THE PERFORMANCE PROFILE OF CHILDREN FROM A LOW SOCIO-ECONOMIC STATUS ON THE GRIFFITHS MENTAL DEVELOPMENT SCALES – EXTENDED REVISED

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DECLARATION OF AUTHENTICITY

I hereby declare that the content of this treatise represents my own and that any substantial assistance I have received from anyone is indicated in my acknowledgement.

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ABSTRACT

This study, focused on child mental development, has aimed to contribute and provide valuable information to a larger research project that is currently under way to create a set of norms for a South African population on the GMDS-ER. The primary aim of the study was to explore and describe the developmental profile of children from a low socio-economic status, aged between 3 and 8 years 4 months old, on the Griffiths Mental Development Scales-Extended Revised (GMDS-ER). The purpose of the study was to generate information on low socio-economic status and child mental development. A quantitative, exploratory-descriptive research design was employed. The participants were selected through a non-probability, purposive sampling procedure. Information was collated using clinical observations, biographical data, as well as the results of an assessment on the Griffiths Mental Development Scales Extended-Revised. The data were analysed using descriptive statistical tables.

Key concepts: Socio-economic status, poverty, child development, child developmental assessment, Griffiths Mental Development Scales Extended Revised, developmental profile.
CHAPTER 1

INTRODUCTION

The present study falls within the field of developmental assessment. It focuses specifically on investigating the influence of low socio-economic status and poverty on the mental development of children. The assessment utilized in an attempt to determine these effects will be done utilizing the Griffiths Mental Development Scales-Extended Revised. This chapter will contextualise this study by looking at the effects of low socio-economic status, poverty and the developing child as well as the developmental assessment of children with specific reference to the Griffiths Mental Development Scales-Extended Revised.

The aim of the study, as well as the basic outline of the methodology, are provided. This chapter also introduces the concepts and definitions relevant to the discussion of the study. The chapter is concluded with an outline of the chapters that follow.

1.1 Low socio-economic status, poverty and child development

SES refers to one’s access to economic and social resources and the social positioning, privileges, and prestige that derive from these resources (Hauser & Warren, 1997; Mueller & Parcel, 1981). Amongst the many problems facing developing countries like South Africa today are poor health mainly due to economic hardships. Poor health is, among other things, manifested by poverty, environmental neglect, lack of basic health and care, lack of exposure to early developmental stimulation and poor education by poor examination results in schools. These are but a few factors that contribute to developmental delay (Steyn, 1999; Themane, 1997; Walker & Walker, 1977). These problems are acute in provinces that are predominantly rural, like the Eastern Cape and Limpopo Provinces because of their poor socio-economic status (Central Statistics Services, 1996).

The exclusive factors contributing to poverty have a direct effect on school performance, and often this cyclical pattern tends to repeat itself. In an attempt to improve the status of education, a new school system, namely new inclusive education together with an outcomes based approach has been introduced into the school areas from both the government and the private sector, but so far there has been very little success (Central Statistics Services, 1997).

As in other parts of the developed world and developed countries, there is now an awareness that more effort should be devoted to research on primary prevention strategies to
supplement funding projects (Kemper, 1985). This need is even more urgent in developing countries like South Africa, but even more so in those areas which are deeply affected by poverty, poor health and the resultant poor education (Monyeki, 2000). The results of these new systems have today been researched.

Low socio-economic status and poverty remain high in most countries in the world and almost one quarter of all children live in families whose socio-economic status falls below the poverty line. Even in America the poverty rate in 1993, 22.7% was about the same as the 1959 rate for all Americans, and was the same as the 1964 rate for children.

This high rate of low SES amongst children and poverty contradicts a major aspect of the American dream - that the standard of living of each generation will exceed that of the preceding one. Because of slow growth in living standards and rising inequality since the early 1970s, a substantial proportion of the current generation of children are worse off financially than the previous generation. Not only has the child poverty rate risen over the past two decades, but the gap between the living standards of the children of the poor and those of the rich has also widened substantially (Baker & Mott, 1989).

Today, many parents, especially younger ones, lack the economic security that was the norm in the quarter-century following World War II, when economic growth was rapid and the gains were widely shared by all the segments of society. The wages earned by many, especially by workers without a college degree, were lower in the early 1990s than they were two decades ago. In many families, both parents must now work to achieve the level of income that had previously been provided by one worker. While many children now avoid poverty because they have two working parents, increasing numbers of children remain poor because they live in mother-only families that receive little assistance from absent fathers or government programmes (Broman, Nichols & Kennedy, 1995).

Furthermore, government policies have also been cut back. A smaller percentage of disadvantaged children are now removed from poverty than was the case in the early 1970s. Their eligibility for government programmes has been restricted and some benefits have failed to keep pace with inflation (Danziger & Stern, 1990).

In 1994, 40 million South Africans witnessed the birth of democracy in their country, heralding the end of 300 years of colonialism and a half-century of life under an oppressive, apartheid system with its iniquitous Bantustans. For many, particularly black South Africans,
it offered renewed hope - an opportunity to dream again, about prosperity; job opportunities; home ownership; access to water; sanitation and electricity; and health, education and security for their children. Indeed, one of the first decrees of the newly elected president, Nelson Mandela, was a declaration that health care would immediately be available free to all children younger than 6 years and to pregnant women in all government health institutions (Monk, 2003).

A decade later, it is worth reflecting on the fruits democracy has borne for the children of South Africa. Of the 46 million people now living in South Africa (SA), 17 million are children. SA has a population pyramid resembling that of other developing countries with one-third (14.4 million) of the population being children younger than 14 years of age. About 84% of children are black African, 9% of mixed descent (‘coloured’), 6% white and 2% Indian. In 2003, there were just over a million births. Although only 43% of the populace resides in rural areas, two-thirds of South African children are located in these areas. SA is classified as an upper-middle-income country with one of the most skewed income distributions in the world. Poverty still engulfs 49% of the population and income inequality has increased from 1995 to 2001 (Statistics South Africa, Census, 2001).

Despite the inequities of the apartheid system, there was a significant reduction in infant and child mortality rates in SA between 1960 and 1994, mirroring gains achieved in other middle-income countries over the same period. This trend has been reversed since 1994; the infant mortality rate (IMR) and the under-5 mortality rate (U5MR) have increased similarly, with both peaking around 2001 (IMR at 63 per 1000, U5MR at 92 per 1000). A single disease has been largely responsible for this reversal - the human immunodeficiency virus (HIV). Since 2002, both rates appear to be decreasing again, mainly as a result of the impact of the prevention of mother-to-child transmission (PMTCT) programme. Neonatal mortality rates have remained relatively static over the past 30 years, again echoing trends in most other developing and middle-income countries (UNAIDS, 2004).

HIV has transformed paediatric practice in South Africa since the first paediatric patients were seen in 1988. A discipline that once dealt mainly with acute illnesses is now consumed, in most settings, with managing chronically ill and dying children. No disease or illness has dominated child or public health discourse in SA over the past decade as much as HIV/AIDS. Controversy has shrouded the disease, fuelling intense political debate, legal challenges, and dissent among paediatricians and scientists alike on appropriate prevention and management.
strategies, including infant feeding options. AIDS in South Africa remains a highly politicised issue. However, in 2003 the health ministry was forced to provide nevirapine for the PMTCT following a Constitutional Court order instigated by a coalition of AIDS activists and over 250 paediatricians and child health practitioners. In 2004, highly active antiretroviral therapy (HAART) became available for both children and adults in government institutions, but the rollout of this programme has been problematic. The extent of the HIV/AIDS pandemic and its devastating impact on the lives of South African children is, however, non-contentious. A quarter of a million children aged between 0 and 14 years were estimated to be living with HIV in SA by the end of 2003.4 The HIV/AIDS pandemic has placed enormous pressure on existing health services. More than 40% of all deaths of children under 5 years of age are attributable to AIDS (Table 1), and in-hospital mortality rates have more than doubled over the past 10 years. In 2003, 24% of pregnant women aged 15–24 years in the country were HIV positive. It is estimated that 63,000 babies were infected with HIV during 2003 (175 a day) via mother-to-child transmission.3 A PMTCT programme is now available in more than 204 public hospitals and 1055 community health centres throughout the country (UNAIDS, 2004).

As the number of AIDS related deaths increase, the effect on a macrolevel of society becomes evident in family systems, in a transformation of the structure of society. There is an increase in the prevalence of the extended and child-headed family system, as well as the amount of orphans. The orphan pandemic threatens to overshadow the HIV pandemic as both HIV positive and negative children are affected (Monk, 2003). UNAIDS estimates the number of orphans currently at 13.2 million worldwide and that this figure will double by 2010. An increasing number of these orphans are HIV positive (Monk, 2003).

The processes by which poverty negatively affects children are complex. Several processes may account for the relationships between family poverty and related child development problems. Severe economic constraints can reduce the quality and quantity of parenting because of financial and psychological stresses. In addition to personal stresses, poor people often live in “stressful” communities, in which resources that could promote opportunity, mobility and support child development are limited (Pollitt, 1988). Children from low SES receive less attention and stimulation from their parents, which results in a deficit in social skills and knowledge. This deficit in combination with delayed emotional maturity negatively impacts their readiness to learn (Whiteside & Sunter, 2000).
The following section will provide an overview of child development focusing on the assessment measure that was utilised in this study, which is the Griffiths Mental Development Scales-Extended Revised (GMDS-ER)

1.2 Child developmental assessment and the Griffiths Mental Development Scales-Extended Revised (GMDS-ER)

A thorough understanding of child development and the use of a comprehensive, well-researched measure are both vital in the evaluation process. Bondurant-Utz and Luciano (1994) point out that the objective in assessment is to gather data that is representative of the child’s typical functioning. Such an assessment requires the employment of a comprehensive measure, which encourages the child to demonstrate his or her developmental abilities.

In addition, for assessment to be considered useful and valid, the psychometric properties of the measure need to be well researched. This is particularly true in culturally diverse contexts, such as in South Africa. To make a measure more valid, reliable and contemporary, the movement towards constructing tests that are culture fair has become prominent. Culture fair tests contain content based on experiences that are common to different cultures. Assessment tools themselves are a product of a particular socio-cultural environment, and as such may be bias toward the culture from whence they came. Many assessment instruments focus only on a section of development, are standardised for specific ethnic groups to the exclusion of others, or are standardised for specific age groups to the exclusion of others and consequently have fragmented research backing and thus limited generalisability (Luiz, 1994; Schrodér, 2004).

The Griffiths Mental Development Scales-Extended Revised are among the most widely researched tests for the assessment of infants and young children in the world (Luiz, 1994). The Griffiths Mental Development Scales-ER (Foxcroft, 2004) provide a general development quotient in addition to measures of six domains of functioning, each of which is assessed on a separate subscale. These subscales are: Subscale A (Locomotor); Subscale B (Personal-Social); Subscale C (Language); Subscale D (Eye and Hand Coordination); Subscale E (Performance); and Subscale F (Practical Reasoning).

The Griffiths Scales assess children from 2 to 8 years of age. The items on the Griffiths Scales are diverse, tapping the main aspects of a child’s development, and are placed in order
of gradually increasing difficulty and play is experience common to all cultures. Many of the items on the Griffiths Scales are based on natural activities, such as walking, talking and playing (Griffiths, 1970).

1.3 Motivation for the study

Little research has focused on exploring the development of South African children from low socio-economic backgrounds, utilizing the Griffiths Mental Development Scales-Extended Revised. It is hoped that this study will contribute towards the standardisation and norming of the GMDS-ER. The proposed study, focusing on mental development, aims to contribute and provide valuable information for a larger research project that is currently under way, aiming to create a set of norms for a South-African population on the GMDS-ER.

1.4 Aim of the study

The primary aim of the study is to explore and describe the developmental profile of children from a low socio-economic status, aged between 3 and 8 years old on the GMDS-ER. The purpose of the study is to generate information on the correlation between low socio-economic status and child mental development.

1.5 Basic outline of methodology

A quantitative, exploratory-descriptive research design will be employed. The participants will be selected through a non-probability, purposive sampling procedure. Information will be collated using clinical observations, biographical data, as well as the results of an assessment on the Griffiths Mental Development Scales-Extended Revised. Data were analysed using the requisite statistical tables and graphs to describe the performance of children on the six subscales of the GMDS-ER.

1.6 Definition of concepts

1.6.1 Child development

According to current views, child development can be described as the phenomenon of the human child adapting to the demands of the context in which it finds itself. This process takes place within the boundaries of its biological maturation and is often timed according to critical periods of optimal development formed by these constraints (Hjelle & Ziegler, 1992).
1.6.2 Child developmental assessment

According to Allan (1992), child developmental assessment can be defined as the examination of a child’s abilities over a broad spectrum of behaviour, including motor, social and cognitive traits. Brookes-Gunn (1990) stressed that to measure the wellbeing of a child is to measure his or her physical, cognitive, social, and emotional development.

1.6.3 Socio-economic status (SES)

Although there are many ways to define socio-economic status (SES) as a construct, for the purposes of this study it will be referred to in the following way: Socio-economic status (SES) refers to one’s access to economic and social resources and the social positioning, privileges, and prestige that derive from these resources (Hauser & Warren, 1997).

1.7 Chapters of the study

This study consists of six chapters. This present chapter has reflected on the interaction between the constructs of low SES and the development of children. It has also outlined the need for appropriate developmental assessment in the South African context and mentioned the use of the GMDS-ER as the relevant assessment tool in the South-African context with its diverse cultures. The motivation, the aim of the study, as well as relevant concepts have been introduced and defined. It introduces the main concepts utilized in the study and contextualized them. A basic outline of the research methodology has also been briefly discussed.

Chapter 2 will provide an overview of the different child developmental theories. Child development is further explored by looking at its different domains, including physical, motor and cognitive domains. The influence of low SES on child development is also explored in this chapter. Chapter 3 provides an overview of the research done on the original Griffiths Scales and looks at the revision and restandardisation that resulted in the GMDS-ER. Chapter 4 describes the research design and methodology employed in the current study, including the participant’s biographical and demographic information. Chapter 5 will present the results of the research findings, based mainly on the statistical analysis (Statistica) in the form of descriptive statistical tables and graphs.

The statistical findings will be used to describe the performance of children on the six subscales of the GMDS-ER. The final chapter, Chapter 6, will finalise this study by providing
a conclusion to the overall results of this study, the limitations encountered, as well as any future recommendations for further research.
CHAPTER 2

CHILD DEVELOPMENT

2.1 Introduction

This chapter provides an overview of child development. The influence of having a low SES, living in, and its influence on the developing child will be discussed on the different domains of child development, namely physical and motor development, cognitive development, as well as socio-emotional development, will also be covered in this chapter. The different developmental theories and their pioneers will also be discussed in some detail.

2.2 Low socio-economic status (SES), poverty and the developing child

In this unique time of nation building in South Africa, education is seen as the key foundation stone to prosperity and development (Kendall, 1997). However, despite more than a decade of restructuring, low SES has become a huge stumbling block and impacts negatively on cognitive development and social-emotional development is one of the factors that results in an inability of access to address needs by paying attention to scholar transportation, nutrition and different examining system and subject choice. Many differing groups of children still do not receive the quality of education they deserve. Amongst these are children from poverty-stricken backgrounds whose parents literally live below the bread line because of their low socio-economic status (SES). According to Winick (1976), malnourished children invariably come from a lower socio-economic class and a generally more deprived environment.

Socio-economic status (SES) encompasses such factors as parental income, educational level, and degree of literacy, parental occupation, quality of the neighbourhood, and community resources (Gonzalez, 2001). Retrospective studies in developing countries throughout the world suggest that early exposure to poverty interferes with the subsequent learning ability of children, (Herbert, 2005; Olivera, Effland & Hamm, 1993; Rutter & Madge, 1977).

Geltman, Meyers, Greenberg and Zuckerman (1996), McLoyd (1998), and Parker, Greer and Zuckerman (1988) maintain that the impact of poverty on young children is significant and long lasting, limiting their chances of moving out of poverty. They further postulate that
poverty is associated with substandard housing, homelessness, inadequate child care, unsafe neighbourhoods, and under-resourced schools.

The Eastern Cape is one of the poorest provinces in SA where high levels of unemployment and financial constraints promote family conflict often resulting from alcohol consumption by low SES community members. Furthermore, people often use alcohol and other drugs to escape the hardships of everyday life; such behaviour leads to a decrease in inhibitions, and thereby an increase in sexual behaviour (Evian, 1995). People tend to engage in high risk sexual behaviours when intoxicated. There is a natural need for sex and intimacy which results in multiple-partner sexual relationships, behaviour which increases the risk of HIV infection (Evian, 1995). High levels of unemployment cause a growing number of women to generate money through prostitution, putting them at risk. Rising rural to urban migration helps to spread the disease to different areas, and high levels of illiteracy create a barrier to education of the cause and prevention of the disease. With an increasing HIV population, and limited resources, health services are minimal at best, and individuals do not always have access to services that are available (Evian, 1995). These factors all come into play in poverty stricken areas. Therefore poverty creates the conditions that help the spread of HIV, and AIDS further causes poverty. Addressing problems that result from these socio-economic factors would then be a starting point to help reduce the spread of HIV (Sandison, 2005).

Most importantly, poor children are at a greater risk than higher-income children regarding a range of problems, including detrimental effects on intellectual ability (IQ), poor academic achievement, poor socioemotional functioning, developmental delays, behavioural problems and poor nutrition (McLoyd, 1998). Hurt, Braitman, Betancourt, Brodsky and Giannetta (1998) postulate that there is a gulf between low and middle SES children in their performance on just about every test of cognitive development, from the Bayley Infant Behaviour Scales to IQ and school achievement tests. Furthermore, these SES disparities are not subtle. For example, in one study conducted by Hurt et al. (1998), the average IQ of a group of healthy low SES 6 year-olds was 81. Only 20% of the sample scored in the normal range, which in this study was defined as 90 or above. Looking further ahead in the developmental trajectories of poor and middle-class children, a 10% increment in family income was associated with a 16% increase in high school graduation rates for children of middle-income families, but a 600% increase in high school graduation for low income and poor children (Duncan, Yeung, Brookes-Gunn, & Smith, 1998).
On the face of things, it might seem unlikely that factors, such as income, education, and job status, which are typically used to estimate SES, would bear any systematic relationship to physiological processes, such as those involved in brain development. It is, however, well established that SES affects physical health through a number of different causal pathways (Adler, 1994), many of which could play a role in brain development.

It is also clear that poverty is associated with differences in brain function on the basis of the differences in standardized test performance (Noble, Norman & Farah, 2005). Childhood socio-economic status is associated with cognitive achievement throughout life. Studies indicate that SES is an important predictor of neurocognitive performance, particularly of language and executive functions. Socio-economic status (SES) refers to a compound of material wealth and non-economic characteristics, such as social prestige and education. SES is invariably correlated with predictable differences in life stress and neighbourhood quality, in addition to less predictable differences in physical health, mental health and cognitive ability (Zimmerman, 1992).

The relevance of SES to cognitive neuroscience lies in its strong relationship to cognitive ability, as measured by IQ and school achievement, beginning in early childhood. Although IQ tests reflect the function of the brain, they are relatively uninformative concerning the specific neurocognitive systems responsible for performance differences. Language ability differs sharply as a function of SES. Studies have indicated that the average vocabulary size of 3-year old children from professional families was more than twice as large as for those on welfare. Socio-economic status (SES) gradients have been observed in vocabulary, phonological awareness and syntax at many different stages of development. Thus, providing clear behavioural evidence for language system differences (Goldstein, 1990).

Several recent studies have also reported SES differences in prefrontal/executive function. Goldstein (1990) reported that children from lower SES families are, on average, less advanced in the working memory and inhibitory control abilities needed to pass tests of executive function. In addition, low SES children performed poorly on tests of the language system and prefrontal system.

Over the last decade, there has been growing support for the view that there is a ‘critical’ period for brain development from birth through the early years of childhood (Wynder, 1998). Both genetics and environment are likely to be important determinants of brain development (Kotulak, 1998). Tirozzi (1998, p. 248) explains the relationship between these
two influences by describing genes as “the bricks and mortar that build a child’s brain”, and a child’s environment as “the master architect”. The quality of the child’s early life environment plays an important role in determining the level of brain stimulation and thus of brain development. Brain development is fundamental to the child’s school performance and achievement, and probably sets the limits within which his/her future economic, social, educational and health outcomes are likely to occur.

Cognitive ability and development are perceived to be central to an individual’s capacity to learn, and to adapt to and exploit the opportunities available within his/her environment. Evidence that childhood mental health has effects on health in adulthood is limited, to a large degree because relevant data are scarce. One review argues that it is well known that well-adjusted, stable and integrated individuals have lower rates of disease (Friedman, 2000). Furthermore, given that some forms of mental illness have a biological/genetic basis, it is not surprising to find that childhood psychiatric disorders predict adult psychopathology (Amminger et al., 2000). It has also been found that emotional control and cognitive and social capacity are significantly associated with the reduced risk of adult drug use (Stenbacka, 2000). Significantly, Myers (1998) stated that cardiovascular patients with higher intelligence and greater cognitive flexibility have a better prognosis than patients with a lower cognitive ability.

