. You don't all have the same favourite animal? Why?....etc.) Discuss the difference in a) their choice of animals, b) their reasons for choosing that particular animal, etc. Introduce "the Puppet" and have the children choose a name for the Puppet. Next, bring out a Thinking Cloud Crown for the Puppet. Have the Puppet act curious about it and ask what it is and what it is for. Allow the children to tell the Puppet about the TC. Next, haave the Puppet notice the thought cards in the children's TC. Subsequently, have children try to guess what "the Puppet's" favourite animal is. *(You may find that the children may themselves ask what the Puppet's favourite animal is.)* Have the "Puppet" identify her favourite animal (whispered into your ear and draw the animal on the laminated thought card - pick an unusual animal!). Have the children try to guess what the "Puppet"'s favourite animal is before you place the thought card on the "Puppet"'s Thinking Cloud Crown. Discuss the "Puppet"'s choice and how it differs from the children's choices.

Task 2. Repeat the above procedure using the same favourite cartoon character laminated thought cards produced the previous day (or the favourite present, whichever you chose). Remind children of their choice if necessary, but first ask them to remember their original choice. Have them place the appropriate laminated thought card onto their TC and verify the choice by looking in the mirror. Ask the same questions as in the previous task, and discuss the differences between their favourite cartoons. Ask the "Puppet" to whisper her favourite cartoon character (choose an unusual character), draw the answer onto a thought card, have the children try to guess what it is, place the thought card onto the "Puppet"'s TC and discuss in a similar fashion as in the previous task.

Task 3. Repeat the above procedure using the favourite cartoon character/Christmas of birthday present if you believe the practice is necessary. If not, proceed to Task 4.

Task 4. Repeat the same procedure as in Task 2 using a newly thought of object, (e.g., asking the children to think of their favourite toy).

LESSON 3

Objective:
1. Realises that one has a perspective, a point of reference on something - and that the "something" is represented.

Materials:
1. Thinking Cloud Crowns
2. Several laminated thought cards (blank)
3. Pre-drawn thought cards

4. Washable colour markers
5. A mirror
6. Large animal pictures (animals between 2 foregrounds)
7. Large picture of a worm between a red and blue line.
8. A tape recorder
9. A supply of Plastitak (to attach the thought cards to the TCs)

Procedure

Task 1. Place the Thinking Cloud Crown on each child's head. Have children stand side by side on one side of the table with the Puppet and the instructor on the other side. Present the children with the first animal card, and ask the children to identify how they see the animal (standing up / on stomach or lying on its back). Once they have identified their perspectives, they are to pick the corresponding laminated thought card and place it onto their TC. Verify using the mirror. Ask the children if they all see the animal (standing up -or whichever position). There should be a consensus. Then repeat the procedure with the animal card presented in the opposite direction. After, ask the children what would happen to their TC if you turned it over again. Do so. (Once children get the hang of it, doing this quickly seems to amuse them a great deal.)

Task 2. Repeat the above task with the other animal cards.

Task 3. Have the children identify the difference between the colours blue and red. Bring out the card with the worm sandwiched between a red and a blue line. Ask the children to identify the colours blue and red, then ask, "Do you see the worm on top of a red blanket or blue blanket?" Then have children place the correct laminated thought card (the one representing their answer - drawing of a worm lying on a red or on a blue blanket) onto their TC. Verify using the mirror. Ask the children if they all see the worm lying on the (red or blue) blanket. (There should be a consensus). Repeat this procedure using the card in the opposite direction.

LESSON 4

Objectives:
1. Realises that someone else may have a different representation due to a difference in perspective.
2. Reinforce the concept that one has a perspective, a point of reference on something - and that the "something" is represented.

Materials:
1. Thinking Cloud Crown
2. Several laminated thought cards (blank)
3. Pre-drawn thought cards

4. Washable colour markers
5. Large animal (between two foregrounds) pictures
6. Worm picture
7. Three sets of smaller versions of the animal cards
8. Puppet (with Thinking Cloud Crown)
9. Mirror (if necessary).
10. A tape recorder
11. A supply of Plastitak

Procedure

Task 1. Place each child's TC on their head. Have the children stand on one side of the table, with yourself and the Puppet (with its Thinking Cloud Crown on) on the other. All must have their Thinking Cloud Crowns on their heads. Present the children with the first large animal card and ask the children if they see the animal standing up / lying on its stomach or lying on its back. Ask, "What's in your mind, what are you thinking when you see the bear?" Have them choose the appropriate thought card and place it onto their TC. (Use mirror only if necessary as it must be phased out. You may begin by allowing the child to ask his/her peers to verify the thought card placement.) Then ask the children if they think the Puppet sees the animal standing on its feet / lying on its stomach or lying on its back. Ask, "What is "Puppet" thinking?" Place the chosen thought card onto the Puppet's TC. If it's the wrong answer, tell the children that the large animal picture will remain fixed and that they will come stand beside the Puppet so that they can see what the Puppet sees. Turn the animal card over and ask, "Are you thinking about something different? Is "Puppet" thinking about something different?.....Oh! Your thoughts have changed!" Repeat the place changing exercise until they can identify their and the Puppet's changing perspectives correctly. Make the necessary changes to their and the Puppet's TCs accordingly.

Task 2. Repeat the above task using the other animal cards and finally the worm card.

Task 3. Allow the children to remove their TCs. Divide the children into partners, then have them sit at the table or on the floor across from each other. Give them the sets of smaller animal cards and tell them that are going to turn an animal card over and try to guess how their partner sees the animal (standing on its feet or lying on its back). The partner then tells them if they are right. Pair the Puppet (and yourself, of course!) with the child having the most difficulty. Repeat this procedure, but have the partners change task.

LESSON 5

Objectives:
1. Realises potential difference in another child's perspective.
2. Realises that this difference may result in the other child having a different representation.

Materials:
1. Thinking Cloud Crowns
2. Several laminated thought cards (blank)
3. Pre-drawn thought cards
4. Washable colour markers
5. Puppet with her Thinking Cloud Crown (plus one extra Thinking Cloud)
6. A cardboard puppet with a well defined front and back of a girl.
7. A cardboard puppet with a well defined front and back of a boy.
8. A cardboard puppet with a different looking individual on each side (face forward on each).
9. A supply of Plastitak
10. A tape recorder

Procedure

Task 1. Have the children wear their TCs. Place the children side by side, two feet away from the table they are facing. The examiner and the Puppet are to be on the opposite side. Tell the children to be careful, that you are going to try and trick them. Place the pre-drawn laminated in front of the children on the table. Stand the first cardboard puppet up with its face facing the children. Ask them each in turn, "What are you thinking, what is in your mind, when you look at this puppet?" Have them pick the appropriate thought card and place it onto their TCs. Once each child has done this, ask them to reach a consensus on what they think the Puppet is thinking on the other side of the table. Have the children pick the appropriate thought card for the Puppet and place the card onto the Puppet's TC. If it differs from the Puppet's actual perspective, have the children walk over to the Puppet's side of the table. Once they see the Puppet's actual perspective, draw it on a thought card and place it on the table. Then look onto the first response on the TC and compare it to the children's second response and discuss the difference. Once they understand this difference, super-impose a second Thinking Cloud onto the Puppet's first one. Then, place the correct laminated thought card onto that Thinking Cloud. Have the children return to their original place on the other side of the table and discuss their perspective and that of the Puppet's. Repeat this procedure after turning the cardboard puppet to its other side.

Tasks 2. Repeat the above procedure using the second (boy) cardboard puppet. Be sure to ask the children "*What is in your mind, what do you think?*" , then *"What is in the Puppet's mind, what does she think?".*

Task 3. Repeat the Task 2 procedure using the third (two-faced) puppet. Begin by first telling the children to *"...be extra careful, extra, extra careful, because I'm going to try to really trick you!"* You can switch the puppets quickly, making a game out of changing their thought cards as quickly as possible to reflect the changing side of the puppet.

LESSON 6

Objectives:
1. Introduce to the children the concept of their representation as not necessarily being fixed; that it can change over the course of an event.
2. Reinforce concept of everybody having a representation.
3. Reinforce concept of difference in perspective resulting in difference of representation.

