

**The use of the
Revised Griffiths Development Scales
in a group of 9 month-old South African babies.**

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SUMMARY

Topic: The use of the Revised Griffiths Development Scales in a group of 9 month-old South African babies

Keywords: cognitive development, social development, motor development, language development, developmental assessment, Griffiths Mental Development Scales, Extended Revised (GMDS-ER), infant development, 9 month-old babies.

The aim of this study was to determine the applicability of the Griffiths Development Scales – Extended Revised (GMDS-ER) in a contemporary South Africa. This study explores the performance of South African babies aged 9 months as it relates to that of British babies (from the standardisation sample).

Over the last few years, researchers have made a significant effort to address the need for more reliable and valid assessment measures for South Africa. The literature study shows research evidence indicating that South African children are influenced by several risk factors such as poverty, HIV/AIDS, inadequate health and social services as well as poor living conditions. Furthermore, the role of culture and gender in child development are discussed in detail. These are only some of the influences that contribute significantly to the healthy development and later successful functioning of South African children as they age. The impact may also impair development leading to possible developmental delays.

The South African context necessitates developmental assessment measures with particular characteristics. A critical examination of a variety of potential measures indicates that there are very few measures available to meet these specific needs. The Griffiths Mental Development Scales – Extended Revised (GMDS-ER) who is judged to be one such measure, are examined.

For the empirical study the research group consisted of normal South African ($n=120$) babies from Potchefstroom and Klerksdorp. Babies were selected on the basis of availability. All babies were tested with the Griffiths Development Scales – Extended Revised (GMDS-ER).

Statistical analysis of the data shows that South African and British babies' overall developmental profiles were similar. The South African sample performed slightly better (although not statistically significant) than the British normative sample on all the subscales. With regard to gender differences, the girls fared significantly better than the boys on the Locomotor, Personal-Social, Hearing and Language Subscales. Comparisons between different ethnic groups on the GMDS-ER showed significant differences, the White and Indian groups performed better throughout on all five subscales than the Coloured and Black groups. The group of Black infants performed poorest throughout on all five subscales compared to the other ethnic groups.

In view of the findings, further investigation into the applicability of the GMDS-ER for South African use is essential and the establishment of South African norms for clinical utilisation should receive urgent attention. Caution with regard to the use of the British-based norms in the South African context is recommended.

OPSOMMING

Titel: Die gebruik van die Hersiene Griffiths Ontwikkelingskale in n groep 9 maande-oue Suid-Afrikaanse babas.

Sleutelwoorde: kognitiewe ontwikkeling, sosiale ontwikkeling, motoriese ontwikkeling, taalontwikkeling, ontwikkelingsassessering, Hersiene Griffiths Ontwikkelingskale, babaontwikkeling, 9 maande-oue babas.

Die doel van hierdie studie was om te bepaal of die Hersiene Griffiths Ontwikkelingskale bruikbaar is in die Suid-Afrikaanse konteks. Die prestasie van Suid-Afrikaanse 9-maande oue babas is in hierdie studie geëvalueer teenoor dié van die babas in die Britse normatiewe groep.

Oor die afgelope aantal jare het navorsers beduidende pogings aangewend om meer betroubare en geldige assesseringsinstrumente vir Suid-Afrika daar te stel. Die literatuurstudie verwys na navorsingsbevindinge wat daarop dui dat Suid-Afrikaanse kinders aan verskeie risikofaktore blootgestel word, soos armoede, MIV/VIGS, onvoldoende gesondheid- en maatskaplike dienste asook swak lewensomstandighede. Daarbenewens word die rol van kultuur en geslag in kinderontwikkeling breedvoerig bespreek. Hierdie is slegs enkele van die faktore wat beduidend bydra tot gesonde ontwikkeling en suksesvolle funksionering van Suid-Afrikaanse kinders soos hulle ouer word. Die invloede kan ook 'n belemmerende uitwerking hê en lei tot moontlike ontwikkelingsagterstande.

Die Suid-Afrikaanse konteks noodsak ontwikkelingsassesseringsinstrumente met spesifieke eienskappe. 'n Kritiese ondersoek van 'n verskeidenheid potensiële instrumente het aan die lig gebring dat daar slegs 'n baie klein aantal instrumente beskikbaar is wat gebruik kan word om hierdie spesifieke behoeftes te ondervang. The Griffiths Mental Development Scales – Extended Revised (GMDS-ER), wat beskou word as een van hierdie instrumente, word ondersoek.

Vir die empiriese ondersoek in hierdie studie het 9-maande oue babas van Potchefstroom en Klerksdorp op grond van beskikbaarheid, as ondersoeksgroep gedien, en die babas is met behulp van die Hersiene Griffiths Ontwikkelingskale geëvalueer.

Statistiese verwerking van die data toon dat Suid Afrikaanse en Britse babas se ontwikkelingsprofiële oor die algemeen dieselfde is. Die dogters het beduidend beter gevaar as die seuns, op die Groot Motoriese, Persoonlik-sosiale, Gehoor- en Taalskaal. Vergelykings tussen die verskillende etniese groepe op die GMDS-ER het beduidende verskille aangetoon, met die Wit en Indiërs groepe wat beduidend beter gevaar het op al vyf getoetse subskale as die Gekleurde en Swart groepe. Die groep Swart babas het die swakste gevaar op alle vlakke van die vyf getoetste subskale vergeleke met die ander etniese groepe.

Teen die lig van hierdie bevindings is dit duidelik dat verdere navorsing noodsaaklik is met betrekking tot die toepaslikheid van die GMDS-ER vir Suid-Afrikaanse gebruik, en die daarstelling van Suid-Afrikaanse norme vir kliniese gebruik dringende aandag moet geniet. Omsigtigheid word ook aanbeveel wanneer die Brits-gebaseerde norme in Suid-Afrikaanse konteks gebruik word.

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Chapter 1: Introduction, problem statement and aim

1.1 Introduction and problem statement

Dehart, Sroufe and Cooper (2004) define development as age-related changes that take place in a directive, cumulative and ordered fashion. Development is a broad term that refers to the “orderly and relatively enduring changes over time in physical and neurological structures, in thought processes, in emotions, in forms of social interaction, and in many other behaviours” (Newcombe, 1996, p.4).

Human development occurs in various ways, in different stages of development and at different rates, but it should be kept in mind that these variables are all related and that they progress simultaneously during the development of an individual. Child development further refers to the ordered emergence of interdependent skills of sensory-motor, cognitive-language and social-emotional functioning, all of which are affected by psychosocial and biological factors and by genetic inheritance (Engle, Black, Behrman, De Mello, Kapiriri, Martorell, & Young, 2007).

Studying development has a three-fold objective: to understand changes that appear to be universal regardless of culture; to explain individual differences, and to understand how children’s behaviour is influenced by the environmental context or situation (Newcombe, 1996). Another important reason why development is studied is the early identification of possible developmental delays (Kotras, 2001; Newcombe, 1996; Schröder, 2004). It is imperative that child development is viewed holistically. This is reflected in the interdisciplinary nature of information that exists about child development. Psychologists, sociologists, anthropologists and biologists have joined forces with professionals from fields such as education, medicine and social services in the search for solutions to problems faced by children on a daily basis (Papalia, Olds, & Feldman, 2009). Consequently, the field of child development has practical relevance for several disciplines resulting in a growing body of knowledge reflecting developmental changes that are systemic in nature, and as such need to be studied holistically. Kail and Cavanaugh (2000) posit four forces fundamental to successful development, namely: 1) biological (genetic and health factors), 2) psychological (perceptual, cognitive, emotional and personality factors), 3) socio-cultural (interpersonal, societal, social and ethnic factors), and 4) life-cycle factors (similar events affect individuals differently).

Perhaps the most distinguishing features of psychological approaches to the study of human development are the assumptions of underlying continuities between behaviours at different points in the life span, and the attempt to understand how interactions between the individual and the environment at one point in time, make possible more elaborate interactions at some later point in time. A simple example concerns the question of continuities between early motor abilities, such as crawling and reaching, and later more sophisticated abilities, such as walking and pointing (Kotras, 2001). Generally, developmentalists take the view that it should be possible to examine the ways in which infants and young children interact with the physical world and with other people, and to determine how they develop and change as a result (Kotras, 2001).

Theoretical writings and recent research have specifically alerted professionals to the importance of the effect that the early years of childhood exert on later development (Luiz, Foxcroft, & Tukulu, 2004). The first few years of life are particularly important because vital development occurs in all domains. The brain develops rapidly through neurogenesis, axonal and dendritic growth, synaptogenesis, cell death, synaptic pruning, myelination and gliogenesis. These ontogenetic events happen at different times and build on each other, such that small perturbations in these processes can have long-term effects on the brain's structural and functional capacity (Grantham-McGregor, Cheung, Cueto, Glewwe, Richter, & Strupp, 2006). In some cases, pathology in the first years may slow development or distort it in some way. In other cases, the child entering primary school is already so limited by his earlier experiences that he is unable to respond to, or benefit from, the enriching environment provided within the school setting and learning does not take place (Luiz, Foxcroft, & Tukulu, 2004). Clearly, identification and screening of children at the youngest possible age may benefit these children and intervention programs should be implemented as early as possible.

In studies conducted in several areas of development, the persistence of early behavioural patterns has been demonstrated. Most child psychologists are also saying that the early years are among the most important of all the stages of development. It is unquestionably during those early years of development that the foundations are laid for the complex behavioural structures that are built in a child's lifetime (Jakins, 2009). Hurlock (1978) believes that, as evidence accumulates to show that early foundations tend to be persistent and to influence the child's attitudes and behaviour throughout life, it becomes

increasingly apparent why early development is important. Hurlock (1978) provides the following explanation of four important factors, in substantiation of this claim:

- Since learning and experience play increasingly dominant roles in development as they grow older, children can be directed into channels that will lead to good adjustment. This task is handled by the family, although the larger social group can provide a culture in which children can fulfil their potential. Guidance is most needed in the early stages of learning, in order to place the child on the right track, which will result in him or her being less likely to run off the rails later.
- It is a fact that early foundations quickly develop into habitual patterns, and as such will exert a lifelong influence on the child's personal and social adjustments.
- Contrary to popular belief, children do not outgrow undesirable traits as they grow older. Instead, patterns of attitudes and behaviour that were established early in life, and these, regardless of whether they are good or bad, beneficial or harmful to the child's adjustments, tend to persist.
- As it is sometimes desirable to make changes in what has been learned, the sooner the changes are made, the easier it is for children and the more co-operative they are in making changes.

Against this background, most professionals are of the opinion that the earlier developmental problems are identified and the earlier the intervention can be implemented, the greater the child's chances are in overcoming the resulting developmental difficulties. Sadly, the future development of the child can be significantly stunted if developmental problems are not detected in early childhood, thus resulting in a lifetime of lowered, untapped potential (Schröder, 2004).

The general aim of the study is to determine whether the Revised Griffiths Development Scales can be used to assess development of South Africa babies age 9 months, to ensure early identification and intervention of developmental problems. At nine months, key transitions mark the emergence of new principles governing the infant's mind. The key transition at nine months signals the first signs of a mythical mind, which brings infants to the threshold of the symbolic gate. Furthermore, by nine months, a major breakthrough in infant development occurs when the infant attains a novel understanding of how people relate to objects in the environment and begin to treat and understand others as "intentional

agents”, somehow explicitly recognising that like themselves, people plan and are deliberate in their actions. For example, infants will start sharing their attention towards objects with others, looking up towards them to check if they are equally engaged. They will start to refer to other people socially, and in particular take into consideration the emotional expression of others while planning actions or trying to understand a novel situation in the environment (Rochat, 2004). Taking the aforementioned into account, there were various reasons moving this researcher towards the decision to test infants at 9 months of age. This stage is crucial in development, and therefore, for purposes of evaluation using the Revised Griffiths Development Scale and against this background, it was decided to use the 9 month-old age group in this study.

According to the latest census data, children represent 10 % (i.e. 4.45 million) of the South African population from birth to four years (UNICEF, 2007). The lives of children, especially in the deep rural areas are directly affected by HIV/AIDS, poverty, unemployment, abuse, crime, malnutrition, poor health, social change, family disharmony and non-stimulating home environments. These multiple risks need to be addressed and pose daunting challenges to the development of children because it affects children's cognitive, motor and social-emotional development (Barbarin & Richter, 1999). Disadvantaged children are likely to do poorly in school, and subsequently, as adults, likely to earn lower incomes. Also, though very likely to have large families, they will provide poor care for their children, thus contributing to the intergenerational transmission of poverty. The problem of poor child development will remain unless a substantial effort is made to mount appropriate assessment and intervention programmes. There is increasing evidence that early assessment and intervention can help prevent the loss of potential in children and improvements can happen rapidly (Walker, Wachs, Gardner, Lozoff, Wasserman, Pollitt, & Carter, 2007).

Developmental variations and delays may be the first indication of a serious condition such as mental retardation or cerebral palsy. This usually first becomes evident in infancy or early childhood, interferes with the future development of the child and may cause a lifetime of lowered potential (Berk, 2006). Consequently, the possibility that some of the problems and difficulties of children may be recognised and evaluated in the initial stages of development and thus be successfully handled at that time, has enjoyed more and more interest (Zeanah, 2000).

According to Allan (1992), developmental assessment is the psychological examination of a child's abilities over a broad spectrum of behaviour, including motor, social and cognitive traits. A thorough and comprehensive assessment should measure a child's physical, cognitive, social and emotional development. In addition, the nature and severity of the difficulty should be assessed (Brooks-Gunn, 1990).

The function of testing / assessment in infancy is not to detect mental superiority or a precise IQ score, but to detect abnormal neurological conditions and subnormal developmental potential. Infant tests' main value has been diagnosis, but they have also contributed substantially to our understanding of the many factors contributing to the development of abilities in the first years of life (Zeanah, 2000). Despite a recent concerted effort by researchers, mainly supported by the HSRC, to address the need for more reliable and valid developmental assessment of pre-school South African children, shortcomings are still evident. For example, existing developmental assessment measures are not comprehensive, with most tests focusing on specific aspects of development or providing a mere screening measure, while specific tests are standardised for specific ethnic and age groups, to the exclusion of others (Luiz, 1994a). It is 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 3 years of life, for the assessment of all South African infants and pre-school children (Kamphaus, Petoskey, & Rowe, 2001).

Ruth Griffiths (1954; 1960; 1967; 1970) has made one of the most valuable contributions to the assessment of developmental delays in young children with her construction of the GMDS-ER and more specifically with her construction of the developmental profile. This diagnostic instrument was designed to assess the development of babies in the first 2 years of their life. A revised and extended version of the scales was published in 1970 and covered the period of development from birth to 8 years (Stewart, 1997). The items on the Griffiths Scales, which are placed in order of gradually increasing difficulty, are diverse, tapping into the main aspects of a child's development. The Griffiths Scales provide a general development quotient in addition to measures of six domains of functioning, each of which is assessed on a separate subscale. Many of the items on the Griffiths Scales are based on natural activities such

as walking, talking and playing. Griffiths mentioned play as an experience that is common to all cultures, and she aimed to maintain the play aspect throughout the scales (Luiz, Foxcroft, & Povey, 2006).

The Griffiths scales were introduced to South Africa in 1977, and at present there are more than 700 registered South African users. It has been translated, using the Brislin back-translation technique, into Afrikaans, Setswana and Xhosa, and have been used to make clinical assessments of the development of both black and white children (Tukulu, 1996). Various institutions make use of the Griffiths Scales for evaluation purposes, and numerous clinicians have indicated that they find the Griffiths a useful and seemingly valid tool (Mothuloe, Richter, Barnes, & Schoeman, 1994). A few studies have reported comparisons between the Griffiths Scales and other psychometric instruments that are used successfully in South Africa, with favourable results. Extensive research regarding the Griffiths Scales' cultural applicability has been conducted throughout South Africa, which has proved the Griffiths Scales to be a worthy evaluation instrument in South Africa (Luiz, 1994a).

From the above it is clear that much of the work done in South Africa using the Griffiths Scales demonstrates their potential applicability for assessing developmental profiles amongst South African children (Mothuloe et al., 1994). Research completed at both national and international level on the use of the Griffiths Scales, indicates that their contribution has unquestionably been invaluable. Their usefulness has demonstrated the essential role that the Griffiths Scales have fulfilled in the assessment of South African children of all cultural and socio-economic groups (Luiz, 1994a; Stewart, 1997).

However, while there is an extensive amount of support for the Griffiths Scales, more recent research indicated a need to revise the Griffiths Scales (Allan, 1992; Bhamjee, 1991; Luiz, Oelofsen, Stewart, & Mitchell, 1995). Since the induction of this project to revise the Griffiths Scales, numerous studies have been completed to improve the content coverage of the scales (Barnard, 2000; Kotras, 1998; Luiz, Collier, Stewart, Barnard, & Kotras, 1999).

The aim of this study is to acquire empirical data regarding the use and application of the GMDS-ER with South African infants' age 9 months.

The following research questions are therefore relevant:

- * Is the measuring instrument used in this study reliable?
- * How do South African babies' (9 months) perform on the Revised Griffiths Development Scales?
- * How do South African babies' (9 months) performance compare with that of the British normative sample?
- * Does interaction occur between gender and ethnicity on the Locomotor Scale (Subscale A), Personal-Social Scale (Subscale B), Language Scale (Subscale C), Eye and Hand Co-ordination Scale (Subscale D), Performance Scale (Subscale E) and with respect to the General Quotient?
- * What differences pertaining to the Locomotor Scale (Subscale A), Personal-Social Scale (Subscale B), Language Scale (Subscale C), Eye and Hand Co-ordination Scale (Subscale D), Performance Scale (Subscale E) and the General Quotient exist with regard to gender?
- * What differences pertaining to the Locomotor Scale (Subscale A), Personal-Social Scale (Subscale B), Language Scale (Subscale C), Eye and Hand Co-ordination Scale (Subscale D), Performance Scale (Subscale E) and the General Quotient exist with regard to the various ethnic groups?

1.2 Aims

This research is intended to measure the performance of South African babies (9 months) on the GMDS-ER.

The relevant components are the following:

- * To establish the reliability of the measuring instrument used in this study
- * To measure the performance of South African babies on five of the six levels of the GMDS-ER (the sixth subscale not being applicable to infants)
- * To compare the performance of South African babies on the GMDS-ER with that of the British normative sample

- * To study the interaction between gender and ethnicity on the Locomotor Scale (Subscale A), Personal-Social Scale (Subscale B), Language Scale (Subscale C), Eye and Hand Co-ordination Scale (Subscale D), Performance Scale (Subscale E) and with respect to the GQ
- * To determine whether differences exist in relation to the performance on the Locomotor Scale (Subscale A), Personal-Social Scale (Subscale B), Language Scale (Subscale C), Eye and Hand Co-ordination Scale (Subscale D), Performance Scale (Subscale E) and the GQ of the genders being tested
- * To determine whether differences exist in relation to the performance of the various ethnic groups on the Locomotor Scale (Subscale A), Personal-Social Scale (Subscale B), Language Scale (Subscale C), Eye and Hand Co-ordination Scale (Subscale D), Performance Scale (Subscale E) and the GQ of the GMDS-ER.

1.3 Hypotheses

- * The measuring instrument that has been used in this study is reliable.
- * The GMDS-ER can be used in the South African context.
- * Differences in the performance of the South African babies with that of the British normative sample are indicated.
- * Interaction occurs between gender and ethnicity on the Locomotor Scale (Subscale A), Personal-Social Scale (Subscale B), Language Scale (Subscale C), Eye and Hand Co-ordination Scale (Subscale D), Performance Scale (Subscale E) and with respect to the GQ.
- * Significant differences in the performance of the respective genders on the Locomotor Scale (Subscale A), Personal-Social Scale (Subscale B), Language Scale (Subscale C), Eye and Hand Co-ordination Scale (Subscale D), Performance Scale (Subscale E) and the GQ are indicated.
- * Significant differences in the performance of various ethnic groups on the Locomotor Scale (Subscale A), Personal-Social Scale (Subscale B), Language Scale (Subscale C), Eye and Hand Co-ordination Scale (Subscale D), Performance Scale (Subscale E) and the GQ are indicated.

1.4 Outline of study

In order to accomplish the aim, the study will investigate the relevant components. The outline of the study is as follows:

* **Chapter 2**

The focus of Chapter 2 is on various aspects / factors that influence or impact on child development, exploring specifically biological factors, maternal influences, family influences and contextual factors that are associated with the developmental outcomes of young children.

* **Chapter 3**

In Chapter 3 the concept of culture will be discussed, focusing specifically on the effects of culture in child development on a physical, socio-emotional and cognitive level.

* **Chapter 4**

Chapter 4 focuses on the role of gender in child development, exploring different aspects of gender identity as well as gender differences in the behaviour and development of young children.

* **Chapter 5**

The focus of Chapter 5 is on developmental assessment of infants and young children, exploring the principles, purposes, value and issues of assessment, as well as different developmental measures utilised internationally and in the South African context.

* **Chapter 6**

Chapter 6 explains the methodology of the study relating to a description of the research design, participants, measures used and statistical analysis.

* **Chapter 7**

The results of the research and the discussion thereof are provided in Chapter 7.

* **Chapter 8**

In Chapter 8, the conclusion of the study is provided.

Chapter 2: Factors pertaining to child development

2.1 Introduction

Growth and development during the first six years are fundamental; important changes take place: the nervous system and the brain grow to 80 % of the level of the adult brain and nervous system (Isaranurug, Nanthamongkolchai, & Kaewsiri, 2005). Child development is thought to be determined by the transaction between characteristics of the child and characteristics of the environmental context in which the child develops.

Urie Bronfenbrenner (Bronfenbrenner, 1986, 2004; Bronfenbrenner & Morris, 1998, 2006) devised an ecological theory that centres on the relationship between the developing individual and four expanding levels of the changing environment, from home and family to the broader cultural context.

Bronfenbrenner (1979) divides the environment into four levels: the microsystem, the mesosystem, the exosystem and the macrosystem. At any point in life, the **microsystem** consists of the people and objects in an individual's immediate environment. These are the people closest to a child, such as parents or siblings. Some children have more than one microsystem; for example, a young child might have the microsystems of the family as well as that of the day-care setting. Microsystems strongly influence development. Microsystems themselves are connected to create the **mesosystem**. The mesosystem represents the fact that whatever is happening in one microsystem is likely to influence other systems. For example, if you had a stressful day at work, you may be bad-tempered at home – an indication indicating that your mesosystem and microsystems of home and work are interconnected emotionally. The **exosystem** refers to social settings that a person may not experience firsthand but that still influence development. For example, a mother's work environment is part of her child's exosystem, because she may pay more attention to her child when her work is going well and less attention when she is under a great deal of work-related stress. Although the influence of the exosystem is at least second-hand, its effects on the developing child may be quite strong (Louw & Louw, 2007).

The broadest environmental context is the **macrosystem**, the subcultures and cultures in which the microsystem, mesosystem and exosystem are embedded. The macrosystem describes the culture in which individuals live. Cultural contexts include developing and industrialised countries, socioeconomic

status, poverty, and ethnicity. A child, his or her parent, his or her school, and his or her parent's workplace are all part of a large cultural context. Members of a cultural group share a common identity, heritage, and values. The macrosystem evolves over time, because each successive generation may change the macrosystem, leading to their development in a unique macrosystem (Kail & Cavanaugh, 2007).

The **chronosystem** can be seen as the patterning of environmental events and transitions over the life course, as well as socio-historical circumstances, capturing the dynamics of development through time (Kail & Cavanaugh, 2007). Bronfenbrenner (1979) states: "Development never takes place in a vacuum; it is always embedded and expressed through behaviour in a particular environment" (p.27). Moving away from the traditional focus that sees either the environment or the person, Bronfenbrenner instead focused on the relationship between them as the most important aspect of development. Furthermore, he focused on the process of development rather than concentrate on isolated variables at a single point in time. In his Ecological Theory, Bronfenbrenner (1979, 1986) acknowledges the systematic interaction among children, families, programmes and communities – it highlights the complexity of developmental processes.

When considering factors that could potentially pose risks to children's development, the entire context within which child development occurs has to be reviewed. The multiple environments (i.e. community, home) within which children develop cannot be viewed as mutually exclusive, but rather as varied aspects of the child's life that determine adjustment and growth. When discussing the factors that influence development of children, various aspects have to be taken into account, that either directly or indirectly affect child development.

The following section provides a review of the literature on critical factors that are associated with the developmental outcomes of young children. They include 1) biological factors; 2) gender; 3) various maternal influences; 4) various family influences and, 5) contextual factors (culture).

2.2 Biological factors

Today, it is commonly accepted that most aspects of a child's development are a product of the interaction of *nature* as well as *nurture*. Nature refers to an organism's biological inheritance; nurture to

its environmental experiences (Santrock, 2011). It is no longer a question of whether it is nature or nurture that influences development, but more importantly, in what ways, and to what extent, development is influenced. Although nurture or environmental experiences indeed influence child development to a great extent, genetic and biological factors contribute largely to the development of the child as well as the development of individual differences (Hook & Cockcroft, 2002).

2.2.1 Genetic factors

Although the genetic heritage of each individual is unique, influencing size, intelligence, gender and many more aspects, genes on their own do not exert an absolute influence on development. Researchers posit that genetic factors should rather be regarded as the raw materials required for development that will determine the parameters within which development will take place (Bjorklund, 2005).

While the most important drive for continuity in cognitive abilities is vested in genetic factors, environmental aspects equally influence developmental trends and individual differences in development (Sigelman & Rider, 2006).

Genes probably have much to do with organising and shaping the brain along gender - they play an important role in the early development of sexual identity.

2.2.2 Gender

Gender refers to the social and psychological dimensions of being male or female. Recognition of one's gender is one of the major developmental tasks during those first six years of life. Around 30 months (2½ years) of age, most children will have acquired gender identity. A *gender role* is a set of expectations that prescribes how females or males should think, act and feel (Santrock, 2011). Gender role development, therefore, implies the development of these behaviour patterns and attitudes. Three processes are involved with gender role development: the acquisition of a gender identity; the development of gender stereotypes, and the development of gender-typed behaviour patterns (Louw & Louw, 2007). Biology, the brain, chromosomes and hormones influence the display of gender behaviours. While biology, however, not completely signifies destiny in gender development, children's

cultural socialisation patterns and family experience do indeed matter a great deal and help a child between the ages of 3 to 4 to develop a gender identity (Crandell, Crandell, & Van der Zanden, 2009).

Some psychologists believe that children's cognitive development plays a role in their gender role development (Louw & Louw, 2007). These viewpoints, as well as the role of gender in child development, will be discussed in more detail in Chapter 4, in view of the fact that one of the aims of the research study was a comparison of the performance of the two genders on the Griffiths Mental Development Scales.

In addition to the aforementioned factors, another factor that influences child development is low birth weight, which will be discussed below.

2.2.3 Premature birth (Very low birth weight)

Globally, an estimated 20 million (or 15.5 %) babies are born with low birth weight (LBW), defined as less than 2,500 g at birth with wide variations over different geographic locations. More than 90 % of all LBW infants are, however, born in developing countries (Alam, 2009). According to the District Health Information System (DHIS), the premature birth rate for South Africa was 13.1 % in 2010/2011. The increase in the number of low birth weight infants is due to such factors as multiple births, drug abuse, poor nutrition, and poverty (Chen, Wen, Yang, & Walker, 2007).

LBW infants represent a heterogeneous group of infants which may result from suboptimal foetal growth relative to gestational age, called intrauterine growth retardation (IUGR) or small-for-gestational age (SGA), or too early delivery, called pre-term delivery (<37 week of gestation). In general, IUGR is the predominant type of LBW in populations in poorer settings where the prevalence of LBW is high, whereas pre-term delivery predominates in settings where the prevalence of LBW is low as in developed countries. Small for date infants may be pre-term or full-term (Alam, 2009).

Although most pre-term and low birth weight infants are healthy, as a group they have more health and developmental problems than normal birth weight infants (Minde & Zelkowitz, 2008). The number and severity of these problems increase when infants are born very early and with decreases in birth weight. Although the survival rate for infants who are born very early and very small have increased, this

improved survival rate has come with increases in the occurrence rate of severe brain damage (Casey, 2008).

Children born low in birth weight are more likely than their normal birth weight counterparts to develop a learning disability, attention deficit hyperactivity disorder, or breathing problems such as asthma (do Espírito Santo, Portuguez, & Nunes, 2009). For some infants, prematurity can lead to developmental delays, neurological problems, chronic respiratory problems and vision and hearing impairment in addition to greater risk of infant mortality (Crandell et al., 2009). Approximately 50 percent of all low birth weight children are enrolled in special education programmes (Santrock, 2011).