There are also indications that child verbal ability and educational outcomes are positively related to SES variables (Alwin & Thornton, 1984). Duncan, Yeung, Brooks-Gunn and Smith (1998) identified family income in early childhood as having a larger impact on completed schooling than in middle childhood. The quality of the home environment during preschool years has also been found to have a greater impact on children’s mathematics and reading scores, than the home environment, at the time mathematics and reading ability were measured (Baharudin & Luster, 1998). Furthermore, maternal income has been found to influence the cognitive abilities of children, independently of maternal educational status, with the home environment being found to be a mediating factor (Smith, Brooks-Gunn, & Klebanov, 1997). These researchers maintain that children from low income families tend to perform poorly on cognitive measures such as vocabulary tests. Deficits also appear in a variety of indices of cognitive and socio-emotional development, including verbal memory, vocabulary, numeracy and reading achievement and an index of behaviour problems.
There is an emerging body of research suggesting that parental socioeconomic disadvantage is associated with child mental health. Poverty has been associated with child behavioural problems (Pagani, Boulerice, Vitaro & Tremblay, 1999) and with externalising, internalising and attentional problems in children at age 5 (Bor et al., 1997). Children of adolescent mothers have been found to be at higher risk of flattened affect and aggressive behaviour (Zahn-Waxler, Kochanska, Krupnik & McKnew, 1990). Dixon, Charles and Craddock (1998) found that there was an increase in externalising behaviour for children whose parents divorced, although the mediating factor here appeared to be parental conflict. Najman et al. (1997) found that women who had had more than one partner were found to have children with a higher rate of mental health/behaviour problems.

Research has also established that accurate developmental assessment of infants and young children is crucial in the early detection and intervention of any possible developmental delays (Herbert, 2005). Unobtrusive developmental variations detected by such an assessment may be the first indication of chronic disorders and disabilities. Thus, early assessment of the developmentally delayed child is of vital importance for the following two predominant reasons: Firstly, the early identification of a child’s areas of developmental weakness will enable professionals, such as psychologists, occupational therapists, physiotherapists, and remedial teachers to provide appropriate intervention in the pre-school years to develop the areas of developmental delay. Secondly, the child can be encouraged and assisted to capitalise on the identified strengths to ensure optimum development, (Herbert, 2005).

In the section that follows the influence of lower socio-economic status and poverty on child development will be further elaborated on.

2.3 Child Development

According to Kotras (1998), human development is studied for the following reasons: (a) to understand changes that appear to be universal; (b) to explain individual differences among children; (c) to understand how children’s behaviour is influenced by the context or situation in which they live; and (d) to identify possible developmental delays, as early as possible, and in so doing to maximise treatment intervention. Studying human development will thus
provide insights into how children perceive, understand, process, recall and learn aspects of their world.

Development has been defined broadly as patterns of change over time which begin at conception and continue throughout the life span (Keenan, 2002). Mussen, Conger, Kagan and Huston (1984), on the other hand, have defined development more specifically, as the “orderly and relatively enduring changes over time in physical and neurological structures, thought processes and behaviour” (p.4). Hook (2002) broadened the concept of development in children by incorporating transactions between the child and his/her environment. The author stated that development occurs in various domains, such as the biological (changes in our physical being), socio-emotional (changes in our social relationships, emotions and personality) and cognitive (changes in our thoughts, intelligence and language). These spheres of development are intertwined and are mutually dependent; they intersect and combine in such a way that they cannot be separated from one another.

Santrock (2001) highlighted this interdependence by stating that socio-emotional processes shape cognitive processes, cognitive processes promote or restrict socio-emotional processes, and biological processes influence cognitive processes. Although it is useful to study the various processes involved in child development, it is of prime importance to keep in mind that one is studying the development of an integrated child with only one interdependent mind and body.

As their cognition develops, they discover what they can and cannot control; they try to generalize from experience; their reasoning changes from simple associations to the beginnings of logic; and they acquire the language necessary to express their needs, thoughts and feelings. The acquisition of language occurs within the framework of the developing cognitive processes that have been explored. Speech involves the coordination of various teams of muscles of the vocal mechanism. It also requires sufficient mental preparation with associated meanings to the sounds produced (Salkind, 1985). Language itself is thus not just speech that is produced, but is the internal process that is used for thinking, and is vital to the way in which individuals accumulate knowledge. The crystallisation of concepts, the structuring of thought, and the communication of ideas are promoted by language (Kotras, 2003).

According to Kail and Cavanaugh (2000), there are four interactive forces that are fundamental to development. When combined, they form a framework in which development
occurs. These include biological forces, psychological forces, socio-cultural forces and life-cycle forces. They further stipulate that each individual is a unique product of a combination of these forces. Children, in particular, differentially experience the influences of culture, language, socio-economic status (SES), urban-rural residence, and experience their own genetic and nurturing influences. All these factors set the stage on which development occurs (Kail & Cavanaugh, 2000). According to Nuttal (1992), these areas are mutually dependent and inseparable, as each domain influences and is influenced by others.

The different domains of child development, namely physical and motor development, cognitive development, socio-emotional development as well as the relevant theoretical approaches pertaining to the process of child development, will be discussed in this section. Also, the impact/effect of low SES on the different domains of child development will be elaborated on. These domains were recognised and used by Ruth Griffiths (1970) when she developed the Griffiths Scales of Mental Development. Separating physical-motor and perceptual development from cognitive development in preschool children is difficult, as almost everything a child does from birth onwards lays the basis, in some way, not only for later physical-motor skills, but also for cognitive processes and social and emotional development (Craig, 1996). By better understanding the development of young children in these specific domains, the interpretation of test results and the understanding of their behaviour and overall functioning in their environment will be facilitated.

2.3.1 Physical and Motor Development

According to Kaplan (1998), the expanding motor abilities of preschoolers allow them to attend to what is going on around them, instead of having to concentrate on how they walk and hold things. Preschoolers can participate in many physical activities, satisfying some of their curiosity about the world and learning from their experiences. Their physical skills give them more independence. They interact more frequently with other children and learn from these social interactions. Many children attend a preschool in which their new physical and sensory abilities are used as tools to encourage social and cognitive growth (Kaplan, 1998).

By the beginning of the early childhood period, children can walk with ease. They are as likely to run as to walk, their movements are smoother, and they turn corners more easily. Large muscles are still much better developed than fine muscles, but by the age of four, the child can hold a pencil like an adult and can fold a piece of paper diagonally (Heinecke, 1979). Children at this stage master many motor skills, including running, jumping, hopping,
skipping and climbing. The advances in fine motor control are also impressive, although fine motor control lags behind gross muscle development and control. The more subtle development of fine motor control shows itself in the way a child controls a crayon or pencil. Babies use their entire fist. Toddlers progress to holding the crayon fairly well but use their wrist for drawing. By about age 5, preschoolers have improved to the point where they are now holding the crayon with more skill and using the small muscles in the fingers for control. Both maturation and practice are responsible for this improvement in control and coordination (Kaplan, 1998).

2.3.1.1 Effect of low SES on the physical and motor development of children

SES has a tremendous impact on the developing child. It encompasses factors such as parental income, educational level, and degree of literacy, parental occupation, quality of the neighbourhood, and community resources (González, 2001). The examination of the effect of lower SES on a physical level may be done from a nutritional perspective as this involves the economic status of the household which is known to be a strong determinant of nutritional status (Smith, 2004). It has been found that infants born to malnourished mothers tend to be smaller in size, and are at increased risk of poor growth and development (Gillespie, 1997). This makes them more vulnerable to infections in their first year, and more likely to develop serious developmental problems (Berg, 2000).

Not only does malnutrition impact in-vitro development, but it plays a pivotal role after birth. Poor nutrition usually leads to a general retardation in growth. Thus, lower SES and malnutrition place children in a disadvantaged position for physical development (Siegelman & Rider, 2003). Malnutrition remains a major problem in SA. In 1999, some 10% of children aged 0–9 years were underweight, 21% stunted and 3% wasted. Some 10–13% of hospitalised children are severely malnourished, with many (over 80% in one rural hospital) associated with HIV. The low birth weight rate, estimated to be 15% nationally, is not as high as in some African countries. There are also high levels of micronutrient deficiency - a 1994 survey found 33% of children under 6 years had subclinical vitamin A deficiency, 21% were anaemic, 10% had iron deficiency and 5% had iron deficiency anaemia.

Accidents and injuries are the foremost cause of mortality in children over 5 years of age in South Africa. Road traffic accidents account for a third of deaths in the 5- to 9-year age group. Children are rarely the cause of road traffic accidents but suffer as pedestrians, cyclists and passengers. Much of this mortality is preventable; environmental hazards include lack of
pavements and pedestrian crossings, and poor lighting. A recent report by the World Health Organisation indicated that the African region had the highest road traffic death rate in 2002, estimated at 28.3 per 100,000 population. SA is no different; poor driver education and vehicle maintenance, and lack of law enforcement being the most easily identifiable causes.

Paraffin is a fuel commonly used for cooking, lighting and warmth in poorer households. It is accidentally ingested by an estimated 20,000 South African children each year. Poisoning rises steeply during the summer months when children are thirsty. Again, simple interventions such as child-resistant safety caps on paraffin bottles can effectively decrease ingestion rates (by 50%) and are cost-effective, but are not widely used because of cost constraints.

Measures of physical development include cross-sectional assessments of height, weight, triceps skinfold, and subscapular skinfold (Jones et al., 1985) and longitudinal measurement of stunting (low height), wasting (low weight), and overweight (Miller & Korenman, 1993). The use of large national samples by Jones, Miller and Korenman, resulted in their mutual finding that childhood poverty constrains physical development, and is generalizable to the population at large.

However, the magnitude of the effect is not well established. Jones, Miller and Korenman’s research, based on repeated cross-sectional measures of poverty and developmental status, does not establish clearly the underlying causal direction of the magnitude of the effect. Their methodological approach is better suited to causal inferences. Its measure of childhood poverty status reflects conditions that predate its measure of physical development. This is because they have more comprehensive and precise measures of childhood poverty that make finer distinctions in economic levels and include a long-term as well as a short-term measure of poverty status (Jones et al., 1985).

2.3.2 Cognitive Development

Cognitive development may be divided into the development of cognitive processes that include memory and planning, and language acquisition. These elements are mutually dependent, with milestones in cognitive processes paving the way for progress in language development (Sandison, 2005). Three theorists who have made invaluable contributions to the understanding of the development of cognition are Piaget and Vygotsky.
their theoretical contributions to child cognitive development will be elaborated on below as they are of particular relevance in the context of this study. This section will be concluded by looking at Maslow’s hierarchy of needs and how it relates to the learning of children from a low SES.

2.3.2.1 Piaget’s Theory of Cognitive Development

According to Piaget, development involves the continuous alteration and reorganization of the ways in which people deal with the environment (Piaget, 1970). Development is defined by four principal factors: maturation, experience, social transmission, and the process of equilibration. Maturation is the gradual unfolding of our genetic plan for life. Experience involves the active interaction of the child with the environment. Social transmission refers to the information and customs that are transmitted from parents and other people in the environment to the child. Equilibration refers to the process by which children seek balance between what they know and what they are experiencing. When faced with information that calls for a new and different analysis or activity, children enter a state of disequilibrium. When this occurs, they change their way of dealing with the event or experience, and a new, more stable and advanced stage of equilibrium is eventually established. In this way, children progress from a very limited ability to deal with new experiences to a more mature, sophisticated level of cognitive functioning (Kaplan, 1998).

Piaget did not believe that children are simply passive receivers of stimulation. Children interact actively with the environment, and their active experiences impel them to new heights in cognitive functioning and action. The child’s cognitive development is based not only on information directly or formally received from parents and teachers, but also on the child’s personal experiences (Kaplan, 1998).

Piaget (1954) argued that children’s cognitive development can be viewed as occurring in a sequence of four stages namely (i) the sensorimotor stage; (ii) the pre-operational stage; (iii) the concrete operational stage; and (iv) the formal operational stage. For the purposes of the current study, more emphasis will be given to the Pre-operational stage within which the sample of the study falls, and the remaining stages will be discussed briefly.

(i) The Sensorimotor Stage

Between birth and about two years of age, children investigate their world using their senses (vision, hearing, etc.) and motor activity. They develop object permanence, the
understanding that objects and people do not disappear merely because they are out of sight. The child’s abilities in this stage are limited by an inability to use language or symbols (things that stand for other things). Children must experience everything directly through their senses and through feedback from motor activities (Kaplan, 1998).

In Piaget’s presentation of sensorimotor behavioural development, the first two years are divided into two sub-stages: namely (1) the active extension and application stage, and (2) the transition to symbolic thought stage. These two stages are described below.

1. Active extension and application

During the sensorimotor stage, the active extension phase is between the end of the first year and the end of the second year. From the perspective of the child, his or her development at 12 months are true achievements, and at that point the child sees no reason to ever want a better system than the one now in place. There is a sense of confidence and self-satisfaction. The child is fearless in taking on many challenges extending the now highly elaborated and organised system. There are assumed to be maturational shifts in the nervous system that prepare the way for each transition into a new stage (Piattelli-Palmarini, 1980). This is why Piaget described the first 18 months as the most “creative” of the stages. The newborn has the least existing structure to work with, yet constructs a system for gathering and organizing knowledge worthy of great admiration (Richardson, 1998).

2. Transition to symbolic thought

The last substage of sensorimotor behaviour is described as the beginning of symbolic thought. Several new behaviours are associated with the transition out of sensorimotor behaviour and into pre-operations including speech, symbolic play, deferred imitation and imagery (Ginsburg & Opper, 1988). The broad, system-wide shift that underlies these changes is assumed to be the availability of the symbolic capability in children. This permits the child to defer response, reflect on his or her own behaviour, and represent events and experiences symbolically, keeping them available for later use in ever more organised symbol systems (Gardner, 1983).

A child can now construct a system for achieving such challenging activities as constituting symbols, learning to speak, and creating imaginary situations based on the available sensorimotor structures (Fodor, 1980). An 18-month old child’s effort to build a fully consolidated sensorimotor system and elaborate on it in numerous ways may provide
internal signals to the central nervous system to extend its capabilities along promising pathways, called the “sculpting” of the nervous system. The remarkable shift to symbolic thought has been called the “Copernican Revolution” of early childhood by Piaget. This represents a transformation from the purely egocentric towards a more reflective understanding of oneself as an object among objects. To achieve this perspective, a child must first begin to have a sense of his or her own reality, as representing a system among systems, an object among objects, an entity among entities, a person among persons. The ability to mentally distance oneself from real-time experiences is an achievement of monumental experience, making possible the development of virtually all reflective thought structures (Ginsburg & Opper, 1988).

(ii) The Pre-operational Stage

As children move from the sensorimotor to the pre-operational stage, which spans ages 2 to 7, there is an increase in mental presentation. Although infants have some ability to represent their world, this capacity blossoms in early childhood (Berk, 2003). Piaget acknowledged that language is our most flexible means of mental representation. By detaching thought from action, it permits far more efficient thinking than was possible earlier. Despite the power of language, Piaget did not believe that it plays a major role in children’s cognitive development. Instead, he claimed that sensorimotor activity leads to internal images of experience, which children then label with words (Piaget, 1970). In support of Piaget’s view, children’s first words have a strong sensorimotor basis. They usually refer to objects that move or can be acted on, or to familiar actions. Also, certain early words seem to depend on non-verbal cognitive achievements. For example, at about the time toddlers master advanced object-permanence problems, they use disappearance words such as “all gone” (Gopnik & Meltzoff, 1987).

The distinct manner in which preschoolers think was described by Piaget, who argued that children from age 2 to age 7 years progress through what he called the pre-operational stage. It is a stage marked by many advances but also many limitations (Kaplan, 1998). By the time children enter the pre-operational stage, they can use symbols. They can use one thing to represent another. Children may use a spoon to represent a hammer. Children can also use language. Words represent particular concepts and objects. Children have the ability to observe an act and imitate it at a later time, a concept called deferred imitation (Kaplan,
Preschoolers often reason differently from adults. Preschool children reason from particular to particular, called transductive reasoning. The child’s understanding of causality is based on how close one event is to another. The preoperational child does not understand that an object can be larger than one thing and at the same time smaller than another (Kaplan, 1998). Most preschool children can concentrate on only one dimension at a time. This is known as centring. Preschoolers rely on a visual comparison and believe that a tall, narrow glass contains more liquid than a short, fat cup. They can attend to only one measure at a time (e.g., length or width), and appearances confuse them. Preoperational children often use height as a means of estimating age. The taller the person, the older the child thinks he is. They centre on size and height cues.

When they are not distracted by these cues they can use others, such as facial characteristics, which are likely to lead to a better guess (Kaplan, 1998). According to Kaplan (1998), preschoolers are sometimes confused by the appearance of objects. Preschoolers are perception-bound, basing their judgements on how things look to them at the present time, and they have difficulty going beyond visual information. The ability to separate reality from appearance increases markedly between 3 and 5 years of age. However, the appearance-reality difficulty depends on the type of situation presented to the child (Gopnik & Astington, 1988). Underlying all the child’s reasoning is a basic egocentrism. Piaget argues that children see everything from their own point of view and are not capable of taking someone else’s view into account (Gillespie, 1997). Young children believe that everything has a purpose that is understandable in their own terms and relevant to their own needs. Preschoolers see the entire world as revolving around them.

(iii) The Concrete Operational Stage

Children start elementary school at the beginning of middle childhood and their cognitive development is naturally a great concern. Children’s abilities to pay attention, remember what they learn, and use information and skills to solve problems are crucial to school success. As children enter the first grade, the long preoperational stage is drawing to a close, and children are entering the concrete operational stage (Kendall, 1998). During this stage, which lasts from age 7 to about age 12, preoperational reasoning is gradually overcome. Children become less egocentric and can see things from other people’s point of view. Children in this stage also develop an understanding that an 8-ounce cup and an 8-ounce glass hold the same
amount despite their different appearance. However, the child still has difficulty with abstract terms such as freedom and liberty, and cannot reason in a scientific manner (Kaplan, 1998).

(iv) The Formal Operational Stage

This is the last Piagetian stage of cognitive development, in which a person develops the ability to deal with abstractions in a scientific manner (Kaplan, 1998). Between the ages of about 11 or 12 and 15 years, many adolescents enter the formal operations stage and develop some interesting capabilities. Adolescents engage in hypothetico-deductive reasoning, the ability to form a hypothesis, which then leads to certain logical deductions (Piaget, 1970).

2.3.2.2 Vygotsky’s Socio-cultural Theory

This section will cover the socio-cultural theory which embraces the development of language in children, pioneered by Vygotsky. This will inform the reader of a view of the development of language in children within a particular social context. The concept of social understanding will also be discussed in detail. This section will be divided into: 1) Vygotsky’s theory and social understanding, and 2) Five Vygotskian ideas.

1. Vygotsky’s theory and social understanding

Vygotsky’s theory postulates that language development broadens preschoolers’ participation in dialogues with more knowledgeable individuals. These, in turn, encourage them to master culturally important tasks (Berk, 2003). His theory may be applied at any age on the child’s developmental spectrum. He believed that cognitive growth results when the child is exposed to information that falls within the zone of proximal development (ZPD). This is the level at which a child can virtually comprehend a task alone. As experts assist children with tasks within their zone of proximal development, children integrate the language of these dialogues into their private speech and use it to organise their independent efforts (Berk, 2003). Skills outside the zone are either well mastered or still too difficult (Sandison, 2005). Thus, learning is collaborated with more knowledgeable companions. Learning begins as a social process involving two people, and becomes a cognitive process in one, as the child develops skills and gains the ability to function intellectually independently once these skills are internalised (Sandison, 2005).

According to Tomasello (2005), human beings attain levels of social understanding whose sophistication is unknown elsewhere in the animal kingdom. Research on the theory-of-mind reveals that the cognitive processes underlying these forms of understanding are
unlikely to be attributable to a unitary social-cognitive capacity (Nelson, 2004). There is evidence that any genetic component to social understanding is considerably weaker than the social-environmental variables that have been proposed to influence the process of social understanding. The evidence for social influences on social understanding development makes it clear that children’s developing understanding of others is determined by their ability to draw on pre-existing social cognitive and general cognitive resources (Fodor, 1992; Leslie, 1991). A number of proposals have been made for psychological capacities and qualities that are likely to play their part in social understanding. Simulation theorists have suggested that social understanding depends on individuals’ ability to project themselves imaginatively into the perspectives of others and simulate their mental processes. This therefore would suggest that children’s pre-existing imaginative capacities are likely to constrain their social cognitive reasoning abilities (Harris, 1989).

2. Five Vygotskian ideas

Vygotsky proposed at least five ideas relevant to explaining the emergence of social understanding. The first idea that can be useful for accounts of social understanding is that of internalization. A view of social understanding development, as involving the gradual and progressive internalization of interpersonal exchanges, can help make sense of the growing evidence that: children’s understanding of others is developmentally rooted in their experience of social interaction. Vygotsky’s ideas about internalization involve a concept that is richer than that of social learning or the assimilation of the information that is made available in social contexts (Nelson, 1996).

The second concept that can help in understanding social understanding development is that of the zone of proximal development, which describes the difference between what children can achieve in isolation and what they can achieve with expert guidance. This notion allows us to understand how caregivers have a role in providing alternative perspectives on reality in such a way that they can be readily assimilated by children with whom they are interacting (Wood, Bruner & Ross, 1976).