Materials:
1. Thinking Cloud Crown
2. Extra Thinking Clouds to attach to Thinking Cloud Crowns
3. Several laminated thought cards (blanks)
4. Pre-drawn laminated thought cards
5. Puppet with her Thinking Cloud Crown
6. Two or three blocks or balls of graded sizes
7. Five gift wrapped presents.
8. A tape recorder
9. A supply of Plastitak

Procedure

Task 1. Have the children wear their TCs. Place the children into a circle, seated at a table or on the floor. Place 1 gift-wrapped present in front of each child with instructions not to touch the presents for a little while. In turn, ask each child what they think the present is. As they try to guess, ask them *"What is in your mind, what do you think it is?"* Draw their representation (the child's guess) onto a thought card and place it onto their TC. Ask the other children to identify what "X" thinks the present is by looking at the child's TC. Move onto the next child without allowing the first child to open his/her gift yet. Repeat the process and the questions until all the children have a drawn representation on their TC. Then, tell the children they must remember what they think the present is (i.e. what is in their TC) before they can open their gifts. Return to the first child and ask him/her to remember what he/she thought the present is, what he/she guessed. If it doesn't coincides with what is in the TC, allow the child to take off the Crown and look at the thought card. Once the child remembers what is in the TC, allow the child to open the present. Once the child has identified the gift, draw a new thought card (or have one prepared) and place it on one of the extra Thinking Clouds. Ask the child what

s/he originally thought the present was - allow the child to look at his/her Thinking Crown if they are mistaken. Then ask the child what the present actually is. Say, "Do you need a new thought, now that you know what it is?.....(prepare a new thought card for the child).....There, you have a new thought!" Then super-impose the new Thinking Cloud with the correct drawn representation onto the old Thinking Crown using plastitak on the top section. Say "Before you thought it was (X), and now you know its (Y)." Lift up the second Thinking Cloud and discuss the difference between the original thought (representation) and the second (correct) one. Repeat this process with each child.

Task 2. Have the children stand on one side of the table (about 2 feet away from the table), forming a line. If the table is short, have them kneel so that their eyes are at about the same level as the table top. The examiner and the Puppet are to be on the other side of the table. Tell the children to be careful, that you are going to try to trick them. Have the children close their eyes (or turn around if you think they might peek) while you place first the biggest block at the front of the table, a smaller box directly behind it, and the next smaller box behind the second one. Have 5 laminated thought cards representing each of the children's potential perspectives from the front of the table and that of the Puppet's perspective. Ask each child in turn to describe what s/he sees on the table. Judging from their description, hold up the appropriate thought card for verification. If the child judges the card to be a representation of their perspective, take it over to the child and place it onto his/her TC and guide the child to the back of the line (do not let the child see the table from any other perspective yet). Once each child has had a turn, ask them what they think the Puppet sees; ":What is in the Puppet's mind when he looks at the table, what is he thinking?" Pick out the appropriate thought card, verify with the children, and place it onto the Puppet's TC. Discuss any similarity or difference between the thought cards chosen. Finally, have them switch places with the Puppet as many times as necessary until most can acknowledge the difference. Prepare a new Thinking Cloud as in the previous task. Super-impose the new representation and Thinking Cloud onto the Puppet's first one. Begin discussing the difference between what they first thought the Puppet saw and what they now know the Puppet actually saw.

Task 3. Repeat using the same procedure in Task 2, but have the boxes increase in size placement from the children's perspective.

LESSON 7

Objectives:
1. Reinforce concept of everybody having an ability to represent what they see.
2. Reinforce the concept of there being a difference between a representation of what one believes an object to be and a representation of what the object

actually is. In other words, reinforce for the children the concept that their representation is not necessarily fixed; that it can change over the course of an event.
3. Introduce the concept that a person can have a representation of "something" that is not correct, that they can have a misrepresentation.

Materials:
1. Thinking Cloud Crown
2. Extra Thinking Clouds to attach to the Thinking Cloud Crowns
3. Several laminated thought cards (blanks)
4. Pre-drawn laminated thought cards
5. Washable colour markers
6. A box with an object inside
7. A yo-yo (eraser)
8. A tube of lipstick (eraser),
9. A Smarties box, filled with short pencils
10. Puppet.
11. A tape recorder
12. A supply of Plastitak
13. Drawings of a confederate and of the Puppet with Thinking Clouds above their heads. Separate drawings of Thinking Clouds to super-impose on these drawings.

Procedure

Task 1. Have the children and the Puppet (wearing their TCs) sit in a circle. Present a closed box and allow the children and the Puppet to shake it. Have children in turn guess as to its content. Allow the Puppet to guess as well (an outrageous guess). While they are guessing, ask them what they are thinking it is, what is in their mind. After each guess, draw it onto the thought card and place it onto their TC. Allow one of the children to open the box. Have children and the Puppet remember and discuss their previous representations. Ask them each in turn what they thought was in the box, and what was really in the box. Allow the children to super-impose a new Thinking Cloud with the accurate (pre-drawn) thought card on it over their original Thinking Cloud. Discuss the difference between the first and second Thinking Cloud further if necessary. At this point, allow the Puppet to return to a special bag for a nap.

Task 2. -----Part 1------Have the children sit in a circle. Tell the children that you are going to try and trick them. Also indicate that the Puppet is sleeping in her special bag and is too tired to play right now. Present the children with a box of Smarties and ask them what they think is in the box. Once they say Smarties, ask them to place the thought card (pre-drawn) with the Smarties on it onto their TC. Open the box and display the pencils. Ask the children what they thought had been in the box. (The children who say "Pencils" should be allowed to take off their TC and look at the thought card on it). Allow each child

in turn to acknowledge that they thought there were Smarties in the box. Then allow each child to pick a new Thinking Cloud and a new thought card with pencils drawn on it and help each child place them onto his Thinking Crown. Discuss "the trick" you played on them. "What did it look like?....What were they really, really?"

----Part 2----Tell the children that you are going to try to play a trick on (Confederate's name). Ask the children what they believe the Confederate will think is in the box of Smarties. Remind the children that the confederate has not seen this special box of Smarties before. Present the children with a drawn picture of the confederate. On this picture, have a Thinking Cloud drawn above the confederate's head. Draw the children's response into the TC. Show the result to all of the children and confirm that this is what they believe the confederate will say. Should any of the children disagree, have two such drawings available and fill them in accordingly. Next, have one child go and get the Confederate. Upon the arrival of the Confederate, present the box of Smarties and ask the confederate what s/he thinks is in the box. Once the confederate has said s/he thinks it is Smarties, super-impose the new drawn response onto the new Thinking Cloud and place over the old Thinking Cloud of the drawn confederate. Compare that answer with the response(s) the children gave. Discuss.

Task 3. Repeat the above procedure (part 1 and 2) using the yo-yo prop.

Task 4. Repeat the procedure in Task 2, but begin using the Puppet instead, saying it's time to wake the Puppet up and try to play a trick on the Puppet. Have drawings of the Puppet (with a Thinking Cloud above her head) available. After, have the Puppet make a big fuss out of being tricked.

Task 5. Repeat the procedure in Task 2 using the tube of lipstick prop.

LESSON 8

Objectives:
1. Reinforce concept of everybody having an ability to represent what they see.
2. Reinforce the concept of there being a difference between a representation of what one believes an object to be and a representation of what the object actually is. In other words, reinforce for the children the concept that their representation is not necessarily fixed; that it can change over the course of an event.
3. Reinforce the concept that a person may have a representation of "something" that is not correct, that a person may hold a misrepresentation

Materials:
1. Thinking Cloud Crowns
2. Extra Thinking Clouds to attach to the Thinking Cloud Crowns

3. Several laminated thought cards (blanks)
4. Pre-drawn laminated thought cards
5. Washable colour markers
6. A supply of other "appearance-reality" objects (i.e. baseball [yo-yo], animal shapes [colouring crayons], Crayola crayon [sharpener], etc.,)
7. Five gift wrapped presents
8. Puppet.
9. A tape recorder
10. A supply of Plastitak
11. Drawings of the Puppet with a Thinking Cloud above her head.
12. Separate drawings of Thinking Clouds to super-impose on the Puppet's in the drawings.