Infants born with LBW are at an increased risk of mortality, morbidity, poor growth, impaired cognitive function, decreased motor and psychomotor development. Extremely low birth weight (ELBW; <1,000 g) infants, particularly those born at 23-26 weeks of gestation, have increased risk of school and cognitive problems and, to a limited extent, motor and vision problems (Pollberger, 2009). The mortality gradient increases several-fold as birth weight decreases. LBW also greatly increases the risk of infant death due to other causes, such as acute lower respiratory infection, pneumonia and diarrhoea. The long-term negative consequences of LBW are associated with the risk of type 2 diabetes, hypertension, and cardiovascular diseases in later life, particularly with rapid catch-up growth (Alam, 2009; Pollberger, 2009). In developing countries, maternal nutritional factors are the major determinants. These may include low pre-pregnancy weight, short stature, low energy intake during pregnancy, or low gestational weight gain (Alam, 2009).

In recent years, research has shown that premature infants gain weight faster and show fewer respiratory problems when physically stimulated by rocking, massage, snuggling and in some cases, listening to recordings of simulated heartbeats. Pre-term infants are more likely to survive if they experience gentle touching and “comfort care” – that is, normal skin contact, massage and other stimulation, especially from the parents (Moore, 2005; McGrath, Thillet, & Van Cleave, 2007; Boshoff, 2008). This level of infant care is expensive and not affordable by everyone. In many European countries, healthcare is free and medical treatment for premature infants is readily available. A case in point is China, where infant care is a top priority and the government offers quality medical care for premature infants at no cost and even conducts weekly or monthly health screenings when children

enter the nation's pre-schools. There are, however, also those countries where care for its population, and of course premature infants, is not always free, or not always of good quality (e.g. the United States, South Africa). Families with insurance or sufficient funds to pay, can obtain the necessary care and attention. For those who do not have insurance or cannot pay, however, at least one of two situations may occur: parents either neglect to take their infants to healthcare professionals and the infants perish (or have more serious problems later) or, they do take them for treatment but are eventually landed with an enormous debt because it may be excessively expensive (Van Heerden, 2007).

2.2.4 Physical development

According to Piaget, a strong correlation exists between physical and cognitive development, especially in the sensorimotor phase. Piaget charted a developmental sequence of stages during which the child constructs increasingly complex notions of the world, and he described how the child acts at each level and how this activity leads to the next level (Crandell et al., 2009). Piaget divides the cognitive development of children into four stages, the sensorimotor stage being the first. The sensorimotor stage lasts from birth to about 2 years of age. In this stage, infants construct an understanding of the world by co-ordinating sensory experiences (such as seeing and hearing) with physical, motoric actions – hence the term “sensorimotor” (Santrock, 2011). The cognitive development of babies therefore closely connects to the mastery of certain sensorimotor actions. As babies' fine motor skills develop, they gain access to an enormous variety of information regarding form, texture and characteristics of the environment, and this promotes cognitive development (Kail & Cavanaugh, 2007).

Piaget divided the sensorimotor stage into six progressive stages: (1) simple reflexes; (2) first habits and primary circular reactions (repetition of actions involving the infant's own body); (3) secondary circular reactions – infants begin to intentionally repeat an action to trigger a response in the environment; (4) coordination of secondary circular reactions (purposeful behaviour where there is means to an end); (5) tertiary circular reactions, novelty, curiosity (infants discover new methods of meeting challenges); and (6) internalisation of schemes (the infant develops the ability to use mental symbols such as words or images to represent objects or events (Santrock, 2011).

Over the first two years, the infant comes to integrate the sensory, motor, and perceptual systems and develops the capacity to look at what she or he is listening to and learns to grasp and walk by visual,

auditory, or tactile cues. In just two years, infants progress from reflexive responding such as grasping objects ‘mindlessly’ simply because they are in their reach, to actively using objects in a constructive way, such as building a tower, understanding objects and using symbols such as words and gestures (Crandell et al., 2009).

In sum, during the sensorimotor period, infants co-ordinate the ways they interact with their environment, giving the environment permanence, and begin to “know” the environment, although their knowledge of the environment is limited to their sensory and motor interactions with it. The child then enters into the next developmental period, ready to develop language and other symbolic ways of representing the world (Crandell et al., 2009). The ongoing process of growth and maturation of the body and the brain, as well as the acquisition of motor skills and health, all add up to physical development, thus influencing other developmental domains such as cognitive development (Papalia et al., 2009).

Another factor that plays a major role in the growth and physical development of the body is nutrition.

2.2.5 Nutritional factors

Malnutrition affects both the growth of the child and his / her overall developmental potential. Louw and Louw (2007) aver that insufficient nutrition could have far-reaching results, as children still experience rapid-growth phases. Malnutrition is not to be equated simply with a lack of food or regarded as a medical problem, but also with complex inter-related, social, economic, political and other processes (Van Heerden, 2007).

Early weaning of infants from breast milk to inadequate sources of nutrients, such as unsuitable and (sometimes) unsanitary cow’s milk formula can cause protein deficiency and malnutrition in infancy (Lartey, 2008). In many of the world’s developing countries, mothers used to breastfeed their infants for at least two years. To become more modern, mothers are stopping breastfeeding much earlier, replacing it with formula feeding. A concern in developing countries is the increasing number of women who are HIV-positive and the fear that they will transmit the virus to their offspring (Oladokun, Brown, & Osinusi, 2010). Thus, breast-feeding is more optimal for mothers and infants in developing countries, except for mothers with HIV/AIDS or those with an unknown HIV status.

Life-threatening conditions that can result from malnutrition (PEM) are Marasmus and Kwashiorkor. Marasmus is caused by a severe protein-energy deficiency and results in a wasting away of body tissues in the infant's first year. Kwashiorkor, caused by severe protein deficiency, usually appears between one and three years of age. The disease can cause swollen abdomen and feet due to oedema (Santrock, 2011). Another condition known as dwarfism (stunted growth and development) occurs in South Africa and other developing countries, which reflects the most important effect of malnutrition. These effects are perceived in enhanced risk of disease, mortality, deficiencies in cognitive abilities and delays in motor and cognitive development. On the other hand, obesity due to malnutrition will also prove to be detrimental to normal development. The enhanced risk for orthopaedic, neurological, gastro-intestinal and endocrinological conditions this gives rise to, could in turn affect children's self-image (Smit, 2008).

Severe and lengthy malnutrition is detrimental to physical, cognitive, and social development (Ruel, 2010; Victoria, de Onis, Hallal, Blossner, & Shrimpton, 2010). Children who survive the effects of malnutrition may have impaired cognitive development, reduced capacity for physical work and be at higher risk for some adult-onset chronic disease (Cooper, 2010). A recent study of Indian children documented the negative influence of chronic malnutrition on children's cognitive development. Children who had a history of chronic malnutrition performed poorly on tests of attention and memory than their counterparts who were not malnourished (Kar, Rao, & Chandramouli, 2008). Another recent study of severely malnourished Bangladesh children revealed that standard nutritional care combined with a psychological intervention (group meetings with mothers and play sessions with infants, as well as six months of home visits) reduced the negative effects of malnutrition on 6- to 24-month-olds' cognitive development, assessed with the Bayley Scales of Infant Development (Nahar, Hamadani, Ahmed, Tofail, Rahman, & Huda, 2008).

Poverty, clearly, is the greatest single worldwide risk factor for malnutrition. In South Africa, about 67.7 % of children are directly affected, living in grinding poverty (Statistics S.A., 2007). Malnutrition (nutritional neglect), is the most common cause of poor growth in infancy and may account for as much as half of all cases of non-organic failure to thrive.

2.3 Maternal influences on child development

The infant brain is designed to be developed by the environment it encounters. While babies are born with a certain set of genetics – a genetic imprint – these genes need to be activated through child development through early experience and interaction. Schore (2001; 2003) believes the most crucial component of child development factors among these earliest interactions is the primary caregiver – the mother. The child's first relationship – the one with the mother – acts as a template that permanently moulds that individual's capacities to enter into all later emotional relationships.

2.3.1 Parent-infant attachment

The direct link between attachment and infant development is important. Bowlby (1969) provided insights that were prescient, not only in the emphasis given to the enduring influence of the infant's first attachment to another human being, but also with regard to his viewpoint on how the early environment interacts with the unique genetic endowment of the maturing child in order to shape developmental processes (Ferrier-Lynn & Skouteris, 2008).

The quality and nature of the relationship between infant and caregiver have been proven by numerous studies over several years to have a significant effect on the individual development throughout his / her development on both physiological and psychological level (Boshoff, 2008). The quality of the child-caregiver attachment relationship can be influenced by a number of factors contributed by the number of systems at play in this relationship and has been found to predict adjustment in many domains, including social, psychological, behavioural, and cognitive domains (Mennen & O'Keefe, 2005). Establishing a secure attachment relationship with the primary caregiver has an effect on how children evaluate themselves, implicate concurrent and later social functioning and improve development of different skills. The process starts with the parent's feelings and behaviour towards the infant and this is known as bonding (Boshoff, 2008).

Bonding can be defined as the emotional tie that develops from the primary caregiver, in most cases the mother, and the infant and that is characterised by a need to maintain both physical and psychological proximity to each other in the dyad (Boshoff, 2008). The quality of bonding creates a basis for the development of **attachment** from the infant to the parent. The term attachment refers to the

development of the relationship from the infant and the attachment figure and that there is an expectation that the attachment figure will care for the child in the dyad (Boshoff, 2008).

Levy and Orlans (2000) describe the attachment process as a mutual regulatory system, meaning that parent and infant influence each other over time. Parental behaviour such as holding, rocking, smiling and keeping eye contact will activate instinctual attachment behaviours in the infant. Previous research suggests that a positive response from the infant acts as a positive stimulant for the mother and enhances sensitive parenting where negative responses may reduce sensitive parenting. A sensitive mother will be able to understand the infant's shift in behaviour, such as displaying negative affect as the infant's way of communicating his / her distress and need for comfort from the mother. By detecting and attending to these shifts, the mother will be able to help the infant to regulate his / her emotions, supporting the progress of secure attachment (Bornstein & Tamis-LeMonda, 2001; Mills-Koonce, Gariépy, Propper, Sutton, Calkins, Moore, & Cox, 2007).

2.3.1.1 Bowlby's ethological theory

The ethological perspective of British psychiatrist John Bowlby (1969, 1989) stresses the importance of attachment in the first year of life, as well as the caregiver's responsiveness. He states that the early relationship between infant and caregiver facilitates the formation of internal working model of attachment for relationships. According to Bowlby (1962/1982) the attachment system utilises cognitive components, specifically mental representations: of the attachment figure, the self, and the environment during the child's interaction with the primary caregiver, the child's own actions, as well as the feedback the child receives from these actions (Cicchetti, Cummings, Greenberg, & Marvin, 1990). Thus, the model includes concepts of the self and other as well as expectations of the relationship. The attachment style is progressively integrated into the individual's psychological organisation. The internal working model can be influenced and changed by new experiences, but the way the new information is integrated into the model depends on the model's existing nature (Goldberg, 2000; Hardy, 2007). Over time, it evolves into a general working model and these internal models do not only have a significant influence on interpersonal relationships, but also play an important role in how people interpret their social world and help to guide behaviour in new situations. It is thought that internal working models work unconsciously and that they can affect the person's mental state (Huston & Ronsekranz-Aronson,

2005; Pielage, Gerlsman, & Schaap, 2000; Willinger, Diendorfer-Radner, Willnauer, Jörgl, & Hager, 2005). The internal model of attachment also has played a pivotal role in the discovery of links between attachment and subsequent emotional understanding, conscience development, and self-concept (Thompson, 2006).

2.3.1.2 Attachment patterns

According to Hardy (2007), it is intrinsically part of an infant's nature to form attachment regardless of the quality of interaction between infant and caretaker.

Four different types of attachment have been identified and are known as:

- **Avoidant attachment**

A child with a pattern of avoidant attachment is most likely to display behaviour resembling rejection. It will most probably be the child that experienced rough or aggressive parenting who will usually avoid close contact with people, ignore the departure and return of the parent as well as actively avoiding any efforts made by the parent to regain contact (Pielage et al., 2005; Sroufe, Egeland, Carlson, & Collins, 2005).

- **Resistant-ambivalent attachment**

The resistant-ambivalent child is one who would be preoccupied with the parent, alternately seeking comfort from or rejecting the parent. These children will not easily take part in exploratory play regardless whether a threat is present or not. This attachment pattern is the result of maltreatment by the parent. It is thought that the conflict between the knowledge that the parent is the source of both the distress and a potential source of comfort causes the infant to both reach out and reject the parent (Swain, Lorberbaum, Kose, & Strathern, 2007).

- **Insecure-disorganised attachment**

The insecure-disorganised attachment style is the pattern which surfaces when parents are emotionally absent. Children who are disorganised-attached will usually react in very strange ways when facing a

threat (Sadock & Sadock, 2007). The infant will show strong patterns of avoidance and resistance or display certain specified behaviours, such as extreme fearfulness around the caregiver.

- **Secure attachment**

Secure attachment will develop when the infant forms a close, enduring and dependent bond to a primary caregiver. The caregiver is usually the parent who is affectionate and will promote attachment behaviour by being quick to respond, available when needed and provide comfort when the infant is confronted with a stressor or threat. It can be expected that an infant who is securely attached will protest during separation period and then attempt to regain proximity to the parent afterwards (Hardy, 2007; Willinger et al., 2005). Positive experiences, during which the infant learns that the parent is looking after the infant's needs, help to generate a basic trust in the world and the self.

2.3.1.3 Attachment quality and the effects on development

Exploration of the attachment formation process (Bowlby, 1969/1982) indicated that interaction between the child and the caregiver forms part of a bigger, more complex cognitive process. Empirical literature suggests that attachment to a primary caregiver may affect different domains of a child's development (Grossmann, Grossman, Fremmer-Bombik, Kindler, Scheurer-Englisch, & Zimmerman, 2002; Mennen & O'Keefe, 2005). Ainsworth (1990) pointed out that cognitive development (after infancy) allows children to part from the primary caregiver for longer periods. According to Janssen, Schuengel, and Stolk (2002), the level of a child's cognition plays a vital role in the development of the attachment relationship and later cognitive representations. Securely attached children are known to be more enthusiastic, persistent, exhibit more positive affect and are more effective in facing environmental challenges on their own than their insecure counterparts (Sroufe, 1979). Infants with disorganised attachment may have deficits in cognitive skills, as these children seem to be unable to use the caregiver as a secure base for exploration (Moss, Rousseau, Parent, St-Laurent, & Saintong, 1998).

Many researchers agree on the effects of secure attachments on later outcomes in studies such as the one carried out by Matas, Arend and Sroufe (1978). In their study, a sample group of toddlers was observed at 18 months of age and their attachment quality to their mothers assessed. These same children were then observed at 24 months of age and asked to engage in a series of problem-solving

tasks as well as a play task. In general, securely attached children were less negative, cried and whined less often and showed less aggression during the tasks than did insecurely attached children. Securely attached children were more enthusiastic on the problem solving tasks, were frustrated less easily, being more persistent in trying to find a solution than insecurely attached infants. Securely attached infants also tended to engage in more symbolic play than did insecurely attached children. Finally, securely attached children were more compliant when their mother made suggestions for solving the tasks and the securely attached children were more likely to make use of these suggestions than were insecure children (Matas et al., 1978).

Work by Meins, Russell, Fernyhough and Clark-Carter (1998) showed that securely attached children did better on theory-of-mind tasks at age 4; these children were more likely to pass the false belief task than insecurely attached children. Consistent with Matas et al. (1978), Lyons-Ruth et al. (1997) found that infants who were judged to be securely attached at 18 months of age were highly likely to be functioning well in interpersonal contexts at school when measured at age 7. In contrast, children assessed as showing disorganised attachments at 18 months were likely to develop externalising behaviours such as hostility towards their peers and acting up in class. Children whose attachment relationships were classified, as avoidant were likely to show internalising behaviours at age seven, such as depression, anxiety and self-criticism. In general, the research by all these researchers has demonstrated several important benefits to emotional, cognitive and social development following the formation of a secure attachment relationship.

Although a secure attachment in infancy does not guarantee continued good parenting, it does launch the parent-child relationship, building on a positive parent-child tie, sustained over time, promoting many aspects of children's development – a more confident and complex self-concept - more advanced emotional understanding, more favourable and supportive relationships with teachers and peers, more effective social skills, a stronger sense of moral responsibility, and a higher motivation to achieve in school (Thompson, 2006). The effects of early attachment security, however, are conditional – dependent on the quality of the child's future relationships and the quality of the parent-infant-child interactions.

2.3.1.4 Attachment in the South African context

Not much research is available regarding mother-infant attachment in Africa. It can be argued that black mothers are able to, despite adverse living conditions, to create a sufficiently good personal environment for the healthy emotional development of their children, as securely attached children were more common in a longitudinal study by Tomlinson, Cooper, and Murray (2005). The communal nature of much of [black] culture, combined with the survival imperatives of living in extreme poverty may well counteract some of the more negative social consequences of poverty that are often present in more developed societies (Tomlinson, Cooper, & Murray, 2005). A humanity and compassion for neighbours and the wider community exists: infants and young children are seen as belonging, to some extent, to the community, with responsibility for their safety and well-being being seen as a collective responsibility, facilitated by the very nature of the housing: extremely small dwellings clustered in very close proximity. Demand feeding, close sleeping arrangements, close proximity; all these contribute to high levels of physical maternal availability, making maternal rejection of infant attachment bids during distress less likely. An additional factor that may contribute to the low level of avoidant attachment is the common black practice of infants being strapped to their mothers' backs. Anisfield, Casper, Nozyce, and Cunningham (1990) found that increased physical contact between mother and infant (whether in the traditional manner or by way of a baby carrier) promoted secure attachment amongst infants of low income, inner-city mothers.

The nature of the relationship, as well as the subsequent attachment style between the mother and infant, have a significant influence on the parent-infant interactions as well as the way the mother thinks of her child and his / her development.

2.3.2 Maternal cognitions and parent-infant interactions

Developmental psychologists have shown that maternal cognitions play an important role in parenting and child development. Earlier research also found significant relationships between what parents believe about children's development and how they behave toward their children, in addition to the relation of parental beliefs to child development. Maternal knowledge has been defined as the parents'

understanding of developmental norms and milestones, processes of child development and familiarity with care giving skills (Robokos, 2007).

Research provides an indication that factors such as socio-economic status, maternal education and culture affects maternal knowledge. It is hypothesised that maternal knowledge about the processes of child development influences the mothers' interpretation of the behaviour of their children and the character of their interaction with their children. Mothers who have accurate understandings of child development are more likely to provide appropriate and stimulating home environments for their child leading to their children being cognitively and socially competent. They are less likely to attribute negative intentions to their child and to use power assertion as a disciplinary tactic (Bornstein & Cote, 2006; Robokos, 2007).

Benasich and Brooks-Gunn (1996) showed that among 608 infants, measures of maternal knowledge at 12 months were found to be statistically significantly associated with the quality of the stimulation and support in the home environment, the number of child behavioural problems and, to a small but significant extent, IQ scores on the Stanford-Binet Scales at 36 months. In another study, maternal scores on a measure of parental knowledge of infant development measured at birth was positively related to performance on the Bayley Scales of Infant Development at 8 months of age in a sample of 40 pre-term, extremely low birth-weight infants (Dichtelmiller, Meisels, Plunkett, Boynski, Clafin, & Mangelsdorf, 1992).

Parental cognitions (i.e., attributions, self-perceptions, knowledge, and style) constitute significant forces at work for self-definition among adults and in the development of the child. Cognition-based models of parenting behaviour suggest that parent cognitions are predictive variables that shape the specific practices undertaken by a parent for the emotional, social, cognitive and physical care of a child (Bugental & Johnston, 2000). Seeing oneself in a particular way may lead to certain affect, thinking, and behaviour in childrearing situations: Parents who rate themselves as higher in competence (versus parents who feel negatively about their competence) act with their children in more optimal and effective ways (i.e., warm, sensitive, and responsive) and these self-evaluations in turn may colour their perceptions of child behaviour (Bornstein & Cote, 2006). Parent cognitions can be regarded as those which are either 'global' in nature (cognitions that can be acquired by vicariously, even by non-parents),

or ‘particular’ in nature (cognitions associated with the specific parenting role and usually about a particular child (Ferrier-Lynn & Skouteris, 2008). Parent cognitions are not only active when parents are behaving deliberately and with forethought, but also contribute to their spontaneous reactions. While parent cognitions are ubiquitous with the interaction between the parent and the child underpinning parenting behaviour, it is likely that this may have an important, direct as well as indirect, effect on child development. Parents’ cognitions help to explain how and why parents parent and provide further insight into the broader cultural contexts of children’s development (Bornstein & Cote, 2006).

Research has frequently found that parental attitudes are predictive of child outcomes but not necessarily parenting behaviour or aspects of the parent-child relationship. In contrast, low parental attribution style – parental perception of reduced control or power compared with the child – has been found to not only reflect a poor parent-child relationship but also less-than-optimal developmental outcomes in addition to revealing that those parents who perceive their infant as having a difficult temperament, express less satisfaction with the parent-child relationship, showing less sensitive responsiveness during parent-infant interaction. Parental perceptions of infant temperamental characteristics could exert a definite influence on the infant’s actual development of these characteristics over time (Ferrier-Lynn & Skouteris, 2008).

While patterns of mother-infant interaction are directly linked to mother variables such as maternal responsive attitude, parent-infant interactions are largely dependent upon the “sensitivity” or “responsiveness” of the mother.

2.3.3 Maternal responsiveness

Conventionally organised patterns of communicative interaction, with maternal responsiveness being a central part, form part of the environment in which infants begin participating during their first few months of life. These patterns provide an entry into the culture-specific systems of meaning that constitute the environment for their subsequent psychological development. In a year-long study of 290 low-income families of 2-year-olds, the children’s receptive vocabulary and cognitive development at ages 2-3 proved to be predicted by both parents’ sensitivity, positive regard for the child, and the cognitive stimulation they provided during play (Tamis-LeMonda, Shannon, Cabrera, & Lamb, 2004). Parental

sensitivity and *responsiveness* may count for even more than the *number of words* a mother uses - infants need a mother who responds *warmly* and *promptly* to their needs. Maternal sensitivity is a correlate of maternal warmth – a supportive maternal presence respectful toward the child's autonomy, and positive regard. Because of their dependence on caregivers and because of the nature of early developmental tasks, young children are especially vulnerable when parental sensitivity and responsiveness are low. Maternal sensitivity has been shown to be critical in determining young children's cognitive development and behavioural adjustment (Shonkoff & Phillips, 2000).

The importance of maternal / paternal responsiveness has been supported by many studies. In one of these, Papalia and her colleagues (2009) videotaped 264 infants and their mothers four times in their homes, from the 6th to 12th month. By 13 months of age, the offspring of that half of the mothers who received instruction in responsiveness behaviours, such as maintaining a positive attitude and speaking to the children encouragingly, showed greater increases in social, emotional, communicative as well as cognitive competence, than those whose mothers did not enjoy such instruction.

Another recent study revealed that maternal sensitive responding was linked to infant attachment security (Finger, Hans, Bernstein, & Cox, 2009). Another study found that maternal sensitivity in parenting was related with secure attachment in infants in two different cultures: The United States and Colombia (Carbonell, Plata, Posada, & Alzate, 2002). Although maternal sensitivity is positively linked to the development of secure attachment in infancy, it is important to note that the link is not especially strong.

Limited maternal responsiveness, or even negative responsiveness, such as irritation and impatience can be caused by maternal pathology such as maternal depression and other clinical disorders.

2.3.4 Maternal pathology

Development of children growing up in harsh conditions concerns the nature of the parenting that is possible under conditions of pervasive adversity. Preoccupation with external problems (e.g. poverty, lack of partner support), as well as more immediate difficulties (e.g. trauma and losses), may directly affect the parent's capacity to be responsive to their child. This difficulty may be further compounded by maternal mental health problems, and, in particular, by the occurrence of depression.

2.3.4.1 Maternal depression

Clinically depressed mothers might have such debilitating symptoms that they are virtually incapable of fulfilling their children's needs. Clinical depression is an emotional disorder characterised by a mood drop that can last for months, even years. As depression deepens, it commonly involves insomnia, disinterest in work, low energy, loss of appetite, reduced sexual desire, persistent sadness, hopeless feelings, and profound overall emotional despair – routine tasks become difficult to perform (Crandell et al., 2009).

The children of depressed mothers are susceptible to developmental deficits due to disturbances in the mother-infant interaction. Health professionals report that depressed mothers often appear sad, are given to frequent sighs, fail to interact playfully with their youngsters, seem insensitive to their babies' needs, often focussing their gaze downward. Poor women with newborns and those without partner support are at a high risk for postpartum depression (Crandell et al., 2009).

Because depressed mothers have a reduced capacity for caregiving, nurturing, and stimulating their infants, their youngsters tend to lag behind in their cognitive adaptations, including emotional, language and social development. Kaplan, Bachorowski, and Zarlengo-Strouse (1999) observed that mothers suffering from depression are unlikely to use child-directed speech – that is, the singsong melodic speech that engages and maintains infant attention. Rather, depressed mothers tend to talk to their infants in a monotone that does not engage the infant's attention. Further, a study by Lovejoy, Graczyk, O'Hare and Newman (2000) also indicates that mothers who experience more stress and depression tend to talk less to their children which, in turn, has a direct effect on the growth of vocabulary production in children, as was seen among 108 low-income families with children ages 1-3 years. Depressed mothers have also been shown to display decreased sensitivity and reciprocity in their interactions with young children. Some mothers with depression display a style of interacting with infants and toddlers that is characterised by less positive and more negative effects - a negative and withdrawn style of interacting. They converse less with their offspring – disengaging rather than engaging.

The babies of depressed women are more withdrawn, unresponsive, and inattentive than other youngsters. They may cry and fuss a good deal, appear apathetic and listless, have problems sleeping

and feeding, failing to grow normally, sometimes diagnosed as ***failure to thrive (FTT)*** (Crandell et al. 2009). Children of depressed mothers have also been found to be less socially competent and active, displaying more chronic, negative, behavioural problems. They suffer from mood and attention disorders and express more somatic complaints than children of mothers who are not depressed (Robokos, 2007).

A study by Petterson and Albers (2001) found that children of depressed mothers have difficulties engaging in social and object interactions as early as 2 months of age. During testing, these infants look less at the mother, engage less with objects, show less positive and more negative affects and exhibit lower activity levels and greater physiologic reactivity, as indexed by higher heart rate and cortisol levels than infants of non-depressed mothers. Lyons-Ruth, Zoll, Connell and Grunebaum (1986) found that increased levels of maternal depression were significantly related to poorer infant mental and motor development assessed by the Bayley Scales at 1 year. Similarly, using a British community sample, Murray (1992) found a significant difference in performance between the children of depressed and well mothers on the number of indices of cognitive development.

Numerous recent investigations of pre-school age children in high-risk samples have identified maternal depression as a significant predictor of children's social-emotional and behavioural outcomes (Burchinal, Roberts, Hopper & Ziesel, 2000; Peterson & Albers, 2001). Toddlers exposed to maternal depression show evidence of having more difficulties with emotional regulation, impulsiveness and co-operation than do toddlers who are not similarly exposed. Maternal depression has been particularly linked to poorer social-emotional development of children whose mothers are chronically depressed, primarily through the negative impact of depression on sensitive caregiving associated with insecure attachment (Robokos, 2007).

A high rate of post-partum depression has been reported in a South African peri-urban settlement, a rate three times higher than that which would be expected in developed countries (Cooper, Landman, Tomlinson, Molteno, Swartz, & Murray, 2002). It was also found that, as in Western samples (Murray & Cooper, 1997), there was a strong association between maternal depression and disturbances in the mother-infant relationship. This is a serious cause for concern. Not only is children's developmental progress likely to be compromised by the extreme levels of social and economic adversity which obtain in the Southern African context (and in similar situations around the developing world), but it is likely to

be further jeopardised by the impact of such forces on the quality of care infants receive from their mothers.

Another mental disorder of the mother that influences her responsiveness to her child is Borderline Personality Disorder (BPD).

2.3.4.2 Borderline personality disorder

Children of mothers with Borderline Personality Disorder (BPD) are a particularly vulnerable population. The difficulties posed by the diagnostic characteristics of the disorder, such as problems with interpersonal relationships and instability of sense of self, prove to be an impediment to a mother suffering from it with regard to the ability to face the challenges associated with parenting. Her explicit parenting behaviours are negatively affected and therefore these maladaptive parenting behaviours of the mother with BPD are anticipated to negatively affect child development (Posner, Rothbart, Vizueta, Thomas, Levy, & Fossella, 2003).