A third relevant Vygotskian idea is that of naïve participation, in which, with adult guidance, children are drawn into practices that they will only later come to understand. For example, Bruner (1975) described how infants are initially able to agree with adults on a word’s correct use before they understand its meaning. Applying this idea to children’s use of mental-state terms, Nelson (1996) notes that children can use such terms before they
understand the concepts that constitute their referents. Carpendale and Lewis (2004) maintain that fragile social understanding with the right sort of experience can develop into a full conceptual understanding of the mind.

Fourthly, the role of semiotic systems, such as natural language, in mediating and enhancing children’s developing social understanding can be considered in the light of Vygotsky’s idea of language as a psychological tool that can augment pre-existing cognitive capacities. The term mediation has a long history in the behavioural sciences, frequently being used to describe a situation where one entity plays a causal role in the relation between two other entities. In a socio-cultural theoretical sense, mediation can refer to the process whereby individuals’ understanding is refracted through the experience of others (Chesnokova, 2004). In a Vygotskian sense, mediation involves the use of culturally derived psychological tools, such as utterances in spoken or sign language, in transforming the relations between psychological inputs and outputs. Thus, the use of semiotic mediation in representing and reasoning about the mental states of others can crucially offset some of the cognitive challenges of these processes (Wertsch, 1980).

The fifth idea concerns the enculturation, according to which exposure to cultural norms of explaining behaviour allows children to “internalize the folk psychology of their particular culture” (Astington & Olson, 1995). Astington (2004) noted that enculturation accounts do not necessarily mean that children are passive participants in the process of absorption of cultural norms.

It has been found that children from lower SES are generally at an increased risk scholastically, and show a higher tendency towards developing language delay (Astington, 2004).

2.3.2.3 The effect of low SES on the cognitive development of children

The extent to which childhood poverty affects cognitive development is not firmly established. However, research on this topic suggests detrimental effects on intellectual ability (IQ), maths abilities, reading abilities, and generally learning abilities. In addition, considerably more research is needed before the magnitude of the effects can be accurately measured. Miller and Korenman’s (1993) data include a number of measures of children’s cognitive abilities; however, it is more common to have only one indicator. “Cognitive ability” is difficult to measure, and several indicators of different aspects of ability are
needed. In addition, different aspects of cognitive ability appear to develop at different rates during childhood. For this reason, many of the standard indicators of cognitive ability are age-specific. This poses a major challenge to measuring the development of cognitive ability over time and the measurement instrument itself changes (Miller & Korenman, 1993).

Over the last decade, there has been growing support for the view that there is a ‘critical’ period for brain development from birth through the early years of childhood (Wynder, 1998). Both genetics and environment are likely to be important determinants of brain development (Kotulak, 1998). Tirozzi (1998, p. 114) explains the relationship between these two influences, by describing genes as “the bricks and mortar that build a child’s brain”, and a child’s environment as “the master architect”. The quality of the child’s early life environment plays an important role in determining the level of brain stimulation and thus brain development. Brain development is fundamental to the child’s school performance and achievement, and most likely sets the limits within which his/her future economic, social, educational and health outcomes are likely to occur (Kotulak, 1998).

Alwin and Thornton (1984) found that child verbal ability and educational outcomes are positively related to SES variables. Duncan, Yeung, Brooks-Gunn and Smith (1998) identified family income in early childhood as having a larger impact on completed schooling than in middle childhood. The quality of the home environment during preschool years has also been found to have a greater impact on children’s mathematics and reading scores, than the home environment at the time that mathematics and reading ability were measured (Baharudin & Luster, 1998). Maternal income has been found to influence the cognitive abilities of children independently of their maternal educational status, with the home environment being found to be a mediating factor (Smith, Brooks-Gunn, & Klebanov, 1997). Children born to generally lower SES and teenage mothers appear to be at increased risk for impaired or lower IQ scores (Kenny, 1995) and poorer linguistic outcomes (Spieker & Bensley, 1994).

Gonzalez (2001) maintains that the availability of educational resources along with the quality of the child’s psychosocial rearing environment has an effect on a child’s cognitive development. Socio-economic status (SES) directly affects these factors in terms of income level, the time the caregivers spend with their children, and the level of stimulation they provide (Gonzalez, 2001). The caregiver’s ability to create a home environment of high
quality is a very individual choice, and may be understood as personal psychological factors interacting with SES, such as their educational status, marital status, level of marital conflict, social class, and income level (Wachs, 2004). The caregiver’s ability to create this environment is critical, as the quality of the child’s early life environment plays a determining role in the child’s level of brain stimulation and thus of the brain development (Najman, Bor, Ocallag, Williams & Shuttlewood, 2004).

Research has found that children from lower SES are generally at an increased risk scholastically, and show a higher tendency towards a delay in developing language. These children have a tendency towards lower general ability and towards attentional problems (Johnson, 1989).

Erickson’s psychosocial developmental theory and its psychosocial stages will be briefly discussed below.

2.3.3.1 Erickson’s Psychosocial Developmental Theory

Erickson (1968) argued that human beings develop according to a preset plan called the epigenetic principle, which consists of two main elements. Firstly, personality develops according to predetermined steps that are maturationally set. Secondly, society is structured so as to invite and encourage the challenges that arise at each particular stage.

Maturation brings about new skills that open new possibilities for the person, but also increases society’s demands on the individual’s functioning. Societies have developed ways to meet the person’s new needs at each step in the maturation process, such as parental care, schools, and occupations (Kaplan, 1998). According to Erickson (1968), each individual proceeds through eight stages of development from the cradle to the grave. Each stage presents the individual with a crisis. If a particular crisis is handled well, a positive outcome ensues. If it is not handled well, the outcome will be negative. Few people emerge from a particular stage with an entirely positive or negative outcome (Hjelle & Ziegler, 1992). Erickson argues that a healthy balance must be struck between the two extremes. However, the outcome should tend toward the positive side of the scale. The resolution of one stage lays the foundation for negotiating the challenges of the next stage (Kaplan, 1998).

For the purposes of this study, more emphasis will be placed on the second, third and fourth psychosocial stages of development, as the sample of the study falls within that age range.
(i) Autonomy versus Shame and Doubt

The acquisition of a sense of basic trust sets the stage for the struggle to attain a certain degree of autonomy and self-control and to avoid shame, doubt, and humiliation. This period parallels Freud’s anal stage and unfolds during the second and third years of life. For Erickson, through interaction with parents during toilet training, the child discovers the difference between holding as a form of caring and holding as a destructive form of restraint.

The child also learns to distinguish between letting go in the sense of a relaxed “letting it be”, and letting go as a type of destructive release. This stage, therefore becomes decisive for the ratio of goodwill and wilfulness. A sense of self-control without any loss of self-esteem is the ontogenetic source of confidence in free will. On the other hand, a sense of over-control and loss of self-control can give rise to a lasting propensity for doubt and shame (Hjelle & Ziegler, 1992). Prior to this stage, children are almost completely dependent on others for their care. However, as they rapidly gain neuromuscular maturation, language, and social discrimination, they begin to explore and interact with their environment more independently. In particular, they feel pride in their newly discovered locomotor skills and want to do everything themselves.

There is a tremendous desire to explore, choose, and manipulate, coupled with an attitude toward parents of ‘let me do it’ and ‘I am what I will’ (Kaplan, 1998). In Erickson’s view, satisfactorily meeting the psychosocial crisis of this stage depends primarily on the parents’ willingness to gradually allow children the freedom to control those activities that affect their lives. At the same time, Erickson stresses that parents must maintain reasonable but firm limits in those areas of children’s lives that are either potentially or actually harmful to themselves or destructive to others (Hjelle & Ziegler, 1992). Erickson regards the child’s experience of shame as something akin to rage turned inward, because the child has not been allowed to exercise autonomy and self-control. Shame may come about if parents are impatient and insist on doing for children what they are capable of doing for themselves; or conversely, if parents expect of children what they are not capable of doing themselves.

It is only when parents are persistently overprotective or insensitive that children acquire a dominant sense of shame with respect to others and a dominant sense of doubt about their own effectiveness in controlling the world and themselves. Such children are conscious of being scrutinized or of being essentially helpless, rather than feeling self-confident about their ability to cope effectively with the environment. They are uncertain of their willpower.
and of those who would dominate and exploit it. The result is a psychosocial attitude of self-doubt, humiliation, and powerlessness (Kaplan, 1998). Erickson believes that the attainment of a stable sense of autonomy adds substantially to the child’s sense of trust. This interdependence of trust and autonomy may sometimes impair future psychological growth. For example, children who have acquired a “shaky” sense of trust may, during the autonomy stage, become hesitant, fearful, and insecure about asserting themselves. This may result in them continuing to seek help and encourage others to do things for them. As adults, Erickson finds that such people are likely to manifest obsessive-compulsive behaviour to ensure the control or paranoid apprehension of secret persecutors (Hjelle & Ziegler, 1992).

(ii) Initiative versus Guilt

This is the final psychosocial conflict experienced by the preschool child during what Erickson calls the “play age”. This stage extends roughly from about age four to entry into formal school. This is when the child’s social world challenges him or her to be active, to master new tasks and skills, and to win approval by being productive. Children also begin to assume additional responsibility for themselves and for that which defines their world (toys, pets, and, occasionally, younger siblings). They become interested in the work of others, in trying out new things, and in assuming the responsibilities available in the society around them. The facility for language and motor skills makes possible associations with peers and older children beyond their immediate home environment, thus allowing participation in a variety of social games (Hjelle & Ziegler, 1992).

This is the age when children begin to feel that they count as persons and that life has a purpose for them. “I am what I will be” becomes the child’s dominant sense of identity during the play age. Initiative adds to autonomy the quality of undertaking, planning, and attacking a task for the sake of being on the move, where before self-will, more often than not, inspired acts of defiance or, at any rate, protested independence (Erickson, 1963, p. 155). Whether children will leave this stage with a sense of initiative favourably outbalancing their sense of guilt depends largely upon how parents react to their self-initiated activities. Children who are encouraged to undertake their own activities have their sense of initiative reinforced. Initiative is further facilitated when parents acknowledge their children’s curiosity and do not ridicule or inhibit fantasy activity.

Erickson indicates that children become increasingly goal-oriented in this stage, as they begin to identify with people whose work and personalities they can understand and admire.
Their learning is vigorous and they begin making projects (Hjelle & Ziegler, 1992). In psychosocial theory, the sense of guilt in children is caused by parents who are unwilling to allow them the opportunity of completing tasks on their own. A sense of guilt is also fostered by parents who employ excessive amounts of punishment in response to the child’s urge to love and be loved by the opposite-sexed parent. In any event, the child who is immobilized by guilt experiences feelings of resignation and unworthiness. Such children are fearful of asserting themselves, hang on the fringes of groups, and rely unduly on adults. They lack the purpose or courage to establish and pursue tangible goals. Erickson also suggests that a persistent sense of guilt may evolve into a variety of adult forms of psychopathology, including generalized passivity, sexual impotence or frigidity, and psychopathic acting out (Hjelle & Ziegler, 1992). According to Erickson, the degree of initiative acquired in this phase of the child’s life is related to the economic system of the community. The child’s future potential to work productively and achieve self-sufficiency within the context of his or her society’s economic system depends markedly on the ability to master this psychosocial stage (Kaplan, 1998).

(iii) Industry versus Inferiority

The fourth psychosocial period occurs from about 6 to 12 years of age. During this stage, the child is expected to learn the rudimentary skills of the culture via formal education. This period of life is associated with the child’s increased powers of deductive reasoning and self-discipline. The child’s love for the parent of the opposite sex and conflict with the same-sexed parent are typically sublimated and expressed by an inner desire to learn and to be productive (Kaplan, 1998). According to Erickson, children develop a sense of industry when they begin to comprehend the technology of their culture through attending school. The term “industriousness” captures the major developmental theme of this period because children are now preoccupied with the manner in which things are made and operate.

Such interest is reinforced and facilitated by people in their neighbourhoods and schools who introduce them to the “technological elements” of the social world by teaching and working with them. The child’s ego identity is now “I am what I learn” (Hjellle & Ziegler, 1992). The danger of this stage lies in the potential development of a sense of inferiority or incompetence. If children doubt their skill or status amongst their peers, they may be discouraged from pursuing further learning (attitudes toward teachers and learning are instilled during this period). A sense of inferiority may also develop if children discover that
their gender, race, religion, or socioeconomic status, rather than their own skill and motivation, is what determines their worth as persons. Therefore, a genuine sense of industry includes a feeling of being interpersonally competent, the confidence that one can exert positive influence on the social world in the quest for meaningful individual and social goals. The psychosocial strength of competency thus underlies the basis for effective participation in the social-economic-political order (Hjelle & Ziegler, 1992).

**2.3.3.2 Socio-emotional Development**

According to Hymovich and Hagopian (1992), infants and young children must learn to master tasks related to early socialisation, developing trust in infancy through attachment and separation, and developing autonomy in preschool years through independent action. The influence of lower SES during these early years can interfere with the mastering of any of these tasks, through impacting on the interaction of caregiver and child. Caregivers are affected by factors such as educational level, marital status, marital disruption and unemployment which, along with economic difficulties, may create stress (González, 2001). The accumulative strain may interfere with the caregiver’s nurturing ability. This nurturing ability is vital to the pattern of caring that is formed between caregiver and child. The psychological characteristics of the caregiver, in terms of academic and social skills, may mediate the effect of poverty in determining this pattern. However, for many within this population group, caring patterns are negatively impacted, resulting in emotional distance (Hill & Sandfort, 1995).

There is an emerging body of research suggesting that parental socioeconomic disadvantage is associated with child mental health. Poverty has been associated with youth delinquency and with externalising, internalising and attentional problems in children at age five (Pagani, Boulerice, Vitaro & Tremblay, 1999). Similar findings have been noted for an older child cohort (Zubrick et al., 1995).

Younger and/or single mothers are disproportionately represented in the lowest income groups. Both of these groups may have higher rates of marital conflict and parenting practices which may lead to increased levels of child mental health impairment (Najman et al., 1994). Children of adolescent mothers have been found to be at higher risk of flattened affect and aggressive behaviour (Zahn-Waxler, Kochanska, Krupnik & McKnew, 1990).
Divorce, separation, and single parenthood may impact negatively on the developing child in a number of ways. These include: the decreased wellbeing of the custodial parent, following a substantial increase in domestic and financial responsibilities; increases in spousal conflict; economic strain; changes of residence; and, the entrance and or departure of one or more adults into the child’s life as a consequence of the development of new intimate relationships for the parents (Benzeval, 1998). Dixon, Charles and Craddock (1998) found that there was an increase in externalising behaviour for children whose parents divorced, although the mediating factor appeared to be parental conflict. Najman et al. (1997) found that women who had had more than one partner were found to have children with a higher rate of mental health/behaviour problems.

2.3.3.3 Maslow’s Hierarchy of needs

Psychologist Abraham Maslow first introduced his concept of a hierarchy of needs in his 1943 paper “A Theory of Human Motivation” and his subsequent book, Motivation and Personality. This hierarchy suggests that people are motivated to fulfil basic needs before moving on to other needs.

Maslow’s hierarchy of needs is most often displayed as a pyramid, with lowest levels of the pyramid made up of the most basic needs and more complex needs are at the top of the pyramid. Needs at the bottom of the pyramid are basic physical requirements including the need for food, water, sleep and warmth. Once these lower-level needs have been met, people can move on to the next level of needs, which are for safety and security.

As people progress up the pyramid, needs become increasingly psychological and social. Soon, the need for love, friendship and intimacy become important. Further up the pyramid, the need for personal esteem and feelings of accomplishment become important. Like Carl Rogers, Maslow emphasized the importance of self-actualization, which is a process of growing and developing as a person to achieve individual potential (Hjelle & Ziegler, 1992).

(a) Types of Needs

Maslow believed that these needs are similar to instincts and play a major role in motivating behavior. Physiological, security, social, and esteem needs are deficiency needs (also known as D-needs), meaning that these needs arise due to deprivation. Satisfying these lower-level needs is important in order to avoid unpleasant feelings or consequences. Maslow term the highest-level of the pyramid a growth need (also known as being needs or B-needs).
Growth needs do not stem from a lack of something, but rather from a desire to grow as a person.

(b) Five Levels of the Hierarchy of Needs

There are five different levels in Maslow’s hierarchy of needs:

1. Physiological Needs

These include the most basic needs that are vital to survival, including the need for water, air, food, and sleep. Maslow believed that these needs are the most basic and instinctive needs in the hierarchy because all needs become secondary until these physiological needs are met.

2. Security Needs

These include needs for safety and security. Security needs are important for survival, but they are not as demanding as the physiological needs. Examples of security needs include a desire for steady employment, health insurance, safe neighborhoods, and shelter from the environment.
3. Social Needs

These include needs for belonging, love, and affection. Maslow considered these needs to be less basic than physiological and security needs. Relationships such as friendships, romantic attachments and families help fulfil this need for companionship and acceptance, as does involvement in social, community or religious groups.

4. Esteem Needs

After the first three needs have been satisfied, esteem needs becomes increasingly important. These include the need for things that reflect on self-esteem, personal worth, social recognition, and accomplishment.

5. Self-actualizing Needs

This is the highest level of Maslow’s hierarchy of needs. Self-actualizing people are self-aware, concerned with personal growth, less concerned with the opinions of others, and interested fulfilling their potential.

2.4 Chapter overview

The main focus of this chapter has been on child development, with a special emphasis on the different domains of child development including physical and motor development, cognitive development, as well as socio-emotional development. The impact of low socio-economic status on these different domains of child development was also discussed. A brief overview of three developmental theorists was provided, with specific reference to Piaget’s stages of cognitive development, Vygotsky’s socio-cultural theory, Erickson’s psychosocial stages of development and Maslow’s hierarchy of needs.

The following chapter will explore child developmental assessment, focusing on the Griffiths Mental Development Scales-Extended Revised (GMDS-ER) as the main assessment tool utilised in this study.
CHAPTER 3

CHILD DEVELOPMENTAL ASSESSMENT AND THE GRIFFITHS MENTAL DEVELOPMENT SCALES-EXTENDED REVISED

3.1 Introduction

This chapter will provide a description of child developmental assessment and the Griffiths Scales (both the Original and Extended Revised) as a developmental assessment tool for children and certain features of their background, construction, standardization, reliability and validity, as well as the research that has been done on the Griffiths Scales will all be discussed. Screening and diagnostic measures used for South African children will be reported on in this chapter. In addition, an overview of the research conducted with these scales, since their inception, will also be provided.

3.2 Child Developmental Assessment

Since the early 1970s it has been internationally recognized that the identification of children with difficulties should take place as early as possible. These difficulties cover a vast spectrum and range, from difficulties of movement to difficulties of speech. Thus, the rationale for assessing a child’s development at an early age is simple: the sooner a child’s difficulties can be identified, the sooner an intervention can be implemented. Hence, the sooner a child can be assisted (Foxcroft & Roodt, 2005).

Brookes-Gunn (1990), in her book entitled Improving the Life Chances of Children at Risk, stressed that the measurement of the wellbeing of a child includes the assessment of physical, cognitive, social, and emotional development. Thus, a comprehensive developmental assessment should include these four aspects of functioning, which are not mutually exclusive. She further maintained that a problem in one area may have an effect on another area. For example, a socially and emotionally deprived child may present with delayed cognitive development as a result of the lack of social and emotional stimulation. The cognitive deficits may disappear after a period of time, if the problem is detected at an early age and the child is provided with additional intensive stimulation.

The developmental assessment of children is important for a number of reasons. Holt (1974) stressed that chronic disorders and disabilities, such as mental retardation or cerebral palsy, are usually first evident in infancy or early childhood. Such problems interfere with the future development of the child and may result in a lifetime of lowered potential. Thus, for
optimum benefit to the child, intervention programmes should be implemented as early as possible. As unobtrusive developmental variations and delays may be the first indication of serious conditions, early assessment of the potentially handicapped child is therefore of vital importance. Holt (1974) further emphasized that developmental delays may also reflect the influence of adverse environmental circumstances, such as emotional abuse and child battering in general (Allan, 1992). Developmental assessment of infants and young children is of vital importance for the early detection of serious disabilities and adverse environmental conditions, and the institution of early intervention programmes. A comprehensive developmental assessment includes the evaluation of a child’s social, motor, and cognitive functions, and psychological tests that cover these areas are required for these purposes (Luiz, 2004).

There is a high risk of developmental problems among many young South African children, due to their low socio-economic and health status. Early assessment of infants and young children is therefore of vital importance to ensure the early detection of serious disabilities and adverse environmental conditions, as well as early intervention where necessary.

The only standardized South African tests that can be used for the developmental assessment of preschool children, are the Junior South African Individual Scales (JSAIS) and the School Readiness Evaluation by Trained Testers (SETT) (Madge, 1981; Robinson, 1989; Van den Berg, 1987).

Despite a recent concerted effort by researchers, mainly supported by the HSRC, to address the need for more reliable and valid assessment of preschool South African children, the following shortcomings are still evident:

The existing developmental assessment measures are not comprehensive, with most tests focusing on specific aspects of development or being mere screening measures.

Specific tests are standardized for specific ethnic groups to the exclusion of others, and there are only a limited number of standardized tests available to assess the development of 70% of the preschool population, namely, black preschool children.

Specific tests are standardized for specific age groups to the exclusion of others; even for white South African children, the group for whom most of the tests are standardized, the
available South African tests do not provide for the assessment of development in the first three years of life.

Due to the specificity of tests regarding age ranges and ethnic groups, related research is fragmentary in nature resulting in limited generalizability of research findings.