Task 1. Have the children place their TCs onto their heads. Repeat the Presents task found in Lesson 6, Task 1.

Task 2. -----Part 1------Have the children sit in a circle. Tell the children that you are going to try and trick them again. Also indicate that the Puppet is sleeping in her special bag right now but will probably come out and play later. Present the children with the baseball (yo-yo) and ask them what they think it is, what is in their minds. Once they identify it as a ball or baseball, ask them to place the appropriate thought card (pre-drawn) with the baseball on it onto their TC. Once all of the children have filled their TC, demonstrate that the object is actually a yo-yo., Ask the children if you tricked them. Say *"Did I trick you? Did you think it was a baseball?" What did you think it was?"* Once the children respond, ask them *"Now what do you think it is?" or " "Do you still think it is a baseball?"* In essence, have the children acknowledge that they initially thought one thing, but now they know something else about an object. Ask the children, "Do you need a new thought?" (The children may indicate this themselves.) Have the children then "change their representations" by picking a new thought card, placing it onto the extra Thinking Clouds and super-impose over their "old thoughts", their old Thinking Clouds. Ask them "At first you thought it was .....right! A baseball! Now you know it's a.....right! A yo-yo!"

----Part 2----Tell the children that you and they are going to try to play a trick on the Puppet. Before allowing one of the children to go wake up the Puppet, ask the children what they think the Puppet will say the yo-yo actually is. Remind the children that the Puppet has not seen this special yo-yo before. Present the children with a drawn picture of the Puppet with a Thinking Cloud above her head and ask the children what you should draw in the Thinking Cloud. If they do not give you an answer, give them a forced choice. Say *"Should I draw a yo-yo or a baseball?"* If some children disagree, draw each response on separate sheets (drawings of the Puppet with a TC) and have the children who believe the Puppet will say its a baseball stand together with the drawing for reference, and the children who think the Puppet will say it's a yo-yo stand together with their reference drawing. Next, allow one of the children

to go wake the Puppet and bring her to you. Present the yo-yo to the Puppet (after making a fuss about waking the Puppet up) and ask the Puppet what she thinks the object is. When the Puppet says it's a baseball, put a thought card of a baseball onto her Thinking Cloud Crown. Then compare her response with those (or that) of the children and discuss. Allow the Puppet to make a big fuss out of being tricked. Allow one of the children to put the Puppet back in her bag so she can take a nap as she is very tired.

Task 3. Repeat Task 2 procedure using the Animal shapes (colouring crayons) prop.Focus on the fact that their thoughts (representaions) change,

Task 4. Repeat the above procedure using other "appearance-reality" props (such as the Crayola crayon [sharpener] if you feel the children need the practice, (focusing on the representaional change).

LESSON 9

Objectives:
1. Reinforce the concept of everybody having an ability to represent what they see.
2. Reinforce the concept of there being a difference between a representation of what one believes an object to be and a representation of what the object actually is. In other words, reinforce for the children the concept that their representation is not necessarily fixed; that it can change over the course of an event.
3. Reinforce the concept that a person may have a representation of "something" that is not correct, that a person may hold a misrepresentation

Materials:
1. Thinking Cloud Crowns
2. Extra Thinking Clouds to attach to the Thinking Cloud Crowns
3. Several laminated thought cards (blanks)
4. Pre-drawn laminated thought cards
5. Washable colour markers
6. A supply of "appearance-reality" objects (i.e. watch [water squirter], panda bear [paper tablet], polar bear and shark [erasers], tube [whistle], green card [yellow card in blue plastic folder], purple card [pink or red card in blue plastic folder], etc.,)
7. Puppet (only if the children ask for it).
8. A tape recorder
9. A supply of Plastitak
10. Drawings of the Puppet with a Thinking Cloud above her head. Separate drawings of Thinking Clouds to super-impose on the Puppet's in the drawings.

Task 1. Have the children sit in a circle with their TCs on their heads. Tell the

children that you are going to continue to try and trick them a few more times. Present the children with the "green card" and ask them what is in their minds, what are they thinking when they see the card? If the chidlren are beginning to make wild guesses at this point, ask them what they think the colour of the card is.. Have the children pick out the thought card with the green card drawn on it and have the children place the thought card onto their TC. Then show the children that the card is in fact yellow and allow the children to take off their previous thought cards and "change their minds" and put the new thought card onto their TC. Then ask the children *"Did I trick you?.....What colour did you think it was?.....What colour was it really, really?"* (You may find that by now, children are beginning to volunteer their understanding that their representations change.

Task 2. Repeat the same procedure using the purple card. If the children had difficulty remembering their initial representations, return to using the second Thinking Cloud to superimpose on their main Thinking Cloud Crowns. Be sure to continue with the next two tasks until the children can remember their initial representations and understand that representations can change over the course of an event. If the children do understand this concept well, skip the next few tasks and begin the next Lesson.

Task 3. Repeat the procedure in Task 2 of Lesson 8 using the watch [water squirter] prop.

Task 4. Repeat the above procedure using other "appearance-reality" props mentioned in the Materials section of this lesson if you feel the children need the practice.

LESSON 10

Objective:
1. Reinforce concept of everybody having an ability to represent what they see and believe.
2. Reinforce the concept that a person may have a representation of "something" that is not correct, that a person may hold a misrepresentation. This misrepresentation can affect their behaviour.

Materials:
1. Thinking Cloud Crowns
2. Extra Thinking Clouds to attach to the Thinking Cloud Crowns
3. Several laminated thought cards (blanks)
4. Pre-drawn laminated thought cards
5. Washable colour markers
6. A small playhouse with kitchen furniture or a small set of cardboard kitchen furniture.

7. A parent and two child figurines
8. A little piece of something to represent a chocolate bar
9. Drawings of the figurines with a Thinking Cloud over their heads
10. Extra thinking Clouds to super-impose over the drawn ones
11. A room with several pieces of furniture (including cabinet of sorts) or use the House Centre of the ECS class
12. A chocolate bar (preferably Smarties - can be distributed fairly)
13. A supply of Plastitak

Procedure

Task 1. Tell the children the following story. You may wish to present it to them in the form of a comic strip they can follow as you tell the story.

Once upon a time there was a brother and sister named Billy and Mary. One day they went grocery shopping with their mother. At the grocery store, Mary was teasing her little brother. The mommy told Mary to stop teasing her little brother, but Mary didn't stop. The mommy was thinking that Mary was not being a good girl and the mommy didn't like it that Mary was not listening. So when they went to the check out to pay for the groceries, the mommy bought Billy a chocolate bar because he had been such a good boy, but did not buy one for Mary because she was being a bad girl and did not listen to her mother. Mary was very mad for not getting a chocolate bar. Billy was very happy he got a chocolate bar for being a good boy. When they got home, the mommy put all the food away and then said, "Billy, come here. Watch while I put your chocolate bar in the cupboard. When you are all done putting your toys away in the room, you can come and get your chocolate bar and eat it." Billy watched as the mommy put the chocolate bar into the cupboard, then went upstairs to clean up his toys. Mary also saw where the mommy put the chocolate bar away. Mary was still mad at not getting a chocolate bar too. When Billy and the mommy were gone, Mary took the chocolate bar from the cupboard and hid it in the fridge.

Next, introduce the figurines and the playhouse and tell the children that they are going to act out the story using the toys. As you read the story, have the children act out the story up to the point where the mommy puts the chocolate away in the cupboard. Then stop and take out the drawing of the 3 character figurines and ask the following questions: *"Where does Billy think the chocolate bar is? Right. In the cupboard."* Have a drawing of Billy with a Thinking Cloud over his head prepared. Draw the cupboard inot Billy's TC. Say, "*Where does Mary think the chocolate bar is? Right. In the cupboard."* Draw a cupboard onto the drawing of Mary's TC. Repeat using the drawing of the mother. Then continue acting out the story by having Mary change the location of the chocolate bar and then having Billy finish cleaning up his toys and and returning to the kitchen for his chocolate bar. Have Billy stop at the door of the kitchen. Ask the children the following question: *"Where does Billy*

think his chocolate bar is? Where will he go to get his chocolate bar?" Have another drawing of Billy ready and draw the children's response onto the TC. Compare the children's answer with the response they gave to the previous question of "Where does Billy think the chocolate bar is?" . Finish acting out the story with Billy going to the cupboard and not being able to find his chocolate bar. Then ask *"Did Mary play a trick on Billy? Did she fool him?"* Discuss.