Mothers with BPD are characterised by a history of broken relationships and marked instability in multiple domains of their lives. It is anticipated that the characteristic behaviours of BPD will infiltrate the mother-child relationship as much as it interferes with other relationships. Concomitantly, a mother with BPD tends to treat the child as a “need-gratifying object” as opposed to an individual – an autonomous persona. Such behaviours, mixed with the powerful, alternating idealisation and devaluation characteristic of BPD, are likely to obviate a positive mother-child relationship and negatively affect the child’s developing interpersonal skills and sense of self (Hobson, Patrick, Hobson, Crandell, Bronfman, & Lyons-Ruth, 2009).

Moreover, effective parenting by the mother with BPD is compromised by instability in her sense of her own self. Overall, those with BPD maintain a negative self-image and feelings of worthlessness. It is also typical for adults with BPD to make abrupt changes in aspirations, vocation, sexual identity and values (APA, 2001). Since it is through the unique relationship with the mother that the infant develops a sense of self, this distorted, unpredictable and fluctuating self-image of the mother is likely to have negative effects on the child’s own self-image (Lamont, 2006).

Furthermore, a mother with BPD's inability to adequately regulate her own emotions may obstruct her ability to cope with the varying affective states of her child. It is common for mothers with BPD to feel anxious, estranged, confused, or overwhelmed by their infants. When these parents are stuck in their own defensive and entangled organisation of thought, they prevent their children from integrating certain affective experiences and behaviours (Newman & Stevenson, 2005).

Empirical studies of children whose mothers have BPD revealed that children aged 4-18 whose mothers have BPD are more likely than are children of mothers with other personality disorders to experience changes in household composition and schools attended, removal from the home and exposure to parent drug or alcohol abuse and mother's suicide attempts (Feldman, Zelkowitz, Weiss, Vogel, Heyman, & Paris, 1995). Secondly, these children are diagnosed with more attention and disruptive behaviour disorders; they also have more anxiety, depression and low self-esteem than do children of depressed mothers, children of mothers with other personality disorders, and children of mothers with no disorder (Barnow, Spitzer, Grabe, Kessler, & Freyberger, 2006).

Two studies of children whose mothers have BPD were conducted from a developmental perspective with children of the same age. First, when infants are 2 months, mothers with BPD demonstrate more intrusiveness and insensitivity and their infants demonstrate more dazed looks, more looks away from the mother, and less responsiveness than do infants of mothers without a disorder (Crandell, Patrick, & Hobson, 2003). Second, when these infants are 13 months, 80 % are disorganised in their attachment with their mothers (Hobson, Patrick, Crandell, Garcia-Perez, & Lee, 2005), which is the same percentage found in maltreated children.

Little is known about cognitive development in children of mothers with BPD specifically, but high levels of 'disorganised' attachment status suggest that these children will face significant cognitive impairments (Holmes, 2005). Attachment security with the primary caregiver is correlated with intellectual development and functioning of children in that responsiveness and attune, maternal involvement, and emotional sensitivity support healthy cognitive development (Crandell & Hobson, 1999). Hence, a mother with BPD's intrusive insensitivity and unpredictability is bound to negatively affect a child's cognitive development. It is likely that the attachment status of children of mothers with BPD mediates the relationship between the mother's psychopathology and the child's level of cognitive functioning.

2.3.5 Maternal education

The relationship of a mother's schooling to her verbal responsiveness strongly suggests that the school experience provides women with verbal skills and models of adult-child verbal instruction that they would not acquire without schooling – this is carried forward into the way they eventually care for their infants as parents. Thus, schooling inadvertently constitutes socialisation for a particular kind of mothering, involving early reciprocal vocalisation that engages mother and infant in a long-term relationship based on verbal communication (Cockcroft, Amod & Soellaart, 2008).

Maternal education is a very important demographic characteristic that has been linked to better cognitive and social outcomes in children during early childhood. For example, Jackson (2003) investigated the relation among maternal education and other family factors on child development outcomes of 266 African-American pre-schoolers. Results indicated that mothers' higher educational attainment was associated with higher reading scores. Sharif, Ozuhah, Dinkevich and Mulvihill (2003) indicated that pre-schoolers of college-educated parents achieved higher scores of receptive vocabulary on a standardised measure than did children whose parents were not college-educated.

In a study involving data from the National Evaluation of Welfare-to-Work Strategies Child Outcome Study, findings suggested that increases in maternal education were positively associated with young children's academic school-readiness, but negatively associated with mothers' reports of their children's academic problems. Little to no effect was perceived on children's behaviour (Magnuson, 2003).

Low maternal education has been predictive of language difficulties in children. Maternal education, as well as maternal vocabulary and literacy skills, relate to child language skills, both directly and indirectly through the language used by the mother. Maternal education and its correlate, maternal IQ, are strong predictors of children's cognitive performance over time (Bornstein, Haynes, & Painter, 1998).

Cockcroft, Amod and Soellaart (2008) presumed that increased education improved parents' perspectives on their lives. This enhancement of their own cognitive and literacy skills may spill over to increased feelings of mastery and competence in the sense that education helps parents to effectively organise their lives and mobilise their resources towards achieving their goals. Education is regularly associated with greater knowledge about child rearing and child development. Education places parents

in a position to provide their children with a cognitively enriched environment. Parents that are more educated are thought to be more effective co-teachers, collaborating with teachers and the school system, knowing more about schooling and schoolwork. In this way, parents' education not only benefits their own lives – it also provides manifest advantages for their children's lives.

According to Holbern and Eddy (2011), 3.3 million young South Africans are not in education, employment or training. This is a concern, considering Vygotsky's suggestion that children master new challenges, hence enhancing their development, through their interaction with competent people who can provide guidance and encouragement.

2.3.6 Maternal employment

A mother's work burden, which determines the amount of time and energy the mother is able to devote to the care of her children, can influence their development. Longitudinal data on 900 European American children from the National Institute of Child Health and Human Development (NICHD) Study of Early Child Care showed negative effects on cognitive development at 15 months to 3 years when mothers worked 30 or more hours a week by a child's 9th month. Although maternal sensitivity, a high-quality home environment and high-quality care minimised these negative effects, they were not eliminated (Papalia et al., 2009). Similarly, among 6114 children from the National Longitudinal Survey of Youth (NLSY), those whose mothers worked full-time in the first year after giving birth were more likely to show negative cognitive and behavioural outcomes at ages 3 to 8 than children whose mothers worked part-time or not at all during their first year. Children in disadvantaged families, however, showed less negative cognitive effects than children in more advantaged families (Hill, Waldfogel, Brooks-Gunn, & Han, 2005). On the other hand, a longitudinal study of a socio-economically, ethnically and geographically diverse sample of 1364 children during their first 3 years suggests that the economic and social benefits of maternal employment may outweigh any disadvantages resulting from reduced time spent with a child. Mothers who worked outside the home compensated for some of their work time by reducing time spent on non-childcare activities. Differences in time spent with infants were modestly related to maternal sensitivity but did not seem to affect social or cognitive outcomes (Brooks-Gunn, Han & Waldfogel, 2002).

Huston and Aronson (2005) found that infants whose mothers spent more time with them did have more stimulating home environments, but so did infants whose mothers spent more time at work. It seems, then, that mothers, who are temperamentally inclined to be sensitive towards providing stimulating, warm, home environments, may find ways to do so, whether or not they are employed.

For graduate mothers, working outside the home for a larger salary could be economically advantageous. In South Africa, however, the reality, particularly for African women, is that the largest employment sector comprises of private, community and domestic services. Much of the employment in this sector is informal and the work is mainly done by females, mostly activities that generate a low level of remuneration, and this low income may obligate females to work longer hours or to take on extra informal employment (Van Heerden, 2007). Thus, the longer hours away from their children may pose an even greater challenge for these mothers to provide adequate, stimulating interaction.

2.4 Family influences on child development

Psychologists agree that the family plays an essential role in children's social, emotional and cognitive development and the quality and stability of family relationships have a direct impact on children's well-being. The family represents the young child's entire social and interactive world, but in turn, the family is subject to the wider and ever-changing influences of neighbourhood, community and society (Jack, 2000).

2.4.1 Family structure

Demographic variables can influence cognitive development and play a significant role. In extended families, gender and age may influence adjustment and familial conflict is definitely detrimental to development (Berk, 2009).

The structure of the family also has a large impact on childrearing and caregiving, for example:

- **Smaller families** tend to promote a higher degree of individual attention; there is a larger extent of parent / child interaction, thus promoting cognitive development. Children are usually healthier, show better intelligence test results, achieve better scholastic results and attain a higher level of education (Berk, 2009).

- **Large families** mean less parent / child interaction, especially with later-borns in larger families. The interaction with one or more siblings in large families may however, be advantageous for the development of social skills (Berk, 2009).
- **Order of birth** could be an influence. First-borns generally are better achievers. Altus (1966) (based on tests conducted throughout the mid-1960's) concluded that first-borns constitute a greater percentage of the intellectual superior portion of the population than of the population as a whole. Findings from many studies suggest that (1) first-borns are viewed as intelligent, obedient, secure, and responsible; (2) middle children are viewed as ambitious, caring, friendly, and thoughtful; (3) lastborns are believed to be the most creative, emotional, friendly, disobedient, and talkative, while least responsible; and (4) only children are viewed as independent and self-centered (Herrera, Zajonc, Wieczorkowska, & Cichomski, 2003).
- **First-borns** talk earlier and more clearly, learn to read earlier, are better at problem solving and perceptual tasks than later-borns. One possible explanation for these differences is that parents and others tend to react differently toward first-born and later-born children, and in turn reinforce personality stereotypes. More social, affectionate, and caretaking interactions occur between parents and their firstborn. Firstborns have more exposure to adult models and to adult expectations and pressures (Crandell et al., 2009). Both parents tend to be more attentive and stimulating to first-born babies, spending more time with them and providing greater encouragement and assistance in walking, talking, reading at the appropriate age and other developmental tasks. According to Berk (2009) these differences in parental treatment are thought to be responsible for first-borns being more serious, responsible, studious and competitive, while later-borns are more outgoing, relaxed, imaginative and athletic. Other explanations for differences between first- and later-born children suggest the oldest sibling experiences a richer intellectual environment than younger siblings do, and family resources such as parental time and encouragement, economic and material goods, and various cultural and social opportunities are finite. Additional siblings reduce the share of parental resources.
- **One-child families** are equally as well adjusted as those with siblings. Although sibling relationships bring many benefits, they are not essential for healthy development. Contrary to popular belief, only

children are not spoiled. In some respects, they are even advantaged (Berk, 2009). North American children growing up in one-child families are higher in self-esteem and achievement motivation, they do better in school, and attain higher levels of education (Falbo, 1992). One reason may be that only children may have somewhat closer relationships with parents, who may exert more pressure for mastery and accomplishment and receive a greater amount of attention. Furthermore, only children have just as many close, high-quality friendships as children with siblings. However, they tend to be less well-accepted in the peer group, perhaps because they have not had opportunities to learn effective conflict-resolution strategies through sibling interactions (Kitzmann, Cohen, & Lockwood, 2002).

Research by Sorenson (2008) showed that during the life-span of only children they often become more aware of their only-child status and are very much affected by society's stereotype of the only-child whether or not the stereotype is true or false. She argues that growing up in a predominantly sibling society affects only children and that their lack of sibling relationships can have an important affect on both the way they see themselves and others and how they interact with the world.

- **Adopted children and adolescents**, in general, are more likely to experience psychological and school-related problems than non-adopted children (Keyes, Sharma, Elkins, Lacono, & McGue, 2008). Altarac and Saroha (2007) confirmed similar findings of adopted children that are more likely to have a learning disability than non-adopted children. However, the vast majority of adopted children (including those adopted at older ages, trans-racially, and across national borders) adjust effectively, and their parents report considerable satisfaction with their decision to adopt (Brodzinsky & Pinderhughes, 2002). In sum, the changes in adoption practice over the last several decades make it difficult to generalise about the average adopted child.
- **Gay / lesbian families:** Generally, research concludes that most children of lesbian and gay parents show no difference in development from children raised by heterosexual parents (Patterson & Hastings, 2007). Researchers are finding that regardless of family type, children feel secure and have high self-esteem when they have close, loving relationships with caring adults (Wainwright, Russell, & Patterson, 2004).

- **Teenage parenting:** We are also forced to think differently about traditional notions of parenting due to the occurrence of teenage parenting. Adolescent mothers have long been identified as a high-risk population. This labelling is due to the fact that research has repeatedly linked teenage motherhood to many negative maternal outcomes. Adolescent mothers are less likely, for example, to complete their high school education. They are also less likely to be consistently employed, to work in positions that offer benefits and sustaining wages, and to be economically self-sufficient (Robokos, 2007).

Teenage motherhood has been linked to many predictors of poverty, including out of wedlock births and heading single parent households. Thus, these mothers are more likely to be raising their children in disadvantage conditions that are known to put a child at greater risk for developmental delay. These conditions also lead teenage mothers to experience greater daily stresses and negative life events that likely influence their parenting behaviours. Many of the negative effects of teenage childbearing on child development operate indirectly based on the cumulative contextual risk factors that a child is exposed to (Robokos, 2007). Research by Hollander (1995) has also indicated that children born to teenage mothers generally have significantly lower scores on measures of cognitive development than children who were born to older mothers.

The presence of the maternal grandmother in these families has been found to offset some of the negative results associated with teen mothering. The grandmother often serves as a valuable source of information about child development. She also tends to be more responsive and less punitive with the child than the teen mother is. In these three-generation households, the child's grandmother plays a very important role as teacher and role model to her daughter – she can provide favourable, positive, social information to the teen child (Van Heerden, 2007).

- **Extended families** are a vital and important feature of childrearing, even when resources are not limited. Many cultures view extended-family childrearing as an integral and important part of their cultures, which can provide a buffer to stresses of everyday living. It is also an important means of transmitting cultural heritage from generation to generation. In the South African context it is perhaps more significant, in view of the prevalent socio-economic conditions (mothers working elsewhere, children staying with grandmother or family, AIDS orphans being “adopted” by family, fathers of

unmarried mothers mostly uninvolved with their children) (Van Heerden, 2007). In an extended-family situation, even though mothers are seen as the primary caregivers, children experience frequent interaction with fathers, grandparents, godparents, siblings and cousins. Sharing households with relatives, the practicality of extended families is seen as a good way of maximising the family's resources for successful child rearing. Extended families differ in their composition from one culture to another, but have in common a sharing of resources, emotional support and care-giving (Van Heerden, 2007).

- **Children of mothers with HIV/AIDS** may be at high risk for psychological disturbance. Studies on the mental health of HIV negative children on HIV-positive mothers have focused on internalising (e.g. depression, anxiety) and externalising (e.g. conduct problems) symptoms and have found that children of HIV-positive mothers tend to exhibit heightened levels of both types of problems (Bauman, Silver, Draimin, & Hudis, 2007; Klein, Armistead, & Devine, 2000; Rotheram-Borus, Stein, & Lin, 2001). Sleeping and learning problems were also mentioned frequently, being in line with studies on symptom formation in children of ill parents (Nöstlinger, Bartoli, Gordillo, Roberfroid, & Colebunders, 2006). In addition to the possibility of losing their mothers, children of HIV-infected women may also face less than optimal mother-child relationships because of the mothers' diminished physical and mental well-being, as well as the mothers' fears that children may know, discover, or reveal their HIV status (Nelms, 2005). Studies that have examined attention problems and cognitive and social competence have also found that children of parents with HIV have more problems in these areas (Esposito, Musetti, Musetti, Tornaghi, Carballa, Massironi, Marchisio, Guaresch, & Principi, 1999). However, some research has not shown an association between parental HIV/AIDS and problems in child functioning (Lester, Stein, & Bursch, 2003). Most of the women who are living with HIV/AIDS in South Africa are mothers whose children rely on them for care. These children face extraordinary challenges to their mental health adjustment and overall development.

A child's family size and its placement in that family's hierarchy can have a considerable influence on a child's health and development. This is of particular concern in South Africa, where about 26.1 % of households with more than six people share one room (Statistics SA, 2007). The total of number of

rooms a household occupies, together with the number of household members, can be expected to have a bearing on the health of children and their development in South Africa.

2.4.2 Family health and aids

A factor that also affects child development is AIDS (Acquired Immuno-Deficiency Syndrome). In children, development may be seriously affected, in view of the fact that all learning processes may be slowed down. The development of younger children will be affected if the parents are dying (resulting in little affection being given), the increased occurrence of sickness, a higher childhood death rate and possibly a higher degree of malnutrition (Van Heerden, 2007). The World Health Organisation (2000) asserts that the common symptoms of HIV infection in children are noticeable when opportunistic infections occur. Their immune systems become increasingly affected, with most of these children manifesting some type of neurological involvement, e.g. a developmental delay. Dorrington, Bradshaw, Johnson and Daniël (2006) found that 294 000 children between the ages of 0 and 14 years in South Africa are HIV-infected. The vulnerability of children to poor health in South Africa is due to not only HIV/AIDS and childhood illnesses, but also due to numerous other contributing elements such as poor sanitation, malnutrition and poverty, as well as the family's health status (Van Heerden, 2007).

It is therefore quite likely that childhood illness will have a profound effect on normal rates of growth and maturation. While these aspects directly impact on children's physical development, other factors such as home environment and socio-economic status play a more indirect role.

2.4.3 Home environment and socio-economic status (SES)

Bronfenbrenner (1977) emphasises the fact that the way in which a child develops is related to the environment a child grows up in directly or indirectly. Environment can be defined as: "every aspect of an individual and his or her surroundings except the genes themselves" (Gray, 2002, p.55).

The quality of the environment a child lives in, can either protect or put children at risk for their development. Both socio-economic status (SES) and the more interpersonal and physical aspects of the immediate home environment, however, are significant predictors of cognitive development. Several attempts have been made to measure the quality of home environments and these have traditionally been based on indices of socio-economic status. SES is seen as a distal variable, providing an index of

the family's relative standing with regard to demographic differences. As such, SES yields little information on proximal variables reflecting the structures and processes established by parents that could potentially enhance development (Grieve & Richter, 1990).

Studies on the quality of home environments have revealed that proximal variables such as parental responsiveness and the availability of stimulating play materials are more strongly correlated with infant mental health development than global measures of the environment such as SES. The results reported by Grieve and Richter (1990) confirmed that home environment bears a stronger relationship to both mental and motor development in infants than either parental socio-economic status or structural features of the family, such as household density, supporting the cross-cultural generality of findings about positive relationships between measures of infant development and physical and interpersonal features of children's home environments, as does the conclusion drawn by Bradley, Caldwell, Rock, and Harris (1986) that differences in the home environment (within a very broad range of environments) are associated with differences in cognitive development regardless the average level of environmental quality that is observed in a particular subgroup. It is a fact that home environment and SES do not operate entirely independently of each other. While quality of home environment is strongly related to SES, it should be viewed as a conglomeration of factors and not as a unitary dimension. That is, within any socio-economic group, considerable heterogeneity with regard to caretaking environments can be expected. Some of the aspects of home stimulation considered to relate positively to cognitive development are the variety of available experiences; the stimulation of educational abilities and enhancement of skills; maternal involvement, and the provision of opportunities for exploration (Grieve & Richter, 1990).

Known risk factors such as the quality of the environment the child lives in, low socio-economic status and weak family ties could impair children's ability for problem solving, social skills, memory skills and language skills. Children living in an environment where there is little to no interaction at all between adults and children are at risk of having developmental problems. In addition, poor social-emotional attachment and control through restriction and punishment can also be potentially harmful for a child's development (Andradea, Santosa, Bastosb, & Pedromônico, 2005; Skinner, Tsheko, Mtero-Munyati, Segwabe, Chibatamoto, Mfecane, Chandiwana, Nkomo, Tlou, & Chitiyo, 2006).

While home environment appears to play an important role in the cognitive and academic outcome of high-risk infants, findings are inconsistent with regard to its influence on motor skills. Goyen and Lui (2002), however, found that the development of gross motor skills appears to be differentially influenced by the home environment, with infants from lower socio-economic groups performing significantly poorer than their wealthier counterparts do. This may subsequently affect the general intellectual functioning of these infants, as motor development during these formative years provides a foundation for subsequent development and optimises occupational performance in the areas of self-care, learning, recreation and play (Gallahue & Ozmun, 2006).

Bradley et al. (1986) found that the best predictors of mental development are variety of stimulation and organisation of the environment. The father plays a mediating role in the creation of an environment, which facilitates child development. While the father's residence at home is not that crucial, the father's involvement with the child does appear to be important. The father's material and emotional support may not directly facilitate infants' mental development, but also have an indirect effect on improved parent-child interaction by virtue of emotional support for the mother. Several authors pointed out that mothers who have extra familial social contacts are better capable of quality interaction with their children (Grieve & Richter, 1990).

The mother's or primary caretaker's responsibility and ability to structure young children's environments for learning, by utilising whatever personal and physical resources are available, is of the utmost importance. Aspects of parenting that have shown positive effects on cognitive development of children are, among others, encouragement of exploration, a rich verbal environment, nurture and warmth. Primary caregivers need to provide an environment that is playful and nurturing, is rich in conversation and that is balanced between safety and freedom-to-explore (Shonkoff & Phillips, 2000). Glascoe (2000) added that mothers play an important role in structuring their infants' environment, irrespective of class and culture, by providing the type of caregiving (stimulation) that bears a strong relationship to mental development. Should the mother, for whatever reason, be incapable of providing the required structural underpinning, this might hold significant implications for the child's developmental progress.

2.4.4 Early childhood care, education and stimulation

Papalia et al. (2009) reported that the impact of early childhood care may depend on the type of care, as well as its quantity and quality, in addition to the family's income and the age at which children start receiving non-maternal care.

Quality of care contributes to cognitive and psychosocial competence. Quality of care can be measured by *structural characteristics*, such as staff training and the ratio of children to caregivers and by *process characteristics*, such as the warmth, sensitivity and responsiveness of caregivers as well as the developmental appropriateness of activities (Papalia et al., 2009). Low staff turnover is important, as infants need consistent caregiving in order to develop trust, towards secure attachments. Unfortunately, most childcare centres do not meet all recommended guidelines for quality care.

The most important element in quality of care is the caregiver; stimulating interactions with responsive adults are crucial to early cognitive, linguistic, and psychosocial development. The cognitive stimulating qualities of the home environment have been related to children's developmental outcomes, with lower levels of social and cognitive stimulation and verbally unresponsive maternal behaviours in the home environment being linked to poor outcomes in young children (Spodeck & Saracho, 2006).

Cognitive stimulation has been defined as the parental use of statements to challenge children to use representational thoughts, providing conceptual links between objects, people, emotions, locations and other topics, and asking questions or making suggestions (Robokos, 2007). Affection and stimulation are crucial ingredients for healthy infant development. Stimulation occurs through responsive and increasingly complex developmentally appropriate interactions (matched to the child's emerging abilities) that enhance child development, between caregivers and children. Infants require relevant input in order to encourage appropriate interconnections among and myelination of all those developing neurons. Both cognitive and social-emotional skills provide the basis for later success at academic and employment levels (Glascoe, 2000).

Inadequate stimulation and interactions can affect child development through disrupting basic neural circuitry. Neural disruptions are measured through stress hormones, brain images, and event-related potentials. Early stimulation may enhance neuro-cognitive processing and brain functioning, particularly

for premature infants. The effects of early stimulation are also evident in the dramatic improvements in child development in undernourished, institution-raised children who are adopted into middle-class homes. A study by Murray and Yingling (2000), involving 58 two-year olds indicated that mothers who had established secure relationships and provided stimulation had children with the highest language scores. On average, the receptive scores of children who had stimulating environments and were securely attached were one standard deviation higher than the scores of children with insecure attachment from non-stimulating environments.

Van Heerden (2007) reports that in South Africa at present, early childhood programmes and stimulation practises are very diverse in nature and not at all geared to address the individual needs of all South African children. The South African government is not monitoring the lack of pre-schools or the success of educating pre-school children in South Africa. Also, daycare facilities are not always equipped with trained teachers; the daycare facilities attended often have caregiver:child ratios that exceed the efficacy levels. This results in a situation where poor, and sometimes even no, educational programmes are in operation.

When considering poverty indicators, as well as the high unemployment rate in South Africa, namely 24.5 % (Statistics South Africa, 2009), it is evident that daycare facilities are not only limited to very few institutions, but also inaccessible to many children in South Africa, especially children living in *rural* areas.

As seen above, early education and stimulation plays a major role in the development of the child. The reality, however, is that many caregivers fail to provide basic care for the children in their care and this, in turn, leads to neglect and the abuse of children.

2.4.5 Abuse and neglect

Economic crises are cited to be one of the most common general cause-and-risk teasers for child abuse. Most parents are indeed loving and nurturing, but some cannot, or will not, take proper care of their children, with some even deliberately harming them. Maltreatment takes several forms; the same child can be a victim of more than one type, like physical abuse, neglect, sexual abuse and emotional maltreatment. Children may be subjected to abuse and neglect at all ages and across socio-economic

lines. Studies have shown that the brains of children who have been severely neglected may be up to 30 % smaller (Van der Kolk, 1987). Some infants die due to failure to thrive (FTT), often the result of neglect. FTT can result from a combination of inadequate nutrition, disturbed interactions with parents and other factors, such as disease, difficulties in breast-feeding and improper formula preparation or feeding techniques (Papalia et al., 2009).

Childhood neglect is of great concern in South Africa. According to Statistics South Africa (2007), 25.8 % of South African children do not live with their mothers, with many children in South Africa thus dependent on others for upbringing and possibly even for feeding, in addition to stimulation. In South Africa, there is also an elevated rate of single mothers who have to work extended hours in order to support their families. Most of them are also obliged to leave their children in the care of other caregivers from a very young age. The above-mentioned factors tend to increase the possibility that neglect and abuse will occur (Van Heerden, 2007).

As Bronfenbrenner's bio-ecological theory would suggest, abuse and neglect reflect the interplay of multiple layers of contributing factors involving the family, the community and the larger society (contextual factors).

2.5 Contextual factors influencing child development

The following section will focus on factors that play a role in the transaction of context with the developing child. No two children's development progresses alike, because of differences in temperament, culture, gender, socio-economic status plus an infinite host of other factors. Most developmental theorists agree that context, whether viewed as extraneous or not, seems to be an important factor to consider when we attempt to understand child development.

2.5.1 Location: rural versus urban

The rapid population growth of Third World cities gives rise to concerns about the changing nature of the relationship of location, namely between urban and rural areas. After the 1994 democratic elections in South Africa and the abolition of the Pass Laws, a huge rural-to-urban migration resulted (Lynch, 2005). Lynch further asserts that the change brought about by the transition from urban to rural residence will

not necessarily bring about change in social structure or growth in economic activity. Yet, according to de Haan (2002), rural-urban migration has implications for both areas and can result in inequality.

The child's urban or rural location can also involve the influence exerted by the absence of sanitation and the lack of access to clean water. When adequate services are absent, the inhabitants / children are exposed to poor health, which will definitely directly influence child development. Furthermore, as mentioned before, the lack of infrastructure in the rural areas, allows for the occurrence of multiple safety hazards (Lloyd & Payne, 2002). In many instances, the infrastructure of the poor areas is so inadequate as to be not only unhygienic but also downright hazardous. South Africa is a developing country that is still establishing its basic infrastructure and is therefore focusing on the lowest needs in Maslow's hierarchy (Van Heerden, 2007).

Play is a physical activity and it is what children do most of in their waking hours (Gallahue & Ozmun, 2006). Play activities not only stimulates physical development but also the development of different senses and social development as well as language and cognitive development. Rural and informal urban settlements inhabited by the poor are less likely to have infrastructure such as street-lighting, telephones, public transport, decent roads and other infrastructure that facilitate crime prevention. In addition, police resources in South Africa are also inequitably distributed. These factors elicit questions surrounding the safety of South African children, resulting in them being allowed to spend less time playing outside for fear of their safety (Van Heerden, 2007).

Gardiner and Kosmitzki (2005) emphasised the importance of the physical and social setting of daily life in which a child lives (e.g. the nuclear family living typically found in many Western cultures, versus the extended family arrangements found in many African countries) and the influence it may exert on development.

Aspects of this component include:

- the kind of company a child keeps (e.g., rural Kenyan families frequently consist of eight or more children, who serve as ready-made playmates and caretakers);
- the size and shape of a person's living space. So, for instance, in a large North American home, children may have their own rooms, compared with families in rural areas in South Africa, where

- several family members live together in overcrowded dwellings or apartments (a small room sometimes having to serve as living cum, dining cum, sleeping area for as many as six occupants), and
- multiple generations living together (e.g. the presence, or absence of, children, parents, grandparents and other relatives).