It is thus evident that there are gaps in the assessment of the development of young children in South Africa. To fill these gaps there is an urgent need to establish a valid, reliable test that covers the important aspects of development and includes items for the first three years of life for the assessment of all South African infants and preschool children.

This need could be satisfied by the development of a new South African test for the assessment of infants and young children, but this is a slow and expensive process. Another way to satisfy the need is to adapt a foreign test for use in South Africa. This has already been done in South Africa on several occasions (Allan, 1988; Bhamjee, 1991; Foxcroft, 1985).

3.3 Screening and diagnostic measures

The difference between screening and diagnostic measures will be discussed and a brief overview of each measure will also be provided in this section. In addition, the developmental measures that are available for South African children will also be discussed.

Developmental measures can be categorized as either screening or diagnostic measures. Developmental screening involves ‘a brief, formal evaluation of developmental skills’ which attempt to identify children who may be potentially at risk for developmental difficulties. Some screening measures can be administered by non-specialists, such as parents, teachers and clinic nurses, who have been trained to use them.

Screening measures often assess a child holistically. They typically examine areas such as fine and gross motor coordination, memory and visual sequences, verbal expression, language comprehension, social-emotional status, etc. Screening measures are cost effective, as children can be effectively assessed in a short space of time.

The results from these measures are generally qualitative in nature as they categorize the child’s performance instead of providing a numerical score. In addition, screening measures provide an overall view of the child’s development, rather than information relating to specific areas (Foxcroft, 1997).
Diagnostic measures can be described as in-depth, comprehensive, individual, holistic measures used by trained professionals. The aim of diagnostic measures is to identify the existence, nature, and severity of the problem. They provide numerical scores and/or age equivalents for overall performance, as well as for each specific area assessed (Foxcroft & Roodt, 2005).

Brookes-Gunn (1990) stressed that any comprehensive plan of developmental assessment should incorporate both screening and diagnostic instruments.

During the last decade, researchers have made a concerted effort to address the need for more reliable and valid developmental measures for South African children. The focus of these researchers has been twofold, namely the construction of new culture-reduced tests, and adapting, refining, and norming appropriate tests that have been constructed and proven to be valid and reliable in other countries (Foxcroft & Roodt, 2005).

3.3.1 Global developmental screening measures

(a) Denver II

The Denver Developmental Screening Test (DDST) was first published in 1967 and revised in 1990 as the Denver II. The Denver II can be administered to children from 0 to 72 months (six years). The domains tapped are personal-social development, language development, gross- and fine-motor development.

The results obtained from the Denver II categorize the child’s current development into one of three categories, namely, Abnormal, Questionable or Normal development. The Denver II was developed in the United States; however, research on the applicability of the scales is still under way in South Africa. There are no norms available for South African children yet (Luiz, Foxcroft, Kotras & Jamieson, 1998).

(b) Vineland Adaptive Behaviour Scales Second Edition (Vineland-II)

The Vineland-II is a revision of the Vineland Social Maturity Scale and Vineland Adaptive Behaviour Scale. The scales assess personal and social competence of individuals from birth to adulthood. The scales measure adaptive behaviour in four domains: Communication, Daily Living Skills, Socialization, and Motor Skills.
They do not require the direct administration of tasks to an individual, but instead, require a respondent who is familiar with the individual’s abilities and general behaviour. This makes the scales attractive to use with individuals with special needs (Foxcroft & Roodt, 2005).

(c) Goodenough-Harris Drawing Test (the Draw-a-Person test)

This test is utilized with children between the ages of five and sixteen years. It involves the drawing of a person. It is scored against seventy-three characteristics specified in the manual. The results provide a non-verbal measure of mental ability. The Draw-A-Person Intellectual Ability Test for Children, Adolescents, and Adults (DAP:IQ) by Reynolds and Hickman (2004) allows for the estimation of the cognitive ability of an individual.

This is achieved through the provision of a common set of scoring criteria against which intellectual ability can be estimated from a human figure drawing (HFD) (Foxcroft & Roodt, 2005).

(d) Miller Assessment for Preschoolers (MAP)

The MAP (Miller, 1988) is a short, yet comprehensive, assessment tool that aids the identification of development delays in a number of domains, namely, neural foundations, coordination, verbal, non-verbal, and complex tasks.

3.3.2 Diagnostic measures

This section will focus on measures that provide a more comprehensive assessment of development, which enables the results to be used for diagnostic purposes. Specific reference will be given to international measures that have been adapted for use in South Africa.

(a) The Grover-Counter Scale of Cognitive Development (GCS)

The Grover-Counter Scale is based on Piagetian theory and was developed according to Piaget’s stages of development. This scale consists of five domains, each measuring a stage in a person’s development. This scale is also divided into sections. Section A consists of simple recognition of shapes and colours. Section B assesses the ability to reconstruct patterns from memory. Section C assesses the ability to copy a model made by the tester. Section D assesses the ability to reconstruct a model from memory, once it has been
removed. Section E assesses the ability to produce and complete patterns from a design card within a time limit.

Each section provides an indication of the test-taker’s stage of current development, not simply from the score obtained, but also from the procedure adopted in completing the item. The GCS was revised in 2000, and a growing body of research is developing on this scale; which has proved its clinical use in South Africa (Foxcroft & Roodt, 2005).

(b) Bayley Scales of Infant Development-Second Edition (BSID-II or Bayley II)

The Bayley II is used to identify children between the ages of one and forty-two months (three-and-a-half years) with developmental delays or those suspected of being ‘at risk’. This scale is divided into three scales: the Mental Scale, the Motor Scale, and the Behaviour Rating Scale. The use of all three scales provides a comprehensive assessment. Norms for interpreting the performance of black South African children on the original Bayley Scales are available. However, no South African norms are available for the revised scales (Foxcroft & Roodt, 2005).

(c) McCarthy Scales of Children’s Abilities

The McCarthy Scales are utilized with children between the ages of three years six months and eight years six months. The scale uses game-like tasks and toy-like materials that children generally enjoy. The tasks are designed to be suitable for both boys and girls, as well as for children from different cultural and socio-economic groups. There are eighteen separate tests which are grouped into five scales: Verbal, Perceptual Performance, Quantitative, Motor, and Memory. When the Verbal, Quantitative, and Perceptual Performance Scales are combined, an overall measure of the child’s intellectual functioning is obtained.

The McCarthy Scales have been adapted for use in South Africa and some normative information is available for various groups of children (Foxcroft & Roodt, 2005)
The Griffiths Scales of Mental Development

In this section, a historical background to the Griffiths Scales (both the Original and the Extended Revised) will be discussed including the six subscales of this measure.

3.4 Historical background to the Griffiths Scales

This developmental assessment of infants and young children has been widely acknowledged as crucial in the early detection and intervention of any possible handicaps (Bhamjee, 1991). The Griffiths Scales of Mental Development, described by Ruth Griffiths in her book *The Abilities of Babies* (1954), introduced a new diagnostic technique for studying the development of children during the first two years of life.

This technique involved the differential diagnosis of mental status based on the developmental profiles. These profiles illustrate the individual child’s range of strengths and weaknesses. The test was developed and standardised on British children and was published in 1954. The inventor of the Griffiths Scales, Ruth Griffiths was bestowed the title of “architect of the most carefully constructed infant scales for her development of the Griffiths Scales” (Allan, 1992; Luiz, 1994).

In the 1960s the Scales were revised and extended to cover the period from birth to 8 years, 4 months. These extended scales were described by Ruth Griffiths in her book, *The Abilities of Young Children* (Allan, 1992; Davidson, 2007; Luiz, 1994). The items for the first two years of the extended scales were obtained by means of a revision and complete restandardization of the baby scales.

Griffiths did not intend the extended scales to supersede the baby scales and she recommended that the latter still be used for the assessment of babies in their first year and for the investigation of older children with special disabilities (Allan, 1992).

The original Griffiths Scales were introduced to South Africa in 1977. The original Griffiths Scales have been translated, using the Brislin back-translation technique, into Afrikaans and Xhosa (Allan, 1988; Allan, 1992; Luiz, 1994; Tukulu, 1996).

The importance of the Griffiths Infant Scales in the clinical diagnosis of both normal and physically and mentally challenged children has been widely acclaimed by clinicians from various disciplines (Griffiths, 1970; Stewart, 1997). Griffiths received many requests for the extension of the Infant Scales for use in clinical practice with older children. Thus, the
extended Scales were the result of the realization of the need to assess infants, preschool and early school-age children in the age group from 2 to 8 years (Stewart, 1997).

Prior to the construction of these scales, detailed and careful observation of infants and young children was undertaken. Children were observed in their natural environments – at home, at play, in the streets, on trains and buses and in the school playgrounds, and their behaviours were recorded. From these formal and incidental observations, material for test items emerged.

The potential test items were tried out and either modified, rejected or accepted. From the pool of items that were retained, supplemented by items from existing tests, a skeleton test was prepared and administered to a sample of normal children (Allan, 1992).

Based on the interrelations among the “basic avenues of learning”, namely, eye, hand, voice and hearing, Griffiths (1986) classified the items in the original Scales into five categories. These categories allowed for the assessment of: locomotor development, personal-social adjustment, hearing and speech, eye and hand co-ordination and performance.

In the extended scales, these categories were retained, but items that did not logically fit into any of them formed a sixth scale to assess the practical reasoning abilities of children of the age of two years or older (Allan, 1992; Stewart, 1997).

According to Van Heerden (2007), in the 1980s and 1990s, noted areas in which the original Griffiths Scales could be enhanced. Various items on the original scales were identified as outdated, culturally biased and ambiguous, thus threatening the reliability and validity of the measure (Davidson, 2007; Kotras, 2003). This resulted in the realisation of a need to revise the original Scales of the measure. A revision of the Baby Scales from birth to two years was then embarked on. As a result of this, a draft version of the Revised Baby Scales from birth to two years was introduced by the ARICD in March 1994 and published in 1996 (Davidson, 2007; Huntley, 1996).

The need for a revision of the Extended Scales (2 to 8 years) was at the same time emphasized; and this led to the recruitment of a working team to embark on this project. The leader of the team, Professor D.M. Luiz of the University of Port Elizabeth, South Africa, was appointed by the ARICD to play an active leading role within the team. The team’s main aim was to revise and renorm the extended scales in the British Isles and Eire (Davidson, 2007; Van Heerden, 2007).
The revision aimed to: 1) update the norms; 2) improve the scoring standards; 3) improve the administration instructions; 4) improve the test material aesthetics; 5) include and add new items; 6) remove items that were not adding value to the scales; and 7) replace outdated training aids (Davidson, 2007; Luiz et al., 2004).

This therefore led to the development of the Griffiths Mental Development Scales-Extended Revised (GMDS-ER) which was published in 2004 (Luiz et al., 2004; Davidson, 2007) and again in 2006.

3.5 A description of the Griffiths Mental Development Scales

3.5.1 The Locomotor Scale (Scale A)

The locomotor Scale allows the clinician to observe certain physical weaknesses or disabilities, or more definite gross motor defects in young children. Items include the ability to run fast out of doors, to bounce and catch a ball, to jump over a 15 to 25 centimetre rope, and suchlike. It requires of the child normal physical strength, skill in speed and movement, rhythm and poise at a level compatible with age.

Performance is also influenced by the ability to concentrate on a task and the emotional determination to succeed. This scale was first placed in the assessment sequence to provide a basis for objective assessment, setting the child at ease, as well as providing an opportunity to gain an initial impression of the overall maturity of the child (Allan, 1992; Luiz, 1994).

3.5.2 The Personal-Social Scale (Scale B)

The Personal-Social Scale provides an opportunity to assess personal and social development. At a level compatible with the child’s age, a degree of self-help is required from the child in terms of personal cleanliness, efficiency at table, and suchlike. Some degree of social interaction is required from the child, and also co-operation in play with other children.

This scale includes items which assess the child’s attempt at dressing and undressing, washing hands and face, efficacy at the table, fastening buttons and other items pertaining to the degree of socialization and compatible with the age group of the child. Information such as the child’s age, home address, family name, how many friends he or she has at school, and so forth, can be obtained by means of a friendly interaction with the child.
These items can be scored without the child realizing that such items are part of the test (Allan, 1992; Luiz, 1994; Stewart, 1997).

Although emotional factors influence performance on all scales, they usually have a more definite effect on this scale. Emotionally disturbed children usually perform poorly on this scale. According to Griffiths (1984), overly protected children usually do badly on this scale too, because they are slower in learning self-help and personal care.

They are used to being waited on at home and get little practice in activities such as washing their own hands and face and fastening shoes. Neglected children who get insufficient attention and or care from parents may, on the other hand, manifest emotional and or behavioural disturbances in a variety of ways (Luiz, 1994; Stewart, 1997).

3.5.3 The Language Scale (Scale C)

According to Griffiths (1984), the language scale is the most intellectual of all the scales since it gives an opportunity for study of the growth and development of language by clinicians. This scale requires not only comprehension of language, but also specific verbal expressive skills, in terms of vocabulary, the use of different parts of speech and the use of sentences and paragraphs.

Items included require the child to name colours, to understand the meaning of words, to provide the opposites of words, to identify differences and similarities, to repeat sentences with 6 to 16 syllables, to comprehend situations, and so forth (Luiz, 1994; Stewart, 1997).

Children who perform poorly on this scale, relative to their own performance on the other scales, may have a speech impediment or may possibly be deaf or suffering from a hearing loss (Luiz, 1994). This subscale used to be referred to as Speech and Hearing subscale prior to the revision of the scales in 2004 and in 2006.

3.5.4 The Hand and Eye Co-ordination Scale (Scale D)

The hand and eye co-ordination scale consists of items relating to the manual dexterity and visual ability of the child. Manual dexterity, co-ordination between the eyes and hands, careful work and persistence in a task, are all required from the child with this scale. These items include drawing, writing, threading beads, and so on.

While the structured, formal drawings of geometric shapes provide information on the child’s conception of space and form relations, information on the child’s personality can also
be obtained from all the drawings. For example, unusually small or constricted drawings may be an indication of depression, and very rapid or very slow execution could be an indication of anxiety (Luiz, 1994; Allan, 1992).

3.5.5 The Performance Scale (Scale E)

The performance scale is largely a scale of performance tests; it enables the examiner to observe and measure skill in manipulation, speed of working and precision. This scale includes items such as formboards, pattern making, building stairs, bridges, and so forth. Items correspond with those in the Hand and Eye Co-ordination Scale, in that some manual performance is required from the child.

Manual dexterity and eye-hand co-ordination are however assumed in the Performance Scale and the child is required to apply these skills in novel situations (Luiz, 1994).

3.5.6 The Practical Reasoning Scale (Scale F)

The Practical Reasoning Scale is only introduced to children over the age of two years. It concentrates mainly on recording the earliest indications of arithmetical comprehension, and the realization of the simplest practical problems. It also indicates the child’s ability to benefit from formal schooling. Items include repetition of digits, counting, comparison of objects for size, length, weight, recognition of coins, and suchlike.

This scale requires the child to reason and provide answers to practical problems. Attention and concentration span also play a major role on this scale (Stewart, 1997).

These six subscales constitute the General Quotient (GQ) and produce an ultimate Mental Age (MA) (in months). The MA is a measure indicating a level of cognitive functioning, achievement, cerebral development and the ability to learn (Jensen, 1979; Davidson, 2007). It can further be described as the “degree of general mental ability possessed by the average child of a chronological age corresponding to that expressed by the MA score” (Sattler, 1982; Davidson, 2007).

A cursory comparison of the Griffiths Subscales-ER with the most important domains of child development reveals that the Griffiths Scales-ER do indeed provide a comprehensive assessment of child development. This is an important consideration in the South African context; therefore the Griffiths scale seems to be an appropriate test to investigate for use in South Africa (van Rooyen, 2005).
3.6 The Administration and Scoring of the Griffiths Scale

The Griffiths Scales consists of 228 items. There are two items per month in each of the five relevant scales from 0 to 24 months, thus allowing a half-month credit for each item. From the third to the eighth year, there are six items for each year in every scale, plus two extra items for the ninth year in each scale, thus allowing two months credit for each item in each scale.

Furthermore, the items in the separate scales are arranged in sequential order of difficulty for each age group (Stewart, 2005).

Administration of the scales begins approximately four months below the child’s age level. A basal level of six consecutive successes is required in each scale. If a child fails any of the six items administered in a scale, earlier items are administered until the basal level is achieved. Item testing on every scale is discontinued when the child reaches a ceiling, that is, after six consecutive failures on each scale.

The sum of credits, for all the items below the basal level of six consecutive passes and for the items passed, provides a separate mental age (MA) for every scale. Developmental quotients are then calculated for every scale by means of the following formula:

Formula 1 Calculating subscale quotients

\[ Q_X = \frac{MA \times 100}{CA} \]

CA above refers to the child’s chronological age in months, and X represents the subscale letter for which the developmental quotient is being evaluated (Griffiths, 1984). Griffiths named the developmental quotients of the scales as follows:

QA = Locomotor Quotient
QB = Personal-Social Quotient
QC = Verbal Quotient (Language Scale)
QD = Hand and Eye Quotient
QE = Performance Quotient, and
QF = Practical Quotient, for Scale F, known as Practical Reasoning.

The G.Q. or General Quotient, representing General Intelligence is derived by taking the average of the quotients of the six subscales of the child’s total performance (Griffiths, 1984, p 28-29).

The separate administration of scales and calculation of quotients is also possible, as the scales were standardized separately (Allan, 1992). Griffiths used histograms, based on the developmental quotient of each scale, to illustrate the relationship between the child’s performance on the different scales.

The use of developmental quotients rather than mental age makes it possible to compare children of different chronological ages and also to compare a child’s performance at different times. Such a developmental profile demonstrates the individual child’s range of abilities and relative disabilities (Allan, 1992).

### 3.7 The Interpretation of Performance on the Griffiths Scales

By studying the profiles of a large number of children, Griffiths (1984) identified certain developmental patterns which may be used for diagnostic purposes. Children whose performance is consistently low on the Locomotor and Hand and Eye Co-ordination Scales almost certainly suffer from a physical defect or a degree of muscular weakness.

Krige (1988) found this pattern in her longitudinal case study of a physically handicapped South African boy. Overly protected children usually perform badly on the Personal-Social Scale because they are slower in learning self-help and personal care activities. They are usually waited on at home and get little practice in activities such as washing their own hands and face and fastening shoes.

Children with consistently low performance scores on this scale only, are probably unhappy or maladjusted (Allan, 1992).

Children with consistently low performance on the Hearing and Speech Scale, relative to their own performance on the other scales may possibly be hearing impaired. A low score on this scale is often accompanied by low performance on the Practical Reasoning Scale. Performance on the Personal-Social Scale also tends to be low, but not as low as the Hearing and Speech Scale.
This pattern was also found in a longitudinal case study of a South African boy with a hearing loss (Luiz, 1988).

According to Griffiths (1984), the drawings in the Hand and Eye Co-ordination Scale provide information on the child’s personality. Bhamjee (1991) suggested that unusually small or constricted drawings may be an indication of depression, while very rapid or very slow execution of drawings could be an indication of anxiety.

Consistently low performance on all the Scales is indicative of retardation with the level of performance indicating the degree of retardation (Allan, 1992).

The analysis of a child’s developmental profile in the main areas on the Griffiths Scales provides useful information for:

- The identification of the child’s strengths and weaknesses;
- Gaining an understanding of the child’s condition, behaviour and functioning;
- Decisions on whether further investigations are necessary;
- Construction of treatment programmes;
- Evaluation of the effect of treatment; and
- Decisions about placement (Allan, 1992; Griffiths, 1984; Hall, 1971; Hanson, 1982; Lister, 1981)

3.8 Standardization of the Griffiths Mental Development Scales-Extended Revised (GMDS-ER)

3.8.1 The sampling procedure for the standardisation of the GMDS-ER

The normative information for the GMDS-ER is based on a national standardisation sample representative of children from the ages of 2 to 8 years of age in the United Kingdom (i.e. England, Wales, Scotland and Northern Ireland) and Eire (i.e. Republic of Ireland) (Luiz et al., 2004).

The recruitment of children to participate in the standardisation occurred in two phases. The first phase involved the random selection of children across the United Kingdom and
Eire. Prior to this random selection of children, however, approval had to be granted by each of the five regions’ and sub-regions’ Local Ethics Committees (LECs).

Upon obtaining this consent, the examiners then selected a random sample from their region by means of data obtained from the Child Health System or an equivalent system. Four times the required number of children in each region were selected in an attempt to account for attrition rates (i.e., unavailability of children at times of testing, children with developmental delays, etc.).

All children selected from the database were screened for normality, as only children with a normal developmental profile could be included in the 65 standardisation sample. Those children with developmental delays were excluded from the sample and replaced by children whose development was normal. However, the unavailability of children towards the end of the deadline for data collection resulted in the remainder of the standardisation sample being obtained by testing children in kindergartens and preschools.

These children had to be willing to participate around the United Kingdom and Eire to ensure that equal numbers of children in each year group were included in the final sample. These children were sampled using a convenience sampling technique, thus making it impossible to adhere strictly to the proportions that had initially been planned.

This was the second phase in the recruitment of participants. Prior to the children being tested in the kindergartens and preschools, local permission had to be obtained from the relevant authorities, as well as the parents of those children involved. The necessary ethical procedures were adhered to at all stages of the recruitment of the children (Luiz et al., 2004).