(Note: another possible detail to the story would be Mary eating the chocolate bar instead of putting it in the fridge.)

Task 2. Have the children wear their TCs. Tell the children they themselves are going to act out the story they just heard (without the figurines). Find a room with 2 to 3 pieces of furniture in which the children will be able to hide the chocolate bar. (Use the house centre in the ECS class if possible). Tell the children that one of them will play the mother and that 2 others will play Billy and Mary. Act out the first half of the story. Then have "Billy" place the chocolate bar somewhere while "Mary" and the "mommy" look on. Then all three are to place a thought card reflecting where they think the chocolate bar is onto their TCs. Then "Billy" and the "mommy" are to leave the room while "Mary" changes the chocolate bar's location, "just to play a trick on 'Billy'!" "Mary" will super-impose a new Thinking Cloud reflecting the new location of the chocolate bar onto her Thinking Cloud Crown. Then ask the children where they think "Billy" will look for the chocolate bar upon his return to the room. (Do not use the drawings of the characters with their TCs unless you feel it is necessary - it must be phased out) Compare the children's response with the picture in Billy's Thinking Cloud Crown. Discuss.

Task 3. Repeat the procedure in Task 2 using different children or switching the roles of the little actors.

Task 4. Repeat the procedure in Task 2 using different children or switching the roles of the actors, but don't allow "Mary" to change the location of the chocolate bar.

****Note**, if the chidlren are experiencing difficulty with this task, restructure Perner and Wimmer's (1985) ice cream task in a similar fashion and repeat this lesson.

Lesson 11

Note: At this point in the instruction programme, the Puppet may be either completely phased out or continued as a group member, depending on the instructor's judgment as to its potential usefulness as an initiator in the tasks described below, (i.e. serve as a story teller model) or depending on the level of attachment the children have formed with the Puppet.

Objectives:
1. To introduce the concept that representations can be about events, not only about objects.
2. To explain the nature of this part of the instruction programme in general terms which are understandable to the group.
3. To motivate the child to take part in the instruction.
4. To make the children aware that the stories they tell are also representations, by introducing the concept of a "thought of" story depicted as picture stories in comic strip form within a Thinking Cloud.
5. To make children aware that their stories are a sequence of discrete but related events.

Materials:
1. A tape recorder
2. An 8 X 11 paper with a drawing of the Puppet, a boy, or girl in one corner and a huge thinking cloud taking up most of the rest of the space.
3. Extra copies of an 8 X 11 paper with drawings of either a boy or a girl (representing the children in the group) in one corner and a huge thinking cloud taking up most of the remaining space.
4. Fine point marker pen for drawing

Procedure

Task 1. Remind the children that they all produced very good stories when they told the stories into the tape recorder. Then explain that you have some questions you want to ask them.

Ask the children how many know any children in grade 1 (if the children are enrolled in kindergarten) or grade 2 (if the children are enrolled in grade 1). Then ask them if they'd like to learn how to tell stories that are as good as those older kids can tell. Tell them that you think you can teach them to do that because you have a special fun way to tell stories that has helped other boys and girls tell stories like the older kids tell. Generally, the goal here is to generate enthusiasm and commitment. Communicate the notion that we're in this together and we're going to do something fun and quite unusual. Consider generating a conspiratorial and suspenseful tone.

Task 2. Bridge to objectives #2, #3, and #4 by presenting the paper with the drawing of the Puppet and the Thinking Cloud. Draw the lines for the comic strip depiction of the story and ask the chidlren to "guess what (Puppet's Name) will be thinking of today....That's right! A story!" /talk to the chidlren about Thinking Clouds and their various uses; that is, how they can think about many different things, but also think about things that happen like when they happen in a story. Explain that you're going to draw pictures to go with the story the Puppet is thinking of -- like in the comics -- into "her Thinking Cloud". As the Puppet tells the story, quickly and roughly sketch it by depicting the salient feature of each event in a line drawing. (Do not draw attention to your drawing

and do not comment on your lack of skill). Then review the Puppet's story box by box. Next, present the children with their own sheet with the Thinking Cloud beside the boy or girl (whichever is appropriate to the chidl). Tell the children that now, just like they used to think of their favourite animal and favourite cartoon character, they are going to be thinking of stories. Ask the children if they're ready to start and ask who would like to go first, telling a story about "a little boy and a dog" (or some other character that might be of interest to the group). Pick one child to tell a story, and help the child begin only if necessary. When this is complete, review the story, box by box.

Task 3. Repeat the procedure for each child.

Lesson 12

Objective:
1. To reinforce the children's awareness of their stories being representations which can be depicted in comic strip form.
2. Solidify the children's current notion of story as a sequence of discrete but related events.

Materials:
1. "Books containing the children's transcribed stories (produced during assessment sessions and Lesson 11). The transcribed portion should be below the Thinking Cloud. Make a copy for all members of the group and staple together with a cover to make a storybook.
2. A tape recorder
3. Copies of 8 X 11 paper with a boy or girl with Thinking Cloud for drawing stories.
4. An 8X11 paper with a picture of the Puppet and each child sharing a Thinking Cloud.
4. Fine point black marker pen for drawing
5. Story Teller's stickers (To give to designated children each day).

Procedure

Task 1. Distribute the "books" to the children and retain a copy for your records. Review the stories by having each child "read" his or her story to the group, using the pictures as the "text". Ask the other children to try to follow along by looking at the pictures. Tell the children they can take the books to their classroom and occasionally even take them home to read or show to someone.

Task 2. Introduce the idea of composing a group story on a scripted topic of relevance to the children, such as Halloween or Easter. Alternately, the topic can be extricated from the children's general dialogue on the way to the session or elicited from the children. Indicate to the children that the group can

make up a story about "X" just like they did by themselves. This time though, each person gets to tell one thing that happened. (The purpose of this activity is to help the children see that the events are discrete but unified, by referential, temporal and causal relations. In other words, the story is about only one thing, follows a time sequence, and one event leads to the other.) Draw the lower portion of the Thinking Cloud above the drawing ofthe Puppet and each child drawn standing side by side, with a box or two above each for the story. Leave room for additions. Note that you don't know how long the story will be but that there's lots of room to draw pictures because you made the boxes big enough to make smaller boxes out of them. Tape the story for transcription. Have the Puppet start the story off by providing the setting. For example: *"Once upon a time, there was a girl named Martha who was thinking about having an Easter party. She wanted some help, so she asked....."* Invite individual children to continue the script: *"Who wants to go next?"* Give each child a turn until the story is completed.

Task 3. Introduce the idea of the "Story Teller". Explain that someone in the group is going to get picked each day to read the story to the group and that that person will get to pick out his or her favourite sticker. Pick one child to tell the story back from the pictures, while the other children look on and listen. Give the child a sticker. Restate that everyone will have a turn either later in the session or on another day. Recycle through the same procedure as in Task 2 for a second story.

Task 4. Read the following simple scripted story to the children and have them tell it back as a group in the same format as in the previous 2 Tasks. Draw on a new sheet with only the children sharing the Thinking Cloud.

The Birthday Party

Once upon a time, there was a boy named Danny. It was going to be his birthday next week so he wanted to invite some friends to come to his birthday party. His mom told him he could pick five friends. He make up a list and filled out the invitation and gave them to his friends the next day. On the day before the party, he and his mom went to the store to buy the surprises for the people coming to the party. Danny was very happy that they found really neat things. On the day of the party, his five friends came and they all brought him presents. He didn't open them right away, though. First they played games. They had a treasure hunt and played video games and then they played with Danny's toys. Next, Danny opened his presents. He was happy because he got lots of neat things. He especially liked the skateboard he got. Then they ate. They had hot dogs and cake and ice cream and kool-aid. Then it was time for all the kids to go home. What a birthday party!