Place of residence (urban versus rural) is related to occupational membership, socio-economic status as well as intelligence test scores. Studies conducted in the United States during the first half of the twentieth century (McNemar, 1942) found that children living in rural areas had significantly lower mean IQs than those living in urban areas. Although this urban-rural difference in intelligence test scores has persisted, it is not as pronounced as it was two or three generations ago. Because of television, better access to schools, and other sources of information and intellectual stimulation, rural children of today may be exposed to a wider range of environmental stimuli than their forebears were when they were growing up. Increased exposure to the wider culture has improved the vocabularies, level of knowledge and general intellectual awareness of rural children (Van Heerden, 2007).

The influences of environment on child development have long been acknowledged. In addition to this, it is a fact that those influences exerted by the greater context (culture) in which a child develops can play an even bigger role in child development.

2.5.2 Cultural factors

In Chapter 3, the integral role of culture in child development will be discussed more extensively, with the focus on the role that culture plays in child development.

A very important role in expanding the cognitive skills of children is played by their environment, the ecology and all those persons with whom they have contact, in other words, cultural factors. Children growing up in different cultural groups will very likely display different patterns of cognitive development (Goldstein, 2005). Development occurs within cultural contexts that are associated with qualitatively different processes and any observed differences in developmental processes are assumed to be adaptive responses to the demands of the cultural environment (Bakermans-Kranenberg, Van IJzendoorn, & Kroonenberg, 2004).

The importance of the cultural context when comparing and interpreting the development data of children as highlighted by the above factors therefore again becomes evident. This is specifically of importance when, for example, we look at the British context and how it differs statistically from South Africa. In Britain, the educational system places great emphasis on the stimulation of children. If any child is found to have some kind of developmental delay, the child is ascribed to a specific educational plan and will receive a subsidy from the state in order to allow for extra support (Van Heerden, 2007). This is clearly not the case for South African children.

The following may be some of the reasons for the differences in cognitive development between different cultures:

- **Problem-solving** - Different cultures address different problems differently, although the role played by socio-economic status should also be taken into account. Thus, persons who daily use technological means to solve problems will be able to solve other types of problems by that means, whereas those in outlying rural communities where no or little resources are available will not be able to resort to such means. In the latter case, problem-solving will rather focus on family life and the daily provision of food (Smit, 2008).
- **Daily experiences** - In their daily existence, different-culture children live through experiences differently. Thus, white children in English-speaking households in Johannesburg will have completely different experiences than children living in rural areas (Smit, 2008).
- **Education** - Children in different cultures enjoy different types of education. Children growing up in a Western community will receive different guidelines with regard to socialising than will children in a community in a developing country (Smit, 2008).
- **Knowledge** - Children discover new knowledge differently in different cultures. According to Goldstein (2005), knowledge influences change in persons' conceptual structures (knowledge structures). Conceptual structures contain certain information or expertise, and the manner in which cognitive tasks are approached and problems solved, is determined by conceptual structures.

- **Culturally regulated customs of childcare and childrearing practices** can influence child development. These include:
 - informal versus formal learning (e.g., family teaching of important skills within most rural African groups versus formal in-school learning that characterises most Western societies) (Gardiner & Kosmitzki, 2005), and
 - independence versus dependence training (e.g., independence practiced by most western parents versus the dependence or even interdependence found among the majority of African parents) (Gardiner & Kosmitzki, 2005).

Interestingly, all cultures have different **inherent** and **inherited** patterns of childrearing and differences often exist in the patterns concerning the rearing of boys and girls. In every culture, parents tend to develop shared ideas about the nature of children, their developmental processes and the meaning of their behaviours (Gardiner & Kosmitzki, 2005).

Strongly influenced by the cultural context, these ideas are closely intertwined with other aspects of life, including time and place, meaning of self, family and parenthood. Harkness and Super (1996), in an important contribution to the literature of culture and human development, point out that these cultural understandings are organised into categories referred to as parents' cultural belief systems and relate in systematic ways to action – including styles of talking to children, methods of discipline, or seeking advice from experts. Ultimately, these belief systems exert a powerful influence on the health and development of children, and they are a key component in the development of parents themselves. Parental beliefs represent one component of the developmental niche – the psychology of the caregiver (Harkness & Super, 1996). Another factor that influence the parents' cultural belief systems, conduct as well as the child's development, is poverty – a multi-dimensional phenomenon with devastating effects.

2.5.3 Poverty

According to Barbarin and Richter (2001), poverty does not have to literally deprive one of life to have a devastating impact on development. The manifestations of poverty may be idiosyncratic and its definition elusive, yet, its effects are palpable. Poverty is associated with human suffering, ranging from

disease and lower life expectancy to stigma and psychological distress. Inadequate living standards have particularly devastating effects on the development of children. Disease, stunted growth, impaired cognitive functioning and early death occur at higher rates among very poor children. This fuels concern that standard of living is not only associated with chronic malnutrition and illness, but with a much broader impact on cognitive development, psychosocial functioning, academic achievement and employment than was originally thought. Living standards are also implicated in a host of problems faced by children, including: prematurity, exposure to environmental pollution, slowed development of language skills, and delayed acquisition of behavioural and emotion regulation. They may also be linked to social ills such as community violence, substance abuse and the disintegration of family life. In all, living standards have important implications for the health and development of children (Barbarin & Richter, 2001).

2.5.3.1 Relation between poverty and cognitive development

Living in poverty is a risk factor that has recently received much attention in the field of child development research, due to its strong negative association with children's cognitive competence and early adaptations (Aber, Jones, & Cohen, 2000; Duncan & Brooks-Gunn, 2000). Earlier studies also served to establish the relation between poverty and cognitive development (Ramey & Finkelstein, 1981; Weikart, 1967). Literature in this field has shown that children as early as age two from backgrounds with lower socio-economic status scored lower on standardised intelligence tests (Ramey & Campbell, 1977). Very young children are particularly vulnerable to the impact of poverty, as it has been found that living in poverty during the *first five years of life* is a stronger predictor of later school difficulties than living in poverty *during middle childhood or adolescence* (Shonkoff & Phillips, 2000). Living in poverty causes young children and families to face many challenges, forcing them to confront many life stressors while lacking adequate resources.

Smith, Brooks-Gunn, and Klebanov (1997) examined the effect of poverty on the cognitive ability (IQ scores) of young children ages 2-8, based on a national data set and found that family income already affected children as early as age 2. Overall, children in families with incomes under 50 % of the poverty line achieved IQ scores 6 to 13 points lower than children in families with incomes 150 to 200 % above the poverty line. Children in families with incomes closer to, but still below the poverty line, also

performed worse than children in the higher income group. Although the latter differences were smaller, they were usually statistically significant. Smith and his colleagues also found that children in persistently poor families scored 6-9 points lower on cognitive assessments than children who were never poor, whereas the effects of transient poverty were typically 4-5 points lower than the effects of living in continuous poverty (Smith et al., 1997).

Cook and Cook (2005) confirmed similar findings of poverty being correlated to lower IQ scores as well as lower academic achievement and lower scores on a variety of cognitive measures. It has also been found that poor children compared to other children become ready for school later in terms of background knowledge, cognitive skills, social skills and self-regulation of behaviour and emotions.

2.5.3.2 Poverty and other risk factors

According to Ecological Systems Theory, poverty is one of the major environmental factors associated with developmental outcomes in young children (Bronfenbrenner, 2004). Poverty is associated with a multitude of risks, these being *environmental*, *biological* as well as *psychosocial*. Poor children are more likely than children who are not poor to suffer physical health problems. Higher rates of pre-term birth, low birth weight, illnesses, injuries, abuse, parental neglect, poisoning or exposure to toxic substances occur among the poor (Petterson & Albers, 2001). Having less access to adequate health care and lower rates of immunisations, illnesses and injuries often progress to quite serious levels before treatment is initiated.

Poverty is also associated with other risks, such as maternal depression, family functioning and conflict, and negative parenting behaviours. Parents in impoverished contexts are more likely to practice harsh and inconsistent parenting, relying on power-assertive discipline tactics, compared to parents with greater economic resources (Cook & Cook, 2005). Compared to children growing up in families with higher socio-economic status, poorer children have a higher likelihood of growing up in unsafe, economically depressed communities with few social controls, being born into families for whom services and resources are less accessible or insufficient, and homes where transience, instability, over-crowding and other problems (e.g. exposure to domestic, and community violence) are often the norm (Evans, 2004).

Generally, children living in poverty have seriously limited options, facing many difficulties in their day-to-day lives. Lack of resources, continuous hassles and relatively frequent negative life events create high levels of stress for all family members, which never seem to abate. The younger a child and the longer its existence in poverty, the larger the impact tends to be. The more poverty risk factors a child experiences, the worse the effect (Petterson & Albers, 2001).

Significant gaps exist in our ability to explain why poverty is so detrimental to children – more importantly, to account for adverse effect sustained by some children while others seem to be immune to its effects. Although childhood poverty is clearly linked to undesirable developmental outcomes, the process through which these effects on emotional and social development are achieved or forestalled is not well understood. The effects of poverty on children's adjustment may be traced to early trauma, low birth weight, malnutrition and iron deficiency. In addition, poverty is associated with food insecurity and malnutrition (specifically protein, energy and iron insufficiency), which can contribute to developmental anomalies, low birth weight, poor physical growth, compromised neurological development and, ironically, obesity in late childhood and adolescence. These, in turn, lead to long-term deficits in physical health, motor co-ordination, problem-solving, attention, and academic achievement, as well as a tendency for shyness and passive, withdrawn behaviour (Barbarin & Richter, 2001).

2.5.3.3 Poverty in South Africa

South Africa is a developing country characterised by high levels of poverty and inequality. As in most of the developing world, the proportion of the population comprised of young children is considerably higher than that in developed countries. As a result of its *apartheid* past, conditions of adversity disproportionately affect the Black South African population. The effects of poverty and the inequalities in South Africa are evident across all aspects of child development: apparent in the high infant mortality rate, stunted growth, high rates of early drop out from school and general low levels of educational attainment, high rates of homelessness and criminality (Tomlinson, Cooper, & Murray, 2005). Many children have lost either one or both parents to AIDS. The occurrence of such hardship is associated with high rates of child psychological disturbances.

Material hardship in South Africa presents many different facets, each posing its own challenges. To be poor and South African usually means to be unemployed with no dependable means of support, such as

having to live with a single mother or grandmother, sometimes for instance having to survive primarily on the grandmother's pension. To be poor is to experience hunger frequently; it means living in a one-room shack without electricity, heat, a refrigerator or a television. It could mean having to rely on taxis for transportation when you can afford it, or otherwise, when there is no money, having to walk to get to places. Poverty may also mean having insufficient money for school fees and books (Barbarin & Richter, 2001).

During the last decade, research and political interest on the impact of poverty on children's development have increased substantially (Robokos, 2007). The poverty rate for young African / black children in South Africa, was 75.2 % in 2007, whereas the poverty rate for young white children in 2007 was 4.9 % (Statistics S.A., 2007).

2.6 Summary

The research in this study focuses on various aspects that influence or impact on child development and in view of its being based in South Africa, prevalent South African conditions will apply. An overview is provided of the nature of child development in context. As this is viewed as an integral part of the nature of development, it has enjoyed discussion in greater detail, with particular emphasis on factors that could play a role in the transaction with the developing individual in a multicultural South Africa.

It is also a known fact that South African children differ greatly in terms of cultural heritage and their degree of acculturation. These children are part of such a diverse combination of ethnic groups – for instance, 13 official and various other languages are spoken. This in turn affects the rural / urban locations that these children inhabit. Their socio-economic background, the educational level of the parents, the preparation for schooling, as well as health-related matters, all of these, contribute to the many other influences that shape human development.

As mentioned, these factors are not exhaustive. There are many other influences that may pose daunting challenges to the development of children in the modern South African context. Clearly, a multi-faceted approach is required towards understanding child development and effective learning in South Africa.

Chapter 3: The role of culture in child development

3.1 Introduction

Two of the many questions asked with regard to development are: “Do all children in the world follow the same (universal) developmental pathways or are there clear differences along cultural lines?”, and: “How do cultural differentiation and universal phenomena interact in human development?” Child development was believed to follow the same pattern of development in all countries and cultures for many decades, a view especially popular among psychologists who believed that development is discontinuous, occurring in stages with universal characteristics. Psychology, as we know it, was mainly developed in Western cultures and developmental researchers in these countries focused almost exclusively on their own cultures (Louw & Louw, 2007).

However, as the horizons of psychology started to expand, many researchers began realising that the cultural context in which a person develops cannot be discarded. More recently, numerous psychological studies have been conducted in most countries in the world, confirming that cultural factors can play an important role in a child's development. For example, Nsamenang (2003) points out that culture influences development by ensuring that children acquire appropriate cognitive, communicative, motivational and social-emotional or affective and spiritual attributes, as well as practical skills that will make them competent adults who will contribute to their own survival and progress and that of their people and society. Human development is, therefore, a cultural process and can be viewed as a socially interactive process of construction comprising two main components, namely; shared activity (cultural practices) and shared meaning (cultural interpretation). Both components of cultural processes are cumulative in nature since they occur between, as well as within generations. Meanings and activities not only accumulate but also transform over both developmental time across a single life cycle, and historical time between generations. Contrary to many earlier accounts, however, culture and biology are not opposites, but intrinsically interrelated and complementary factors that influence development (Greenfield, Maynard, & Childs, 2003).

3.2 Defining and conceptualising “culture”

What is culture? It is commonly acknowledged in literature that culture cannot be defined in a simple sentence; almost everyone who studies culture views it differently. The term culture is one of the most difficult terms in the social sciences to define. Almost everyone who studies culture has a different way of looking at it. Taylor (1871) defined culture as being that complex unit where knowledge, belief, art, morals, laws, customs and any other capabilities and habits acquired by man as a member of society are included. According to Greenfield et al. (2003) culture is a dynamic system of rules, explicit and implicit, established by groups in order to ensure their survival, involving attitudes, values, beliefs, norms and behaviours, shared by a group but harboured differently by each specific unit within the group, communicated across generations, relatively stable but having the potential to change across time. Culture encompasses the behaviour patterns, beliefs, and all other products of a particular group of people that are passed on from generation to generation. Culture results from the interaction of people over many years (Cole & Cagigas, 2010).

According to Harris and Moran (1999) one can describe culture as coming in layers, like an onion. To be able to understand it, it has to be unpeeled layer by layer. On the outer layer are the products of culture, like language, food or dress. As the layers are peeled away, one will discover expressions of deeper values and norms in a society that are not directly visible and more difficult to identify.

There are three predominant layers to culture, namely; the outer layer of explicit products, the middle layer of norms and values, and the core layer consisting of assumptions about existence (Adekola & Sergi, 2007).

- 1) The outer layer, or explicit culture, is the observable reality of language, food, houses, architecture, agriculture, markets, fashions, art, and so on.
- 2) The second layer reflects the norms and values of an individual group. Norms are the shared sense a group has of what is right and wrong. Values, on the other hand, determine the definition of good and bad and are, therefore, closely related to the standards shared by a group.
- 3) The third layer reflects the core of the individual, the centre of essence of their assumptions about their existence. It is their individual harmony with the world.

The concept “culture” is complex, embedded in many aspects of life and living. Some aspects involve material things, such as food and clothing while some refer to societal and structural entities, such as government organisations and community structures and others refer to individual behaviours, to reproduction, or to organised activities, such as religion and science language (Matsumoto, 2000). Culture refers to so much of life and living, but culture itself can neither be seen, felt, heard nor tasted. One can only see the manifestations of culture. What is concrete and observable is not culture *per se* but differences in human behaviour comprising actions, thoughts, rituals, traditions and the like. Like many labelled aspects, culture has a life of its own. Just as similarities within groups and differences between groups give rise to culture as an abstract concept, that abstract concept reaches back to those behaviours, reinforcing our understanding of those similarities and differences. Culture, in whatever way one comes to know it, helps to reinforce, promulgate, and strengthen the behavioural similarities and differences that produced it in the first place, producing a cycle of reciprocity between actual behaviours and the theoretical understanding of them as culture language (Matsumoto, 2000).

Although one of the most important influences on our lives, it is probably the least thought of. One does not think about our culture every day and one does not necessarily see culture. Although one sees manifestations of our cultural heritage and that of others (the similarities and differences) all the time, one does not really stop to think about culture on a socio-psychological level. As culture is invisible, one may resort to other, more readily observable concepts to help explain and understand people's behaviours, using race or nationality. Our minds deal with this type of information more easily because they can be observed (Gardiner & Kosmitzki, 2005).

Different categories are associated with culture:

- ❖ Culture and diversity; many categories are typically associated with culture, such as race, ethnicity, and nationality, but they also include others not usually associated with culture such as gender, sexual orientation, and disability (Matsumoto, 2000)
- ❖ Culture and race; persons of the same race may be very similar or very different in their cultural dispositions, and in their actual behaviours, thoughts, and feelings. Same racial heritage people may share socialization processes, thereby enculturated in similar ways (Matsumoto, 2000)

- ❖ Culture and ethnicity; the term ethnicity is used interchangeably with race and culture, to describe different groups of people. Ethnicity mostly is groups of a common nationality geographic origin, culture or language (Garcia-Coll & Magnuson, 2000)
- ❖ Culture and nationality; strictly, nationality refers to a person's country of origin and is often equated with culture. For example, a person from France is French, from Japan, Japanese (Matsumoto, 2000).

Cultures can be vastly different in their specific customs and meanings, but one important dimension on which people often compare cultures has to do with their emphasis on the group or on the individual. These two general cultural orientations / pathways / values, will be discussed below.

3.3 Individualism / Collectivism as cultural pathways towards development

Differences in cultural learning throughout development have been accumulating around two different trajectories. This is a model of two idealised developmental pathways, one emphasising individuation and independence, the other emphasising group membership and interdependence (Oyserman, Coon, & Kemmelmeier, 2002; Fiske, 2000). Each ideal is part of a larger socio-cultural system, termed individualistic, collectivistic or socio-centric. This conceptualisation links to the "cultural syndromes" of individualism and collectivism as well as to the cultural construction of self as independent and/or interdependent. According to Greenfield et al. (2003) adult conceptions of the ideal and actual self also serve as developmental goals that organise socialisation experiences in characteristic ways. These goals, experiences and the resultant behaviours define pathways across the life-span.

Cultural orientations encompass individualism as opposed to collectivism with Western cultures being regarded as individualistic, whereas African cultures are rather collectivistic. Individualism refers to the subordination of the goals of the collectives to individual goals, and a sense of independence and lack of concern for others, and collectivism refers to the subordination of individual goals to the goals of a collective and a sense of harmony, interdependence, and concern for others (Hui & Triandis, 1986). These constructs reflect individual societal values regarding self, others, family as well as community, and thus are related to attitudes and social behaviour. Individualistic societies value autonomy, independence, achievement, identity,

self-reliance, solitude and creativity. Collectivistic societies value loyalty to the group, dependence, tradition, harmony, respect for authority, and co-operation (Triandis, 2001).

In individualistic cultures, people are supposed to look after themselves and their immediate family only, and in collectivistic cultures, people belong to in-groups or collectives which are supposed to look after them in exchange for loyalty (Hofstede, 1984). In individualistic cultures, the development of the individual is foremost, even when this is at the expense of the group, whereas in collectivistic cultures the needs of the group are more important, with individuals expected to conform to the group (Gudykunst, 2003). Conformity is valued in collectivistic cultures, but diversity and dissent are more esteemed in individualistic cultures. In individualistic cultures, the 'I' identity has precedence over the 'we' identity which takes precedence in collectivistic cultures. The emphasis in individualistic societies is on individuals' initiatives and achievements. Here, hierarchical differences and vertical relationships are emphasised, with role, status, and appropriate behaviours being more clearly defined by position. Collectivistic cultures, on the other hand, stress the needs of a group; individuals are identified more through their group affiliation and their sense of belonging to it, than by individual position or attributes.

Collectivistic cultures require a greater degree of harmony, cohesion and co-operation within their peer groups and place greater burdens on individuals to identify with the group and conform to group norms. Sanctions usually exist for nonconformity. Individualistic cultures, however, depend less on groups and more on the uniqueness of their individuals. The pursuit of personal goals rather than collective ones is of primary importance. As a result, individualistic cultures require less harmony and cohesion within groups and place less importance on conformity of individuals to group norms (Robinson, 2007).

The above mentioned model of two cultural pathways can be seen as a unified developmental theory.

3.4 Theories of development

A theory is a set of hypotheses or assumptions about behaviour. Theories allow us to see the world coherently and to act on the world in a rational way. Many theories have evolved over the past century in Western cultures that attempt to explain how human personality develops, why we behave as we do, what environmental conditions motivate us to act certain ways, and how these factors are interrelated (Crandell et al., 2009).

Some of these theories base their explanations on critical physical and social-emotional circumstances in our earliest years of life; some on the impact of environmental influences of our family, community, and culture; some on our distinct learning and thought processes; some on successful completion of specific developmental “tasks” at each stage over the life span; and some on how a healthy / unhealthy sense of self shapes our personality and behaviours. Each contributes an important piece to the life-span development puzzle. Although the theories disagree about certain aspects of development, many of their ideas are complementary rather than contradictory. Together they let us see the total landscape of life-span development in all its richness (Santrock, 2011).

Theories of Piaget, Kohlberg, and Erikson can be thought of as traditional or mainstream psychological theories focussing on the individual, with primary attention given to internal cognitive processes (e.g., knowing and thinking, moral reasoning, and psycho-social development). On the other hand, the theories of Bronfenbrenner, Super and Harkness, and Vygotsky can be viewed as inter-actionist theories because they focus on the interactions between the individual and his or her environment in specific psychological domains (e.g., ecology and the interrelationship of the developing individual and his or her changing physical and social environment, links between children’s behaviour and the developmental niche in which they are raised, and cultural influences on development of language, thinking, and guided participation) (Gardiner & Kosmitzki, 2005).

These above-mentioned inter-actionist theories will be discussed in more detail below.

3.4.1 Environmental / Contextual theories of development

The following theories attempt to capture the complexity of child development by focussing on the rich network of environmental systems that operate in and around the child.

3.4.1.1 Sociocultural Theory (Lev Vygotsky)

Vygotsky (1962) emphasised that children actively construct their knowledge and understanding and are more often described as social creatures. They develop their ways of thinking and understanding primarily through social interaction. Their cognitive development depends on the tools provided by society and their minds are shaped by the cultural context in which they live (Gredler, 2008; Holzman, 2009). Vygotsky’s

belief in the importance of social influence, especially instruction, on children's cognitive development is reflected in his concept of the zone of proximal development. Zone of proximal development (ZPD) is Vygotsky's term for the range of tasks that are too difficult for the child to master alone, but which can be learned with guidance and assistance of adults or more skilled children. Thus, the lower limit of the ZPD is the level of skill reached by the child working independently. The upper limit is the level of additional responsibility the child can accept with the assistance of an able instructor. The ZPD captures the child's cognitive skills that are in the process of maturing and can be accomplished only with the assistance of a more skilled person (Santrock, 2011).

Closely linked to the idea of the ZPD is the concept of scaffolding. Scaffolding means changing the level of support. Over the course of a teaching session, a more skilled person (a teacher or advanced peer) adjusts the amount of guidance to fit the child's current performance. When the student is learning a new task, the skilled person may use direct instruction. As the student's competence increases, less guidance is given (Daniels, 2007).

The use of dialogue as a tool for scaffolding is only one example of the important role of language in a child's development. According to Vygotsky, children use speech not only to communicate socially, but also to help them solve tasks. Vygotsky (1962) further believed that young children use language to plan, guide and monitor their behaviour. This use of language for self-regulation is called private speech, which to Vygotsky is an important tool of thought during the early childhood years (John-Steiner, 2007).

Vygotsky emphasised that all mental functions have external, or social, origins. Children must use language to communicate with others before they can focus inward on their own thought. Children also must communicate externally and use language for a long period of time before they can make the transition from external to internal speech. After a while, the self-talk becomes second nature to children and they can act without verbalising. When they gain this skill, children have internalised their egocentric speech in the form of inner speech, which then becomes their thoughts (Santrock, 2011).

The major theses of his work are as follows:

- Development of individuals occurs during the early formative years and has a specifically historical character, content, and form; in other words, development will be different depending on when and where you grow up
- Development takes place during changes in a person's social situation or during changes in the activities the person undertakes
- Individuals observe an activity and then internalise the basic form of that activity
- Systems of signs and symbols (like language) must be available in order to internalise activities
- Individuals assimilate the values of a particular culture by interacting with other people in that culture (Crandell et al., 2009).

It follows that development is always a social process for Vygotsky, with child-adult interaction always playing an important role. Therefore, it should come as no surprise that for Vygotsky, the way to understand development is to observe the individual in a social activity (Crandell et al., 2009).

3.4.1.2 Ecological theory (Urie Bronfenbrenner)

Psychologist Bronfenbrenner was the foremost proponent of Vygotsky's view, with his views showing the developing child as embedded in a series of complex and interactive systems. Bronfenbrenner's original model (still being adapted and evolving) now known as the bio-ecological model, incorporates earlier concepts, along with new ideas, into a series of propositions that focus more directly on the role of environment and the concept of time in the processes of human development (Gardiner & Kosmitzki, 2005).

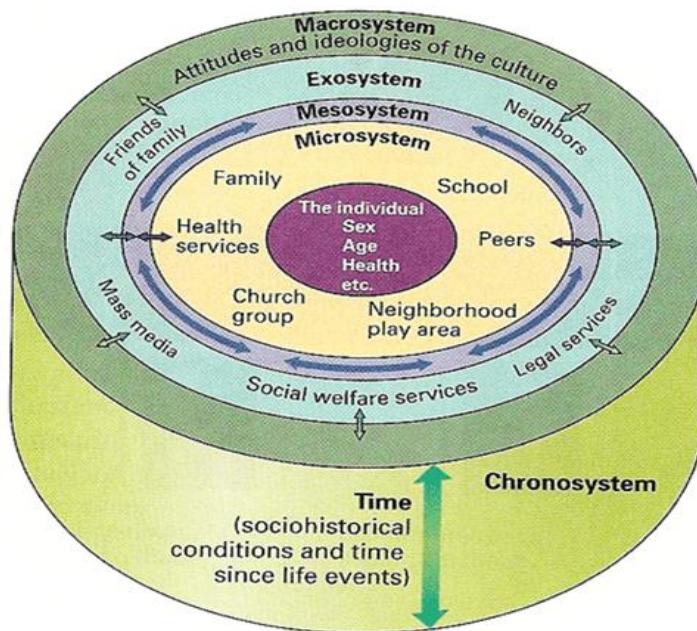


Figure 1: Bronfenbrenner's Ecological Theory of Development (Santrock, 2011)

The ecology of human development, as defined by Bronfenbrenner (1979), involves “the scientific study of the progressive, mutual accommodation between an active, growing human being and the changing properties of the immediate settings in which the developing person lives, as this process is affected by relations between these settings, and by the larger contexts in which the settings are embedded” (p.21). In short, a human being is not merely seen as a “blank slate”, but as a dynamic and evolving being. These interactions between individual and environment are viewed as two-directional and characterised by reciprocity. For example, while a child’s development is being influenced and moulded by parents, family, school and peers, he / she is, at the same time, influencing and moulding the behaviour of others. Whether in a laboratory, a classroom or a backyard, the ecological systems approach allows one to go beyond the experienced setting, thus permitting the incorporation of indirect, but nevertheless very real, effects from other settings as well as the culture as a whole (Gardiner & Kosmitzki, 2005).

Building on Bronfenbrenner’s definition, the concept “environment” is expanded to include increasingly complex interconnections among settings; considerably broader and more differentiated than previous presentations in psychology generally and developmental psychology particularly (Gardiner & Kosmitzki, 2005).

Bronfenbrenner has suggested that an individual's perception of the environment is often more important than "objective reality"; and that this perception influences one's expectations and activities. The importance of peer groups, schools and neighbourhood environments is clear and cannot be disregarded. Recognition and acceptance of the critical role played by the cultural or environmental context seem particularly suited to the study of human behaviour and development (Gardiner & Kosmitzki, 2005).