The second phase also included only children whose general development was normal (i.e. the absence of any sensory, physical or mental handicap). The final standardisation sample for the Revised Griffiths Scales of Mental Development included 1026 children between the ages of two and eight years of age, representing children from Wales (n = 107), Scotland (n = 61), Northern Ireland (n = 102), Southern Ireland (n = 103) and England (n = 653).

Although the final standardisation sample was not exactly proportional to the population ratios in Wales, Scotland, Northern Ireland, Southern Ireland and England, it still revealed trends similar to the majority of the sample representing the England region. In an attempt to achieve an evenly spread sample in terms of age, gender, urban/rural, and SES (calculated
from parental occupation and highest level of education), a quota-sampling technique was employed to select the children (from the random and convenience samples described earlier) to participate.

Although equal proportions of children were selected for each of these sampling variables, the final cell sizes were not exactly equal owing to attrition rates and the availability of the children at the time of testing.

Relatively even proportions of children were sampled from each year group, with slightly more children falling into Year VII and comparatively fewer children into Year III. The numbers of boys and girls were similar, with slightly more girls (53%; n = 542) than boys (47%; n = 484) in the standardisation sample.

The children’s SESs were inferred from their parents’ level of education and occupation (Helms, in Flanagan, Genshof & Harrison, 1997; Luiz et al., 2004). Just less than half of the sample belonged to the middle socio-economic status group (44%, n = 457), with the remainder of the sample being relatively equally distributed between the lower (24%, n = 245) and upper (32%, n = 327) socio-economic status groups.

The major portion of the sample (86%; n = 862) consisted of children residing in the urban areas of the United Kingdom and Eire, while 14% (n = 139) lived in the rural areas.

3.8.2 Reliability

The “reliability” of a test refers to the accuracy, consistency, and stability of test scores across situations (Aiken, 1997; Anastasi, 1982). Internal consistency coefficients are the most suitable test of reliability in cases where an individual’s score on some attribute, such as development, may invariably change significantly over a short period of time (Kline, 1993).

The most frequently cited measure of the internal consistency of the items in a scale is Cronbach’s alpha coefficient. The calculation of Chronbach’s alpha is based on the average correlation of all pairs of items in the scale; it indicates the extent to which the items can be regarded as measuring a single construct.

The value of the Cronbach’s alpha coefficient increases with the proportion of the variation in the item scores that can be attributed to differences between individual increases. The value of Cronbach’s alpha also increases as the number of items in the scale increases. The items in the scale are assumed to be independent. A commonly adopted convention is to
accept values of alpha that are in the range 0.70 to 0.90 inclusive, as indicating an acceptable level of internal consistency.

For this reason, Cronbach’s Alphas were calculated for each subscale separately, also for the GQ per age group, as well as across the five age groups, as an indication of the reliability of the subscales as a measure of mental development (Luiz et al., 2004).

3.8.3 Validity

The “validity” of measuring instruments is defined as “the degree to which evidence and theory support the interpretations of test scores entailed by proposed uses of tests” (American Educational Research Association (AERA), 1999, p.9). Due to the fact that the Griffiths Scales are used for diagnostic purposes, content-based evidence was explored, including an empirical analysis of the adequacy with which the test content represents the content domain. This was accomplished by means of a literature review and the consultation of experts.

Content-related evidence is provided as “a logical structure that maps the items on the test to the content domain, thereby illustrating the relevance of each item and the adequacy with which the set of items represents the content domain” (AREA, 1999, p.19). A facet analysis was conducted on each subscale separately in order to provide proof of the validity of its contents.

The results of the facet analysis indicated that the items in each of the six subscales are representative of their respective content domains and that each item has a satisfactory degree of relevance to the construct being measured (Luiz et al., 2004).

Congruent validity is described by Jensen (1980) as the correlation of a previously unvalidated test with an already validated test. To establish adequate congruent validity of the Extended Scales, the Terman-Merrill Scale (the latest revision of the original Stanford-Binet Scale) was administered to 534 children aged 3 to 6 years of the 2260 children in the standardized sample (Griffiths, 1984).

The Terman-Merrill sample consisted of 97 children in their third, 130 in their fourth, 140 in their fifth, and 157 in their sixth year. Both tests were also done on children in their seventh and eighth years, but because the Griffiths Scales’ ceiling was reached at this age level, these children were not included in the sample.
The G.Q. ranged from 99.45 to 101.92 for the different year groups, while the Terman-Merrill IQ ranged from 102.77 to 106.87. The correlation between G.Q. and IQ from 0.79 to 0.81 for the different year groups, indicating:

A substantial Common Factor was found to exist between the two tests, in spite of considerable difference in the subject matter of the actual tests included (Griffiths, 1984, p. 70).

For the 285 children in their fifth year, the G.Q. was correlated with the developmental quotients of the different scales. The correlation coefficients ranged from 0.64 to 0.78. Griffiths (1984) regarded this as an indication of a common factor in the different scales (Allan, 1992).

Griffiths (1970) recognised that the Locomotor Scale had the lowest correlation with the G.Q. She felt the inclusion of this Scale in the test was legitimate, as it provided a measure of an important developmental domain. The higher correlations on scales C, D, E, and F were understood by Griffiths as an indication of the general intelligence factor or ’G’, as described by Spearman (1927).

She hypothesised that the remaining variance could be accounted for by the specific factors or abilities which the individual Scales purported to measure. She acknowledged further research would be needed to confirm this (Stewart, 1997).

Longitudinal studies conducted by Hinley (1965), using the Stanford-Binet Scales and the Griffiths Scales showed generally positive correlations between the Scales. Lister’s (1979) study specifically, provided evidence of predictive validity for developmentally retarded children when assessed with the Griffiths Scales. Ludlow and Allen (1979) in their study of the effects of early intervention on the development of Down’s syndrome children found high positive correlations ranging from 0.85 to 0.90 between the Revised Stanford-Binet Scale and the Griffiths Scales.

Heimes (1983) investigated the congruent validity of the JSAIS and the Griffiths Scales for a South African play-school population. Although she utilized a small sample, she exercised stringent control in the methodological procedures. She found significant relationships between the G.Q. of the JSAIS and the Griffiths Scales. In addition, she found that various combinations of the Griffiths developmental quotients correlated highly with the JSAIS G.Q.
This is significant in the clinical application of the Griffiths Scales, as it implies that accurate assessment of a child with a specific handicap may be possible, provided that the Griffiths Scale most affected by the handicap is excluded. For example, a child with a physical handicap may be evaluated on the Griffiths Scales excluding the Locomotor Scale (Stewart, 1997).

3.9 Research Application of the Griffiths Scales

Reports on the applications of the original and extended revised scales, as well as research related to them will be discussed in this section.

Hanson and Alridge-Smith (1982) investigated the application of the Griffiths Scales. They sent questionnaires to 1600 users in Great Britain and 600 in other countries. They received completed questionnaires from 228 respondents, probably the most enthusiastic users of the test. Although this figure appears to be very low, it must be remembered that many users may have relocated without providing their new addresses, while others may have retired or changed the nature of their work.

They found that the majority of the test users were medical practitioners, mostly in child health posts, while the rest were psychologists, mostly educational and clinical psychologists. The ages for peak usage were the second to fourth years, followed closely by the first, fifth and sixth years. The completed questionnaires further indicated that the Griffiths Scales were used for the assessment of children with a wide variety of problems e.g., delayed speech, convulsions, clumsiness, hydrocephaly and phenylketonuria (Allan, 1992).

Many Griffiths Scales users have reported on the usefulness of the Scales for assessment purposes. This is the first aspect that will receive attention.

Hall (1971) reported that the Griffiths Scales were included in the initial screening battery for all patients at the Balvicar Child Development Centre for Preschool Handicapped Children. He believed that a study of the profile obtained from the Griffiths Scales contributed towards a better understanding of the patient’s condition and that repeated assessment often contributed towards proper management of the child and his/her family.

Bankes (1974) highlighted the usefulness of the Griffiths Scales for detailed testing of visual functions in relation to other senses. Welbourn (1975) discussed the assessment of spina bifida children to decide about their placement in ordinary schools or special facilities.
This included a developmental assessment. The Griffiths Scales were selected for this purpose, being more compact, convenient to administer and easy to report on than the Stanford-Binet Scale.

Clement, Bidder, Gardner, Bryant, and Gray (1980) reported on the development of a home-advisory service for preschool children with developmental delays. The Griffiths Scales were administered to decide whether or not to allow a child admission to the service. It further appears that the Scales were also used to monitor children’s progress.

Lister (1981) investigated the developmental patterns of 63 children aged 2 to 7 years, and found a large number of developmental profiles characterised by marked unevenness. For the majority of the children, differences between their highest and lowest developmental quotients, were more than 16 points, while for about half of the sample, the differences exceeded 30 points.

The clarification of children’s relative abilities and disabilities provided an increased understanding of their functioning and their ability to make appropriate provision for their needs. Lister believed that his findings confirmed the usefulness of the Griffiths approach (Allan, 1992).

Luiz (1988) performed a similar study to investigate the usefulness of the Griffiths Scales for South African white children. She also found considerable differences when she compared the highest and lowest subscale scores of 93 white children aged 2 to 7 years. Differences exceeding 93 points were obtained for 52 children, while the differences were between 16 and 30 for another 36 children.

She further found differences exceeding 15 points between the Eye and Hand Coordination Scale and the Hearing and Speech Scales for 28 children. The difference between the Hearing and Speech and Performance Scales exceeded 15 points for 53 of the children. Luiz concluded that the use of the Griffiths’ profile analysis was justified for South African white children, since great differences between the levels of development in different areas occurred with sufficient frequency (Stewart, 1997).

Krige (1988) presented the findings of a longitudinal case study, in which the Griffiths Scales were used for the assessment of a physically disabled South African boy. The boy, with a limited number of fingers and toes on both hands and feet, was first tested with the Griffiths Scales at the age of 38 weeks, and again at the age of 26, 40 and 64 months. His
scores on the individual scales varied over time, reflecting the extent to which his physical disabilities affected his ability to perform the tasks required at the different stages.

He, however, obtained consistently high scores on the Hearing and Speech Scale. The G.Q. enabled Krige (1988) to compare his total potential with that of his age group, while the individual scales enabled her to pinpoint his strengths and weaknesses. From the test results at different ages, she could assess whether or not his strengths and weaknesses had changed over time.

She could furthermore make qualitative observations, such as that he was friendly, interested and persistent and that he showed a high degree of independence and courage.

A similar case study in South Africa was that of Luiz (1988), who assessed a boy with a hearing loss with the Griffiths Scales at the ages 30, 50, and 65 months. At the time of the first assessment, an audiologist was unable to assess the child due to his high activity level and lack of cooperation. Regarding his first Griffiths assessment at 30 months, his scores on the Hearing and Speech and Practical Reasoning Scales were below average, while he scored above average on three of the four remaining individual scales, and average on the fourth.

In general, he scored above average on the individual scales which tested gross and fine motor abilities and eye-hand co-ordination, and below average on those that are largely verbal in content. Luiz (1988) also tested his ears with a tuning fork, although this is actually an item for a much younger age group.

From the test behaviour and results and his reaction to the tuning fork, it was clear that his hearing abilities needed further investigation. A hearing loss was subsequently identified and the child received hearing aids, while he and his mother took part in an early parent guidance programme at the centre where his hearing was tested (Stewart, 1997).

At the second and third testing sessions, his Hearing and Speech and Practical Reasoning Scale scores were well above average. Except for his Personal-Social Scale score which showed steady improvement over time, the scores for the other individual scales did not change much, nor did any trends emerge from the changes that had taken place.

The increase in his Personal-Social Scale score was in keeping with Griffiths’ (1984) findings in this regard for children with a hearing loss. In this case study, Luiz (1988) demonstrated that early diagnosis of hearing problems is possible with the Griffiths Scales.
She further illustrated the usefulness of the Scales for the assessment of a child’s progress after he had received a hearing aid.

In another local study, Luiz (1988) further illustrated the application of the Griffiths Scales to establish the effect of foster-care placement on a battered child. When first assessed at the age of 30 months, the girl’s performance was generally poor. Shortly after this, she was placed in foster care, and at the age of 49 months, she was again assessed with the Griffiths Scales. Her G.Q., as well as scores on the individual scales had improved considerably.

From the test results, it was clear that the child benefited considerably from the foster care, but her scores were still low during the second testing session, indicating that additional stimulation of a more formal nature was needed (Allan, 1992).

Research has further indicated the usefulness of the Griffiths Scales in the assessment of children with various disorders, for example, Down’s syndrome and hyperactive children. This research will be briefly discussed below.

Ludlow and Allan (1979) used the Griffiths Scales to evaluate the effects of early intervention on the development of Down’s syndrome children. These researchers compared the Griffiths Scales performance of groups receiving treatment with that of control groups, but obtained different results.

These researchers came to the conclusion that early intervention is beneficial for Down’s syndrome children. Research with Down’s syndrome children is a further illustration of the sensitivity of the Griffiths Scales to developmental assessment (Allan, 1992).

Van Staden (1980) compared the Griffiths Scales performance of 30 white South African children who had been abused with that of a control group of non-abused children. The ages of the children varied between 6 months and 6 years. There were no significant differences in respect of the Locomotor Scale, but the G.Q. and all the other developmental quotients were significantly lower for the abused group.

This study illustrated the effect of child abuse on the development of a child. The Griffiths Scales proved to be an important diagnostic tool for use with abused preschool children (Allan, 1996).

In a South African study, Houston-McMillan (1988) investigated whether the identification and treatment of borderline mentally handicapped children, by a professional
multi-disciplinary team, could enhance their level of intellectual functioning. The Griffiths Scales were used for the assessment of 27 preschool children, who were identified as borderline mentally handicapped, between the ages of 3 years 6 months and 6 years at the Child and Family Unit of the Transvaal Memorial Institute for Child Health Development.

The children attended nursery school, staffed by a specialized multi-disciplinary team consisting of a teacher, a speech therapist, an occupational therapist, a psychiatric nurse, a psychologist and a psychiatric registrar. The Griffiths Scales were used to evaluate the effects of the special treatment programme.

They were again administered at the end of the first and at the end of the second year of treatment. The G.Q., as well as the developmental quotients for the Personal-Social and Hearing and Speech Scales obtained during the three administrations were compared. There was a significant gain in all these scores over time, except for the Hearing and Speech Scale, where the developmental quotient after one year was not significantly higher than the quotient at commencement of the programme (Allan, 1992).

Schröder (2004) explored the developmental profiles of hearing impaired pre-school children, and compared their performance to a sample of normal pre-school children, highlighting significant differences. Results indicated a mean G.Q. that fell within the average range, as with all the subscales including Hearing and Speech (C) and Practical Reasoning (F), that fell within the below average range.

Houston-McMillan (1988) is in favour of the downward extension of special education into the preschool and nursery school period. Although the sample was relatively small, the research at the Child and Family Unit illustrated that the Griffiths Scales can be used to identify children in need of such special education. The test also proved to be useful in the evaluation of the special treatment programme (Stewart, 1997).

The aim of Allan’s (1988) study was to investigate whether the British norms of the Griffiths Scales were applicable to white South African children. She compared the performance of English and Afrikaans speaking white South African children on the Griffiths Scales with that of children in the British standardized sample.

The South African sample consisted of 60 children aged 5 years with equal numbers of each sex and language group. The extent to which the subject variables of sex, language and SES influenced performance on the Griffiths Scales was also investigated. One of the main
contributions of Allan’s (1988) study was the translation of the Griffiths Scales into Afrikaans.

This was the first study in respect of the Griffiths Scales that also included Afrikaans-speaking children. Another important contribution of Allan’s research study was that it provided information that could improve the interpretation of the Griffiths Scales assessments of individual South African children (Allan, 1988).

The British and South African children differed significantly on the G.Q. and in their performance on four of the six scales. The South African children scored significantly higher than their British counterparts, except on the Eye and Hand Co-ordination and the Practical and Reasoning Scales. The British normative sample was, however, tested around 1960, while the South African data were collected 26 years later.

When they compared the Griffiths Scales performance on British children tested between 1978 and 1982, with that of children in the normative sample, Hanson and Alridge-Smith (1987) found the G.Q. of their samples to be significantly higher than those of the normative samples. The performance of the South African 5-year-olds was therefore compared to that of 5-year-olds in the sample of Hanson and Alridge-Smith (1987).

The statistical comparisons indicated that there were no significant differences between the two groups. With the exception of the Locomotor Scale, English-speaking children consistently scored higher than their Afrikaans counterparts. The two groups only differed significantly on the G.Q. and in their performance on the Practical Reasoning Scale.

Allan concluded that for the majority of the Scales there are no differences between the performance levels of white English and Afrikaans-speaking South African 5-year-old children. The performance levels of children did not differ significantly on any of the individual scales (Allan, 1988).

The children from the different socioeconomic groups differed significantly in their performance on the G.Q. and four of the six individual scales. Upper-class children performed significantly better than middle- and lower-class children on the Hearing and Speech, Eye and Hand Co-ordination, Practical Reasoning and Performance Scales and in terms of the G.Q.
This study demonstrated that the present British norms are not applicable to 5-year-old South African children. The absence of significant differences between the performance of South African 5-year-olds and a more recent sample of British children, however, indicated that the time factor, rather than cultural differences, may have been responsible for these differences in performance (Allan, 1988).

Mothuloe (1990) investigated the applicability of the Griffiths Scales as an assessment instrument for Setswana children. He compared the Griffiths Scales performance of Setswana school beginners with that of their White counterparts in the British standardized sample and investigated the influence of certain subject variables on the performance of South African children, as measured on the Griffiths Scales.

He used a sample of 45 black Setswana-speaking grade 1 children between the ages of 5 years, 9 months and 7 years, 3 months. The Griffiths Scales G.Q. and developmental quotients varied between 106 and 94 for his sample of South African black children. There were no significant differences in the performance of the South African children and their counterparts in the British standardized sample.

Girls obtained significantly higher scores than boys and girls did not differ significantly in respect of the G.Q. or any of the other individual scales. Nor did the performance of lower and middle class children differ significantly on the Griffiths Scales. Mothuloe’s (1990) study demonstrated that the Griffiths Scales can be validly used to assess black children, that the British norms can be used, and finally that the influences of the subject variables of sex, SES, weight and height on the Griffiths Scales performance are minimal (Allan, 1992).

Bhamjee (1991) investigated the applicability of the Griffiths Scales for South African Indian children. She also investigated the extent to which the subject variables of age, sex, and SES influence the Griffiths Scales performance of these children. She used a large sample of 360 children from the ages of 3 years 0 months to 8 years 4 months.

Her sample included subjects of all the age groups covered by the Griffiths Scales, excluding the first two years. Bhamjee (1991) changed “penny” to “cent” and “turnip” to “potato”, as is customary when the test is used for South African children.

The G.Q.s. of South African Indian children were significantly higher than those of their counterparts in the British standardized sample for each age group. South African children
obtained significantly higher scores for every age group, except the 3-year-old group, on at least two of the individual scales.

It was only in respect of the Eye and Hand Co-ordination Scale that the South African and the British children did not differ significantly. With the exception of the Eye and Hand Co-ordination Scale for 7-year-old children, where the scores of South African children were slightly higher, the scores of South African Indian children were always lower than those of their counterparts in the British sample of Hanson and Alridge-Smith (1987).

Significant differences were more marked for the nursery school population than for the preschool and school-going populations.

The performance of boys and girls only differed significantly in respect of the Personal-Social Scale, with girls obtaining a higher score than boys. Bhamjee (1991) also performed a two-way ANOVA to assess the separate and interactional effects of sex and age groups. She obtained significant age effects on the G.Q. and all the individual scales, except the Performance Scale and sex-age interaction effects on the Personal-Social and Eye and Hand Co-ordination Scales.

The performances of upper, middle, and lower SES children differed significantly in respect of the G.Q. and all the individual scales, except the Locomotor Scale. Bhamjee (1991) further investigated the interactional effects of sex and SES with the effect of age ignored. There were significant sex and different SES interactional effects in respect of the G.Q. and the Hearing and Speech, Performance and Practical Reasoning Scales.

In the performance of middle and upper SES groups, girls’ scores were significantly higher than those of lower SES group girls in respect of the G.Q. and all the individual scales, except the Locomotor Scale. There were, however, no significant differences in the Griffiths Scales performance of boys from the upper, middle and lower SES groups (Allan, 1992).

Bhamjee also compared the scores of 5-year-old Indian children with those of South African white 5-year-olds tested by Allan (1988). The white children performed significantly higher than did their Indian counterparts in respect of the G.Q. and the Locomotor and Performance Scales.

Bhamjee (1991) suggested that the performance differences could possibly be related to cultural differences. Different criteria were, however, used to classify the Indian and white
children into SES groups. It is therefore possible that SES, rather than cultural differences could have been responsible for the performance differences in respect of the G.Q. and the Performance Scale.

Scores on the Locomotor Scale did not differ significantly for upper, middle, and lower class children in any South African study, and it is therefore unlikely that SES differences could have affected the results in respect of the Locomotor Scale (Stewart, 1997).

Utilizing the GMDS-ER, the clinical populations which have been the focus of research include: autistic children (Gowar, 2003), HIV positive/AIDS infants (Kotras, 2001; Sandison, 2005), children with cochlear implants (Makowem, 2005), children with Attention Deficit Hyperactivity Disorder (ADHD) (Baker, 2005) and hearing impaired children (Schróder, 2004).