LESSON 13

Objective:
1. To reinforce the children's awareness of their stories being representations which can be depicted in comic strip form.
2.Solidify the children's current notion of story as a sequence of discrete but related events by rendering it in comic strip form.

Materials:
1. "Books containing the children's transcribed stories produced during assessment sessions, accompanied by "picture stories" within the Thinking Clouds. Make a copy for all members of the group and add to the story books.
2. A tape recorder
3. Several copies of an 8X11 paper with a picture of 2 children sharing a Thinking Cloud.
4. Fine point black marker pen for drawing
5. Story Teller's stickers (To give to designated children each day).
6. Letter Cards (A to E)

Procedure

Task 1. Pass out story books and retain one for your records. Pick two children and have each read one of the stories from yesterday's session. Give each child a "Story Teller's" sticker.

Task 2. Take a sheet with the picture of two children sharing a Thinking Cloud. Next, take out the letter cards and review the letters in the proper sequence with the children. Then turn the cards over, mix them, and have each child in turn pick a card and identify it. Ask the children *"Who has the first two letter cards?"* Place each child's name on the body of the two children in the picture and have the child with the A card begin the first half of the story and the child with the B card finish it. Pick a theme relevant to the children and help the first child begin if necessary. For example, ask the child *".....to think of a story about a little boy and a friendly old dog.....etc."* Tape and sketch the story as the children recite it. Encourage peer critique and review to stimulate discussion. Recycle through this process until each child has had a turn. Should the number of children in the group be uneven, pair the last child up with the child experiencing the most difficulty.

Task 3. When each child has has a turn, invite them to go with their partners and read the stories from the pictures taking turns to begin and end the story. Tell them to use a soft voice so they won't disturb the other pairs.

NOTE: Do all of the children understand that the stories they compose are comprised of a connected sequence of events, centered around a single topic? If not, recycle through Lesson 13.

LESSON 14

Objective:
1. To phase out the Thinking Cloud as it has been used in the past two lessons.
2. To solidify the children's current notion of story as a sequence of discrete but related events.
3. To introduce to the children the notion that stories can be about a great variety of subjects.

Materials:
1. "Books containing the children's transcribed stories produced during assessment sessions, accompanied by "picture stories". Make a copy for all members of the group and add to the story books.
2. A tape recorder
3. Unlined paper with children drawn on the left side (the same number of children on the paper as in the group)
4. Fine point black marker pen for drawing
5. Story Teller's stickers (To give to designated children each day).
6. A "Story Box" which contains at least 4 cards upon which story topics are written (e.g., "Tell a story about a boy who wants to go to the park", "Tell a story about a girl who wants to go on a picnic", "Tell a story about a birthday party", "Tell a story about when you go to your friend's house to play".), and an additional number of blank cards, equalling the number of children in the group.

Procedure

Task 1. Pass out story books and retain a copy for your records. Pick the "Story Tellers" , award the stickers. Have one child read each of the picture stories. (NOTE: You might not want every story re-read, as the activity could become tedious.)

Task 2. Bring out the "Story box" and explain that inside it are all kinds of things that stories can be about. Let the children guess what the topics might be. Pretend that you hadn't thought of the topics the children generate, record each on the blank card, and place it in the box. Make sure the group generates enough topics so that there is at least one for each group member, including those you have already placed in the box.

Task 3. Explain that each child is going to pick a card, one at a time and tell a story about it, but no else is going to know what is written on the card because you (the instructor) will just whisper in each person's ear what's on the card. Then tell the children that we don't need their big Thinking Clouds anymore, because everyone now understands that they have been "thinking of" stories. Instead, when you draw the stories today you will put their name on the picture of the boy or girl beside the boxes used for drawing the stories. Bring out the

paper which has a child drawn on the left side of the sheet at 4 or 5 intervals. Begin adding the boxes for the stories after each drawn child. Ask one child to pick a card. Whisper what is written on the card to the child then write the child's name beside one of the drawn children on the sheet of paper and prepare to sketch and tape record the story as the child begins to tell the story. (Children might have some difficulty maintaining coherence. If this is the case, have the child go over the story again ostensibly because it was so long you had trouble understanding it and getting it all down in pictures. Draw as the child retells the story.)

Task 2. Recycle through each child in this fashion.

LESSON 15

Objective:
1. Demonstrate that the protagonist of the story has a current representation within the story context.

Materials:
1. "Books containing the children's transcribed stories produced during assessment sessions, accompanied by "picture stories". Make a copy for all members of the group and staple together with a cover. Retain a copy for your records.
2. A tape recorder
3. Unlined paper for drawing
4. Fine point black marker pen for drawing
5. Story Teller's stickers.
6. A story book that is centered around an event sequence, such as a trip to the zoo or planting a garden.
7. A Thinking Cloud on a card (to use as cue for the children)

Procedure

Task 1. Pass out story books and pick the "Story Tellers" who will receive the stickers. Ask the children who sees their books. Do they show it to anyone in their family? Do they show it to their teacher? Next, have one child read each of the picture stories and pass out stickers. (NOTE: Again, you might not want every story re-read.)

Task 2. Indicate to the children that today you may want them to listen to a story that you're going to read, and get them to tell it back to you, and then you'll draw it. Ask the children to listen carefully. Once the story has been read, ask the children who the story was about. Tell them that when you want them to tell you what "the character" was thinking about, you will raise the "Thinking Cloud card". Allow the children to tell you about the character, then raise the cue card.

Then ask what happened and allow the children to tell the story back to you, occasionally raising the card and asking the children what "so and so" was thinking. (do not draw a thinking cloud yet.) Sketch and tape record the story.

Task 3. Ask the children to begin retelling the story done in Task 2 by looking at the drawn pictures. Within the first few events, raise the Thinking Cloud card and ask the children "What is the (protagonist's name) thinking?" Draw a Thinking Cloud above the appropriate box leading to the protagonist and draw in the thought or the Happy Face.

LESSON 16

Objectives:
1. To solidify the idea of the protagonist of the story having a mental representation within the story context.
2. To solidify the children's current notion of story as a sequence of discrete but related events.
3. To solidify the notion that stories can be about a great variety of subjects.

Materials:
1. "Storybooks" containing the children's transcribed stories from the previous session, accompanied by "picture stories". Make a copy for all members of the group and retain a copy for your records.
2. A tape recorder
3. Unlined paper for drawing
4. Fine point black marker pen for drawing
5. Story Teller's stickers.

Procedure

Task 1. Pass out the story books and pick the "Story Tellers" who will receive the stickers. Have the chosen child read the picture story from the previous lesson. Pass out the stickers.

Task 2. Have all the children in turn generate new stories ideas for the story box. Allow the children to call upon a peer if they run out of ideas for their stories. Then have the children in turn generate stories from the ideas in the story box. Allow the children to re-read the stories they have created by looking at the drawn stories just completed.

Task 3. Once the stories from Task 2 have been reviewed, return to each story and at two separate points in each story (beginning and end), raise the Thinking Cloud cue card and ask the group "What was (protagonist name) thinking?" and draw a Thinking Cloud above the appropriate box as they reflect on the question. Fill in the Thinking Cloud. Have one child re-read one

of the stories and include the protagonist's thoughts in the story telling.

LESSON 17

Objectives:
1. To move the children to the next level in the developmental hierarchy. This involves building a "conceptual bridge" from a scripted event sequence to a simple plot structure, consisting of a problem and its immediate resolution. This is done by "mapping" the sketched picture story, which depicts the story's action sequence onto a set of icons or symbols which represents mental states such as desire and sadness. This process is explained in the procedures below.
2. Reinforce the concept that the story's protagonist has a mental representation, and that this mental representation can change over the course of an event.