Bronfenbrenner described four environmental systems that influence, and are, influenced by the developing person:

- ❖ The microsystem is a pattern of activities, roles, and interpersonal relations experienced by the developing person in a given setting (Ngaujah, 2003). These contexts include the person's family, peers, school and neighbourhood. It is in the microsystem that the most direct interactions with social agents take place; with parents, peers, and teachers. For example, the individual is not a passive recipient of experiences in these settings, but someone who helps to construct the setting (Papalia et al., 2009; Santrock, 2011).
- ❖ The mesosystem comprises the interrelations among two or more settings in which the developing person actively participates (such as for a child, the relations among home, school, and neighbourhood peer group; for an adult, among family, work, and social life) (Ngaujah, 2003). The mesosystem represent the fact that what happens in one microsystem is likely to influence other systems. Examples are the relation of family experiences to school experiences, school experiences to religious experiences, and family experiences to peer experiences (Santrock, 2011). For example, you may find that you have a stressful day at work and now you are bad-tempered at home. This indicates that your mesosystem and microsystem of home and work are interconnected emotionally (Louw & Louw, 2007).
- ❖ The exosystem refers to one or more settings that do not involve the developing person as an active participant, but in which events occur that affect, or are affected by what happens in settings containing the developing person (Ngaujah, 2003). For example, a husband's or child's experience at home may be influenced by a mother's experiences at work. The mother might receive a promotion that requires more travel, which might increase conflict with the husband and change

patterns of interaction with the child (Santrock, 2011). Although the influence of the exosystem is at least second-hand, its effects on the developing child may be quite strong (Sigelman & Rider, 2006).

- ❖ The macrosystem is the broadest environmental context, the subcultures and cultures in which the microsystem, mesosystem and exosystem are nested (Papalia et al., 2009).
- ❖ The chronosystem refers to changes within the individual and changes in the environment across time, as well as the relationship between the two processes. For example, if a divorce occurs in a child's family during the preschool period, it will have a different impact than if the child is an adolescent or young child. All above-mentioned nested systems are embedded in the chronosystem (Crandell et al., 2009).

In the South African context, a mother, her workplace, the child's school, all form part of a larger cultural setting, such as Indians living in Kwazulu-Natal or Coloureds living in the Western Cape. Members of these cultural groups share a common identity, a common heritage and common values. In addition, these cultural groups live in a larger context as South Africans. As South Africans, one shares a common government, implementing policies that impact on development. The macrosystem evolves over time; what is true about a particular culture today may or may not have been true in the past and may or may not be true in the future. Thus, each successive generation of children develops in a unique macrosystem (Louw & Louw, 2007).

According to Bronfenbrenner, a person is not merely an outcome of development, but also a shaper of development. People affect their development through their biological and psychological characteristics, talents and skills, disabilities, and temperament. When looking at systems that affect individuals in and beyond the family, this bio-ecological approach helps one to see the variety of influences on development. The contextual perspective also reminds one that findings about the development of people in one culture or in one group within a culture may not apply equally to people in other societies or cultural groups (Papalia et al., 2009).

3.4.1.3 The developmental niche (Super and Harkness)

The developmental niche is a conceptualisation at the interface of child and culture, which can serve as a framework for relating findings in the separate disciplines of psychology and anthropology, and for examining

the mechanisms involved in the cultural regulation of child development. The concept of the developmental niche was originally borrowed from the field of biological ecology, where niche describes the combined features of a particular animal or species of animal, environment or habitat (Super & Harkness, 1994a). In applying the term to psychology, Super and Harkness (1994) averred that “at the center of the developmental niche, therefore, is a particular child, of a certain age and sex, with certain temperamental and psychological dispositions. By virtue of these and other characteristics, this child will inhabit a different cultural ‘world’ than the worlds inhabited by other members of his family; and further, the child’s world will also change as the child grows and changes” (p.96).

The three components of the developmental niche involved in this mediation are:

- ❖ The physical and social settings or contexts of everyday life in which a child lives (e.g. one's family).
- ❖ The culturally regulated customs of child-care and child-rearing practices (e.g. interactions with siblings).
- ❖ The psychology of caregivers or psychological characteristics of parents involved (e.g., parental cultural belief systems and developmental expectations).

These three subsystems (components) function with different relationships to other features of the larger culture and environment and thus they constitute somewhat independent routes of disequilibrium and innovation in the rearing of different cohorts of children. Nevertheless, homeostatic mechanisms tend to keep the three subsystems in harmony with each other and appropriate to the developmental level of the child. The settings, customs and caretaker psychology share a common function in organising the individual's developmental experience. Regularities within and among the subsystems as well as thematic continuities and progressions across the niches of childhood provide material from which the child abstracts the social, affective and cognitive rules of the culture. Super and Harkness proposed that these components interact and function as a dynamic (but not always as a completely co-ordinated system) in which the individual and the developmental niches adapt and are mutually influential (Gardiner & Kosmitzki, 2005).

All of these systems exist within and are affected by a specific cultural setting. At the broadest levels (i.e. the macrosystem and the exosystem), culture affects the options that are available to children and their families,

the resources they have to draw on, the governmental policies and laws that help or harm them, the types of neighbourhoods they live in and the types of lifestyles they have and wish for. On the more individual levels (i.e. the microsystem and the mesosystem), culture affects how and with whom children's social interaction take place, what kinds of parenting families consider appropriate, what people see as important or problematic, possible or impossible, what constitutes acceptable versus inappropriate behaviour; and what children expect of themselves and others. In short, culture permeates all these levels to affect children's thoughts, emotions, beliefs, and behaviours (Cook & Cook, 2005). Yet, most often one is not even aware of the pervasive effects of one's own culture; that is, until one encounters someone else's culture! Since cultural beliefs and customs are so thoroughly ingrained, it is not surprising that one sometimes misconstrues cultural differences as deficits. One is so accustomed to doing and thinking about things in the ways considered correct by one's own culture that one forgets there may often be other, equally correct, ways to go about things (Cook & Cook, 2005).

3.4.2 Evaluation of above-mentioned theories

Development is a very wide ranging concept, permitting multiple theoretical interpretations, with each theory suggesting different ways to understand personal transitions. A critical evaluation of the different theoretical perspectives involved in this study will follow:

3.4.2.1 Vygotsky's sociocultural perspective

Vygotsky's theory reflects the real world of children very well. His speculations were founded on the results of experiments with children of various ages, and he sought to check his conclusions with other studies from various nations. Vygotsky has exerted a remarkably potent, lasting influence on the field of child development (Thomas, 2005). Vygotskian theory breaks from traditional developmental psychology by focusing on the importance of social interaction. It emphasises activity, rather than the individual, as the basic unit of analysis. This more dynamic vision of child development offers a relational view on transitions. In this view, children are actively involved in the timing and quality of their transition experiences. Vygotskian sociocultural psychology has the advantage of recognising all aspects of childhood as shaped by social, cultural and economic processes. This also applies to

children's environments, whether these are within the home, the farm, or a preschool setting (Vogler, Crivello, & Woodhead, 2009).

While much of Vygotsky's work has been praised for its originality and usefulness, like the pioneering ideas of Piaget, it also has its critics (Karpov, 2006). Some critics point out that Vygotsky was not specific enough about age-related changes (Gauvain, 2008; Gauvain & Parke, 2010). Another criticism is that Vygotsky did not adequately describe how changes in socioemotional capabilities contribute to cognitive development (Gauvain, 2008). Yet another criticism is that he overemphasised the role of language in thinking. Also, his emphasis on collaboration and guidance has potential pitfalls. Facilitators might be too helpful in some cases, such as when a parent becomes too overbearing and controlling. Further, some children might become lazy and expect help when they might have done something on their own (Santrock, 2011). Nevertheless, the theory still represents an increasingly important contribution to cross cultural human development.

3.4.2.2 Bronfenbrenner's bioecological theory (model)

Ecological frameworks offer a comprehensive approach for the study of transitions and like socio-cultural perspectives, ecological approaches not only recognise children's immediate experiences in context, but also capture patterns of interaction between individuals, groups and institutions as they unfold over time. They have the benefit of capturing how, for instance, transitions impact at macro level (e.g. economic depression) on children via parental unemployment (exosystem) with consequences for the household microsystems with which children directly engage. The framework alerts us to not neglect environmental forces and proposes a heuristic scheme for categorising the multitudinous forces into four interlocking systems (Rimm-Kaufmann & Pianta, 2000).

Urie Bronfenbrenner elaborated the ecological approach to human development in the 1970's. It is informed by systems theory, which underscores the interactions of (ever-changing) environments. In his research, Bronfenbrenner was mostly concerned with an individual's position in wider ecological systems and how, for example, external influences affect the capacity of caregivers to foster the healthy development of children (Vogler, Crivello, & Woodhead, 2008).

Ecological theory has been very influential as an underpinning framework for the study of early childhood, with important implications for the study of transitions. However, it also has limitations, especially when systems are oversimplified and reified. For example, while the identification of multiple interacting systems is conceptually elegant, there is a risk of objectifying boundaries and assuming internal sub system coherence, (especially when represented by the classic ‘onion’ diagram) (Vogler, Crivello, & Woodhead, 2008). Each actor’s experiences of their ecology will be different. Children’s perspectives may be different from adults’, which may be overlooked by an outside observer’s attempt to model a singular ‘ecology of child development’ (Bronfenbrenner, 1979). Their experiences of settings, relationships and activities may be more dispersed and changing than the concept of a microsystem implies, especially where family relationships are fractured, conflictual and even dysfunctional. These complexities are highlighted by studies of how household and family formation, their breakdown and reconstitution affect children’s relationship building, loss and adjustment as well as their domestic arrangements and well-being (Hagan, MacMillan, & Wheaton, 1996; Smart & Neale, 1999).

According to Vogler et al. (2008) another caution regarding ecological theory relates to the way the model typically positions the child at the centre of multiple nested systems. While centring on the singular child may be desirable from a social policy and child rights perspective, it does not reflect the multiple priorities of many of the systems in which children participate, nor does it recognise the competing priorities of adults with power over their lives. For example, while being ‘child centred’ is ostensibly the raison d’être for child-focused services, the child is but one of the priorities within family settings and the child may be a marginal member of some community systems. The interactions between individual, social, economic, political and cultural processes is also at risk of being overlooked within Bronfenbrenner’s original formulation, especially where individual and ‘larger’ contexts are viewed as separate entities organised in hierarchical fashion or organising ‘larger contexts’ (macrosystems) in relation to ‘smaller’ ones (Rogoff, 2003). Identifying the cultural context as part of macrosystems draws attention away from the central role of cultural beliefs, goals and practices in mediating children’s experiences and activities at every level (Vogler, Crivello, & Woodhead, 2008).

Further, to render the model operational, a set of more precise guidelines is needed. Numerous aspects of the theory call for more detail (Thomas, 2005). For example:

1. Discriminating among microsystems; how does one decide where one microsystem leaves off and another begins?
2. Identifying roles; if one defines a microsystem by its physical setting during a period of time (Tuesday's seventh-grade forty-five minute math class), which roles should we identify for people in that setting when some of the people may be evincing more than one role or may shift from one role to another? Should each of the roles be identified, if not what criteria should we use for choosing those roles that are to be depicted?
3. Assessing the strength of system components; implicit in the theory is the assumption that some elements of the model will exert greater influence on the child's perceptions and behaviour than will others. Although Bronfenbrenner has proposed some general principles for judging the relative power of elements or subsystems, the way one would make this judgment in a specific case is still unclear (Thomas, 2005).

Furthermore, it must be remembered that ecological theory is not a theory in the formal sense. Rather, it is a structured framework for identifying influences at numerous levels. Therefore, it is not falsifiable. The theory presently is at a high level of abstraction. Only when specific hypotheses are spelled out for particular aspects of the model can empirical tests be applied to confirm or disconfirm these aspects. Its value is in alerting clinicians to factors that otherwise might be neglected (Thomas, 2005).

Despite these cautions, many researchers have found Bronfenbrenner's framework helpful to explore experiences in early childhood in general and transitions to kindergarten or primary school in particular (Bohan-Baker & Little, 2004; Johansson, 2007; Fabian & Dunlop, 2002; Tudge & Hogan, 2005).

Bronfenbrenner himself has been frank in recognising that his model is still in an early formative stage, particularly in regard to the details of devising suitable investigative techniques and applications to child rearing and education. Hence, because his version of ecological psychology is so new in the developmental marketplace, there is as yet a paucity of empirical examples to illustrate its applications or to test its hypotheses. Therefore, compared with such theories as Freud's, Piaget's, and Vygotsky's his ecological model is still very much a baby and its contributions to developmental psychology, whatever they may be, lie necessarily in the future (Thomas, 2005).

When discussing developmental psychology, the theories of Bronfenbrenner and Vygotsky are often referred to. They both focus their attention on human development and both have introduced a systems dimension to their ideas. It may well be that Vygotsky's theory provides a more varied picture of this system and its character rather than Bronfenbrenner's.

3.4.2.3 Super and Harkness's developmental niche

The developmental niche, in response, is a theoretical framework for studying cultural regulation of the micro environment of the child, and it attempts to describe this environment from the point of view of the child in order to understand processes of development and acquisition of culture.

The idea of a 'developmental niche' refers to the combination of: 1) caregivers' belief systems (ethno theories) regarding child rearing, 2) the material conditions and, in particular, the spatial arrangements, of child rearing, and 3) the actual practices of child rearing. At the centre of the model rests the individual child (Super & Harkness, 1986), and although it is very family and child centred, it does not look at wider social affects (unlike ecological models). The three sub systems of the developmental niche represent the way individual children's worlds are arranged and are related to the wider cultural environment. In this view, children contribute to the construction of their developmental niches through their own expectations and through their interaction with their caregivers (Vogler, Crivello, & Woodhead, 2008).

The 'developmental niche' approach has mostly been used to study early child rearing practices in relation to local beliefs and customs, illustrated by Le Vine's research amongst the Gusii of Kenya (LeVine et al., 1994).

Super and Harkness's developmental niche (Gardiner & Kosmitzki, 2008) aligns nicely with Bronfenbrenner's ecological model, with the physical and social setting of daily life correlating to Bronfenbrenner's microsystem level. Levels two ("customs of child care and child rearing") and levels three ("psychology of the caretakers") incorporating cultural elements (Gardiner & Kosmitzki, 2008). Like Bronfenbrenner's updated bioecological model which incorporates a child's biological heritage (i.e. genetic make up, specific biologically modulated traits, etc.), so too does the developmental niche theory involve a child's particular set of inherited dispositions (Harkness, Super, Sutherland, Blom, Moscardino,

Mavridis, & Axia, 2007). Super and Harkness (1986) contend that the developmental niche provides a framework for examining the effects of cultural features on child rearing in interaction with general developmental parameters. In this sense, with its specific focus at the family level, it is somewhat narrower in scope than Bronfenbrenner's bio-ecological model.

Research on human development has been shaped by two central but contrasting metaphors. In psychology, human development has been viewed as a process of growth, of stage like unfolding species specific abilities. In anthropology, development has been viewed primarily as learning, even as a process of moulding from rather general potentials the culturally particular patterns of behaviour and thought (Super & Harkness, 1986). The concept of the developmental niche represents an attempt to synthesise these two opposing metaphors, and it has drawn from several disciplines recent theories of the relationships between individual growth and its environmental context. The developmental niche is, therefore, also a metaphor, in which the child and the culture are seen as mutually interactive systems. The usefulness of this metaphor for research lies in its delineation of aspects of the child's environment that have gone often unrecognised in psychology, while focusing on the processes of growth that are at the heart of developmental theory (Super & Harkness, 1986).

3.5 Differences in child development across cultures

It is important to keep in mind that there are probably as many overlaps among cultural groups as there are differences. For example, developmental processes should be similar among different cultural groups (Garcia-Coll, Ramos, Magnuson, Halpern, & Valcarcel, 1997) but that their particular expressions might differ given the different promoting and inhibiting environments to which they are exposed. Language acquisition, attachment to primary caregivers, and emergence of major emotional and cognitive systems are relevant processes in all populations. However, the particular language, the number of important attachment figures, and the expression of emotions and cognitive skills in particular contexts might differ.

When the study of culture and psychology uncovers cultural differences, several questions come to mind:

- Just how did these differences arise?
- What happens during development that makes people of different cultures different?
- What are the relative influences of parents, families, schools and other social institutions?

- What differences are there in infancy / childhood and development when people are raised in different cultures?

Aspects of motor, social, cognitive and language development are involved and the differences below are highlighted as some of the most significant.

3.5.1 Physical / gross motor development

When discussing physical development, an individual's size and body structure are the points of interest (e.g. variations in height and weight, increases in muscle size, specialization of brain and sensory organ functions, improved motor skills, various effects of nutrition and physical health). Changes such as these do not take place in a vacuum separate from one's cognitive experience, social and emotional development, or cultural context (Gardiner & Kosmitzki, 2005).

During infancy, the changes that take place in physical growth and development are enormous. In two short years, most infants make the transition from dependent, practically helpless babies to independent, curious children. As their bodies grow and respond to social and cultural cues, their nervous systems mature, and their cognitive experiences are enhanced. Quickly adapting to the world outside the womb, they slowly begin to imagine a future involving themselves and others, discovering useful methods for storing memories of past and present events (Gardiner & Kosmitzki, 2005).

Although motor development follows a virtually universal sequence, its pace does respond to certain cultural factors. A normal rate of development in one culture may be quite different in another. Infants raised in different ecological settings sometimes show significant variations in physical development. All infants do not follow the same sequence of motor accomplishments. The body of knowledge of the stages and timing of motor development are based largely on studies of infants from Western cultures. However, the possibility that there are considerable differences among cultures in the timing of motor development has been raised by a number of studies of African infants (Ainsworth, 1967; Keefer, Tronick, Dixon, & Brazelton, 1982). Geber and Dean (1957a, 1957b) tested nearly 300 infants living in an urban area of Uganda. They found that these babies were clearly accelerated in motor development, relative to American white infants. The Ugandan infants' precocity is greatest during the first six months of life, after which the gap between the two groups tends to decrease. It closes by the end of the second

year. The timing of motor development is not universal. North African children develop motor skills sooner than Western children do, and American Indian and East Asian children develop them later (Field, 2007). Infants in European cities start walking at about 12 to 15 months, whereas Jamaican infants start walking sooner than British infants. African infants, however, do not start crawling sooner than their Western counterparts. It has also been well documented that the motor skills of African infants in such activities as sitting, walking, and running develop several months before they do in other infants. In Uganda, for example, infants begin to walk at about ten months (earlier than in most countries); in France, fifteen months is more typical; in the United States the average is around twelve months (Papalia et al., 2009).

The theory of black precocity states that black infants are more advanced than white in mental and motor development during the first fifteen months or so of life. In the 1980's, the precocity of black South African babies was investigated and Richter-Strydom & Griesel (1984) showed that black South African babies were significantly more advanced than the American babies, as far as both mental and motor development was concerned. A more recent study by Lynn (1998) found that black infants are significantly in advance of the white infants from the age of 2 to 10 months; their advantage falls to non significance between 12 to 15 months and from 18 months onwards there are no differences. According to Louw and Louw (2007) there are conflicting results on the available research and it cannot be concluded that early precocity is a common phenomenon among black African babies.

How can the above mentioned differences in physical / motor development of infants from different cultural backgrounds be accounted for? While there are many contributing factors, a few deserve special mention.

It is likely, in most cases, to be the result of a combination of factors, including genetics, activity level, body type and physical maturation. Genetic factors will obviously play a major role in early motor development. Cultural and environmental factors, however, such as interactions between the child and others in the micro- and mesosystems and the unique developmental niche, are also extremely influential. Individual styles of parenting contribute because parents help their children to develop many of the fundamental motor abilities and this can vary considerably from one culture to another. During

infancy, nutrition is of the utmost importance. Poor nutritional status and other effects of poverty are detrimental to physical growth and development of children (Gardiner & Kosmitzki, 2005).

Cultural variables play a part in the differences between groups' developmental milestones timetables. For example, many American infants never crawl on their belly or on their hands and knees. They may discover an idiosyncratic form of locomotion before walking, such as rolling, or they might never locomote until they get upright (Adolph & Joh, 2009). In the African Mali tribe, most infants do not crawl. Early "formal handling experiences" can stimulate physical / motor development. Caregivers in some cultures handle babies vigorously and this might advance motor development. Handling exercises may assist in gaining motor skill development; stretching exercises from early on, gradually introducing other activities, such as making them sit up, or playing games that promote jumping and walking skills (Gardiner & Kosmitzki, 2005). Mothers in developing countries, for example, tend to stimulate their infants' motor skills more than mothers in more modern countries (Hopkins, 1991). Parents and extended family members in many African cultures place considerable importance on babies' sitting and walking, thus actually providing early "formal handling experiences" that stimulate these behaviours (Gardiner & Kosmitzki, 2005). Richter-Strydom and Griesel (1984) investigated the assumption that precocity in black South African babies is the result of specific child rearing practices such as mothers' feeding, physical contact and carrying and child-rearing practices or expectations for development which may be influencing infants' abilities. As Rogoff (2003, p.159) explains: "In some communities walking sooner is valued in others it is not desired." In Wogeo, New Guinea, infants were not allowed to crawl and discouraged from walking until nearly 2 years of age so that they know how to take care of themselves and avoid dangers before moving about freely. African children are seldom placed on their stomachs, as Western infants are, thus not practicing crawling as much. African parents also do not encourage or value this behaviour; it is generally regarded to be dirty and dangerous.

In many African, Indian, and Caribbean cultures, mothers massage and stretch their infants during daily baths (Adolph, Karasik, & Tamis-LeMonda, 2010). Jamaican and Mali mothers regularly massage their infants and stretch their arms and legs. Mothers in the Gusii culture of Kenya also encourage vigorous movement in their babies (Hopkins & Westra, 1988). Do these cultural variations make a difference in the infant's motor development? When caregivers provide babies with physical guidance by physically

handling them in special ways (such as stroking, massaging, or stretching) or by giving them opportunities for exercise, the infants often reach motor milestones earlier than infants whose caregivers have not provided these activities (Adolph, Karasik, & Tamis-LeMonda, 2010). For example, Jamaican mothers expect their infants to sit and walk alone two to three months earlier than English mothers do (Hopkins & Westra, 1990). Nonetheless, even when infants' motor activity is restricted, many infants still reach the milestones of motor development at a normal age. For example, Algonquin infants in Quebec, Canada, spend much of their first year strapped to a cradleboard. Despite their inactivity, these infants still sit up, crawl, and walk within an age range similar to that of infants in cultures who have much greater opportunity for activity. Louw and Louw (2007) suggested that a complex interaction between cultural and genetic factors is responsible for the differences in the speed of early development that was seen in the cross cultural research.

3.5.2 Socio-emotional development / psychosocial development

The values of the society in which children are raised provide a framework that shapes parental behaviours and interactions with children and the resulting developmental outcomes (Kagitçibasi, 1996; Super & Harkness, 1997). Within all cultures, parents engage in practices aimed at socialising the child to become a responsible adult member of the society. Yet the patterning of values varies widely across cultural groups. The two fundamental values as discussed previously are individualism and collectivism. These underlying values shape the processes of development through ways in which parents socialise their children (Robinson, 2007).

When a newborn arrives in the world, independent of its particular culture, the manner in which its basic needs that require immediate attention are met, and how it is socialised, varies considerably across cultures and often among ethnic groups within a single society. It is clear that culture influences patterns of parenting from the first hours of infancy (e.g. when and how parents care for infants, the extent to which they allow them to explore their surroundings, how nurturing or restrictive they might be, and which socialising behaviours they value) (Gardiner & Kosmitzki, 2005).

3.5.2.1 Emotional development

Child psychologists and early childhood experts believe that children's emotions are central to their lives and should be central to the nursery school, preschool, and early elementary school curriculum (Crandell et al., 2009). Hyson (1994) notes that emotional development and social development are intertwined and that "current theory and research support the belief that all behaviour, thought and interaction are in some way motivated by and coloured by emotions. Thinking is an emotional activity, and emotions provide an essential scaffold for learning. In fact, children's feelings can support or hinder their involvement in and mastery of intellectual content" (p.4).

Contemporary social scientists are studying cross cultural expectations or unwritten "rules" for expressing emotions. Young children learn by imitation and modelling to convey culturally prescribed emotions through gestures and body language. In Western industrialised cultures, parents tend to support individualism; the view that individual autonomy is paramount. Western parents promote values such as freedom of expression, independence, individuality, creativity, and competition and encourage their children to exhibit feelings more openly (Friedlmeier & Trommsdorff, 1999). For example, it is common to witness a young American child crying loudly or having a "temper tantrum" in public. In contrast, native Americans often convey emotions through nonverbal communication and tone of voice (Paniagua, 2005). Japanese mothers try to prevent their children from having negative emotions by anticipating their needs. East Asian parents value contentment and serenity more highly than they value joy (Cole & Tan, 2007b). Children from Asian cultures are typically encouraged not to show their emotions and to comply with their parents' wishes (Cole & Tan, 2007a).

3.5.2.2 The self concept and self definition

The self concept is our total picture of our abilities and traits. It is "a cognitive construction ... a system of descriptive and evaluative representations about the self," that determines how we feel about ourselves and guides our actions (Harter, 1996, p207). The sense of self also has a social aspect: Children incorporate into their self image their growing understanding of how others see them. The self concept begins to come into focus in toddlerhood, as children develop self awareness. It becomes

clearer as a person gains in cognitive abilities and deals with the developmental tasks of childhood, of adolescence, and then of adulthood (Papalia et al., 2009).

Children's self definition can be defined as the way children describe themselves. Parents transmit, often through everyday conversations, cultural ideas and beliefs about how to define the self. For example, Chinese parents tend to encourage interdependent aspects of the self; compliance with authority, appropriate conduct, humility, and a sense of belonging to the community. European American parents are more apt to encourage independent aspects of the self; individuality, self-expression, and self-esteem (Papalia et al., 2009).

A comparative study of 180 European American and Chinese preschoolers, kindergartners, and second graders (Wang, 2004) found that children absorb differing cultural styles of self definition as early as age 3 or 4, and these differences increase with age. European American children tend to describe themselves in terms of personal attributes and beliefs ("I am big."), whereas Chinese children talk more about social categories and relationships ("I have a sister."). European American children more often describe themselves in terms of personality traits and tendencies ("I'm good at sports."), whereas Chinese children describe specific, overt behaviours ("I play Snowmoon with my neighbour."). European American children tend to put themselves in an unqualifiedly positive light ("I am smart."), whereas Chinese children, and adults, describe themselves more neutrally ("I sometimes forget my manners."). Thus, differing cultural values influence the way children in each culture perceive and define themselves (Papalia et al., 2009).

3.5.2.3 Attachment and child: caregiver relationships

Attachment was discussed extensively in Chapter 2 and will only be briefly referred to in this chapter. The focus in this section will be on attachment in different cultural groups. Attachment theory was proposed as a universal theory of human development. If attachment is biologically based and adaptive in the evolutionary sense, as Bowlby (1969, 1982) asserted, then the major propositions in attachment theory should apply to all human beings in all homes and places. The strange situation has been used in numerous cultures; by 12 months of age, infants universally display strong emotional attachments to

their caregivers. The quality and type of attachment seems to be influenced by the specific childrearing patterns predominate in the culture.

Studies have shown that the strange situation attachment patterns occur in a wide variety of cultures (Robinson, 2007). Van IJzendoorn and Kroonenberg (1988) summarised the distribution of the three attachment styles in eight different cultures (Germany, Great Britain, Netherlands, Sweden, Israel, Japan, China and United States). The authors found that the countries differed in the percentage of children falling into each of the attachment categories: anxious / avoidant classification relatively higher in West European countries and anxious / resistant classification relatively more prevalent in Japan and Israel.

Although the behaviours that indicate an infant's attachment to a caregiver are universal, how one interprets the meaning of those behaviours must be understood in its proper cultural context (Cole & Tan, 2007a). For example, German and Japanese babies often show different patterns of attachment than American infants. German infants are more likely to show an avoidant attachment pattern and Japanese infants are less likely to display this pattern than U.S. infants (van IJzendoorn & Kroonenberg, 1988; Grossman et al., 1981). The avoidant pattern in German babies likely occurs because their caregivers encourage them to be independent (Grossman et al., 1985). Observations of parent child interactions within German homes, however, did not indicate that German mothers generally were insensitive to their children. Rather, these mothers endorsed a broader cultural belief system emphasising independence; this system indicated that babies should be weaned from body contact with their mothers as soon as they became mobile. These cultural beliefs were translated into socialisation practices that affected the mother infant relatively large interpersonal distance from their children. German parents deliberately discourage their infants from clinging and becoming emotionally dependent because they value independence and obedience. Japanese babies are more likely than American babies to be categorised as resistant. This may have more to do with the strange situation as a measure of attachment than with attachment insecurity itself. In Japan, mothers are rarely separated from their infants; they spend much of their time talking to and touching their infants. Consequently, Japanese babies are more distressed by the presence of a stranger and separation from their mothers. Traditional Japanese mothers instil a strong sense of dependence in their young children by being available at all

times (Miyake, Chen, & Campos, 1985; van den Boom, 2001). These two examples demonstrate that mother / caregivers bring their unique cultural beliefs about parenting to the relationship (Harkness & Super, 1996). Japanese mothers rarely let anyone unfamiliar with their babies care for them. Thus, the strange situation might create considerably more stress for Japanese infants than for their mothers (Miyake et al., 1985).