Among the technical studies conducted using the GMDS-ER is the study which explored and compared the profiles of normal South African and British children (Van Heerden, 2007). Van Rooyen’s study (2005) on the performance of South African and British children on the GMDS-ER yielded results which indicated that South African children performed similarly to their British counterparts on the GMDS-ER, as represented by the GQ. However, their performance differed with regard to the year groups.

Among the recent studies that have been conducted into the construct-related validity of the revised Personal-Social, Language, Practical Reasoning and Locomotor subscales of the GMDS-ER, were those conducted by Barnard (2004), Knoesen (2005), Kotras (2003) and Moosajee (2007). Their findings revealed that these four subscales yielded more than one construct (Davidson, 2007).

3.10 The effect of SES on Performance on the Griffiths Scales

According to Golden and Birns (1976), the social class differences probably play a minor role in the measurement of intelligence of young infants. From the age of 18 to 24 months, nevertheless, social class as an issue does emerge.

A number of researchers have investigated the relationship between the SES and performance on the Griffiths Scales. While studies by Munro (1968) and Roberts and Rowley (1972) found that babies from birth to 18 months in the different social classes did not differ significantly, Hanson et al. (1987) found small, but significant differences in the Griffiths
Scales G.Q. of groups of children from different SES levels whose ages ranged from birth to two years.

In a factorial study, Munro (1968) also found a significant relationship between social class and a verbal factor on the Griffiths Scales for girls aged 18 months. This finding, however, was not confirmed for boys. Munro (1968) further established that the correlations between social class and ability rose steadily for both boys and girls, but for boys only reached a level comparable to that of girls by the age of five years.

Hanson et al. (1987) found significant social class differences for children in their third and fourth years, but no similar comparisons have yet been undertaken for older children (Allan, 1992).

Marked social class differences are generally accepted for children of school age. Allan (1988) compared the performance of 5-year-old South African white children from different socioeconomic backgrounds on the Griffiths Scales and found significant differences on the G.Q. and all the individual scales, except the Locomotor and Personal-Social Scales.

The variations in SES accounted for between 16.5% and 30.5% of the obtained variation. Mothuloe (1990) found no significant SES differences in the Griffiths Scales performance of 5 to 7 year old South African black children. He did, however, point out that the parental educational and occupational differences in his sample may have been too small to overcome the uniformity of experience imposed by social and political factors (Stewart, 1997).

Bhamjee (1991) found significant SES differences for South African Indian children in respect of the Griffiths Scales G.Q., the Hearing and Speech, the Performance and the Practical Reasoning Scales. For the girls, there were significant SES differences in the G.Q. and all the individual scales except the Locomotor Scale. No SES differences were found among the boys.

3.11 Chapter overview

This chapter has provided a detailed overview of child developmental assessment, highlighting the reasons for embarking on developmental assessment with children. The screening and diagnostic measures have also been discussed in detail. The historical background of the Griffiths Scales was also discussed and the role it played in the assessment of infants and young children.
A description of the different subscales of the Griffiths Scales was also provided. This was followed by the interpretation of performance on the Griffiths Scales. The standardisation of the GMDS-ER including the sampling procedure, reliability as well as validity was discussed.

Research applications of the original scales, as well as the extended revised scales, was discussed in detail. The chapter was concluded by looking at the effect of low SES on the performance on the Griffiths Scales.

The following chapter introduces the reader to the problem statement and methodology utilised in this study.
CHAPTER 4

RESEARCH DESIGN AND METHODOLOGY

4.1 Introduction

This chapter provides an overview of the research design and methodology that was utilized in this study. The primary aim of the study is presented. This is followed by an overview of the research methodology with a specific focus on the research design, the participants and sampling procedure, the method of data gathering, the research procedure and the data analysis.

The chapter concludes with an outline of the ethical issues that the researcher employed, such as gaining informed consent the schools and research participants, maintaining the confidentiality of the participants’ identities, as well as minimizing psychological risk or harm.

4.2 Aim of the study

This study aimed to explore and describe the developmental profiles of children from a low socio-economic background in the Nelson Mandela Bay. These profiles were obtained using the Griffiths Mental Development Scales-Extended Revised. The purpose of this study was therefore to generate profiles regarding the development of children who come from a low socio-economic background.

In order to achieve the above, the following more specific aim was explored:

Aim: To explore and describe the developmental profiles of children from a low socio-economic background (between the ages of 3 and 8), by looking at their overall performance on the six subscales of the GMDS-ER.

4.3 Research design and methodology

This section aims to explain the research methods that were employed during this study.

4.3.1 Quantitative research

This study employed a quantitative method in order to establish the relationship between the developmental profiles of children aged 3 to 8 years and their low socio-economic background. Quantitative research can be defined as, “a formal systematic process in which numerical data are utilized to obtain information about the world” (Cozby, 2004 p. 51).
According to Bless and Higson-Smith (1995), quantitative research relies on measurement to compare and analyze different variables. Quantitative researchers collect data in the form of numbers and use statistical types of data analysis (Terre Blanche & Durrheim, 2002).

Quantitative research begins with a series of predetermined categories, usually embodied in standardised quantitative research measures, and uses these data to make broad and generalizable comparisons. Quantitative studies enable the researcher to describe phenomena in a systematic manner. Quantitative research is different from qualitative research in that the data used in qualitative research are primarily verbal in nature rather than numerical in nature, as used in quantitative research.

This design will provide the researcher with an opportunity to indicate how the variables are arranged conceptually in relation to each other (Punch, 1998).

The advantage of quantitative research is that the study object is not influenced by the researcher, nor does the study object influence the researcher (Hopkins, 2001). Another advantage is that the results are generalizable (De Vos, 1998). Although it is widely acknowledged that the quantitative approach is given great respect in the scientific field, it can be argued that it provides only one particular view of the data (Gorard, 2003).

Some kinds of information cannot be adequately recorded using quantitative data. In many cases, language provides a far more sensitive and meaningful way of recording human experiences. This is one of the disadvantages of quantitative research.

4.3.2 Exploratory-descriptive research

Exploratory descriptive research was employed in this study. Exploratory research is typically used to examine a new topic or issue, or if the subject of the study is in itself relatively new (Neuman, 1997). Exploratory studies employ an open, flexible and inductive approach to research, as they attempt to look for new insights into phenomena. Even though exploratory research might not yield definite answers, it is considered to be an essential step in research, since it creates a foundation for further research (Gravetter & Forzano, 2003; Rosnow & Rosenthal, 1993).

Research into the applicability of GMDS-ER to children from a low SES is still in its infancy stage. The literature survey, as well as a conclusive NEXUS search revealed that there were no records of a research project such as this having been conducted on a South
African sample. This study will therefore contribute to the development of a set of South African norms for the Extended Revised version of the Griffiths Mental Development Scales.

Descriptive research plays an important role in psychology, as it presents a picture of specific details, including the frequency and prevalence of a situation, social setting or relationship (De Vos, 2005; Rosnow & Rosenthal, 1993). According to Leary (1991), descriptive research can be defined as the description of thoughts, feelings or behaviours of a particular group of participants.

This definition describes the present study well, as behavioural indicators of development, as well as their causal attributions were described. The purpose of a descriptive research strategy is to describe a single or multiple variables (Gravetter & Forzano, 2003).

4.4 Participants and sampling

The sampling procedure and the issues related to the research participants are discussed in the following section. The sample for this study consisted of 20 children (both males and females) aged between 3 and 8 years. The sample was taken from the pre-primary and primary schools situated in low socio-economic areas, namely kwaZakhele, Walmer township as well as in the informal settlement areas in the Nelson Mandela Metropole. In addition, children from a low socio-economic background, who were referred for school readiness at a psychology clinic, were also included in the sample.

A sample of only 20 participants was used, as most of the identified potential participants fell outside the low socio-economic classification (Riordan’s classification system), as measured by what their parents owned at home.

Sampling procedures are normally divided into two categories, probability and non-probability purposive sampling (Leedy, 1989). This study made use of non-probability purposive sampling, as only the most readily available participants were included in the sample. In non-probability sampling, the probability of a person being chosen as a research participant is unknown, since the researcher does not know the size or the members of the population (Gravetter & Forzano, 2003).

In this type of sampling only the most convenient and accessible participants are employed (Cozby, 2004). It is based entirely on the researcher’s judgement, in that the
sample is made up of units of analysis that contain the most characteristic, representative or
typical attributes of the population (De Vos, 2002; Davidson, 2007).

A limitation of this method is that the participants were not randomly selected. Another
disadvantage of this type of sampling is that it relies more heavily on the subjective
considerations of the researcher than on scientific criteria (Bless & Higson-Smith, 1995). On
the other hand however, non-probability sampling is useful when there is no sampling frame.

For example, no list exists of all children from low socio-economic backgrounds between
the ages of 3 and 8 years living in the Nelson Mandela Bay, and often the cost of probability
sampling is too high.

**The inclusion criteria for the sample are:**

**4.4.1 Age**

As the GMDS-ER measures the development of children from age 2 to 8 years 4
months, all the participants were between the ages of 3 and 8 years. Children younger than 3
years were not included in the sample.

**4.4.2 Residential Area**

Only those participants who resided in disadvantaged residential areas, including
townships and informal settlements, were selected for this study. These areas are believed to
have more residents from a low socio-economic class.

**4.4.3 Normalcy**

The biographical questionnaire was designed with the respondent’s level of education
in mind, that is to say, it was easy to read and understand and was also translated into Xhosa
to accommodate the Xhosa-speaking respondents. This questionnaire was designed to serve
as a screening measure in identifying the participants, by looking at their parents’,
breadwinners’ or caregivers’ levels of education and their residential areas. All the
participants had no physical or mental disabilities, and therefore were normal children. All
the children were tested in their home language, namely Xhosa, English and Afrikaans.

**4.4.4 Socio-economic classification**

The participants of this study were selected from the geographical areas in low socio-
economic suburbs within the Nelson Mandela Metropole areas. These are believed to have
most residents from a low socio-economic class. Riordan’s (1978) socio-economic classification system was used to identify participants from low socio-economic classes.

Although this system can at this stage only be used as a guide as many changes have taken place since the new government in 1994, it was standardized for use in the South African population. This classification system has frequently been used for the Griffiths’ studies in Port Elizabeth on both the original and Extended Revised versions (e.g. Allan, 1992, 1988; Barnard, 2000; Bhamjee, 1991; Foxcroft, 1985; Knoesen, 2003; Van Heerden, 2007; Van Rooyen, 2005).

Erwee (1976) in his study of the Port Elizabeth population, developed an index of socio-economic status (SES) based on four variables, namely, occupation, income, dwelling area and mobility. He found a high degree of association between the occupation and income indices. Riordan (1978) adapted Erwee’s (1976) system and used only occupation of the father or mother/guardian in the father’s absence (parental occupation), and highest level of education of the father or mother/guardian in the father’s absence (parental education).

Based on the total score for these two variables, Riordan (1978) arbitrarily set boundaries for upper, middle and lower socio-economic levels for the black, coloured, Indian and white population groups in Port Elizabeth.

Riordan’s tables for scoring the highest level of education and occupation of the breadwinner, are presented in Tables 1 and 2. The total score derived from the occupation and education of the father/mother provided the socio-economic index for each subject, by means of which they were classified as being of upper, middle, or lower socio-economic status, using Riordan’s (1978) cut-off points. These are presented in Table 3.
**Table 1: Classification of the breadwinner’s education**

<table>
<thead>
<tr>
<th>Father’s education</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>University attendance</td>
<td>7</td>
</tr>
<tr>
<td>Postmatric training (not university)</td>
<td>6</td>
</tr>
<tr>
<td>Matric</td>
<td>5</td>
</tr>
<tr>
<td>Apprenticeship</td>
<td>4</td>
</tr>
<tr>
<td>Junior Certificate</td>
<td>3</td>
</tr>
<tr>
<td>Primary school</td>
<td>2</td>
</tr>
<tr>
<td>None at all</td>
<td>1</td>
</tr>
<tr>
<td>No response</td>
<td>0</td>
</tr>
</tbody>
</table>

**Table 2: Classification of breadwinner’s Occupation**

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top professional, executive, administrative and technical occupations</td>
<td>9</td>
</tr>
<tr>
<td>Professional, administrative and managerial workers</td>
<td>8</td>
</tr>
<tr>
<td>Independent commercial</td>
<td>7</td>
</tr>
<tr>
<td>Lower grade administrative, technical, clerical, with limited supervisory and administrative responsibility</td>
<td>6</td>
</tr>
<tr>
<td>Artisans and skilled workers with trade qualifications</td>
<td>5</td>
</tr>
<tr>
<td>Routine clerical and administrative workers, service and sales workers</td>
<td>4</td>
</tr>
<tr>
<td>Semi-skilled production and manual workers</td>
<td>3</td>
</tr>
<tr>
<td>Unskilled production and manual workers</td>
<td>2</td>
</tr>
<tr>
<td>Not economically active or productive</td>
<td>1</td>
</tr>
<tr>
<td>No response</td>
<td>0</td>
</tr>
</tbody>
</table>

**Table 3: Classification of Socio-economic Status**

<table>
<thead>
<tr>
<th></th>
<th>Lower</th>
<th>Middle</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blacks</td>
<td>2 − 5</td>
<td>6 − 10</td>
<td>11 − 16</td>
</tr>
<tr>
<td>Coloureds</td>
<td>2 − 6</td>
<td>7 − 10</td>
<td>11 − 16</td>
</tr>
<tr>
<td>Indians</td>
<td>2 − 6</td>
<td>7 − 10</td>
<td>11 − 16</td>
</tr>
<tr>
<td>Whites</td>
<td>2 − 10</td>
<td>11 − 13</td>
<td>14 - 16</td>
</tr>
</tbody>
</table>
4.4.5 **Senior South African Individual Scale-Revised SED Questionnaire**

The Senior South African Individual Scale-Revised SED questionnaire was used to obtain relevant information related to the socio-economic status of the participant’s home background. Items such as the availability of electricity, running water and the child’s access to the health care facilities are included in this questionnaire.

This questionnaire was used in conjunction with the Riordan’s socio-economic classification system in order to provide a more accurate estimate of the child’s socio-economic status (SES).

4.4.6 **Assessment measure**

The measure that was used to collect the data required for this study was the Griffiths Mental Development Scales – Extended Revised (GMDS-ER).

The GMDS-ER was discussed in detail in the previous chapter and will therefore not be dealt with at length in this section. According to Luiz, Foxcroft and Povey (2006), numerous international studies have researched and reported favourably on the Griffiths Scales’ validity and reliability. Although this is true, a revision of the Scales was nevertheless highly recommended, especially focusing on the social and cultural factors influencing performance (Luiz, Foxcroft & Kotras, 1997; Davidson, 2007).

Participants were assessed on the Griffiths Scales at the Nelson Mandela Metropolitan University Psychology Clinic (Uclin). The test duration was two and a half hours. However, since some of the children got tired in the middle of the test session, the assessment was spanned over two sessions, with the second appointment being made less than a week after the initial appointment.

The test was administered by intern psychologists and Masters psychology students who had been trained in the administration of the Griffiths Mental Development Scales-Extended Revised.

4.5 **Research procedure**

Prior to the commencement of this research study, the necessary approval was obtained from the pre-schools and primary schools. The research proposal was then forwarded to the Faculty of Health Sciences Research, Technology and Innovations (FRTI) Committee and the
Ethics Committee (Human) at the Nelson Mandela Metropolitan University (NMMU) for their approval.

The potential participants who met the relevant criteria for the study were identified by approaching the preschools and primary schools in the Nelson Mandela Metropole. The information letter, consent forms and biographical questionnaires were delivered by hand to the parents at the respective schools of the identified participants.

This was done to ensure that the researcher was present to clarify any misunderstanding and answer any questions related to the documents given to the parents. The signed consent forms and biographical questionnaires were then screened to ensure that the identified participants met the inclusion criteria.

The respective parents of the participants were informed of the nature, purpose and procedure of the study at the children’s schools. They were also advised of their children’s right to anonymity and confidentiality and how this was to be maintained in the proposed study. Testing sessions were then set up with the identified participants.

It was ensured that any intern psychologist and psychologists-in-training, who were assisting with the data gathering, had been trained in the GMDS-ER, and anonymity was ensured by creating an efficient coding system for the participants. An individual report for each child assessed was compiled and the respective parents collected the reports at the University Clinic (UClin).

Verbal feedback on the children’s performance was given to the respective parents on the same day that they came to collect the reports. The data were analysed with the assistance of a statistician at the NMMU.

The treatise will be compiled and feedback regarding the overall findings will be provided to the parents in a form of a comprehensive letter.

4.6 Data analysis

As the research is quantitative, exploratory-descriptive in nature, descriptive statistics and frequency tables were used to analyse the data collected. Concepts such as means, medians, standard deviation and ranges were also used to describe the data to the reader. These statistics assisted in achieving the aim of the study, by describing the performance of the children on the six subscales of the GMDS-ER measure.
4.7 Ethical considerations

The primary purpose of ethical principles and values is to protect the welfare and rights of research participants, and to reflect the basic ethical values of respect for individuals, beneficence and justice (Ethics in Health Research in South Africa, 2000). De Vos, Straydom, Fouche and Delport (2000) reported that a number of unique ethical problems come to the fore when human beings are the object of study in the social sciences.

In psychological research, the researcher must be acutely aware of the rights of the subjects, and balance these with the “right” of the researcher to produce sound data. The proposed study underwent strict evaluation by the Ethics Committee (Human) at NMMU. Various ethical issues were considered before commencing the present research study.

4.7.1 Informed consent and confidentiality

The first ethical issue considered, was to obtain informed consent from the parents of the participants. Cozby (2004) suggested that the consent form be written in the second person, in language appropriate to the estimated language level of the participants. The consent form for the current study included the purpose and voluntary nature to the research, the identity of the researcher and a contact number should any questions arise in the absence of the researcher.

Issues of confidentiality and anonymity were stressed, both in writing and verbally, and an offer to provide feedback on the conclusion of the research was made. The respective parents of the participants met with the researcher at their children’s schools on a scheduled day for more clarification on the study. Also, they were required to sign the consent form, indicating the voluntary nature of participation in the research.

Furthermore, the opportunity to discontinue their involvement at any time was clearly stated (Cozby, 2004). The voluntary nature of the research was emphasized in the covering letter given to the parents of the participants. Confidentiality and anonymity were ensured at all times by not indicating the names of the participants on the questionnaires, and by using pseudonyms and codes instead.

Confidentiality means that the privacy of the participants will be protected, in that the data they provide will be handled and reported in such a manner that their personal identities will not be revealed when reporting the research (Mertens, 1998).
Anonymity - ensuring that no uniquely identifying information is attached to the data, was ensured through participants’ personal details only being recorded if they specifically requested feedback on the research (Abbot & Sapsford, 2006).

Finally, the researcher maintained cultural sensitivity, collaboration and respect at all times in the present research study. This was achieved by being continuously aware of the diverse ethnicity of the children taking part in the study, by respecting the individual differences of the participants, and conducting research in a respectful manner.

Cultural sensitivity is also echoed by contextualism, since particular attention was paid to the differences in how people of various ethnic groups develop throughout life (Dacey & Kenny, 1997).

4.7.2 Fairness

Children were not required to fulfil tasks above the level expected for their age. This was ensured by commencing the administration of the Scales approximately 4 months below the child’s chronological age and terminating the administration after 6 consecutive negative scores (Davidson, 2007).

4.7.3 Investigator competence

The assessment of the participants using the GMDS-ER was conducted by intern psychologists and psychologists-in-training who had received formal training in the administration of the GMDS-ER. According to De Vos (2002), researchers are ethically obliged to ensure that they are competent and adequately skilled to undertake the proposed investigation.

4.7.4 Feedback

Feedback in the form of a confidential report, as well as a comprehensive document with the overall findings of the study was provided to the parents concerned. In addition, verbal feedback was also provided to the parents regarding the participants’ performance on the GMDS-ER. The data were not falsified or fabricated, and the limitations of the findings have been pointed out (Davidson, 2007; Terre Blanche & Durrheim, 1999).
4.8 Dissemination of results

The sharing of knowledge obtained from this study was felt to be of importance, and therefore a copy of this research in the form of bound treatise will be placed in the Nelson Mandela Metropolitan University Library. The researcher will present the results at a national psychology conference or congress. Furthermore, a manuscript will be prepared and submitted for publication in a national or international journal.

4.9 Chapter overview

Chapter 4 provided an overview of the research methodology followed in this study. The aim of the present study was best met through the use of a quantitative research approach and methodology. The data for this study were gathered in the form of a biographical questionnaire, an SES classification system, and the GMDS-ER assessment measure.

A number of 20 children from a low socio-economic status were assessed using the GMDS-ER to establish their development profile based on their performance on the six subscales of the GMDS-ER measure.

This overview concludes the methodology chapter. The next chapter provides the reader with the results and their discussion based on the performance of children on the six subscales of the GMDS-ER.

The quantitative data were analysed through the use of frequency tables. The researcher was at all times aware of the ethical requirements when conducting research. The results from the statistical analysis will be presented and discussed in the following chapter.
CHAPTER 5

RESULTS AND DISCUSSION

5.1 Introduction

It has been highlighted in the previous chapters that there is a high risk of developmental problems amongst many young South African children. This is because of their lower socio-economic backgrounds and resultant health status. In addition, there are multiple shortcomings in the assessment of the development of young children in the country. Also, there is no finance for therapeutic interventions and this raises the need for sound family to implement home programmes.