Materials:
1. "Books containing the children's transcribed stories from the previous session, accompanied by "picture stories". Make a copy for all members of the group and retain a copy for your records.
2. A tape recorder
3. Unlined paper for drawing
4. Prepared story drawings with no ending for Task 4
5. Fine point black marker pen for drawing
6. Story Teller's stickers.

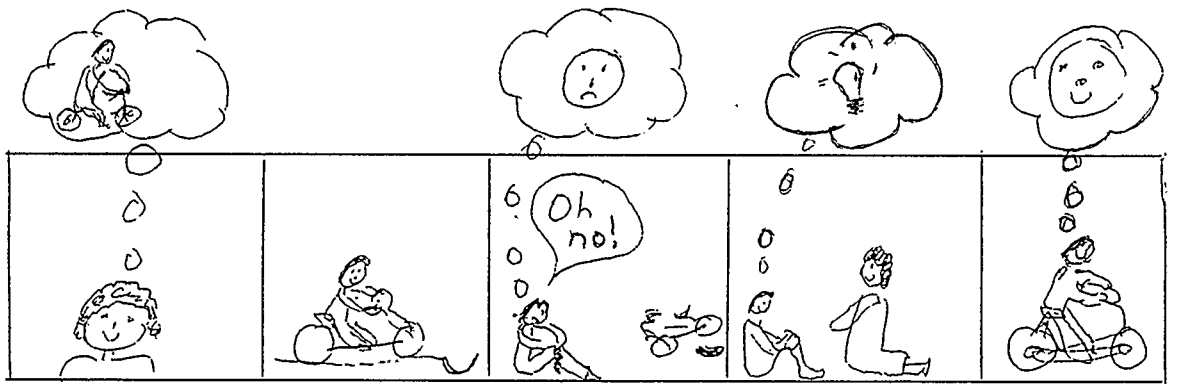
Procedure

Task 1. Pass out the story books and pick the "Story Tellers" who will receive the stickers. Have the children read the picture stories from the previous session. Encourage the Story Tellers to include a review of the protagonist's thoughts in their story telling. (Use the Thinking Cloud card only if necessary.) Tell the children that they are all becoming very good story tellers because they make up and remember interesting stories.

Task 2. Ask 2 of the children who need the practice to tell (each in turn) a story from their very own heads. Remind them briefly to include what the person was thinking in their story. Sketch and tape the stories. If the children have difficulty remembering to include the main character's thoughts at one point, recycle through the last Lesson. If the children do well, continue.

Task 3. Ask the children if they think they will even be able to finish a story that you start. Relate and tape the following story while drawing the pictures: "Once upon a time, there was a little boy who was thinking 'I want to ride my bike!' He hopped on his bike and rode down a hill. 'Weeeee!' he said. He was having fun until he hit a big hole and fell off. His knee was bleeding and so he felt

very very unhappy." Then ask the children, "Now who can finish the story?" Pick one child from those who volunteer. "Re-Read your portion of the picture story and then invite the volunteer to complete the story. Draw the pictures to accompany his/her composition. Again, tape it. (An example of one child's response is presented below, by way of illustration.) Differentiate between the following icons (within the thinking clouds) above the appropriate segment of the picture story, as the following example demonstrates. Say: *"You were able to finish it! No problem! That's a great story! Look here. First the boy is thinking that he wants to ride his bike, so he hops on his bike and goes riding."* Here, put a thinking cloud above the appropriate box and put in the child riding a bike with a very b· g happy face. Then continue by saying: *"Then he falls off after he hits a big hole. OHHHH! Look at the blood on his knee. He feels very unhappy. He is thinking 'Oh no! I wanted to have fun on my bike!' Look he's crying and he feels very sad"* At this point, you depict the protagonist's mental state by placing a sad face within a thinking cloud above the appropriate frame. Continue by adding: *"Then the boy thinks of what to do. He gets an idea doesn't he."* This mental state is represented by a light bulb within a thinking cloud above the appropriate frame. *"What was his idea?"* Verify the response by saying: *"That's right and he feels better. He feels happy that he can ride his bike again."* The final mental state icon of a happy face is drawn within a thinking cloud above the appropriate frame.



Task 4. Explain to the children that people can often think of two or three ideas to solve a problem. Cover the previously generated resolution sequence. Ask the children what other things the little boy could have done to solve his problem of having a bleeding knee. (Have prepared sheets if possible). Invite one of the children who had an idea to make up another ending to the story. Re-read the problem portion from the action sequence, tape the child's resolution sequence, sketch it, and review it as before, highlighting the character's mental states and his or her plans using the same thinking clouds with icons at the appropriate frames. Encourage peer critiques and review.

Tasks 4. Repeat Task 4 with another child if you feel it is necessary.

LESSON 18

Objectives:
1. To build a "conceptual bridge" from a scripted event sequence to a simple plot structure, while minimising the demands placed on the children's memory.
2. Reinforce the concept that the story's protagonist has a mental representation, and that this mental representation can change over the course of an event.

Materials:
1. "Books containing the children's transcribed stories from the previous session, accompanied by "picture stories". Make a copy for all members of the group and retain a copy for your records.
2. A tape recorder
3. Unlined paper for drawing
4. Fine point black marker pen for drawing
5. Story Teller's stickers.
6. A "Story Box" which contains at least 4 cards upon which the problem portion of a story is printed (e.g., "Tell a story about someone who has no one to play with.", "Tell a story about someone who got lost from his or her mom.", "Tell a story about someone who fell in a river.", "Tell a story about a little puppy that got lost.")

Procedure

Task 1. Pass out the story books and pick the "Story Tellers" who will receive the stickers. Have the chosen children read the picture stories. Emphasise the new structure by asking the following questions after each reading: "What was she/he thinking?", "What was his/her problem?" and "What was his/her idea for getting happy again?" At the end of the story, ask the children "What was he/she thinking then?".

Task 2. Bring out the "Story box" and explain that inside it are some problems that stories can be about. Explain to the group that these are the kind of stories that older kids tell. (Play this up a bit to motivate the children.) Let the children guess what the stories might be about. Write the new ideas on a blank card and add to the "Story box". Next, have the children pick a partner and explain that each pair will pick a problem card and then (as a pair) they can decide who will tell the problem part of the story and who will think of the idea to solve the problem so that its happy again. Allow the first child to pick a card and help him or her identify the topic. Tape and sketch the story. Say: *"Oh, your story is about a little boy who has no one to play with. Go ahead and tell the story from the pictures. Once...."* Next, have the second member of the pair tell *"the part about the idea he gets to fix the problem so that he feels happy again."* Tape record the child's production and sketch it. Review the story in a manner similar to that described in the "bike story" of Lesson 17.

Task 3. Recycle through each pair of children. If more practice is needed, create more problem story ideas and have the partners switch the portion of the story they will tell.

LESSON 19

Objectives:
1. To build a "conceptual bridge" from a scripted event sequence to a simple plot structure within the framework of story-telling, while also focusing on the mental representations of the main character.
2. To familiarise the children with the mnemonics used to minimise the demands placed on their memory.

Materials:
1. "Books containing the children's transcribed stories from the previous session, accompanied by "picture stories". Make a copy for all members of the group and retain a copy for your records.
2. A tape recorder
3. Unlined paper for drawing
4. Fine point black marker pen for drawing
5. Game called: "The Spinner Game"

Procedure

Task 1. Pass out the story books and pick the "Story Tellers" who will receive the stickers. Have the children read the picture stories. highlight the new structure by asking the following questions after each reading: "What was she/he thinking?", "What was his/her problem?" and "What was his/her idea for getting happy again?" At the end of the story, ask the children "What was he/she thinking then?".

Task 2. Have the children play the "Spinner Game". Tape record and sketch the stories as they are produced. Play as many rounds of the game as interest and time permits.

Spinner Game

Materials:
1. Spinner
2. Problem cards
3. A blindfold

Show the children the spinner and point out that there are four different colours on the dial (blue for sad, red for mad, yellow for scared and green for lonely).