The way that mothers cultivate attachment is culturally sensitive as well. Carlson and Harwood (2003) found that Puerto Rican mothers, who value proper demeanour in their children very highly, used much more physical control with their very young infants while they were feeding them or teaching them to be calm and well behaved than did Anglo American mothers. This mothering style would be considered intrusive in an Anglo American mother; the overall social goal of Anglo American mothers is to teach their children to be independent and explore their worlds for themselves. However, the overall social goal of the Puerto Rican mothers; to teach their children proper demeanour, was congruent with their mothering style, and the researchers reported that contrary to their expectations, the Puerto Rican children exhibited secure attachments to their mothers at 12 months.

Several cross cultural researchers have suggested that, although a universal repertoire of attachment behaviours may exist among infants across cultures, the selection, shaping and interpretation of these behaviours over time appear to be culturally patterned (Van IJzendoorn, 1990). According to Grossman and Grossman (1990) the main issue is whether the different attachment strategies observed may be differentially adaptive in different cultures. It may well be that behaviour strategies are universal, but the relevance for them may be culture specific.

There is also some evidence that the secure attachment relationship may be preferred in many different cultures (Posada, Gao, Wu, Posada, Tascon, Schoelmerich, Sagi, Kondo-Ikemuta, Haaland, & Synnevaag, 1995; Thompson, 2006; Van IJzendoorn & Kroonenberg, 1988). It does not, however, follow that the development of attachment is insensitive to culture specific influences. If a cultural niche requires the suppression of negative emotions, infants may develop an avoidant attachment pattern to meet this cultural demand. The conceptual similarity of attachment security across diverging cultures does not mean that exactly the same infant attachment behaviours are considered indicative of secure or insecure attachment (Van IJzendoorn & Sagi, 1999).

As noted above, cultures differ in their notion of “ideal” attachment. Crittenden (2000) suggests that we should stop using value laden terms such as ‘secure’ and ‘insecure’ in describing the attachment relationship. Instead, she proposes that it might be more useful to describe the attachment relationship as ‘adaptive’ or ‘maladaptive’ to the specific context, which would take into consideration how cultures differ in the particular attachment strategy that may be most appropriate for that culture. She defines adaptive attachments as relationships that promote the maximum level of safety for the child within a specific cultural context. This would then allow one to define an ‘optimal’ relationship between infant and caregiver as one that may be achieved in different ways, under different circumstances, in different cultures.

3.5.2.4 Temperament

Temperament can be defined as a person’s characteristic behavioural style or typical pattern of responding to events in the environment. It is sometimes defined as a person’s characteristic, biologically based way of approaching and reacting to people and situations; the how of behaviour and not what people do, but how they go about doing it. Temperament appears to be largely inborn, probably hereditary (Schmitz, Saudino, Plomin, Fulker, & DeFries, 1996; Thomas & Chess, 1977, 1984) and there are indications that certain temperament characteristics such as sociability, shyness, activity level and irritability show moderate stability during infancy, into early childhood and even into adulthood. That does not mean, however, that temperament is fully formed at birth. Temperament develops as various emotions and self-regulatory capacities appear (Rothbart, Derryberry, & Hershey, 2000) and can change in response to parental treatment and other life experiences (Papalia et al., 2009). Temperament also may be affected by culturally influenced child rearing practices. Infants in Malaysia tend to be less adaptable, more wary of new experiences, and more readily responsive to stimuli than U.S. babies. This may be because Malay parents do not often expose young children to situations that require adaptability, and they encourage infants to be acutely aware of sensations, such as the need for a diaper change (Banks, 1989). This indicates that temperament could, to a large degree, be modified by environmental influences.

The quality of the adaptation, or “match” between a child’s temperament and the demands of his/her immediate environment, is called: ‘Goodness of Fit’ (Santrock, 2011). This concept is well illustrated in cultural differences in the acceptance of certain temperamental traits. Among Puerto Rican families it was

found that an early difficult temperament did not predict poor adjustment and behavioural difficulties in later childhood, the simple reason being that these families did not classify the characteristics to be difficult or problematic. Clearly, the view taken by a family or culture of a trait may influence their response (Louw & Louw, 2007). Each culture seems to favour some aspects of development to the detriment of others.

According to Thomas and Chess (1977), it is not the individual child's temperament that is related to future maladjustment but rather the match, or mismatch, of the child's temperament with the environment that predicts problematic behaviour. If a "difficult" temperament disrupts the family routine and leads to negative parental reactions, negative developmental outcome is likely (Louw & Louw, 2007).

Possibly, differences in temperament reflect differences in genetics and in reproductive histories. Environmental and cultural pressures over generations may have produced minor biological differences in infants through a functionally adaptive process. In addition, the cultural experiences of the mother during pregnancy (including diet and other culture related practices) may contribute to a prenatal environment that modifies an infant's biological composition to correspond to those cultural practices. Findings following research on the exact nature of this relationship are not clear (Gardiner & Kosmitzki, 2005). There are indications that certain temperament characteristics, such as sociability, shyness, activity level and irritability are moderately stable during infancy and early childhood and even into adulthood. Over the course of time, children's characteristics may change noticeably. Overall stability of temperament is not very durable and temperament can also be modified considerably by environmental influences such as good quality caregiving (Louw & Louw, 2007).

The various elements of a chronosystem as theorised by Bronfenbrenner deserve mention in that they represent the establishment of the customs, values and laws important to the child's culture and together provide the individual child with his / her developmental niche, or unique combination of socialisation experiences.

A child's individual temperament provides a reciprocal influence and although a child's behaviour will initiate a specific response from a caregiver in a particular setting (home or pre-school), these responses differ from one environmental setting to another. For example, a mother's reaction to a child who exhibits irregular sleeping and eating patterns differs from North America to East Africa. A North American mother typically pays more

attention to an infant who is unpredictable in eating and sleeping patterns and she arranges her schedule to take care of the child's needs. In contrast, Super and Harkness (1994) report that mothers in Kokwet, a small farming town in Kenya, interact more with children who operate on a regular daily schedule. Knowing when her baby will be awake and alert, the mother can more easily arrange her many other duties and activities. Kokwet infants who are less predictable in their daily patterns are more often left to the care of an older sister or another caregiver (Gardiner & Kosmitzki, 2005). This example illustrates how a child's temperament influences the environment. At the same time, however, specific patterns of response exhibited by others in the child's environment may facilitate or inhibit particular behavioural styles on the part of the child, thus making the child environment relationship a two way interaction. A fussy child receives more attention from the primary caregiver in most Western cultures, thus potentially rewarding and facilitating the child's dependency on the caregiver. In non-Western cultures, dependency and emotional attachment to the mother are often less pronounced because mothers may not be available to respond to fussy children with immediate emotional attention (Gardiner & Kosmitzki, 2005).

An important cultural factor to consider is the interaction between parents' responses and infant temperament. This interaction is certainly one of the keys to understanding the development of culture and socialisation processes. The quiet temperament and placidity that are notable in infants from Asian and native American backgrounds are probably further stabilised in later infancy and childhood by the response of the mothers. Navajo and Hopi babies spend long periods of time tightly wrapped in cradle boards, as do South African babies of colour; sitting wrapped in blankets on their mothers' (or even siblings') backs. Chinese parents value the harmony that is maintained through emotional restraint (Bond & Wang, 1983). Therefore, different parenting styles and behaviours teach and reinforce particular cultural practices. Temperament, therefore, may serve as a baseline biological predisposition of the infant, allowing this type of learning to occur.

3.5.2.5 Play

Play, aimed at healthy development of body and mind, is vital. It enables children to engage with the world around them; to use their imagination, to discover flexible ways to use objects and solve problems, thus preparing for adult roles. Play contributes to all domains of development, with children stimulating their senses, exercising their muscles, co-ordinating sight with movement, gaining mastery over their bodies,

making decisions and acquiring new skills, all being enhanced through play (Papalia et al., 2009). Infants are active explorers and stimulus seekers, orchestrating their own perceptual, motor and cognitive development by exploring their environment and learning what it will allow them to do. By combining perception and action in their exploratory behaviour, infants actively create sensory environments that meet their needs and contribute to their own development (Gibson, 1988; Gibson & Pick, 2000). This need is one of those addressed in play.

While seeming to be a simple activity for adults, play is a highly complex and intricate achievement for a young child. Physical play builds on the relationship among a child's cognitive abilities, social experiences and cultural context. The simplest, least developed form of play is called functional play, consisting of a child making simple repetitive movements with or without an object. In constructive play, children learn how to physically manipulate objects in order to construct or create something. In most cultures, children are encouraged to play with blocks or similar objects, providing fun as well as problem solving practice (e.g. building towers, colouring within the lines, and building simple jigsaw puzzles). Dramatic play (also called pretend play, fantasy play, or imaginative play) involves imaginary objects, actions, or roles; it rests on the symbolic function, which emerges during the last part of the second year. Adults use play to teach children the importance of play and work, stimulating co-ordination, encouraging imagination and fostering interpersonal relationships. It is also an important expression of cultural heritage (Papalia et al., 2009).

Cultural values affect the play environments adults set up for children, and these environments in turn affect the frequency of specific forms of play across cultures (Bodrova & Leong, 1998). The opportunity to play, the central themes and styles of social interactions that occur during play, as well as space available for play, however, vary substantially across diverse cultures (Cook & Cook, 2005). As an example, consider how different cultures value work and play. Children in the United States, Britain and South Africa spend most of their after school time in play, but children in Japan and Korea are more likely to spend time studying for school (Takeuchi, 1994). Japanese and Korean cultures place a high value on hard work, sacrifice, and educational achievement. In Japan, for example, students study hard in hopes of getting into the best universities and professional schools. After graduation, Japanese citizens devote enormous time and energy to their occupations. Men work long hours and children have little opportunity to play or interact with their fathers (Takeuchi, 1994).

Spaces available for play also differ across cultures. In Britain, there is little open space, so children typically play indoors and in small groups (Takeuchi, 1994). In the West African nation of Senegal, children tend to live in communal "compounds" containing numerous households, all related to the eldest male in the compound (Bloch & Adler, 1994). Children play outdoors, roaming the compound in larger groups consisting mostly of siblings and cousins. Due to the extended family arrangement of the compounds, all available adults take responsibility for watching the children, and by the age of four, children roam the compounds rather freely. As in most cultures, gender typing is clear in these children's socio dramatic play. Senegalese girls tend to playact family roles, nurturing younger children and doing domestic chores like cooking and carrying water. Senegalese boys playact at farming, herding animals, fishing, and working with machines and automobiles (Bloch & Adler, 1994). Through their play, these children learn the skills that are important in their culture (Gardiner & Kosmitzki, 2005).

Only recently have cultural and ethnic differences in play been studied (Chen, French, & Schneider, 2006). American parents typically tend to encourage exploration, imagination, and independence in play and are more likely to play with their children. However, cross cultural studies reveal that parents across cultures have different attitudes about play. Although some view play as unnecessary, undesirable, or unsafe, play might be difficult to achieve because time, space, materials, or playmates, are lacking. North American parents view play as essential for development and tend to control their children's play activities (Scarlett, Naudeau, Ponte, & Saloni-Pasternak, 2004).

Children in developing countries have a very different experience of childhood. They fill their days with home chores, sibling care, or work and school obligations and are encouraged by parents to work hard, take responsibility, and show initiative. "Play is at best tolerantly accepted by adults, and often it is discouraged or prohibited" (Harkness & Super, 1996, p. 359). Variations in play and social interaction are shaped by what adults believe children need so that they become productive members of their society.

Play is a dominant activity of children in cultures around the world; in some sense both a cause and an effect of culture (Roopnarine & Johnson, 1994). Infants around the world engage in sensory motor play; symbolic and socio dramatic play emerge in early childhood; later, play becomes more logical and realistic and often focuses on the physical skills that are important in the child's culture. Clearly, however, the culture in which children live can influence their play; where they play, with whom they play, and the main themes in their play.

Play helps transmit the culture's important values and attitudes to the child, who will then pass them along to the next generation. Cultural values affect the play environment adults set up for children and these environments in turn affect the frequency of specific forms of play across cultures (Papalia et al., 2009).

The variety of activities involved in play (e.g. talking, touching, and interacting) help children to learn skills that will enable them to be active participants in later cultural interactions. These ideas fit into and support Bronfenbrenner's theory. For example, it is within the family context (mesosystem) that early parent child interactions take place. Here, infants are introduced to activities (e.g. play and use of language) that help prepare them for successful participation in the broader cultural context of the workplace (exosystem) and understanding of important values and attitudes (macrosystem) (Gardiner & Kosmitzki, 2005).

The context in which early social interactions take place, are characterised by different parameters that define the developmental niche, such as characteristics of the caregiver, general conditions of infant development, and the child caregiver relationship itself. These parameters vary from culture to culture, as do the developmental niche, thus providing each child in its first months of life with unique developmental challenges and opportunities (Rogoff, 2003).

3.5.3 Cognitive and language development

Vygotsky (1978) claimed that cultural influence, mental processes, and language were dynamic processes that occur simultaneously. He further believed that continuous interaction between language and thought, embedded in a particular cultural context, resulted in dialogue between individuals, especially a mother and her child. It is this social interaction that helps shape the quality of mental abilities at various ages across the lifespan. With this theoretical perspective in mind, Vygotsky coined the expression: "Talking to Learn." By this, he meant that children internalise language and use it to organise their thoughts as they verbally interact with others. Other researchers go even further, suggesting that children learn language and become socialised into a particular set of cultural values and beliefs as parents interact with them (Budwig, Wertsch, & Uzgiris, 2000). Another example of cultural influence concerns the ability to translate perceptions of the human form into a drawing, the capacity to create two-dimensional representations, but we apparently develop that capacity more rapidly if our culture provides us with relevant experiences (Sigelman & Rider, 2006).

3.5.3.1 Cognitive development

Of all Piaget's periods, the sensory motor (occurring during infancy) has been the least studied from a cross cultural perspective. A major reason is that observation methods and data collecting techniques based on Piagetian concepts have only recently been standardised. According to Dasen (1978), the first cross cultural study of sensory motor intelligence, using a scale developed by Corman and Escalona (1969), was conducted in Zambia (Goldberg, 1972). In general, Goldberg's findings tend to support Piaget's observations. Minor differences in behaviour were noted; a slight advance for African infants over American (and other whites) at six months and a slight lag at nine and twelve months.

A later study conducted by Dasen and Heron (1981) suggested that African infants are advanced in their development of object permanency and other object related cognitive behaviours. In yet another African study, this one in Nigeria, Mundy-Castle and Okonji (1976) reported that while early manipulation of objects is similar for English and Igbo infants, important differences emerge in later interactions. These differences support the emphasis on the importance of looking at cognitive behaviour from an ecological point of view. Specifically, Mundy-Castle (1974) proposed that, after a certain age, European and American infants develop increased experiences in the handling of objects, with their attention "more often deliberately focused on objective properties of reality" whereas African babies receive more social stimulation and early emotional support than European babies do. It can be argued that this divergent stimulation in the end brings about a different patterning of cognitive development, with Africans acquiring an intelligence that is more socially oriented, while Europeans acquire one that is more technologically oriented (Gardiner & Kosmitzki, 2005). This could be an indication that, in terms of Bronfenbrenner's ecological theory, the microsystem (family) and macrosystem (cultural values) have an important effect on these cognitive behaviours and differences in abilities (Gardiner & Kosmitzki, 2005).

Earlier research, by Dreger and Miller (1960) concluded that as a whole, whites were superior to blacks in psycho physical, psycho motor and intellectual functions but the differences were not as large in young children as in older children and adults. Similarly, many social scientists (Klineberg, 1980) have attributed the results of research on racial difference in cognitive abilities to differences in the cultural environments of black and white children, whereas others later maintained that the differences are due in large measure to genetic factors (Jensen, 1969; Eysenck, 1971). After analysing the findings of research on black and white differences

in intelligence, Jensen (1969) concluded that the frequency of genes carrying higher intelligence is lower in the black population as a whole than in the white. The consequence, he maintained, is that blacks, though equal to whites in rote learning ability, are poorer in abstract reasoning and problem solving (Greenfield et al., 2003).

More recent findings by Lynn (1998) suggested that mental development of black infants is significantly in advance of the white infants from the age of 4 to 15 months; the difference at 2 to 3 months is not statistically significant; but possibly the concept of mental development at this age is not meaningful; there is a sharp fall from the substantial advantage of black infants in mental development at the age of 15 months to the absence of any advantage from the age of 18 months onwards.

In a review of the cross-cultural literature, Dasen and Heron (1981) later recognised that differences do occur in the ages at which the sub-stages of the sensory motor period are attained. They stress that the amazing commonality in the qualitative characteristics of sensory motor development that remain nearly identical in all infants despite vast differences in cultural environments, may be overlooked.

Werner (1979) concluded that: "even in the first stage of cognitive development, that of sensory motor intelligence, culture seems to influence the rate of development to some extent, although admittedly, the similarity of structure and process is more striking than the differences. Content seems to have little relevance to the activation of sensorimotor schemata" (Gardiner & Kosmitzki, 2005, p. 216).

3.5.3.2 Speech and language development

Along with cognitive development, infancy is also marked by the first attempts to produce speech and language. Prominent linguist Noam Chomsky believes that language ability is "hard wired" into the human brain. When born, infants have the entire range of human language possibilities available to them. Which language(s) they acquire depends on the languages to which they are exposed on a regular basis (Gardiner & Kosmitzki, 2005).

Recent research has shown that the babbling sounds of infants show remarkably similar patterns across many languages (MacNeilage & Davis, 2000), meaning that all infants produce basic sounds such as "ma", "da", "fa", "ba", and so on. At this point, parents and others in the child's social environment begin to play a crucial role in language development. If the infant produces a sound that is part of the language spoken in

his/her environment, this sound is acknowledged and celebrated as an attempt to communicate. In contrast, any sound that is not part of the language environment is dismissed as babbling. Soon, due to lack of encouragement, the infant stops producing these non-relevant sounds and focuses on combining relevant sounds into meaningful words. This account of language acquisition demonstrates Vygotsky's concept of scaffolding as well as the developmental niche. The caregivers, with their specific language characteristics, gently guide the child in developing the tools for communication within a specific cultural environment. Once the child has learned language to communicate, the basis for facilitating further cognitive and language development through social interaction is set (Gardiner & Kosmitzki, 2005).

Cross cultural studies of language development show that the acquisition of certain linguistic elements such as nouns, verbs and grammatical structure may vary (Gelman & Tardif, 1998; Caselli, Casadio, & Bates, 1999). A variety of studies examining the child's understanding and use of these language markers in Mandarin, Italian and English showed the following general results: an overall bias in infancy to use nouns; no differences among children in these cultures in the time they begin to use nouns; and as the use of verbs varies across languages, so does the complexity of grammar and vocabulary. These examples clearly demonstrate Vygotsky's claim that culture plays an active role in directing cognitive activity, even in infancy (Gardiner & Kosmitzki, 2005).

While children are biologically predisposed to learning language, a child's experiences influence in language acquisition. Children all over the world acquire language milestones at about the same time and in about the same order. Environmental influences are also very important in development competence in language (Gleason, 2009; Goldfield & Snow, 2009). Children whose parents provide them with a rich verbal environment show many positive benefits. Parents who pay attention to what their children are trying to say, who expand their children's utterances, who read to them, and who label things in the environment, are providing valuable benefits for them (Gleason, 2009).

There are cross cultural differences in practices in teaching children to speak. Children learn to speak in a variety of ways across cultures. In Papua, New Guinea, Kaluli mothers carry their infants so they face outward and can be part of the social flow. The mothers believe their children cannot understand conversation or converse, so they speak for them using language that would be appropriate for an older child. Some Mayan infants in Mexico rely heavily on nonverbal communication and learn to speak by

listening to the conversations around them. In the Solomon Islands, parents use an emotionally powerful process called “shaping the mind” to teach their children traditional knowledge as they learn to speak (Shweder, Goodnow, Hatano, LeVine, Markus, & Miller, 2006). All of these children learn to speak fluently, of course, in ways that meet the expectations and needs of their cultures.

Along similar lines, Bornstein and his colleagues (1992) looked at the various ways in which young infants in Argentina, France, Japan and the United States were engaged in conversation by their mothers. They found that all the mothers were more conversant with older children (thirteen month olds) than they were with younger children (five month olds) and exhibited a variety of cultural differences in speech patterns when talking with them. For example, expressive speech was employed more often by Japanese mothers than it was by French, Argentinean, or American mothers, a behaviour that is compatible with their culture’s stress on interdependence as an important value. French, American and Argentinean mothers, on the other hand, gave greater attention to speech that communicated information to their infant or child. While this is consistent with other findings in cultures characterised by individualistic behaviour, not all of these mothers communicated the same kind of information to their children. For example, American mothers asked many questions, reflecting, in part, the view within American society that children are active participants in the learning process and often construct their own knowledge. In contrast, French mothers provided their infants and children with less stimulation but greater emotional support. Finally, the Argentinean mothers appeared to be the most direct in their interaction with their children, which is indicative of a more authoritarian approach to dealing with children (Bornstein, Tal, Rahn, Galperin, Pecheux, Lamour, Azuma, Toda, Ogino, & Tamis-LeMonda, 1992).

It should be borne in mind that most of the research on language development has been done in the USA and was, therefore, based on American English. Few studies on language development of South African children exist and when taking into account that South Africa has 11 official languages (with many more spoken) and that some of these have unique characteristics, the need for such research is clear. Contingent with the language diversity issue, socio demographic factors should also be taken into account. For example, the vocabulary of deprived children in disadvantaged communities could be considerably smaller, due to a lack of stimulation and exposure. Such children attend nursery schools less often, while their parents often have neither the money nor the education to provide intellectual stimulation for their children (Louw & Louw, 2007).

3.6 Summary

This chapter focussed on culture as well as the role played by culture in child development. Different theories of human development were discussed, which included the ecological systems approach, the developmental niche concept as well as the contributions made by Lev Vygotsky. Special emphasis was given to the interactions between culture and the development of physical / gross motor skills, emotions, cognitions and language in early childhood. Further cultural differences in development during the early childhood years were highlighted and possible reasons / explanations for the differences were stated.

Chapter 4: Role of gender in child development

4.1 Introduction

Many introductory textbooks in psychology carefully differentiate the concepts “sex” and “gender”. Sex is usually defined as biological aspects of femaleness and maleness; gender, as acquired behavioural and psychological aspects of being a women or a man. However, on further review, it becomes clear that the two are not as independent as these definitions might suggest. Rather, it is essential to understand that the relationship between biological sex characteristics and gendered social behaviour is much more complex (Gardiner & Kosmitzki, 2005). Human beings are products of both biology and environment, past and present, simultaneously and inseparably. From conception to death, gender directs and influences how children are reared and what roles they learn and carry out (Best, 2010).

Gender refers to the characteristics of people as males and females. Few aspects of our development are more central to our identity and social relationships than gender (Best, 2010; Martin & Ruble, 2010). Gender roles are different for males and females in all cultures. There are stereotyped notions about gender differences that seem to be universal across cultures, such as aggressiveness, strength and lack of emotionality for males, or weakness, submissiveness and emotionality for females. Other research however, has shown that the degree, and in some case the direction, of these differences vary across cultures. That is to say, not every culture will necessarily harbour the same gender differences in the same way as other cultures do (Plomin & Defries, 1985a).

Towards describing and understanding psychological gender differences, one is obliged to go beyond the biological, anatomical, or physiological differences between the sexes. Differences in the psychological cultures transmitted to men and women lead to gender differences, thus these are cultural differences, while it can, therefore, be said that men and women belong to different cultures. Of course, they may also belong to a larger culture (such as a national culture) and their gender cultures may co-exist within the larger culture (Gardiner & Kosmitzki, 2005).

Examining gender differences in South Africa is especially challenging because of the cultural and ethnic diversity within this country. While each ethnic group has its own cultural preferences for gender

differentiation, some blending of the old with the new, the traditional with the modern, appears to be taking place.

4.2 Different aspects of gender identity

Gender identity; an awareness of one's femaleness and maleness and all it implies in one's society of origin, is an important aspect of the developing self-concept (Papalia et al., 2009). One aspect of gender identity involves knowing whether you are a girl or a boy, which most children do by about 2½ years of age (Blakemore, Berebaum, & Liben, 2009).

In order to account for gender differences and why some of them emerge with age, the most influential explanations until recently, centred on the differing experiences and social expectations that boys and girls meet almost from birth (Halpern, 1997; Neisser, Boodoo, Bouchard, Boykin, Brody, Ceci, Halpern, Loehlin, Perloff, Sternberg, & Urbina, 1996). These experiences and expectations concern three related aspects of gender identity: gender roles, gender typing and gender stereotypes.

4.2.1 Gender roles

Gender roles are sets of expectations that prescribe how females or males should think, act and feel. During pre-school years, most children increasingly act in ways that match their culture's gender roles (Santrock, 2011). As languages vary around the world, so do gender roles; thus, children have to figure out what it means to be a boy or girl within a particular society. All societies have gender roles. No known human culture has raised boys and girls identically; every society makes some distinctions between male and female roles and this is reflected in how young children are treated. Historically, in most cultures, it has been the case that women are expected to devote most of their time caring for the household and children, with the men being providers and protectors (Papalia et al., 2009). Some of the distinctions between male and female gender roles probably originate in the biological differences between the sexes, namely, that women bear and nurse infants and toddlers. This leads to certain kinds of activities being more conveniently performed by women, such as work that can bear continuous interruptions, or requires travelling long distances. The particular divisions that are made between male and female roles vary considerably over time and across cultures, however, indicating that gender distinctions are at least in part social constructions. Today, gender roles in western cultures have

become more diverse and are flexible (Bjorklund, 2005). If development is in part the process of socialising children so that they will fit smoothly into their culture as a well functioning adult man or woman, then gender role learning is an important and necessary part of this process. In fact, a child who does not seem to be mastering the gender role behaviours considered appropriate for his or her gender, attracts attention and concern (Beal, 1994).

4.2.2 Gender typing

Gender typing refers to the acquisition of a traditional masculine or feminine role. For example, fighting is more characteristic of a traditional masculine role and crying is more characteristic of a traditional feminine role. A recent study revealed that sex typed behaviour (boys playing with cars and girls with jewellery, for example) increased during the pre-school years and that children engaging in the most sex typed behaviour during the pre-school years still did so at 8 years of age (Golombok, Rust, Zervoulis, Croudace, Golding, & Hines, 2008).

4.2.3 Gender stereotypes

Gender stereotypes are widely held beliefs about characteristics deemed appropriate for males and females ("all females are passive and dependent; all males are aggressive and independent"). These stereotypes pervade many cultures. Although the past four decades have brought a new level of awareness about the wide range of roles possible for each gender, strong beliefs about gender differences remain. Besides personality traits, other gender stereotypes exist. These include physical characteristics (tall, strong and sturdy for men; soft, dainty and graceful for women), occupations and activities or behaviours. The variety of attributes consistently identified as masculine or feminine, their broad acceptance and their stability over time suggest that gender stereotypes are deeply ingrained patterns of thinking (Berk, 2009). Between 18 months and 3 years, children label their own and others' sex, using such words as boy and girl and woman and man. As children sort out what these categories mean in terms of activities and behaviours, gender stereotypes appear and expand rapidly. Before age 2, children have begun to acquire subtle associations with gender that most of us hold; men as rough and sharp, women as soft and round. Pre-schoolers associate toys, articles of clothing, tools, household items, games, occupations, colours (pink and blue) and behaviours (relational and physical aggression)

with one gender or the other. Gender stereotyped metaphors are even adopted; “bears are for boys”; “butterflies are for girls” (Giles & Heyman, 2005; Ruble, Martin, & Berenbaum, 2006). During early childhood, gender-stereotyped beliefs strengthen, so much so that many children apply them as blanket rules rather than flexible guidelines. When children were asked whether gender stereotypes could be violated, half or more of 3 and 4 year-olds answered “no” to clothing, hairstyle and play with certain toys (Blakemore, 2003). Furthermore, most 3 to 6- year olds are firm about not wanting to be friends with a child who violates a gender stereotype (a boy who wears nail polish, a girl who plays with trucks) or to attend a school where such violations are allowed (Ruble, Taylor, Cyphers, Greulich, Lurye, & Shrout, 2007).