Thus, there is a crucial need to establish a valid, reliable developmental test for all infants and young children in South Africa. The GMDS-ER is therefore regarded as an answer to this problem.

The primary aim of the study was to explore and describe the performance of children between the ages 3 and 8 years 4 months from low socio-economic backgrounds on the GMDS-ER. This was done for each of the six subscales.

The empirical findings of the study are presented and discussed below. Descriptive statistics are presented to summarise the composition and performance of the sample. As the results discussed below will make use of the designations per age group, which are standard according to the GMDS-ER, the table below is presented as a reference for converting the year groups into month-equivalents.

**Table 4: Ages per Year Group Designation**

<table>
<thead>
<tr>
<th>Age range per year group</th>
<th>Year III (24 – 35.9 months)</th>
<th>Year IV (36 – 47.9 months)</th>
<th>Year V (48 – 59.9 months)</th>
<th>Year VI (60 – 71.9 months)</th>
<th>Year VII (72 – 83.9 months)</th>
</tr>
</thead>
</table>
5.2 Descriptive statistics results for the children from a low SES background

The frequencies of gender, race, language, parent’s education, parent’s employment status, as well as the geographical area of the sample, will be discussed in this section. Cross-tabulation of the sample’s performance on the six subscales of the GMDS-ER will also be provided.

The provision and discussion of these frequencies and cross-tabulation will introduce the reader to the characteristics of the sample.

**Figure 1: Gender distribution of the sample**

The above figure illustrates the gender distribution of the sample. Out of the 20 participants of the sample, 45% were males and 55% were female children who participated in this study.

**Figure 2: Race distribution of the sample**
The above figure illustrates the race distribution of the sample. The sample comprised 15% black, 55% coloured and 30% white children. South African research has demonstrated the usefulness of the Griffiths Scales for South African black, white and coloured children (Allan, 1988; Bhamjee, 1991).

**Figure 3: Language distribution of the sample**

The above figure illustrates the distribution of language of the participants. The sample comprised 10% Xhosa speaking, 55% Afrikaans speaking, 30% English speaking and 5% English/Afrikaans speaking children. Research reveals that the Griffiths Scales have been successfully used to assess children of all three language groups (Allan, 1996).

**Figure 4: Level of parent’s education**

The sample of this study consisted of children whose parent’s education differed significantly. Five percent of the sample provided no response with regard to this aspect.
Another 5% comprised parents with no schooling background whatsoever, while 45% represents the parents with junior certificate or less education.

Thirty-five percent of the parents had a matric certificate, and 10% had postmatric qualifications. Research has found that parents with higher levels of education promote their children’s achievement by holding higher expectations for their children and providing more stimulating, learning materials and activities.

They also engage in higher quality instruction levels with their children, using more varied and complex language. They become involved in and supportive of their children’s learning (Davis-Kean, 2005; Hoff, 2003).

**Figure 5: Parent's employment status in the sample**

With regard to the parents’ employment status, 60% of the parents were unemployed, whereas 15% were doing domestic work. Another 15% represents the parents who were working as artisans, while 5% comprised those parents who were doing semi-skilled jobs, examples of which include clerical work, as well as those parents who provided no response to this issue.

Research has consistently shown that family background characteristics, such as socio-economic status (SES) as measured by parental education level, parental occupation and family income, have an influence on school achievement (Heyneman & Loxley, 1983).
Among SES indicators, parental employment status has been found to be the most significant source of disparities in children’s performance (Chevalier & Lanot, 2002; Guncer & Kose, 1993; Parcel & Dufur, 2001).

**Figure 6: Geographical residence of the sample**

The above figure illustrates the distribution of the geographical area of residence of the sample. A larger portion of the participants (45%) resided in the townships. On the other hand, 20% of the participants resided in informal settlements. Only 35% of the participants resided in other areas, which fell neither in the informal settlement category nor in the township category.

Neighbourhoods vary widely along a number of dimensions that may shape children’s development. The risks posed by low quality neighbourhoods are most striking in high poverty urban communities plagued by violence, gangs, drug activity and environmental pollutants. In these communities, some parents may not allow children to walk to school alone or play outside for fear that they will be harmed in some way.

Such a neighbourhood may cause elevated stress on the children, as a result of community violence and the lack of a proper social set-up. This in turn might result in poor scholastic achievement and behavioural problems (Brooks-Gunn, Duncan & Aber, 1997; Jarrett, 1997; Ellen & Turner, 1997; Evans, 2004).
Reliability of Mental Age scores

The “reliability” of a test refers to the accuracy, consistency, and stability of test scores across various situations (Aiken, 1997; Anastasi, 1982). The calculation of Chronbach’s alpha is based on the average correlation of all pairs of items in the scale, and it indicates the extent to which the items can be regarded as measuring a single construct. A commonly adopted convention is to accept values of alpha that are in the range 0.70 to 0.90 inclusive as indicating an acceptable level of internal consistency.

Table 5: The reliability of the scores on the six subscales of the GMDS-ER

<table>
<thead>
<tr>
<th>Scale</th>
<th>Cronbach’s α</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA-A</td>
<td>0.83*</td>
</tr>
<tr>
<td>MA-B</td>
<td>0.89*</td>
</tr>
<tr>
<td>MA-C</td>
<td>0.84</td>
</tr>
<tr>
<td>MA-D</td>
<td>0.89*</td>
</tr>
<tr>
<td>MA-E</td>
<td>0.83</td>
</tr>
<tr>
<td>MA-F</td>
<td>0.88</td>
</tr>
<tr>
<td>Tot MA</td>
<td>0.94</td>
</tr>
</tbody>
</table>

* Calculated without Year 1, as Year 1 yielded scores of zero on all the subscales.

The above Table 2 illustrates that the mental age scores of the children are highly reliable, given that all Cronbach’s alpha values are greater than 0.80.

5.3 Cross tabulation: Illustrating Mental Age (MA) vs Chronological Age (CA)

Table 6: Cross tabulation on Locomotor Scale

<table>
<thead>
<tr>
<th>CA</th>
<th>&lt;CA</th>
<th>=CA</th>
<th>&gt;CA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 years</td>
<td>0 (0%)</td>
<td>3 (50%)</td>
<td>3 (50%)</td>
<td>6 (100%)</td>
</tr>
<tr>
<td>4 years</td>
<td>0 (0%)</td>
<td>2 (40%)</td>
<td>3 (60%)</td>
<td>5 (100%)</td>
</tr>
<tr>
<td>5 years</td>
<td>0 (0%)</td>
<td>2 (40%)</td>
<td>3 (60%)</td>
<td>5 (100%)</td>
</tr>
<tr>
<td>6 years</td>
<td>1 (33%)</td>
<td>2 (67%)</td>
<td>0 (0%)</td>
<td>3 (100%)</td>
</tr>
<tr>
<td>7 years</td>
<td>0 (0%)</td>
<td>1 (100%)</td>
<td>0 (0%)</td>
<td>1 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>1 (5%)</td>
<td>10 (50%)</td>
<td>9 (45%)</td>
<td>20 (100%)</td>
</tr>
</tbody>
</table>
The above table illustrates that out of the six 3-year olds, 50% of them have a Mental Age which is equal to their Chronological Age, and another 50% represent children with a MA which is greater than their CA. This illustrates that 50% of the 3-year olds performed better on the Locomotor Scale, while the remaining 50% of the same age group’s performance was merely average.

Out of the five 4-year olds, 40% obtained a MA which is equal to their CA, and 60% performed better with an MA greater than their CA. The 5-year olds obtained the same scores as the 4-year olds. The 6-year olds’ performance differed slightly, with 1 child (33%) obtaining an MA which was below his CA, and 67% obtaining an MA which was equal to their CA. The performance of the 7-year old child was average, as the MA was equal to the CA.

**Table 7: Cross tabulation on Personal-Social Scale**

<table>
<thead>
<tr>
<th></th>
<th>MA-B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;CA</td>
</tr>
<tr>
<td>3 years</td>
<td>2 (33%)</td>
</tr>
<tr>
<td>4 years</td>
<td>1 (20%)</td>
</tr>
<tr>
<td>5 years</td>
<td>1 (20%)</td>
</tr>
<tr>
<td>6 years</td>
<td>1 (33%)</td>
</tr>
<tr>
<td>7 years</td>
<td>1 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>6 (30%)</td>
</tr>
</tbody>
</table>

The table above illustrates that out of the six 3-year olds, 33% have a MA which is below their CA, and 17% have a MA which is equal to their CA, while 50% have a MA which is above their CA. This performance suggests that only 50% of the 3-year olds performed better on the Personal-social Scale. Out of the five 4-year olds, only 1 child (20%) had a MA below his CA, and 4 children (80%) had a MA above their CA.

Twenty percent (20%) of the 5-year olds had a MA that was below their CA, and 40% had an average MA which was equal to their CA, while another 40% had a MA above their CA. Out of the three 6-year olds, only one child obtained a MA below his CA, and another
child obtained a MA which was equal to his CA, and yet another child obtained a MA above his CA.

Table 8: Cross tabulation on Language Scale

<table>
<thead>
<tr>
<th>CA</th>
<th>&lt;CA</th>
<th>=CA</th>
<th>&gt;CA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 years</td>
<td>4 (67%)</td>
<td>2 (33%)</td>
<td>0 (0%)</td>
<td>6 (100%)</td>
</tr>
<tr>
<td>4 years</td>
<td>3 (60%)</td>
<td>2 (40%)</td>
<td>0 (0%)</td>
<td>5 (100%)</td>
</tr>
<tr>
<td>5 years</td>
<td>4 (80%)</td>
<td>1 (20%)</td>
<td>0 (0%)</td>
<td>5 (100%)</td>
</tr>
<tr>
<td>6 years</td>
<td>3 (100%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>3 (100%)</td>
</tr>
<tr>
<td>7 years</td>
<td>1 (100%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>1 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>15 (75%)</td>
<td>5 (25%)</td>
<td>0 (0%)</td>
<td>20 (100%)</td>
</tr>
</tbody>
</table>

With regard to the performance of the 3-year olds on the Language Scale, 67% yielded a MA which was below their CA, and 33% had an average MA which was equivalent to their CA. Out of the five 4-year olds, 3 children (60%) obtained a MA which was below their CA, and 2 children (40%) had an average MA which was equivalent to their CA. Only one (20%) 5-year old had a MA that was equal to his CA. The remaining 80% of the 5-year old children had a MA which was below their CA. All the 6 and 7-year olds (100%) performed poorly on this Scale with a MA which was below their CA.

Cognitive theorists postulate that language learning requires a number of cognitive processes, such as attention, information processing, and retention. For example, paying attention to stimuli that are loud or connected to some vital activity, remembering them, making discriminations and judgements about them and classifying them according to these judgements are all cognitive processes related to language learning (Peters, 1986).

Cognitive psychologists argue that cognitive factors either precede or place a limit on language learning. They maintain that children notice things in their environment and learn words best when parents focus on what children are paying attention to, rather than forcing children to redirect their attention to something else.

In order to create sentences children also need the cognitive ability to remember words. In addition, children must understand something about an object or an idea before using
words in a meaningful manner. Linguistic growth necessarily parallels cognitive growth (Rice, 1989).

**Table 9: Cross tabulation on Eye-Hand Co-ordination Scale**

<table>
<thead>
<tr>
<th>CA</th>
<th>&lt;CA</th>
<th>=CA</th>
<th>&gt;CA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 years</td>
<td>3 (50%)</td>
<td>3 (50%)</td>
<td>0 (0%)</td>
<td>6 (100%)</td>
</tr>
<tr>
<td>4 years</td>
<td>4 (80%)</td>
<td>0 (0%)</td>
<td>1 (20%)</td>
<td>5 (100%)</td>
</tr>
<tr>
<td>5 years</td>
<td>5 (100%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>5 (100%)</td>
</tr>
<tr>
<td>6 years</td>
<td>2 (67%)</td>
<td>1 (33%)</td>
<td>0 (0%)</td>
<td>3 (100%)</td>
</tr>
<tr>
<td>7 years</td>
<td>1 (100%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>1 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>15 (75%)</td>
<td>4 (20%)</td>
<td>1 (5%)</td>
<td>20 (100%)</td>
</tr>
</tbody>
</table>

On the Eye-Hand Co-ordination Scale, the performance of the 3-year olds revealed that 50% of them had a MA which was below their CA, and another 50% had an average MA which was equal to their MA. Out of the five 4-year olds, 4 children (80%) yielded a MA which was below their CA, and only 1 child (20%) had a MA which was above his/her CA. With regard to the 5-year olds, their performance indicated that 100% of the children in this age range had a MA which was below their CA. Sixty-seven percent of the 6-year olds had a MA which was below their CA, and 33% had an average MA which was equal to their CA. The 7-year old child also yielded a MA which was below his/her CA.

A study by Van Heerden (2007) revealed that South African children performed their worst on this subscale. Sweeney (1994) also found that the white South African children in her study performed their worst on this subscale. According to Van Heerden (2007), the diverse nature of early childhood programmes which fail to meet the needs of South African children, coupled with a lack of resourced preschools and a lack of well-trained teachers could all be considered factors that influence the performance of children on this subscale (Davidson, 2007). Financial factors that inhibit activities that could stimulate this skill include:
• Lack of family coherence – no interest in young child by mother and father.

• Lack of experiential learning where children take part in household tasks and learn from doing and participating in activities, and

• Lack of parental knowledge on child rearing.

**Table 10: Cross tabulation on Performance Scale**

<table>
<thead>
<tr>
<th></th>
<th>MA-E</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CA</td>
</tr>
<tr>
<td></td>
<td>&lt;CA</td>
</tr>
<tr>
<td>3 years</td>
<td>3 (50%)</td>
</tr>
<tr>
<td>4 years</td>
<td>4 (80%)</td>
</tr>
<tr>
<td>5 years</td>
<td>5 (100%)</td>
</tr>
<tr>
<td>6 years</td>
<td>3 (100%)</td>
</tr>
<tr>
<td>7 years</td>
<td>1 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>16 (80%)</td>
</tr>
</tbody>
</table>

The above figure illustrates that out of the six 3-year olds, 50% had a MA which was below their CA, and 33% yielded an average MA which was equal to their CA, while 17% obtained a MA above his/her CA. Eighty percent of the 4-year olds yielded a MA below their CA, and 20% obtained a MA above his/her CA. All the 5, 6, and 7-year old children (100%) performed their worst on this subscale with a MA below their CA.

A study by Van Heerden (2007) revealed that the South African children performed poorly on this subscale compared to the other subscales. This poor performance by children from a low socio-economic status could be attributed to the fact that children from poverty-striken areas lack resources, such as pencils, crayons and other toys that could enhance their performance skills.

In addition, these children are not exposed to the items of this scale and therefore are not familiar with the games and puzzles which require fine motor skills in order for them to be competent in this game. Thus, lack of stimulation places these children in a disadvantaged position of poor performance on this subscale. Other factors that may contribute to these children’s poor performance on this subscale include:
• Lack of exposure to educational pre-school environment as a result of financial constraints.

• Lack of transport to take children to school

• Crime and motor vehicle accidents as children travel distanced by foot and exploring their environment.

• Lack of practice with educational games, and no toy libraries are available in the communities they live in.

**Table 11: Cross-tabulation on Practical Reasoning Scale**

<table>
<thead>
<tr>
<th></th>
<th>CA &lt;CA</th>
<th>CA =CA</th>
<th>CA &gt;CA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 years</td>
<td>5 (83%)</td>
<td>1 (17%)</td>
<td>0 (0%)</td>
<td>6 (100%)</td>
</tr>
<tr>
<td>4 years</td>
<td>3 (60%)</td>
<td>1 (20%)</td>
<td>1 (20%)</td>
<td>5 (100%)</td>
</tr>
<tr>
<td>5 years</td>
<td>3 (60%)</td>
<td>2 (40%)</td>
<td>0 (0%)</td>
<td>5 (100%)</td>
</tr>
<tr>
<td>6 years</td>
<td>2 (67%)</td>
<td>1 (33%)</td>
<td>0 (0%)</td>
<td>3 (100%)</td>
</tr>
<tr>
<td>7 years</td>
<td>1 (100%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>1 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>14 (70%)</td>
<td>5 (25%)</td>
<td>1 (5%)</td>
<td>20 (100%)</td>
</tr>
</tbody>
</table>

The overall performance of the total sample on the Practical Reasoning Scale indicates that 70% of the children yielded a MA which was below their CA, and 25% obtained an average MA equivalent to their CA, while only 5% yielded a MA above his/her CA.

According to Stewart (1997), the Practical Reasoning Scale indicates the child’s ability to benefit from formal schooling. It requires the child to reason about practical problems. Attention and concentration span also play a major role on this scale.

According to the Maslow’s hierarchy of needs, physiological needs include the most basic needs that are vital to survival, including the need for water, air, food, and sleep. Maslow believed that these needs are the most basic and instinctive needs in the hierarchy because all needs become secondary until these physiological needs are met. Physiological, security, social, and esteem needs are deficiency needs, meaning that these needs arise due to deprivation. Satisfying these lower-level needs is important in order to avoid unpleasant
feelings or consequences. Thus, if children are hungry and their basic needs are not met, learning cannot take place and consequently, they cannot self-actualize.

**Figure: 7 Performance on Locomotor Scale (A)**

The developmental profile of the total sample revealed that 3-year old children performed significantly better on the Locomotor Scale with a GAQ of 140.8. The performance of children in Year IV yielded a GAQ of 128.5. The children’s performance in Year V yielded a GAQ of 129.3. A significant drop in performance of the children in Year VI was noted with a GAQ of 99.01, which is significantly lower than the performance of all the age groups. The 7-year olds obtained a GAQ score of 111.9, which was significantly lower than the performance in Years III, IV and V, but definitely higher than Year VI.

No research is available on South African children from a low socio-economic class, on Subscale A of the GMDS-ER. Comparable studies on the original Griffiths Scales provided results that support the above findings with regard to the Locomotor Subscale.

A research study that was conducted by Bhamjee (1991) on the performance of South African Indian 5-year-olds revealed that there were significant differences between SES measures and the performance of South African Indian children in regard to the Griffiths Scales GQ and all the individual scales, except the Locomotor scale. Mothuloe (1990) found no significant differences in the Griffiths Scales performance of 5 to 7-year old South African black children.
Many writers have discussed the characteristics of the experiential world of poor children. These writers have, inter alia, pointed out that housing is inadequate in their low quality communities and that income is generally low. These children may consequently have less toys and have less chance to play indoors and may therefore concentrate on outdoor activities, such as running and jumping (Evans, 2004). Lack of television in these children’s households promote them to spend more time on aimless movements and the South African weather is very conducive to outside play.

These factors could have contributed to the high performance of children in respect of the items on the Locomotor Scale.

The poor performance of the 6 and 7-year olds could be attributed to the fact that when locomotor activities become more complex than running around, they as a result of lack of exposure and practice cannot co-ordinate muscles in a complex manner.

**Figure: 8 Performance on Personal-Social Scale (B)**

The above graph indicates that children in Year III obtained a GBQ of 108.8 on the Personal-Social Scale. The performance of children in Year IV was significantly higher than the rest of the age groups with a GBQ of 115.8 Children in Year V who obtained a GBQ of 112.7 and those in Year VI that obtained a GBQ of 108.3.

Finally, the performance of children in Year VII was the lowest compared with that of the children in Years III, IV, V and VI. They obtained a GBQ of 85.7. Literature reveals that emotional factors usually have a more definite effect on this scale.
It further postulated that emotionally disturbed children usually perform poorly on this scale, thus failure at school affects self-esteem. Most children are often aware of the difficulties the family is experiencing which consequently adds an emotional strain on them. In addition, prolonged poor nutrition becomes lethargic.

According to Griffiths (1984), overly protected children usually do badly on this scale because they are slower in learning, in self-help and in personal care. On the other hand, neglected children who receive insufficient attention and or care from their parents may manifest emotional and or behavioural disturbances in a variety of ways (Luiz, 1994; Stewart, 1997). Usually, they are not aware of the social class difference until they compare themselves to their peers.

Marked social class differences are generally accepted for children of school age. Allan (1988) compared the performance of 5-year-old South African white children from different socio-economic classes on the Griffiths Scales and found significant differences on the GQ and all the individual scales, except the Locomotor and Personal-Social Scales.

However, a study by Mothuloe (1990) revealed no significant SES differences in the Griffiths Scales performance of 5 to 7-year old South African black children.

**Figure: 9 Performance on Language Scale (C)**

The above figure illustrates the performance of children across the different age groups on the Language Scale. Children in Year III obtained a GCQ of 70.3 and in Year V, they obtained a GCQ of 56.8, which is significantly lower than the rest of the age groups. This was
followed by Year V with a GCQ of 67.4. Years IV and VII yielded GCQs of 82.9 and 85.7 respectively. No research is available on South African performance of children from a low socio-economic status on Subscale C of the GMDS-ER. Schróder’s study (2004) yielded similar results with regards to the Language subscale when exploring the developmental profiles of hearing impaired pre-school children, and comparing their performance to a sample of normal pre-school children. Results indicated a mean G.Q. that fell within the average range, as with all the subscales including Language (C) and Practical Reasoning (F), that fell within the below average range.