When you spin, the pointer will land on one of the colours. Explain that you also have stacks of cards in the same four colours. If you spin and land on red, you pick a card from the red pack, and if you land on blue, you pick a card from the blue pack. Explain that each card contains the first part of the story. Children should look at the pictures and tell what the problem is. (NOTE: They may require your help to determine what the problem is). Then they should identify what the main character is feeling and think of an idea to solve the problem the main character has. Each child's story should be tape recorded and sketched on the card - including the icons. If the child forgets any of the main points of the story structure which we are encouraging, back track with the story and ask the questions like *"What is so and so thinking at first?..... What is in his mind? What will he do now that he is sad?..etc."* There is no need to focus on differentiating the emotions of mad, sad, lonely or scared. If you do not have a spinner, place the different coloured cards on the table and blindfold the child, spin them around, then stop in front of the table with the cards and have the child pick a coloured card. Then he can get the story card and finish the story.

PROBLEM EXAMPLES:
1. forgot your library book at home and today is the day you should return it (Scared)
2. left the gate opened and your pet got out (Sad)
3. your grandma just moved away (Lonely)
4. someone stole your lunch (Mad)
5. you lost your new ball (Sad)
6. your big brother is doubling you on his bike and he's going VERY fast . (Scared)
7. all your friends are gone away for vacation (Lonely)
8. lost your new skipping rope (Sad)
9. your big brother is mean to you for no reason (Mad)
10. someone broke your new bike (Mad)
11. your friend dares you to climb up VERY high in a tree (Scared)
12. your daddy had to go away on business and you miss him (Lonely)

LESSON 20

Objectives:
1. To highlight the interconnectedness between the action sequence of the story and the internal mental states as represented in the Thinking Clouds.
2. To familiarise the children with the mnemonics used to minimise the demands placed on their memory.

Materials:
1. "Books" containing the transcribed stories from the previous session, accompanied by "picture stories". Make a copy of each story for all members of

the group and retain a copy for your records.
2. A tape recorder
3. Unlined paper for drawing
4. Two fine point magic markers of different colours for drawing (use the non-black one to draw the Thinking Clouds and related icons).
5. Story Teller's stickers
6. A problem-resolution story book.

Procedure

Task 1. Pass out story books and pick the "Story Tellers" who will receive the stickers. Have the chosen children read the picture stories. Highlight the causal relations between the two levels in each of the preceding session's stories by drawing in the directional arrows, as is shown in the example below. The purpose of this activity is to help the children construct an integrated or coordinated representation of the new structure. To accomplish this, ask the following questions: *"What was (protagonist's name) thinking at the beginning of the story?"* (Point to the first frame). *"Right. He was thinking X."* (Take an arrow from the story frame and point it up to the Thinking Cloud when you ask the first question. Put a happy face into the Thinking Cloud and then return the arrow to the story frame. Continue with the story.) *"Then what happened?"* (point to the next two frames) *"Right, and how did that make him/her feel?"* (Connect the story frame to the second Thinking Cloud and input a sad face.) *"So he wanted to get happy again, didn't he, because he didn't like feeling that way. So he thought of a plan....he got an idea."* (Draw a vertical arrow between the second and third Thinking Cloud and place a light bulb into the third Thinking Cloud) *" What was his idea?* (Return the arrow to the story frame.) *Right! He ..... And then how did he feel, what was he thinking?"* (Return to the fourth Thinking Cloud and place a happy face into it). *"Yes! He was thinking .....!"* Repeat the procedure for each story.

Task 2. Read a problem/resolution story book to the children. If the book contains any failed attempts or complications, as might be the case, skip them in this lesson. Have the children tell the story back to you. Tape record and sketch the recalled story. Repeat the procedure outlined in the second half of Task 1.

LESSON 21

Objectives:
1. To highlight the interconnectedness between the action sequence of the story and the internal mental states as represented in the Thinking Clouds.
2. To familiarise the children with the mnemonics used to minimise the demands placed on their memory.

Materials:
1. "Books" containing the transcribed stories from the previous session, accompanied by "picture stories". Make a copy of each story for all members of the group and retain a copy for your records.
2. A tape recorder
3. Unlined paper for drawing
4. Two fine point magic markers of different colours for drawing (use the non-black one to draw the Thinking Clouds and related icons).
5. Story Teller's stickers
6. A set of Thinking clouds with icon cards for each child in the group.

Procedure

Task 1. Pass out the story books. Next, explain that today you're going to retell the story and when you say what the person is thinking and feeling at first, everyone has to try to be the first to pick the right Thinking Cloud, the one with the happy face. Then, when you say the problem, everyone has to try to be the first to pick the Thinking Cloud card with the sad face. Next, when you say the idea for solving the problem, everyone has to try and be the first to pick the Thinking Cloud card with the light bulb; and finally, when you say the solution to the problem, everyone has to try to be the first to pick the Thinking Cloud card with the happy face. The first person to do it each time gets a sticker and whoever has the most stickers at the end wins the game. (NOTE: Try to choose the children who need encouragement, as well as those who are good at the game.).

Task 2. Play a round or two of the Spinner Game, reviewing each story in the same fashion as done in Lesson 20.

LESSON 22

Objectives:
1. To highlight the interconnectedness between the action sequence of the story and the internal mental states of its main character as represented in the Thinking Clouds.
2. To familiarise the children with the mnemonics used to minimise the demands placed on their memory.
3. To solidify the notion that the problem aspect of stories can be about a great variety of subjects.

Materials:
1. "Books" containing the transcribed stories from the previous session, accompanied by "picture stories". Make a copy of each story for all members of the group and retain a copy for your records.
2. A tape recorder

3. Unlined paper for drawing
4. Two fine point magic markers of different colours for drawing (use the non-black one to draw the Thinking Clouds and related icons).
5. Story Teller's stickers
6. Spinner Game
7. Coloured cards (blank)

Procedure

Task 1. Pass out the story books and pick the "Story Tellers" who will receive the stickers. Have these children read the picture stories.

Task 2. Explain to the children that they are going to make up their own story starters and then use them in the game. Invite each child to think of a story problem dealing with one of the following: Being lonely, being mad or angry, being sad, and being scared. Sketch the problems the children have thought of onto the coloured blank cards as follows: blue for sad, red for mad, yellow for scared and green for lonely. Tape record and sketch the story resolutions. Review each story in the same fashion as done in Lesson 20.

LESSON 23

Objectives:
1. To solidify the children's ability to recognize the changing mental state of the main character in a story, that is, the change in the main character's representation.
2. To familiarise the children with the mnemonics used to identify this change, thereby minimising the demands placed on their memory.
Materials:

1. "Books" containing the transcribed stories from the previous session, accompanied by "picture stories". Make a copy of each story for all members of the group and retain a copy for your records.
2. A tape recorder
3. Four puppets, each with their own Thinking Clouds.
4. One set of laminated Thinking Cloud cards with icons.
5. Story Teller's stickers.
6. Stories with a clear cut problem/resolution structure highlighting the the protagonists mental representations.
7. Plastitak to stick the Thinking Cloud cards onto the puppets' Thinking Clouds.

Procedure

Task 1. Pass out story books and pick the "Story Tellers" who will receive the

stickers. Have the children read the picture stories.

Task 2. Show the children the puppets and explain that you want one child to act out a story you tell. Explain that each child will get a turn because you have many stories to tell. Also, explain that in all of these stories, you have to tell what the puppet is thinking and feeling or it might not feel good. As well, at the appropriate times in the stories, they are to pick the appropriate icon cards and place them onto the puppet's Thinking Clouds. Proceed to the reading of the 4 stories. Review each story in turn in a fashion similar to that used in the more recent lessons and highlight the use of the character's thoughts and feelings, noting that it makes a better story.

Rabbit, The Frog

Once upon a time, there was a little frog named Rabbit. his name was Rabbit because that's the noise he made all evening when he was singing in the pond. He said, "Rabbit! Rabbit! Rabbit!" all night because he liked to sing. All his friends asked him to stop singing so much, but he didn't because he liked to sing. Then, all his friends moved to the other side of the pond and Rabbit was all by himself with no one to talk to or to play with. He felt very lonely and he wanted his friends to come back. So he decided that he would stop signing for a little while to see if they would. Sure enough. They did come back and Rabbit was happy again. Now when he sang, he used a little quiet voice.