Most pre-schoolers do not yet realise that characteristics associated with being male or female; activities, toys, occupations, hairstyle and clothing, do not determine a person’s gender. They have trouble understanding that males and females can be different in terms of their bodies but similar in many other ways. Younger pre-schoolers often attribute positive qualities to the other gender. Still, even at this early age they call boys strong, fast and cruel and girls fearful and helpless (Ruble, Martin, & Berenbaum, 2006). Shared assumptions about the sexes become stereotypes that influence how one perceives others, leading one to assume they will behave in the ways they expect and unconsciously overlooking their unique characteristics as individuals. Second, gender stereotypes help shape children’s development, leading children to master the skills that will be required as adults, be they weaving or tailoring, caring for babies or running a stall at the local market, deferring to others or leading them, and so on (Poulin-Dubois, Serbin, Eichstedt, Sen, & Beissel, 2002).

Stereotypic expectations about males and females have drawbacks as well as advantages. First, gender distinctions become exaggerated; one thinks of being male or female as an either-or proposition, even though in actuality there is considerable flexibility and overlap in male and female behaviour. A second drawback to gender roles is that the developmental options for children of each gender encounter restrictions that come in both explicit and subtle forms (Poulin-Dubois et al., 2002).

The next section will focus on different theoretical perspectives on gender development including biology, socialisation and learning as well as cognitive approaches.

4.3 Theoretical perspectives on gender development: nature vs. nurture

The existence of similar gender roles in many cultures suggests that some gender differences may be biologically based. Investigators are uncovering evidence of genetic, hormonal and neurological explanations for some gender differences. It is probable that both nature and nurture play important roles in the significance of being either male or female. Biological influences are not necessarily universal, inevitable or unchangeable, nor are social and cultural influences easily overcome (Papalia et al., 2009).

The theoretical perspectives of the investigators have guided research on the many questions regarding gender differences in cognitive abilities.

The important questions for experimental psychology are:

- (a) Whether these differences in activities reflect gender related differences in cognitive abilities?
- (b) Whether these cognitive differences are due to the factors that are inherent in the biological make up of maleness and femaleness or to differential gender related experiences and expectations?

The question of whether it is nature or nurture that plays the greater part in the differences in cognitive abilities are always controversial and politically charged (Halpern, 2000). Numerous studies in various fields of science have revealed a very complex interplay between, *inter alia*, genetic, biological, physical, psychosocial and environmental factors which shape and determine the development of gender differences in human beings (Nordberg, Rydelius, & Zetterstrom, 1991).

To this end, then, one should scrutinise three perspectives on gender development: biological, social and cognitive-based approaches. While each of these perspectives can contribute to our understanding, none fully offers any explanation as to why boys and girls turn out differently in some respects but not in others.

4.3.1 Biological and evolutionary perspective

Biological theories emphasise a genetic basis for gender differences and focus particularly on the differences in chromosomes, hormonal production, reproductive capabilities and the effects of hormones

during prenatal development and at puberty. Sex hormones also affect brain development and neural activity in many animal species and they do so in humans as well (Berk, 2009). Researchers using magnetic resonance imaging (MRI) have found gender differences in brain lateralisation, or the degree to which one hemisphere of the brain is active in a given task. Females show brain activity in both brain hemispheres on language-processing and spatial tasks, so females are less lateralised for these tasks. Males' brain activity is more lateralised. Although gender differences in brain structure and functioning do exist, however, these differences could be the result of gender differences in environments and experiences rather than their cause (Ruble, Martin, & Berenbaum, 2006).

According to an evolutionary perspective, adaptation during human evolution produced psychological differences between males and females (Buss, 2008; Cosmides, 2011). Due to their differing roles in reproduction, males and females faced differing pressures when the human species was evolving. In particular, because having multiple sexual liaisons improves the likelihood that males will pass on their genes, natural selection favoured males who adopted short-term mating strategies. These are strategies that allow a male to win the competition with other males for sexual access to females. Therefore, say evolutionary psychologists, males evolved developing dispositions that favour violence, competition and risk taking. In contrast, according to evolutionary psychologists, females' contributions to the gene pool were improved when they secured resources that ensured that their offspring would survive (Santrock, 2011). Evolutionary theorists claim that family and cultural forces can influence the intensity of biologically based gender differences, leading some individuals to be more gender typed than others. However, experience cannot eradicate aspects of gender typing that served adaptive functions in human history (Maccoby, 2002). Critics of evolutionary psychology argue that its hypotheses are backed by speculations about prehistory, not evidence, and that in any event people are not locked into behaviour that was adaptive in the evolutionary past. Critics also claim that the evolutionary view pays little attention to cultural and individual variations in gender differences (Best, 2010; Matlin, 2008).

4.3.2 Socialisation and learning perspective

Beginning at birth, individuals are socialised into their particular culture and taught the values, beliefs and behaviours that will permit them to successfully function within that environment. Boys and girls receive disparate treatment from almost every social agent and in practically every social setting, they

encounter. The social learning approach points to two major influences on gender development: (1) direct and indirect reinforcement and (2) observational learning (Cook & Cook, 2005).

Direct reinforcement consists of consequences the child personally experiences for gender typed behaviours. One may get praise for wearing a dress if one is a girl ("You look so cute in that pretty dress – what a nice little girl you are!") or for being tough if one is a boy ("That didn't hurt at all, right? You're so tough!"). Direct reinforcement for gender typed behaviour, emotions and activity preferences can be quite explicit and often starts early in a child's life. One study examined the bedrooms of children aged 5 to 25 months, finding that boys' rooms were more likely to be decorated in blue and to contain vehicles and sports equipment, while girls' rooms tended to be pink or yellow and to contain dolls (Cook & Cook, 2005).

Differential reinforcement can also be subtle, however. For example, caregivers may limit the choices available to a child, interact with boys and girls in different ways, or hold different expectations for boys' versus girls' abilities and behaviour. Parents usually offer different kinds of toys to boys and girls and tend to be more responsive and supportive when children show gender typed behaviour. They also accept different emotional reactions in girls (e.g. fear) than in boys (e.g. anger) (Leaper & Friedman, 2007). Additionally, parents use language differently with boys and girls: They talk more overall to girls and use more supportive and directive language with girls than with boys (Tenenbaum & Leaper, 2002). Studies have revealed that parents' expectations and beliefs about gender differences in abilities correlate significantly with their children's performance and self-perceptions, regardless of the children's actual ability levels. This probably occurs, in part, because parents provide different experiences for sons and daughters that are consistent with their beliefs (Cook & Cook, 2005).

Children also learn a great deal by observing gender differences. First, of course, they observe "live" models such as parents, older siblings and relatives. There is some evidence that children have greater exposure to observe and initiate same gender models (both adults and peers) and, therefore, have more opportunity to observe and initiate same sex behaviour and attitudes; a trend that increases as children move through adolescence. Children do not, however, need to have direct contact with gender models to learn from watching their behaviour. The development of gender typed behaviour and attitudes can also be promoted by media sources (Cook & Cook, 2005).

Observation, imitation, rewards and punishment; these are the mechanisms by which gender developments occur according to the social cognitive theory. Interactions between the child and the social environment are the main keys to gender development in this view. Some critics argue that this explanation pays too little attention to the child's own mind and understanding and portrays the child as passively acquiring gender roles (Martin & Ruble, 2004).

4.3.3 Cognitive approaches to gender development

Cognitive theories of gender differences emphasise the child's developing understanding on behaviour. Based on Piaget's theory, Kohlberg's cognitive developmental theory proposed that knowledge of gender and gender-related behaviour constitutes a cognitive category and develops in the same way as knowledge of any other cognitive category, through interaction with the world that is filtered through existing cognitive structures. According to Kohlberg, children will not have a mature understanding of gender until they achieve the Piagetian stage of concrete operations, which happens by approximately age 7 (Kohlberg, 1966).

The key concept children must grasp in order to understand gender is that of gender constancy, or the understanding that an individual's gender remains the same despite changes in outward appearance or behaviour (e.g. in hairstyle, clothing, or mannerisms) (Bjorklund, 2005).

Adherents of Kohlberg's theory have identified three stages of gender understanding:

- Gender labelling (by 2½ years); children can label their own gender and that of others correctly (Fagot, 1985b)
- Gender stability (by 4 to 5 years); at this stage, children have a partial understanding of the permanence of gender, in that they grasp its stability over time. Even though they know that male and female babies will eventually become boys and girls and then men and women, they continue to insist that changing hairstyle, clothing or "gender appropriate" activities will also change a person's gender (Fagot, 1985b)
- Gender constancy (also called consistency; by 6 to 7 years); during the late pre-school and early school years, children understand that gender is biologically based and remains the same even if

a person dresses in “cross gender” clothes or engages in non traditional activities (Ruble, Taylor, Cyphers, Greulich, Lurye, & Shrout, 2007).

According to Kohlberg, all children progressed through these stages in the same order and studies in different cultures have supported this sequence of development. Kohlberg further proposed that children will not show gender typed behaviour until they begin to understand gender constancy, then they will become increasingly interested in and motivated to engage in the behaviours deemed appropriate for their gender (Cook & Cook, 2005). Children do spend more time watching and imitating same gender models as their knowledge of gender constancy increases, a finding that supports Kohlberg’s theory (Luecke-Aleksa, Anderson, Collins & Schmitt, 1995). Nevertheless, other findings have not supported several aspects of Kohlberg’s theory. Particularly troublesome is the fact that children consistently show gender typed behaviour long before they have a fully developed understanding of gender constancy. Some studies have even found that lower levels of gender understanding relate more strongly to sex typed behaviour than does full understanding (Martin & Little, 1990; Ruble, Martin, & Berenbaum, 2006). Finally, although one knows that gender is a very salient characteristic for children, it is not clear from Kohlberg’s theory why children would pay particular attention to gender when developing category knowledge.

A more recent cognitive approach, gender schema theory, incorporates elements of Kohlberg’s theory with the information processing theory of cognition. A gender schema is a cognitive network of gender related information that organises gender knowledge and guides expectations and behaviour. This approach explains how environmental pressures and children’s cognitions work together to shape gender typing (Blakemore, Berenbaum, & Liben, 2009). It also integrates the various elements of gender typing; gender stereotyping, gender identity and gender role adoption, into a unified picture of how masculine and feminine orientations emerge and are often strongly maintained. At an early age, children pick up gender typed preferences and behaviours from others. At the same time, they organise experiences into gender schemas, or masculine and feminine categories, that they use to interpret their world. As soon as pre-schoolers can label and grasp the stability of their own gender, they select gender schemas consistent with it (e.g. “Only boys can be doctors” or “Cooking is a girl’s job”) and apply those categories to themselves. Their self perceptions then become gender typed and serve as additional

schemas to be used to process information and guide their own behaviour. It would appear that gender schemas develop for two main reasons. First, it is usually easy to tell if a person is male or female; a fact that makes it easy for children to use gender as a basis for categorisation. Once categorised, gender serves as an organising framework for new information. In the second place, gender is a very salient characteristic for children, because it is so strongly emphasised by most cultures in so many different ways, both physically (e.g. in hair and clothing styles or physical attributes) and psychologically (e.g. through differences in typical male and female activities, occupations and interaction styles) (Bjorklund, 2005).

It is likely that all the reviewed theories of gender development are correct to some extent. Ruble and Martin (1998) suggest that gender segregation may play a particularly influential role, describing it as a developmental phenomenon “that increases with age and potentially serves as a mechanism for socialising children into the ways of their own gender group” (Ruble & Martin, 1998, p.994). Gender segregation reflects biological factors (e.g. arousal levels and temperament differences), social factors (e.g. play styles, interests and styles of influence) and cognitive factors (e.g. what children understand about and expect from each gender). Thus, gender segregation shows how biological, cognitive and social factors interact to explain gender development; and it may help drive gender development as well (Cook & Cook, 2005).

In summary, these perspectives all propose a slightly different explanation for why some behaviour seems to vary with gender. The biological perspectives consider gendered behaviour as a result of underlying biological and physiological processes. Socialisation and learning theories see gendered behaviours as the result of a person’s individual learning history within a specific socio-cultural context. None of these perspectives can explain the phenomena of gender differences and how they originated. They, nevertheless, show clearly that gender, like many other concepts, cannot be viewed just from one perspective. Although the relationship of biological, social and cognitive factors to children’s gender-typed preferences and behaviour have been examined, little has been said about the extent to which boys and girls actually differ in mental abilities and personality traits (Gardiner & Kosmitzki, 2005).

4.4 Gender differences in behaviour and development

A great deal of research has attempted to answer the question of whether there are actual sex or gender differences in behaviour and development. For a long time past, in a series of studies, differences between the sexes have been described, mainly as regards to the development of puberty and the consequences of early and delayed maturity in relation thereto (Berk, 2009). Over the past several decades, thousands of studies have measured gender differences in these characteristics, with the age old nature nurture debate at the heart of these efforts. Researchers have looked for stable differences between males and females and, from there, have searched for the biological and environmental roots of each variation. Although differences in some areas have been identified, other areas show no gender differences whatsoever. At birth, there are few differences, other than obvious anatomical ones, between males and females and even these few differences tend to be small and inconsistent. Nevertheless, it does not take long after newborns are labelled as girls or boys for gender stereotypes to affect how they are perceived and treated; and for infants to notice that males and females are different (Berk, 2009).

Gender differences are psychological or behavioural differences between males and females. Although some gender differences become more pronounced after age 3, boys and girls, on average, remain more alike than different. Extensive evidence from many studies supports this gender similarities hypothesis. Fully 78 % of gender differences are small to negligible, and in some differences, such as in self-esteem, change with age (Papalia et al., 2009). Consequently, males and females are actually more alike than different in developmental potential. Although there are certain general differences in intelligence between the sexes, researchers still disagree as to how and when such differences arise. Some researchers favour a biological explanation while others consider that the new born infant is influenced by the social environment at a very early stage and adapts to the gender role patterns and expectations concerning girls' and boys' behaviour that are present in their environment (Nordberg, Rydelius, & Zetterstrom, 1991).

In 1974, Maccoby and Jacklin published their classic text in which more than 1000 research reports on gender differences published before 1974 were reviewed. Although their synthesis and review of the literature, now more than 25 years ago, have been severely criticised on methodological grounds, much

of the research that followed was based on its premises. Literature regarding gender differences burgeoned in the years since 1974 and, in general, confirmed and extended their conclusions, with recent publications concentrating not on whether gender differences exist but on how large a difference really exists. Verbal, quantitative and visual spatial abilities are the three cognitive abilities that have been identified as the loci of gender differences (Halpern, 2000; 2004). The aspects discussed below reveal gender differences that are considerable:

4.4.1 Verbal abilities

Of all the cognitive gender differences, differences in verbal ability are among the first to appear developmentally. Some researchers have reported faster rates of language acquisition for girls (Galsworthy, Dionne, Dale, & Plomin, 2000), although other studies have failed to observe any significant gender differences (McCarthy, 1954), with some finding a difference favouring young girls for spontaneous speech but not on standardised tests (Morisset, Barnard, & Booth, 1995).

Various researchers found that greater vocalisation occurred among infant girls than boys even as early as 3 months, with infant girls between the ages of 3 and 13 months mostly vocalising more in response to facial stimuli than boys. For example, 3 month old girls were found to vocalise more than boys in response to their mother's invitation to "talk" (Bjorklund, 2005). In a meta-analysis summarising the effects in more than 30 studies that looked at differences in how mothers talked with their sons and their daughters, Leaper, Anderson and Sanders (1998) reported moderate gender differences, with mothers talking more and using more supportive speech with their daughters than with their sons. Other research has shown that mothers talk about different things with their sons than with their daughters. For example, examining the emotive talk of women to their 2, 3 and 4 year-old children, mothers were more apt to explain emotions to boys rather than just to label them, but they showed no difference in the use of explanations and labels with their daughters (CervantEs & Callanan, 1998).

There is also some evidence that girls may start to talk about 1 month earlier than boys and produce longer utterances than boys (Gazzaniga, Ivry, & Mangun, 1998). There are also significant gender differences in the rate of vocabulary growth during the toddler years. On average, there is a 13 word difference in vocabulary size between girls and boys at 16 months of age, which grows to a 51 word

difference at 20 months and 115 word difference at 24 months (Huttenlocher, Haight, Bryk, Seltzer, & Lyons, 1991). It was found that the differential rate in vocabulary growth did not relate to how much mothers spoke to their children. They spoke as much to their infant sons as to their infant daughters.

Others have proposed that the gender differences sometimes found in language acquisition are related to cultural factors. For example, there is evidence in Greece (where boys are valued more than girls), that boys rather than girls are more vocally responsive (Bjorklund, 2005). Perhaps, the gender differences favouring girls found in the United States can be attributed to different ways in which girls and boys are spoken to rather than to endogenous factors. Such differences are related to gender differences in event memory ('girls being better than boys') and are consistent with the hypothesis that differences in cultural practices are responsible, in part, for gender differences in the rate of language acquisition (Bjorklund, 2005).

However, some gender differences in early language are found that are not related to differences in how parents talk to boys and girls. A study by Haden, Haine and Fivush (1997) reported that girls between 40 and 70 months of age produced longer and more structured narratives than did boys of the same age; however, unlike other aspects of language presented to boys and girls, there were no differences in how parents used narratives to talk about past experiences with their sons and daughters. These results indicate that girls are more advanced in their narrative production than boys are, and that a simple socialisation explanation cannot adequately account for these differences. Similarly, in a behaviour genetics study, examining more than 3000 pairs of 2 year-old twins (Galsworthy, Dionne, Dale, & Plomin, 2000); gender differences favouring girls were found (although they accounted for only 3% of the variance). Interestingly, the hereditary of verbal ability was higher for the boys than for the girls. In other research, it emerged that 18 and 24 month-old girls had significantly larger vocabularies than boys did, with the differences being related to exposure to foetal testosterone. The greater the prenatal exposure to the male hormone testosterone, the smaller a child's vocabulary tended to be (Lutchmaya, Baron-Cohen, & Raggatt, 2002).

Research suggests that girls might be more vocal than boys early in infancy and that this difference leads to a subsequent advantage in learning a first language. However, other research suggests that the small advantage in language acquisition girls do hold is a function of cultural practices, with boys in

some cultures displaying the typical “feminine” pattern of faster language acquisition one has come to expect in that culture. In general, the majority of the evidence tends to support the idea that females are more verbally precocious than males, but the effects are small and probably of little practical significance.

4.4.2 Physical development

It is scientifically established that girls develop physically earlier than boys in several respects. One accepted method of determining the physical development is to evaluate the development of skeletal maturation (bone age) by radiographic examinations. Such examinations have revealed considerable differences between the sexes as regards the transformation of cartilage into bone. Even at birth, girls show a more advanced skeletal development than boys and they continue to do so throughout childhood (Nordberg, Rydelius, & Zetterstrom, 1991). Boys' brains at birth are about 10 percent larger than girls' brains, a difference that continues into adulthood (Gilmore, Lin, Prastawa, Looney, Sampath, Vesta, Knickmeyer, Evans, Smith, Hamer, Lieberman, & Gerig, 2007).

At birth and during infancy boys are heavier (and taller) than girls of the same age and this fact may, perhaps, explain why boys learn, for instance, to walk somewhat later than girls do. Heavy children, whichever their gender, learn to walk slightly later, on the average, than lightly built children. The child's development, in various respects; motoric, social, linguistic, emotional and intellectual, shows close interrelationships (Nordberg, Rydelius, & Zetterstrom, 1991). While boys are more vulnerable to prenatal and perinatal stress, they are also more prone to experience a number of diseases and disorders such as reading disabilities, speech defects, hyperactivity, emotional problems and mental retardation (Sigelman & Rider, 2006). Girls are less reactive to stress and more likely to survive infancy (Davis & Emory, 1995; Keenan & Shaw, 1997).

4.4.3 Fine motor skills

The fact that the sexes differ at an early age as regards their fine motor skills may have purely physical explanations. When Ulin (1949) compared hand impressions from various pre-school children, he found definite physical differences between the sexes. The boys' hands remained rounded like those of infants for longer, which means that in later years they work mainly with the middle portion of their hands. The

girls' fingers, on the contrary, become longer at an earlier stage and work more independently, while the middle portion of their hand becomes less used. Thus, fine motor maturity develops earlier in the girls and the difference between the sexes is considerable. At four years of age, the girls' development is nearly one year ahead of the boys'. It is possible that the girls' greater interest in fine motor work that requires precise movements, such as sewing and laying out patterns, really is not due largely to such factual physical gender differences, but probably differences in motivation and in the environment's expectations from them also play a big role. Lewis (1987), in his studies of little girls and boys at play, found that girls more often chose toys and games that trained their fine motor abilities, while boys more often used their gross motor abilities. According to Lewis, girls develop their fine motor abilities and a steady use of their hands earlier in life than do boys (Nordberg, Rydelius, & Zetterstrom, 1991).

4.4.4 Gross motor skills

Sex differences in gross motor development are present as early as the pre-school years, increase during middle childhood, and are large at adolescence. In early childhood, boys are slightly advanced over girls in abilities that emphasise force and power. By age 5, they can broad jump slightly farther, run slightly faster, and throw a ball about 5 feet further. During middle childhood these differences intensify (Berk, 2009). For example, on average, a 12 year-old boy can throw a ball 43 feet further than a 12 year-old girl. Boys are also more adept at batting, kicking, dribbling, and catching. Girls have an edge in fine motor skills of handwriting and drawing and in gross motor capacities that depend on balance and agility, such as hopping and skipping (Haywood, & Getchell, 2005). Boys' slightly greater muscle mass and, in the case of throwing, slightly longer forearms contribute to their skill advantages, and girls' greater overall physical maturity may be partly responsible for their better balance and precision of movement (Berk, 2009).

From an early age, boys and girls are usually encouraged into different physical activities. For example, fathers are more likely to play catch with their sons than with their daughters. Differences in motor skills between boys and girls increase with age. However, sex differences in physical capacity remain small throughout childhood, suggesting that social pressures for boys, more than girls, to be active and physically skilled exaggerate small genetically based sex differences. In support of this view, boys can throw a ball much further than girls only when using their dominant hand. However, practice seems to

be largely responsible for this advantage; when boys use their non-dominant hand, the sex difference is minimal (Berk, 2009).

4.4.5 Mental development (cognitive abilities)

It appears that the influence of *gender* on South African boys' and girls' performance on the Griffiths Scales has not really enjoyed significant interest. When reviewing the existing Griffiths research, it was found that more studies exist that do, in fact, mention gender differences being found, than those not mentioning finding significant differences. Mothuloe (1990) investigated the use of the original Griffiths Scales as a measure of development for black Setswana-speaking children (age range: 5 years and 9 months, to 7 years and 3 months) finding that girls obtained significantly higher scores than boys in respect of the Locomotor Scale. Bhamjee (1991) using the original Griffiths Scales, conducted a study of 360 South African Indian children in the age range of 3 to 8 years of age, investigated the extent to which the variables of age, gender and socio-economic status influenced the performance of her sample on the Scales. She found significant gender differences within the GQ and Personal-Social Subscale, with girls respectively obtaining a higher quotient and sub-quotient. Knoesen (2003) using the revised Griffiths Scales explored the relationship between the scales and grade 1 scholastic development. That sample consisted of 93 children within the age range of 5 years to 6 years and 11 months. The results indicated that boys and girls performed differently on each of the subscales. As this was not statistically tested, however, Knoesen (2003) is unable to comment on the significance of this observed difference, namely that the girls in the sample obtained slightly higher sub-quotients than the boys for each subscale (the exception being the Locomotor Scale). While the girls obtained an *above average* GQ, the boys' GQ fell just short of the *above average* cut-off point of 110. Van Rooyen (2005) explored the performance of a sample of normal South African children between the ages of 4 to 7 years, compared to the performance of a sample of normal British children on the GMDS-ER. The sample consisted of 129 South African children and 161 British children. Significant differences were found favouring girls in the South African sample on the Personal-Social, Eye and Hand Co-ordination, Performance and Practical Reasoning Subscales. It is interesting to note that significant differences were found on all the subscales within the British sample, where the girls performed significantly better than the boys. A study by Smit (2008) on the performance of boys and girls (between the ages of 5 to 6 years) on the Griffiths

Mental Development Scales showed only a practical significant difference (girls performed better than the boys) on the Language Scale. Performance on the other sub-scales showed no significant difference in the performance of the boys and girls. In a more recent study by Jakins (2009), however, no statistically significant differences were found between the performance of boys and girls (5 and 6 years old) within the sample. This also was the case in the performance of boys and girls on the original Griffiths Scales when tested by Allan, 1988, Tukulu, 1996, and Ward, 1997. Thus, this researcher, from the overview of the above-mentioned literature and South African research studies, considers that many inconsistencies exist regarding the existence of developmental gender differences between boys and girls.

Cognitive gender differences are few and small (Spelke, 2005). Overall, intelligence test scores show no gender differences (Keenan & Shaw, 1997), perhaps because the most widely used tests are designed to eliminate gender bias (Neisser et al., 1996). Boys and girls do equally well on tasks involving mathematical skills and are equally capable of learning mathematics. There are small differences, however, in specific abilities. Girls tend to perform better on tests of verbal fluency, mathematical computation and memory for locations. In most studies, these differences do not emerge until elementary school or later (Spelke, 2005).

Studies revealed definite early gender differences in mental development in the infant and pre-school age groups, with these differences manifesting even before the children were one year old. Thus, Zazzo (1960), a French professor and expert on the psychobiology of infants, examined pairs of twins of different sexes and found that the girls' performances were superior to the boys', even at one year of age, being most superior between the ages of eight and ten. The girls learned, *inter alia*, to walk and talk and keep clean at earlier stages than their twin brothers. Stensland-Junker (1972), when constructing the "Boel-test," found gender differences as early as six to eight months of age. In their longitudinal study of children living in Solna (a suburb of Stockholm), Klackenberg-Larsson & Stensson (1968), found early and definite differences in development between the sexes. The children were tested at 3, 6, 9, 12, 18 and 24 months of age, using Brunet-Lezine's psychomotor development test and at three and five years of age using the Terman-Merrill test. The results show that the differences between the sexes are significant at 18 months of age and at two and three years of age. Based on

measurements of the linguistic and personal social developments (Nordberg, Rydelius, & Zetterstrom, 1991) the differences between the sexes are particularly clear.

Many of the gender related differences in perceptual thresholds are detectable soon after birth, suggesting that they do not reflect learning, response biases, or postnatal environmental factors. For example, Reinnisch and Sanders (1992) reported that newborn girls are more sensitive to touch than newborn boys are. They found evidence of gender differences in the functional development of the central nervous system as early as 3 months of age. These are important findings in the quest to understand gender differences in cognition because these early perceptual differences could create behavioural dispositions that vary as a function of gender. Slight behavioural predispositions could then be exaggerated, reduced, eliminated, or ignored, depending on the way in which cultures respond to male female differences. These findings do not mean that gender differences in cognition are inevitable or unalterable, only that they probably have an early physiological basis (Halpern, 2000; 2004).

Many gender differences in cognitive abilities can be found during the infancy and pre-school years. Numerous studies have shown that parents respond differently to male and female babies, probably from birth (Rubin, Provenzano, & Luria, 1974). Stewart (1976), for example, found that in the first 6 weeks of life, male infants are handled more than female infants are and female infants receive more vocalisations. It is very possible that these early differences in home experiences provide the basis for later cognitive differences. Life experiences are reflected in brain structures, with life experiences in infancy especially important for neural development. It is clear that early life experiences are critical to brain development (Halpern, 2000; 2004).

4.4.6 Spatial cognition

When one thinks of spatial cognition, what often comes to mind are relatively complicated tasks such as reading maps, finding the “hidden object” within a complex visual scene, or mentally rotating figures; these are all forms of spatial cognition and involve the mental representation of spatial relations to solve problems. However, not all spatial tasks are so complex and even infants display often impressive spatial cognitive abilities (Bjorklund, 2005).

Some of our culture's most familiar gender stereotypes relate to spatial cognition. Women, for example, are alleged to have difficulty using a map (that is, mentally rotate it) to find where one is and where one wants to go. Many of the gender differences are found early and persist into adulthood. For example, gender differences in spatial orientation are frequently found, favouring males, beginning in the pre-school years (LeVine, Huttenlocher, Taylor, & Langrock, 1999). Males tend to perform better than females do on tasks that involve manipulating spatial relations, finding their way through physical (or virtual) environments and making and using maps (Silverman, Choi, Mackewn, Fischer, Moro, & Olshansky, 2000; Halpern & Collaer, 2005). Gender differences are not always found at all ages, however, and other studies have failed to find any differences between males and females on spatial orientation tasks (Uttal, Grey, Tan, Chamberlin, & Sines, 2001).