Comparable research on the original Griffiths Scales is in contradiction with the above findings. Allan’s (1988; 1992) studies only found significant differences between black South African and British children in Year VI of the Language Subscale. There was a trend for British children to perform better than their South African counterparts, but none, other than this one, were significant.

Luiz and Bhamjee (1991) found significant differences in the performance of British and South African children on Subscale C of the original Griffiths Scales in Years IV and V when comparing Asian South African children with their contemporary British counterparts. Again the British means tended to be higher for the later years (VI, VII and VIII), but none were significantly so.

According to Griffiths (1984), the language scale is the most intellectual of all the scales and it gives an opportunity for study of the growth and development of language by clinicians. Children who perform poorly on this scale, relative to their own performance on the other scales, may have a speech impediment or may possibly be deaf or suffering from a hearing loss (Luiz, 1994).
The above figure illustrates the performance of children on the Eye-Hand Co-ordination Scale. Children in Year III obtained a GDQ of 93.2 which was almost similar to that of children in Year VII with a GDQ of 95.2. Children in Year IV achieved a GDQ of 83.8 and those in Year VI 82.1 respectively. A significantly low score was obtained by children in Year V, with a GDQ of 75.7. Research findings of the study by Allan (1988) revealed that the children from different socio-economic groups differed significantly in their performance on the GQ and four of the six scales. Upper-class children performed significantly better than middle- and lower-class children on the Eye-Hand Co-ordination, Hearing and Speech, Practical Reasoning and Performance Scales and in terms of the GQ.
The above graph illustrates the performance of children on the Performance Scale. Children in Year III obtained a GEQ of 98.6, and this performance is significantly better when compared with the other age groups. Children in Year IV yielded a GEQ of 85.4, followed by children in Year V with a GEQ of 81.3. Children in Year VI obtained a GEQ of 78.8 and those in Year VII yielded a GEQ score of 80.95. There was no significant difference in the performance of children in Years IV, V, VI, and VII.

The above findings seem to be in contradiction with previous research done on the original Griffiths Scales as far as Year III is concerned, but the results for the later year groups seems to be similar to previous comparable research.

Bhamjee (1991) found that South African 3-year-old children performed poorly on this Scale when compared with a British sample. Allan (1988, 1992) found that British children performed better than Black South African children in Years VI and VII and better than Coloured South African children in Year VI.

No differences were found between White and Asian South African children in Year VI and their British contemporaries. Bhamjee (1991) found significant differences between Indian South African children in Years IV and V when compared with their British contemporaries, with British children performing better. She did not find any differences between Asian South African children in Years VI and VII when compared with their British counterparts.
The above figure illustrates the performance of children in all the age groups on the Practical Reasoning Scale. Children in Year III obtained a GFQ of 60.4 which was the lowest score when compared with scores from the other age groups. Children in Years IV and VII yielded GFQ scores of 92.1 and 92.9 respectively. Children in Year V obtained a GFQ of 81.2, and those in Year VI yielded a score of 71.3.

No research is available on South African children from a low socio-economic class, on Subscale F of the GMDS-ER. Allan’s (1988,1992) comparisons indicated that British children in Year VII performed significantly better than their Black South African counterparts, whereas this was not the case with Black South African children in Year VI. British children also performed significantly better than Coloured South African children in Year VI, but this was not the case with White or Asian South African children.

Bhamjee (1991) only found significantly better British performance in Year VII in her comparison of British children with Asian South African children. She also found significant differences for South African Indian children in respect of the Griffiths Scales GQ and the Practical Reasoning Scale.

Practical Reasoning is the most intellectual of the six subscales, and thus it may be hypothesised that it be greatly affected by skills that are stimulated more formally within a crèche or pre-school, to which participants within the sample were not exposed. There are
neurological implications for HIV positive children. Children are endowed with a particular cognitive inheritance, which in lower SES groups may be lower. As chronological age increases, the gap between mental age and chronological age also grows. Children may have slowed abilities, due to both cognitive inheritance and HIV, and thus expend a larger amount of time to learn and retain information. Furthermore, HIV is implicated in the decline of executive functioning, and this in combination with SES factors may impact on the child’s ability to learn reasoning skills (Sandison, 2005).

**Figure: 13 Summary of the performance of children in all age groups on the six subscales in accordance with the above discussion**

In Year III, children’s scores in Subscale A were significantly higher, whereas scores in Subscales C and F were significantly lower. In Year IV, children’s scores in Subscales A and B were significantly higher, whereas scores in Subscales C, D, E and F were lower. In Year V, the performance scores of children in Subscales A and B was higher than those in Subscales C, D, E and F.

In Year VI, children scored higher on Subscales A and B as compared with the other Subscales C, D, E, and F. In Year VII, children’s scores on Subscale A were higher than those on Subscales B, C, D, E and F.
The above figure illustrates the general mean performance of the total sample on the six subscales of the GMDS-ER. It is interesting to note that the highest scores are on the Locomotor subscale with a mean of 114 and a standard deviation of 21. The minimum score in this scale is also the highest as compared with the other subscales with 79, and the maximum score being 162.

The order of performance on the six subscales is as follows: Locomotor scale, Personal-social scale, Performance scale, Eye-Hand Co-ordination scale, Practical Reasoning scale, and Language scale.

5.4 Summary of children’s performance on the six subscales of the GMDS-ER on age groups.

The children performed better on the Locomotor Scale followed by Personal-social Scale. Their worst performance was on the Language Scale, followed by Eye-Hand Co-ordination Scale and finally, the Practical Reasoning Scale. The 3-year olds performed better on the Locomotor, Personal-social, Eye-Hand Co-ordination and Performance Scales. They performed poorly on the Language and Practical Reasoning Scales.

The 4-year olds performed satisfactorily on the Locomotor, Personal-social, Language, and Practical Reasoning Scales. Their worst performance was on the Eye-Hand Co-ordination and Performance Scales. With regard to the 5-year old children, their performance on the
Locomotor and Personal-Social Scales was satisfactory compared with their performance on the other scales which turned out to be their worst. The 6-year olds performed better on the Personal-social Scale as compared with the rest of the scales.

Finally, the 7-year olds performed better on the Language, Eye-Hand Co-ordination and Practical Reasoning Scales.

5.5 Chapter overview

This chapter has covered the frequencies illustrating the sample characteristics in the form of charts. Descriptive statistics in the form of cross tables and graphs were also provided to address the aim of the study by looking at the performance of children on the six subscales of the GMDS-ER. Cross-tabulation of the children’s Mental Age and Chronological Age was done to identify the children’s strengths and weaknesses on the six subscales of the GMDS-ER. The chapter concluded by looking at the summary of children’s performance on the six subscales of the GMDS-ER.

The next chapter will inform the reader about the limitations, conclusions, as well as the recommendations for future research.
CHAPTER 6

LIMITATIONS, CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

6.1 Introduction

The limitations, conclusions and recommendations of the study are presented in this chapter. The present study’s overall aim is an exploration and description of the developmental profile of children from a low socio-economic status utilizing the GMDS-ER. This aim was achieved by looking at the overall performance of the children on the six subscales of the GMDS-ER.

6.2 Limitations

The limitations of the present study need to be acknowledged. Limitations mainly involve those issues concerning sampling procedure and sample size. The limitations encountered in this study will now be discussed.

6.2.1 Limitation regarding the sampling procedure

The South African sample was collected by using a non-probability sampling methodology. The one main weakness with non-probability sampling is that the researcher is not aware of the statistical probability that an individual will be included in the study, and therefore cannot claim that the sample is generally representative of the larger population. The sampling technique is therefore detrimental to the external validity of the results and means that generalizability to the larger population is severely limited.

6.2.2 Limitation regarding sample size

The current study employed a small sample size. A small sample size has been regarded by Glutting and McDermott (1990) as being adequate for a clinical sample. However, they maintained that it becomes methodologically improper for a normative typology. They further postulate that a small sample size leads to difficulty in permitting generalizations of the results.

The external validity of the study is therefore compromised as a result of a small sample size, and thus the sample cannot be considered representative of the population (Davidson, 2007; Sweeney, 1994).
Factors, such as the availability of participants who fall within the inclusion criteria and the assessment period of the participants, also contributed to the smaller sample size of this study. In addition, the fact that children were sampled far from their homes, transportation became problematic and resulted in a limited number of children being assessed.

6.2.3 Limitation regarding the actual assessment time

The amount of time needed to perform an assessment on the GMDS-ER is quite long, and therefore it requires children to concentrate on the assessment process for a long period of time. It is however impossible for young children between the ages of 3 and 8 years 4 months to pay attention and concentrate for a lengthy period. This resulted in the assessment sessions being divided into two sessions in order to accommodate this limitation. A clinical observation that was noted during the assessment of these children was that the children were easily fatigued and the assessment session had to be stopped half way, as they could not co-operate any longer on the task at hand.

6.3 Conclusions

The research findings revealed that the children from a low SES performed better on the Locomotor Scale, followed by Personal-social Scale, while their worst performance was on the Performance Scale. Their second worst performance was on the Language Scale, followed by the Eye-Hand Co-ordination Scale and finally, the Practical Reasoning Scale. The 3-year olds performed better on the Locomotor, Personal-social, Eye-Hand Coordination and Performance Scales. They performed poorly on the Language and Practical Reasoning Scales.

The 4-year olds performed satisfactorily on the Locomotor, Personal-social, Language, and Practical Reasoning Scales. Their worst performance was on the Eye-Hand Co-ordination and Performance Scales. With regard to the 5-year old children, their performance on the Locomotor and Personal-Social Scales was satisfactory compared with their performance on the other scales which were worse.

The 6-year olds performed better on the Personal-social Scale as compared with the rest of the scales. Finally, the 7-year olds performed better on the Language, Eye-Hand Coordination and Practical Reasoning Scales. As tasks became more conceptual and higher order thought processes became involved, performance deteriorated.
Respectively, after having considered the statistics and the research as a whole, I have come to realize that the need for the study is reflecting the real-life issues including HIV and AIDS, poverty, that are tampering with the children’s potential and capabilities. Also in the context of an ever changing South African society, the study does add value in the area of child development.

6.4 Recommendations for future research

Based on the totality of the research findings, the following recommendations for future research were made:

Studies to be conducted in the future need to make use of a larger sample size in order to be able to generalize the findings to the entire population. In order to ensure better internal validity, the assessment should take place in the morning, as children tend to concentrate best in the morning, and the assessment time should be as short as possible, while not neglecting to administer all the items. Also, a longitudinal study of this nature is highly recommended in order to assess the children’s performance on a long term basis.

6.5 Chapter overview

This chapter has provided an overview of the limitations that were encountered in this study and this has led to the recommendations for future research. Conclusions pertaining to the performance of children on the six subscales of the GMDS-ER were also provided.
CHAPTER 7

REFERENCE LIST


Dear Participant

You are being asked to participate in a research study. We will provide you with the necessary information to assist you to understand the study and explain what would be expected of you (participant). This information will be provided to you on a group basis at your child’s school on a scheduled day. These guidelines will include the risks, benefits, and your rights as a study subject. Please feel free to ask the researcher to clarify anything that is not clear to you.

To participate, it will be required of you to provide written consent that will include your signature, date and initials, to verify that you understand and agree to the conditions.

You have the right to query concerns regarding the study at any time. Immediately report any new problems during the study, to the researcher. Please feel free to call this number if you have any concerns. Telephone numbers of the researcher are provided:

Ms Thembi Kheswa (041) 585 2323

Furthermore, it is important that you are aware of the fact that the study has to be approved by the Research Ethics Committee (Human) of the University. The REC-H consists of a group of independent experts that has the responsibility to ensure that the rights and welfare of participants in research are protected and that studies are conducted in an ethical manner. Studies cannot be conducted without the REC-H’s approval. Queries with regard to your rights as a research subject can be directed to the Research Ethics Committee (Human) and you can call the Director: Research Management at (041) 504-4536.
If no one can assist you, you may write to: The Chairperson of the Research, Technology
and Innovation Committee, PO Box 77000, Nelson Mandela Metropolitan University, Port
Elizabeth, 6031.

Participation in research is completely voluntary. You are not obliged to take part in any
research. If you do participate, you have the right to withdraw at any given time during the
study without penalty or loss of benefits. However, if you do withdraw from the study, you
should return for a final discussion in order to terminate the research in an orderly manner.

If you fail to follow instructions in such a way that the researcher believes that it is not in
your best interest to continue in this study, or for administrative reasons, your participation
may be discontinued. The study may be terminated at any time by the researcher, the sponsor
or the Research Ethics Committee (Human) that initially approved the study.

Although your identity will at all times remain confidential, the results of the research
study may be presented at scientific conferences or in specialist publications.

This informed consent statement has been prepared in compliance with current statutory
guidelines.

Yours sincerely

Ms. Thembi Kheswa                               Dr. Louise Stroud
(Researcher)                                     (Supervisor)

Dr. Jenny Jansen                               Prof Mark Watson
(Co-Supervisor)                                (HOD Psychology)
APPENDIX B

Biographical Questionnaire

SECTION A

PERSONAL DETAILS

Child’s name and surname: _______________________________________________

Address: _________________________________________________________________

Area: ___________________________________________________________________

Telephone number: ___________________________________________________________________

Date of Birth: _______/_______/_______

Gender: [ ] M [ ] F

Cultural Group: [ ] Black [ ] Coloured [ ] Indian [ ] White

Current Preschool / School:

Preschool / School Telephone No: ____________________________________________

Home language: ____________________________________________________________

Has your child been diagnosed with a mental and/or physical disorder? If yes, please specify.

__________________________________________________________________________

__________________________________________________________________________
Breadwinner’s / Guardian’s occupation: _______________________________________________________________________

Breadwinner’s / Guardian’s occupational level: (Please tick the highest level achieved)

<table>
<thead>
<tr>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
</tr>
<tr>
<td>Primary School</td>
</tr>
<tr>
<td>Junior Certificate</td>
</tr>
<tr>
<td>Apprenticeship</td>
</tr>
<tr>
<td>Matric</td>
</tr>
<tr>
<td>Further Training (not at University)</td>
</tr>
<tr>
<td>University degree or diploma</td>
</tr>
</tbody>
</table>
APPENDIX C

Senior South African Individual Scale-Revised SED QUESTIONNAIRE

<table>
<thead>
<tr>
<th>SSAIS-R SOCIO-ECONOMIC DISADVANTAGED QUESTIONNAIRE (YES/NO)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Has at least one parent passed at least Standard 10?</td>
</tr>
<tr>
<td>2</td>
<td>Do the child’s parents have a permanent job?</td>
</tr>
<tr>
<td>3</td>
<td>Does at least one of the child’s parents hold a position with pension benefits?</td>
</tr>
<tr>
<td>4</td>
<td>Do the child’s parents own a car?</td>
</tr>
<tr>
<td>5</td>
<td>Does the child usually live in a home where at least one of the following types of rooms are available under the same roof to the use of the family: bedroom, living room, kitchen, &amp; bathroom?</td>
</tr>
<tr>
<td>6</td>
<td>Does the child sleep in a room with not more than two other people present?</td>
</tr>
<tr>
<td>7</td>
<td>Does the child have his /her own bed to sleep in?</td>
</tr>
<tr>
<td>8</td>
<td>Is there at least one hot water tap in the pupil’s home?</td>
</tr>
<tr>
<td>9</td>
<td>Is electricity and/or gas available in the child’s home?</td>
</tr>
<tr>
<td>10</td>
<td>Is there a flush toilet in the child’s home?</td>
</tr>
<tr>
<td>11</td>
<td>Is there a fridge in the child’s home?</td>
</tr>
<tr>
<td>12</td>
<td>Is there a radio and/or TV set in the child’s home?</td>
</tr>
<tr>
<td>13</td>
<td>Does the child usually have at least three meals a day?</td>
</tr>
<tr>
<td>14</td>
<td>Does the child have adequate clothing items?</td>
</tr>
<tr>
<td>15</td>
<td>Does the child receive adequate medical, dental and health care?</td>
</tr>
<tr>
<td>16</td>
<td>Does the child own a number of toys?</td>
</tr>
<tr>
<td>17</td>
<td>Is the attitude of the child’s parents towards his/her schooling positive or at least neutral?</td>
</tr>
<tr>
<td>18</td>
<td>Is the child free from severe physical and/or emotional abuse?</td>
</tr>
</tbody>
</table>
APPENDIX D

Riordan’s Socio-economic Classification System

Classification of Breadwinners Occupation

<table>
<thead>
<tr>
<th>Occupational Classification</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top professional, executive, administrative and technical occupations</td>
<td>9</td>
</tr>
<tr>
<td>Professional, administrative and managerial workers</td>
<td>8</td>
</tr>
<tr>
<td>Independent commercial</td>
<td>7</td>
</tr>
<tr>
<td>Lower grade administrative, technical, clerical, with limited supervisory and administrative responsibility</td>
<td>6</td>
</tr>
<tr>
<td>Artisans and skilled workers with trade qualifications</td>
<td>5</td>
</tr>
<tr>
<td>Routine clerical and administrative workers, service and sales workers</td>
<td>4</td>
</tr>
<tr>
<td>Semi-skilled production and manual workers</td>
<td>3</td>
</tr>
<tr>
<td>Unskilled production and manual workers</td>
<td>2</td>
</tr>
<tr>
<td>Not economically active or productive</td>
<td>1</td>
</tr>
<tr>
<td>No response</td>
<td>0</td>
</tr>
</tbody>
</table>

Classification of Breadwinner’s Education

<table>
<thead>
<tr>
<th>Breadwinner’s education</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>University attendance</td>
<td>7</td>
</tr>
<tr>
<td>Post-matric training (not university)</td>
<td>6</td>
</tr>
<tr>
<td>Matric</td>
<td>5</td>
</tr>
<tr>
<td>Apprenticeship</td>
<td>4</td>
</tr>
<tr>
<td>Junior Certificate</td>
<td>3</td>
</tr>
<tr>
<td>Primary school</td>
<td>2</td>
</tr>
<tr>
<td>None at all</td>
<td>1</td>
</tr>
<tr>
<td>No response</td>
<td>0</td>
</tr>
</tbody>
</table>
APPENDIX E

NELSON MANDELA METROPOLITAN UNIVERSITY

INFORMATION AND INFORMED CONSENT FORM

(Please delete any information not applicable to your project and complete /expand as deemed appropriate)

<table>
<thead>
<tr>
<th>Title of the research project</th>
<th>The Developmental Profiles of Children from a Low Socioeconomic Status Utilizing the Griffiths Mental Development Scales - Extended Revised.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference number</td>
<td></td>
</tr>
<tr>
<td>Principal investigator</td>
<td>Thembi Kheswa</td>
</tr>
<tr>
<td>Address</td>
<td>NMMU Psychology Clinic</td>
</tr>
<tr>
<td></td>
<td>South Campus</td>
</tr>
<tr>
<td>Postal Code</td>
<td>6031</td>
</tr>
<tr>
<td>Contact telephone number</td>
<td>041-585 2323</td>
</tr>
</tbody>
</table>

A. DECLARATION BY OR ON BEHALF OF PARTICIPANT

(Person legally competent to give consent on behalf of the participant)

<table>
<thead>
<tr>
<th>I, the participant and the undersigned</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I.D. number</td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>I, in my capacity as</td>
<td></td>
</tr>
<tr>
<td>of the participant</td>
<td></td>
</tr>
<tr>
<td>I.D. number</td>
<td></td>
</tr>
<tr>
<td>Address (of participant)</td>
<td></td>
</tr>
</tbody>
</table>

Initial
### A.1 I HEREBY CONFIRM AS FOLLOWS:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>I, the participant, was invited to participate in the above-mentioned research project that is being undertaken by Thembi Kheswa of the Department of Psychology in the Faculty of Health Sciences of the Nelson Mandela Metropolitan University.</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>The following aspects have been explained to me, the participant:</td>
</tr>
</tbody>
</table>

#### 2.1 **Aim:** The investigator is exploring: The developmental profiles of children between the ages of 2 and 8 years from a low socioeconomic background on the Griffiths Mental Development Scales - Extended Revised.

The information will be used to/for:

To contribute to an ongoing research project in this field and encourage further research in this area.

To contribute to the restandardisation of the South African norms of this measure.

#### 2.2 **Procedures:** I understand that

I will be required to complete a biographical form and return it to the researcher. I will then be contacted to bring my child to participate in the Griffiths study.

#### 2.3 **Confidentiality:** My child’s identity will not be revealed in any discussion, description or scientific publications by the investigators.

#### 2.4 **Voluntary participation/refusal/discontinuation:**

- My participation is voluntary: YES | NO
- My decision whether or not to participate will in no way affect my present or future: TRUE | FALSE
The information above was explained to me/the participant by (name of translator) in Afrikaans, English, Xhosa, or Other. I was given the opportunity to ask questions and all these questions were answered satisfactorily.

4. No pressure was exerted on me or my child to consent to participation and I understand that I may withdraw at any stage without penalisation.

5. Participation in this study will not result in any additional cost to myself or my child.
C. IMPORTANT MESSAGE TO PATIENT/REPRESENTATIVE OF PARTICIPANT

Dear participant/representative of the participant

Thank you for your/the participant’s participation in this study. Should, at any time during the study:

- an emergency arise as a result of the research, or
- you require any further information with regard to the study, or
- the following occur

(indicate any circumstances which should be reported to the investigator)

Kindly contact
at telephone number

| Thembi Kheswa |
| 041 585 2323 |