Reddie Freddie

Once there was a little boy named Freddie. All the boys at school called him "Reddie Freddie" because he had red hair and freckles. They teased him about it all the time and always make fun of him. Freddie felt very sad when the other kids teased him. he decided that he would tell his teacher what they were doing to see if she could make them stop. The teacher had a talk to the whole class and said that it wasn't nice to tease people about how they looked and that they couldn't do it any more. So the boys stopped calling him Reddie Freddie and soon he was happy because the kids were nice to him.

Patty

Once there was a little girl named Patty. She was very happy because she had a lot of toys to play with. But her baby brother was always taking her toys and breaking them. Every time she went in her room to get something to play with, he was there, wrecking it. Patty felt very angry at her little brother. She told her dad about how he was always taking her things and her dad put a hook on her door that was too high for her little brother to reach. Patty could hook it every time she left her room so her little brother couldn't get in. She felt happy now that her toys were safe.

Miss Pinkie

There was a little piggy named Pinkie who lived in a barnyard on a farm. It was a very nice barnyard and Miss Pinkie liked her home. But some of the animals were mean to Miss Pinkie. When she had to walk across the barnyard to get a drink of water, sometimes they chased her and sometimes they pushed her into the mud. Pinkie was scared of the mean animals. One day she was really thirsty so she had to walk across the yard to the water trough. She was sacred by she went anyway. when they came up to her, she said in a loud tough voice, "Leave me alone, you bullies!!!" And then she just walked away. They did leave her alone and now she's not scared any more.

LESSON 24

Objectives:
1. To solidify the children's ability to recognize the changing mental state of the main character in a story, that is, the change in the main character's representation.
2. To familiarise the children with the mnemonics used to identify this change, thereby minimising the demands placed on their memory.

Materials:
1. A tape recorder.
2. Unlined paper
3. Two fine point markers of different colours
4. A set of laminated icon cards
5. Puppets with Thinking Clouds (different from those in the previous lesson, so that the children with not regenerate the same stories.)

Task 1. Lay out the icon cards and present the puppets, noting that they have Thinking Clouds. Remind the children that when telling stories with the puppets they should tell lots about what it thinks and feels so it won't feel bad. Tell them to include the puppet's name and to talk about what the puppet thinks and feels. Next, pair up the children, give each pair a puppet, and have them go off to separate corners of the room to prepare a story. Tell them to do it quietly so that it will be a surprise for the rest of the group when they act out their story with the puppet. As the children are planning their stories, circulate through the group, ensuring that each story includes the expanded setting, as well as the problem, idea and resolution. Once this is completed, have each pair present their story. One child should tell the story while the other acts it out with the puppet. At the appropriate moments, the story teller should hold up the appropriate icon card (which would usually be placed onto the puppet's Thinking Cloud). Tape record the story and sketch it. Finally, review each story in a similar fashion to that used in Lesson 19 and highlight the use of the

character's name and something about what he thinks and feels, noting that it makes the story better.

LESSON 25

Objective:
1. To automatise the use of the mnemonics as a means to consider the character's representations.

Materials:
1. "Books" containing the transcribed stories from the previous session, accompanied by "picture stories". Make a copy of each story for all members of the group and retain a copy for your records.
2. A tape recorder
3. Prepared paper for drawing stories (has boxes and icons drawn in red)
4. One black fine point magic markers
5. Story Teller's stickers
6. Treasure Hunt game

Procedure

Task 1. Pass out story books and pick the "Story Tellers" who will receive the stickers. Have these children read the picture stories.

Task 2. Play the Treasure Hunt game. Remind the children to elaborate on the character's thoughts and feelings. Tape record the stories the children produce. After the game is over, replay the tape of the stories for the children and sketch the action sequence on the paper which has the Thinking Clouds and icons already drawn. Review each story in a fashion similar to that used in Lesson 20 and highlight the use of the character's thoughts and feelings, noting that it makes the story better.

LESSON 26

Objective
1. To conduct an interim assessment of children's performance

Materials:
1. "Books" containing the transcribed stories from the previous session, accompanied by "picture stories". Make a copy of each story for all members of the group and retain a copy for your records.
2. A tape recorder
3. Story Teller's stickers

Procedure

Task 1. Pass out story books and pick the "Story Tellers" who will receive the stickers. Have these children read the picture stories.

Task 2. Ask each of the children to tell you a story about someone who has a problem they want to solve. Tell them you would like them to use all the things they learned in the story sessions you had together. Tape record the stories, but do not sketch them.

Task 3. You may wish to use the remaining time to repeat part of a previous lesson which may help the children you find have the most difficulty.

LESSON 27

Objectives:
1. To solidify the elaborated plot structure using only the Thinking Clouds with icons as memory support.
2. To sure-up any diagnosed weaknesses individual children might have.

Materials:
1. A tape recorder
2. Story book with a problem/resolution structure
3. A set of Thinking Cloud cards with icons
4. The Spinner Game

Procedure

Task 1. Read the book and ask the children to identify the character, what the character was thinking and feeling, what the problem was and how the character felt at that point, how the problem was resolved and how the character felt at that end.

Task 2. Have the children think of alternate ideas and resolutions to the problem presented in the story used in Task 1.

Task 3. Play the Spinner game without the story starters; that is, have the children tell stories about someone who is sad or mad or lonely or scared. Use only the Thinking Cloud cards with icons as a guide. Do not sketch the stories.

LESSON 28

Objectives:
1. To solidify the plot structure, using only the Thinking Cloud cards with icons

as memory support.
2. To elaborate on the idea portion of the story.

Materials:
1. A tape recorder
2. Two story books with a problem/resolution structure

Procedure

Task 1. Read the story to the children. Review it verbally, highlighting the character's name, what he or she thought and felt, the idea for solving the problem and the resolution. Note that all of these pieces make more interesting stories. Explain that when you get an idea for solving a problem you can do it by yourself or you can get someone like your dad or mom or teacher to help you. Review the book, generating alternative ideas -- both independent ones where the character solves the problem alone and dependent ones where the character solves the problem by appealing to another for help.

Task 2. Read the second story book, but stop after the problem has been identified and allow the children to identify the main character's feelings and provide several resolutions to the problem.

LESSON 29

Objectives:
1. To solidify the plot structure, using only the Thinking Cloud cards with icons as memory support.
2. To elaborate on the idea portion of the story.

Materials:
1. A tape recorder
2. Story book with a problem/resolution structure
3. Treasure Hunt Game

Procedure

Task 1. Read the story to the children. Review it verbally, highlighting the character's name, what he or she thought and felt, the idea for solving the problem and the resolution. Note that all of these pieces make very interesting stories. Have the children think of some ideas for solving the problem independently as well as some ideas which involve eliciting the help of someone else.

Task 2. If time permits , play the Treasure Hunt Game to allow the children to practice generating different sorts of ideas. Highlight the nature of these ideas.

LESSON 30

Objective:
1. To solidify the plot structure using only a Thinking Cloud as memory support.

Materials:
1. A tape recorder
2. A Thinking Cloud card

Procedure

Task 1. Make up two or three group stories. Include the character's name, what they were thinking and feeling, the problem , the feeling, the idea for solving the problem and the resolution. Note that all of these pieces make stories longer and more interesting.

LESSON 31

Objectives:
1. To solidify the plot structure, using no memory support
2. To sure-up any diagnosed weaknesses individual children might have.

Materials:
1. A tape recorder
2. Two story books which have simple problem/resolution plots

Procedure

Task 1. Read each book to the group. Review each story verbally, highlighting the character's name, where s/he lived, the problem, the feeling, the idea for solving the problem and the resolution (which includes the character's thoughts and feelings). Note that all of these pieces makes stories longer and more interesting.

END

Some of the tasks in Lessons 1 to 10 were adapted from the following research studies: Flavell et. al. (1981); Perner et. al. (1987); Flavell et. al. (1983); and Wimmer and Perner, (1983).

Lessons 11-31 were adapted from Case and McKeough, 1990