One explanation for gender differences, when they are found, has to do with familiarity with the environment. For example, Hazen (1982) controlled for pre-school children's exposure to the test environment and reported no gender differences in a spatial orientation task. Thus, although age differences are robust on spatial orientation tasks, gender differences are less so, but when gender differences are found, they invariably favour males (Bjorklund, 2005).

Although gender differences in spatial cognition have consistently been found, the absolute magnitude of those differences is small. Hyde (1981) reported that differences in spatial abilities attributed to the gender of the child accounted for less than 5 percent of the differences in performance. Other meta-analyses have reported similar findings. For example, Linn and Petersen (1985) reported that only between 1 percent and 5 percent of differences in spatial abilities could be attributed to gender, depending on the particular task. One exception Linn and Petersen (1985) noted was mental rotation, in which males of all ages performed better than females did. Rosenthal and Rubin (1982) similarly reported small differences between the sexes in their meta-analysis, but also reported that the size of effect diminished across the years, with females showing a substantial gain in cognitive performance (relative to males) in recent years (Bjorklund, 2005).

4.5 Summary

Occasionally, a difference between males and females in general intelligence is found, but it is usually insignificant. The results of research indicate, however, that gender differences do indeed exist in specific cognitive and perceptual motor abilities.

Females tend to do better in verbal tasks (but not analogies), at mathematical computation and at tasks requiring fine motor and perceptual skills, while males excel in most spatial ties and in abstract mathematical and scientific reasoning (Lachance & Mazzocco, 2006).

Some of these differences, which seem to exist across cultures, begin to manifest early in life. Girls' superiority in perceptual speed and verbal fluency appears during infancy and toddlerhood and boys' greater ability to mentally manipulate figures and shapes can be observed as soon as it can be tested. Other differences do not become apparent in children of average ability until pre-adolescence or beyond (Halpern, 2000). In a statistical analysis of 286 studies of spatial abilities, few significant differences appeared before adolescence (Voyer, Voyer, & Bryden, 1995).

It must be remembered, of course, that gender differences are valid for large groups of boys and girls but not necessarily for individuals (Turner & Gervai, 1995; Berk, 2009). One cannot, by simply knowing a child's gender, predict whether that particular boy or girl will be faster, stronger, smarter, more obedient, or more assertive than another child.

Chapter 5: Developmental assessment of infants and young children

5.1 Introduction

The process of screening and assessment goes beyond scores, standard deviations and levels of functioning. It is often a family's first introduction to the human service or educational system and it is potentially a short-term therapeutic experience in itself. For examiners, it is better to use tests and other procedures to organise observations about a child and family rather than to merely use the observations as a way to determine eligibility for interventional services. Assessment, in particular, should be approached as an ongoing, dynamic process with multiple components, including case management, family support and transitional programmes (Meisels & Provence, 1989).

5.2 Defining screening, assessment, and evaluation

The terms *screening*, *assessment* and *evaluation* have distinct meanings and purposes.

5.2.1 Screening

Developmental screening involves 'a brief, formal evaluation of developmental skills' (Squires, Nickel, & Eisert, 1996), which attempts to identify children who may be potentially at risk for developmental difficulties. "Screening allows for many children to be screened, identifying those who may require a more comprehensive assessment" (Kotras, 2001, p.18). The screening process is only the initial step of ongoing observations about the needs and resources of the child and family. Screening assesses a child holistically and is cost-effective, as children can be effectively assessed in a short period of time. The results from screening measures are generally qualitative in nature, in that they categorise the child's performance, rather than provide a numerical score. Furthermore, screening usually provides an overall view of the child's development, rather than information relating to specific areas (Foxcroft & Roodt, 2009).

5.2.2 Assessment

Assessment, as typically defined, consists of the measurement of several different aspects of children's knowledge, skill, ability, achievement or personality. Assessment refers to the process of establishing a baseline or entry-level measurement of the child's skills and desired family outcomes (Bricker, 1993).

Assessment is more in-depth, comprehensive, individual focused and holistic than screening. According to Foxcroft and Roodt (2009) "assessment provides numerical scores and / or age equivalents for overall performance as well as for each specific area assessed" (p.210). The aim of assessment is to identify the existence, nature and severity of the problem.

Developmental assessment is a process designed to deepen understanding of a child's competencies and resources and of the caregiving and learning environments most likely to help a child make the fullest use of his or her developmental potential (Meisels & Atkins-Burnett, 2000).

One way or another, all early childhood assessments involve a process of gathering information about children in an attempt to better understand and support learning and development.

5.2.3 Evaluation

Evaluation refers to the process of comparing the child's performance on selected intervention objectives before and after intervention and comparing the progress toward established family outcomes. An evaluation is conducted to determine or diagnose a developmental delay and to develop strategies for intervention, and only such children that are suspected of having a developmental delay, are referred for an in-depth evaluation. The early intervention partners in the community are key resources for ensuring an effective approach to evaluation and early intervention (Early Head Start National Resource Centre, 2002).

Thus, both the screening process and the formal evaluation to determine eligibility for early intervention services are part of the ongoing developmental assessment of children.

5.3 Assessment of the developmental domains of infants and toddlers

The following sections describe each developmental domain and include suggestions for assessment strategies. In all domains the results will be most accurate when the assessment is completed in a variety of contexts, including home, and when each domain is viewed in relation to others.

5.3.1 Cognitive domain

The cognitive domain encompasses a child's ability to learn from past and novel experiences. Infants' skills include early object use, interaction with the environment, object permanence, and understanding of cause and effect. The skills of older toddlers and pre-schoolers include verbal and nonverbal problem solving, symbolic play, memory, attention, discrimination, classification, sequencing, numeric reasoning, visual perception and visual motor integration. A profile of a young child's cognitive development should be obtained by incorporated information collected from various sources, including information from parents and caregiver, formal and informal observations in a variety of settings; play based and standardised assessment, when appropriate, and a review of developmental concerns (Ong & Broms, 2000).

5.3.2 Physical development domain

The physical development domain encompasses both large and fine motor abilities. Large motor skills for infants and toddlers include rolling, crawling, as well as balance and mobility in standing, walking, running and hopping. Other aspects assessed as part of this domain are the infant's range of motion and quality and integration of movement and muscle tone. Fine motor skills include; oral motor movement for feeding and speech, manual grasp and release; and the ability to reach and to use small muscles for self-help and drawing. Ong and Broms (2000) aver that assessment takes into account the infants' regulatory and sensory system by determining patterns of consistency in sleeping and eating and the ability to provide personal comfort. Information is obtained through formal and informal observations or a report of infant skills and abilities in those areas.

5.3.3 Health domain

The health domain includes; the infant's birth and developmental history, current health information, current diagnoses, medications and possible effects, required medical procedures, current medical supplies and technological devices, primary and speciality care providers, neurological status, nutrition, feeding and oral health, immunisations, hearing and vision. Qualified assessment team members evaluate the impact of the infant's health problems on his or her development and assess pre-natal, perinatal and general health conditions that may increase the infant's vulnerability and risk. Information on physical development and health is obtained from parents, health care providers, medical records and other sources, as well as by direct assessment and observation of the baby (Ong & Broms, 2000).

5.3.4 Communication domain

The communication domain covers both verbal and nonverbal modes. It encompasses pre-intentional and intentional communication, speech development, receptive and expressive language development, gestures, body movement and posture. Areas of language and speech development encompass articulation (sound development), semantics (word meaning), morphology (grammar), syntax (word order), pragmatics (how language is used in relation to others), voice and fluency. Communication and language should be assessed in an interactive, meaningful context in which the baby is encouraged to initiate communication. Differences in communication between home and school or other less familiar surroundings should be noted. The assessment should be based on information provided by parents, other caregivers, and a variety of sources, including structured and unstructured conversations, play-based assessment and standardised assessment, when appropriate (Ong & Broms, 2000).

5.3.5 Social-emotional domain

Identifying infants and toddlers with emotional disturbances requires the participation of professionals with expertise in mental health and behavioural interventions. The comprehensive assessment includes information on the presenting behaviour, the infant's temperament, parent-child interaction patterns, and the full scale developmental assessment components for young children.

Social-emotional development, according to Ong and Broms (2000), means the acquisition of capacities for human relationships, emotional expression, communication and learning. Social-emotional development is based on the motivation to engage in positive interaction and to sustain personal relationships and precedes the development of effective coping skills, self-esteem, and the ability to take advantage of opportunities for learning. Differences in temperament, self-regulation, range and intensity of affect and modulation of one's response to the environment are additional factors influencing social-emotional development. An assessment of infant social-emotional development includes observations of the infant's attachment to the parents or guardians, relationships and interaction with other adults and peers, its temperament, awareness of social roles and conventions, initiation of reciprocity and motivation. Social-emotional skills are assessed by observing or reporting a baby's ability to gain attention appropriately from and respond to others, express affection and protest, ask for help when a task is too difficult, and engage in interactions with adults and then with peers (Ong & Broms, 2000).

5.3.6 Adaptive domain

Assessment of the adaptive domain takes into consideration the various abilities of an infant to adapt and function within the environment (for example, self-help skills; the interaction with toys, other objects or family members and peers; activity level; attention span and motivation). Ong and Broms (2000) consider that using a standardised form or informal interview / questionnaire with one or more parents or family members may be an effective way whereby information can be acquired about the infant's functioning in the home environment, which information should reflect the values and culture of the family. Where children are taken care of in a day-care or a school programme environment, information may also be obtained by consulting an adult who has knowledge of the infant in that setting.

Therefore, a comprehensive developmental assessment should include these above-mentioned domains of functioning, which are not mutually exclusive. A problem in one area may have an effect on another area. For example, a socially and emotionally deprived infant may present with delayed cognitive development as a result of the lack of social and emotional stimulation. However, if this problem is detected at an early age and intensive stimulation is provided, the cognitive deficit may disappear after a period of time (Foxcroft & Roodt, 2009). The holistic view of child development cannot be emphasised enough, and by implication a holistic perspective to the developmental assessment of South African

children is vital in view of the poor social conditions the majority of South African children are experiencing (Luiz, 1994a).

5.4 Aim, purpose and value of assessment and evaluation

The purpose and value of assessment and evaluation are fundamental to effective intervention. Without the systematic conduct of assessment and evaluation activities, early interventionists do a significant disservice to children and their families who can ill afford to waste precious time, effort and money. The uses and purposes of assessment in the infant period determine to some extent the domains assessed.

Wyly (1997) suggests four purposes of infant assessment:

- To identify infants who may be at risk for developmental delay
- To diagnose the presence and extent of developmental problems
- To identify an infant's specific abilities and skills
- To determine appropriate intervention strategies.

This list does not include many purposes typical of assessment for older pre-schoolers, such as evaluation of intervention strategies, prediction of future competencies, or assessment of skills that are fundamental for success in a classroom environment, such as ease of gaining the child's attention and ability to sustain it. The focus is on the identification of possible developmental problems at an early age; in part, one argues, because of the relatively undifferentiated nature of developmental organisation in early infancy and the associated difficulty of making precise predictions to later abilities. In spite of wide agreement that screening and monitoring of the development of these youngest children is important, paediatricians still do not fully agree on the most important domains to measure or the best measures to use (McCormick, 2008). Most of the assessment conducted in infancy is actually screening to identify potential problems, to be followed by more definitive diagnostic assessment. When children are thriving, with no evident problems, assessment is rarely attempted.

Of course, routine screening programmes and research projects involve assessment of children with typical development, as do accountability efforts to track child achievement. Yet, assessment becomes

important or “high stakes” when problems are suspected or predicted. Hence, the specific purposes of assessment apply to children who have suspected or evident developmental delays and / or disabilities. According to Neisworth and Bagnato (2004), four assessment purposes typical of assessment for older pre-schoolers are recognised within early intervention:

(a) Screening

Early detection of developmental problems can result from referrals by parents, teachers, physicians, or community wide screening efforts. Screening is a relatively rapid method for selecting those children who should receive more detailed assessment. Such rapid methods are socially useful because of the economy of time, effort and cost, but are subject to error when false negatives and false positives may occur. Clearly, the real issue is when false negatives (i.e. indications of “no problem”) are given, where an actual problem exists. These instances will not be afforded up-close assessment and children’s problems will go unrecognised (Neisworth & Bagnato, 2004).

(b) Eligibility

According to the current system, children who need early intervention services and support must be evaluated and declared eligible before special help can be delivered. Eligibility determination refers to this assessment process. Although varying across states, criteria for eligibility are based on the extent of a child’s test-identified deviation from typical developmental norms. Ordinarily, cut-off scores are used to make decisions about the need for services. At best, eligibility testing documents disability rather than capability and, therefore, is a grossly incomplete look at the child (Neisworth & Bagnato, 2004)

(c) Programme planning and progress monitoring

Measurement plays an important role in outlining the child’s individual plan of instruction and therapy. The plan should be based on a range of information about the child’s strengths and needs, and the child’s developmental progress based on his individual plan should be recorded to guide instruction and detect change (Neisworth & Bagnato, 2004).

(d) Programme evaluation

The quality and impact of the child's programme should be clear if programme evaluation is done effectively. Periodic feedback to teachers, parents, and staff is important for programme modifications. Linkages between assessment content and instructional content are essential to reveal programme outcomes and impact (Neisworth & Bagnato, 2004).

5.5 Critical issues when considering the assessment of infants and young children

Critical issues should be considered in the approach of assessment of infants and young children and attention will be given to these critical issues in the following section below.

❖ Meaningful assessment approach

Any specific assessment approach is primarily a sampling process, attempted at a particular point in time, from a particular vantage point and with a particular instrument or recording device, involving taking a "snapshot," or series of snapshots, of a child's knowledge, skills, abilities, or personality characteristics. A measurement or assessment approach that is not representative of a child's usual functioning will not be meaningful; a particularly important concern since the first three years of life constitute a period of such immense modification, growth and development (Meisels & Fenichel, 1996).

Early childhood professionals are feeling ever increasing pressure to document learning outcomes in an era of standards, accountability and achievement testing. Many professionals have legitimate concerns about misuse of assessment practices and instruments and the potential for inequitable consequences for the children in their programmes. It is important to consider some implications of the unique nature of early development and learning (Slentz, Early, & McKenna, 2008).

❖ Knowledge on development and multiple factors influencing it

The constructs and phenomena that are assessed should be closely related to core processes of human growth and development. For assessment approaches to be meaningful, therefore, knowledge of how development transpires and how children's growth in the first few years of life is enhanced, has to be incorporated. One must recognise that development is a complex process; from the very beginning of

life, multiple factors influence its course. Although areas of development can be addressed separately, they are not necessarily independent; rather, they are interdependent (Greenspan & Meisels, 1996).

♦ **Interactivity among areas of development**

Related to the interactivity among areas of development is the fact that both biological and environmental influences operate to support, facilitate, or impede the development of infants and young children. When, therefore, data from assessments is interpreted, both the child's biological status and the impact of environmental factors on the aspect of development being assessed must be considered. For example, when one is assessing general cognitive functioning of a 2-year-old, observational or test data assessed by premature birth or a medical condition, living in poverty, and spending most of his or her waking hours in a poor quality childcare setting must be considered. Alternatively, according to Greenspan and Meisels (1996), the question is: is the child the product of a healthy, full-term delivery and is he or she living in an economically secure, two-parent household that affords many opportunities for play and discovery?

♦ **Protective and risk factors in the caregiving environment**

An understanding of protective and risk factors in the caregiving environment is essential to meaningful assessment, particularly for very young children and those children who are at risk developmentally. A mixed measurement strategy that incorporates a wide range of ideas is essential in an assessment approach aimed at the identification of existing or potential developmental problems in young children in order to suggest interventions that might eliminate or reduce risk factors (Meisels & Fenichel, 1996).

♦ **Cultural context of the caregiving environment**

Knowledge and an understanding of the cultural context of a young child's caregiving environment is essential to understanding the meaning of the child's repertoire of skills, knowledge and personality characteristics. Family and community culture, among other experiences, influences the child's access to multiple approaches to literacy; expectations regarding educational accomplishments, explicit and implicit connections to rite, ritual and tradition, and overall sense of familial / communal interaction and support (Garcia-Coll & Magnuson, 2000).

♦ **Child rearing context**

For measurement in early childhood to be faithful to the phenomena it seeks to document, so as to be meaningful, it has to take into account how children are affected by the contexts in which they are reared. It is not necessary for each assessment approach to set the impossible task of taking all of this complexity into account at once. In order to give the data meaning, however, assessments of relatively isolated aspects of functioning should be interpreted within a larger conceptual framework (Greenspan & Meisels, 1996).

♦ **Authentic assessment most valuable**

Young children learn by doing and demonstrate knowledge and skills through action-oriented activities. Authentic assessment of youngsters as they participate in daily activities, routines and interactions generally produces the most valuable information for assessment. To every extent possible, assessment methods, according to Slentz, Early and McKenna (2008) should allow for observation of young children engaged in spontaneous behaviours in familiar settings and with familiar people.

♦ **Refine assessment to appropriate methods and instruments**

More assessments and increased data do not necessarily result in better assessment information. Early childhood professionals should only gather information they need and know ahead of time how they will use all the information collected (Slentz, Early & McKenna, 2008). It is, generally speaking, most desirable to identify a set of appropriate methods and instruments that provide necessary information and refine the use of those procedures over time.

♦ **Assessment to benefit children, families and programmes**

Some assessment instruments and procedures are better than others. Factors such as purpose, content, reliability and validity, efficiency, cost and availability of professional development are all more important than an appealing packaging and effective advertising. Of primary importance is the quality of information gathered and the decisions made as a result of assessment. Ultimately, Slentz, Early and McKenna (2008) emphasise that whatever the assessment used, it should be aimed at benefiting the children, families and programmes involved.

Identifying behaviours that represent the infant's or child's true range and depth of capacities is no easy task towards understand the biological endowment, current health status and caregiving environment that, given immature perceptual and motor capacities, form the context for a young child's functioning. As existing approaches to assessment in the first three years of life are scrutinised, one is struck by how much work is required before the field will have adequately addressed these critical issues (Greenspan & Meisels, 1996).

5.6 Types of early childhood assessments

The traditional model for assessment of infants in the first several months of life was primarily medical in nature. It focused on using assessments for pediatric appraisal of normative physical and neuromotor development. Attention to behavioural and psychosocial factors was secondary, although most paediatricians acknowledge the importance of developmental factors over those of a purely physical or biological nature. Over the past half-century, behavioural development has become an intergral part of regular pediatric evaluation and paediatricians routinely provide clinical information on behavioural, cognitive, psychosocial factors, thus providing a more comprehensive picture of each child's overall growth and development. The integration of biophysical examination with cognitive and socio-emotional assessment links early infant assessment with the developmental outcomes (Snow & Van Hemel, 2008).

Assessment practices with young children encompass a variety of general methods, perspectives and tools. As mandated by law (Health Professions Act No. 56 of 1974), no single test measurement may be used in the assessment process.

Beginning as a downward extension of conventional standardised testing, the dramatic changes in the conceptualisation of early childhood assessment occurring over the years gradually moved early childhood assessment out of the tester's office into more familiar settings (e.g., homes, child care locations, early intervention programmes). Assessment teams are becoming more common, as is the use of many more innovative and contextually relevant techniques than ever before. Recent modifications of conventional assessment procedures and the concomitant changes in expectations of caregivers and families, as well as changes in the information acquired from these assessments, can be described in terms of the following different approaches (Meisels, 1996).

5.6.1 Screening tools

Screening tools, that detect developmental delays of which an example is the Denver Developmental Screening – II, are used primarily to identify a suspected area of concern related to a child's development that may warrant further evaluation. These measures take a sampling of a few skills that may indicate a need for a diagnostic assessment. Screening tools are generally more reliable when used with children, ages three to five years, than with infants and toddlers and such tools should not be the only method for identification of children in need of referral for diagnostic assessment. Due to the small sample of behaviours that they measure, screening tools may fail to identify all children in need of referral. Rather, the use of ongoing observation, parental interviews and information from other care providers, combined with a screening measure, will increase the accuracy of the identification procedures. Screening measures are not the appropriate tool to be utilised to determine eligibility for special education programmes and related services (Neisworth & Bagnato, 2004).

5.6.2 Traditional methods

Traditional assessment methods include standardised tests and systematic observations. Assessment tools may be norm-referenced or criterion-referenced and may measure one or more developmental domain. The purpose of an early childhood assessment is to gather information about child performance in order to plan an educational and developmental programme that meets a child's specific needs (Meisels & Provence, 1989).

5.6.2.1 Norm-referenced assessment tools

These instruments constitute a method of measurement that allows infants, toddlers and young children to be ranked numerically and to be compared in relation to a set of external standards. Principally, a linear scale is used for differentiation and each child's performance is judged in relation to the performance of the norm reference group. A norm-referenced instrument is used to compare the performance of an individual infant to the normative group. Group "norms" are developed by obtaining the performance of a representative sample. This is called the standardisation process. The standardisation is critical to the validity and reliability of a test. The normative sample should be comprised of a representative cross-section of the population for whom the test is designed. The results

of this type of test are generally presented as developmental ages, OQ's, or percentile scores (Early Head Start National Resource Centre, 2002). Norm-referenced tests often lead to an under-estimation of the capabilities of children with disabilities. Also, the behaviours tested may not necessarily be educationally relevant and these assessments do not yield direct information for making programme decisions or choosing curricula content. Little information is gathered on any environmental factors and intervention strategies that may be promoting or hindering an infant's progress (Losardo & Notari-Syverson, 2001). The Bayley Scales of Infant Development II (BSID-II) (Bayley, 1993) is the most widely used norm-referenced test for infants and toddlers.

5.6.2.2 Criterion-referenced assessment tools

These tools provide an "absolute" criterion, primarily used to evaluate the level of a baby's functioning relative to well-defined standards that are implicit in a domain or area of development, with the suggestion that the domain or areas being evaluated have homogeneous patterns or shapes. The focus is on what the baby knows or can do, not on how they compare to others. Test results are typically reported within an age range and a list is presented of the specific tasks a baby is or is not able to perform (Meisels, 1996). A possible limitation can be that many criterion-referenced assessments were developed by selecting isolated items from various norm-referenced instruments, which do not necessarily represent functional behaviours that can be used to develop educational goals. These instruments are based on a fragmented skill, test-teach-test approach that does not reflect early 21-century models of the way young children develop and learn (Losardo & Notari-Syverson, 2001). The Griffiths Mental Development Scales are criterion-referenced in nature.

5.6.2.3 Curriculum-based assessment tools

Curriculum-based assessment tools are criterion-referenced but the natural environment and ongoing activities, with materials in the home, classroom, or day-care setting is the source of collected information regarding the infant. Rather than measuring achievement against external norm-referenced data, these tools rate skills against previous performance along a developmental continuum of instructional objectives. These tools are best used for planning the child's instructional programme or intervention. This type of assessment generally uses a single set of observations at specified times for

data collection rather than the information gathered during ongoing observations, the intention being that the assessment results be used to determine the rate of learning, ability to make generalisations, and learning style (Meisels, 1996). Some critics say that its limitations are found in the simplistic approach of the assessment; that learning development is not taken into consideration and that the teacher is teaching the test. There are questions about the appropriateness and validity of the curriculum used to develop curriculum-based assessments (Losardo & Notari-Syverson, 2001).

5.6.3 Alternative methods

Alternative assessment approaches are highly recommended for children ages from birth through to five years. Such approaches are a more realistic way to obtain valid information about infant knowledge, skills, and abilities (Ong & Broms, 2000).

5.6.3.1 Play-based assessment

Play-based assessment is a highly recommended method of alternative assessment. Certainly, in the assessment of babies, toddlers and young children, playing certainly constitutes a major area of behavioural expression. For pre-schoolers playing is central, thus this type of assessment becomes a particularly powerful evaluation tool. Play provides a familiar and less stressful arena in which the infants can demonstrate strengths and weaknesses, as well as emotional issues that are overwhelming or frightening to them (Schaefer, Gitlin, & Sandgrund, 1991).

It is possible to assess all developmental areas and there is a greater likelihood that such a setting provides an atmosphere that is conducive towards allowing the child to demonstrate his or her true abilities. Play-based assessments yield information to develop plans for intervention, to make recommendations for goals or outcomes for the child and family, and to evaluate progress (Ong & Broms, 2000).

Due to the limitations in language and conceptual development, babies, toddlers and young children's ability to verbally express what they feel and know is inadequate and often unreliable. Children's use of play, therefore, develops into their most comprehensive form of expression and it must be studied in order to learn enough about the situation to ensure that accurate and completely informed diagnoses are

made. Play reveals emotional concerns, cognitive approach, the ability to imitate and interact in the social environment, and much more. Furthermore, play provides access to children who are otherwise not amenable to classic test batteries because of behaviour problems (such as elective muteness, autism, conduct disorders, and others). It allows children to gain a safe distance from sensitive, threatening, distasteful or taboo issues, thereby reducing their anxiety and freeing them to express and recall what may otherwise be denied or unidentified in a verbal interview. The assessment of play can function as an important adjunct to more formalised testing and interviewing in any population of children. It can be used as an aid or substitute to verbal communication. Play assessment also offers information, not only on the infant but also on the ways in which environmental factors reinforce and change the child's behaviour over time, and *vice versa* (Schaefer et al., 1991).

There are many different formats in which play assessments can be made, ranging from naturalistic free-play observations through highly structured laboratory-play interviews. In each case, the clinician has to prepare the stage in some way in order to obtain the relevant information, which may be needed to answer the referral questions. For younger children, only specific toy materials may be made available for the play interview. Since older children are more likely to engage in structured reality-based games, the clinician may choose a storytelling technique. This would allow the older child comfortably to enter into the world of "pretend", in which communication can be safely achieved through the use of the characters in a story (Schaefer et al., 1991).

After the play observation is completed, the clinician must analyse and interpret the data. Similar to formal testing procedures, the accuracy of the final conclusions depends greatly on the skill of the evaluator. The clinician's ability to integrate and compare the information gleaned from the play with broad-based knowledge of normal age-appropriate developmental issues, the infant's current life situation as well as past history, and the data regarding the its functioning that were collected from other sources, is of the utmost importance. As long as the play information is used judiciously and cautiously, it will add a newer and deeper dimension to the understanding of the infant's strengths and weaknesses (Schaefer et al., 1991).

Despite its many strengths and advantages, there are also several significant actual and potential limitations that prevent play-based assessment from being considered to be sufficient to make a

comprehensive early childhood assessment. Shortcomings of this type of assessment include limited research on the reliability and validity of play-based measures, along with unsupported claims about the strengths of the approach, as well as the fact that state regulations may preclude the use of play-based assessment in isolation as a method for determining service eligibility, some limitations to the amount of information that can be derived from play-based measures, and limited information being available about diversity issues with this type of assessment (Bracken & Nagle, 2007).

5.6.3.2 Portfolio-based authentic assessment

This method (Ong & Broms, 2000) embeds assessment in the child's curriculum and involves gathering information from events throughout the child's school day, which, because it is not used in an artificial setting, may allow the data collected to present a truer picture of the child's skills and abilities. The most important disadvantage posed by portfolios is its low score reliability. If the purpose and assessment criteria of the portfolio are not clear, the portfolio may just be a miscellaneous collection of action results that cannot accurately reflect children's growth or achievement. Also, the use of portfolios is very time consuming and it may be difficult to analyse data from portfolio assessments. Another problem of using portfolios is their storage, handling and controlling (Birgin & Baki, 2007).

5.6.3.3 Performance assessment

These tools represent an alternative to conventional measurement models. A child's current status is described within a domain or area of development by documenting that child's skills, knowledge, personality variables and accomplishments within daily contexts in relation to specific developmental goals (Meisels, 1996). These goals may be set by the child's family and service providers, or outcomes based on developmental expectations for the child's age or from the outcome of consultations with professionals.

Performance assessments, unlike other assessment types, transform the historical model of separated assessments and interventions into a model where assessment and intervention is combined into a common set of procedures. Performance assessment recognises that assessments depend on intervention data in order to obtain the most useful information possible for enhancing a child's

development, namely; information that accounts for the complex interaction between development, environmental impact, the influence of parental figures and the role of context (Meisels, 1996).

When conducting performance assessments, one set of assessment procedures is not applied to a child in order to use the information collected to prescribe another set of interventions, as is often done with the first three types of assessments mentioned above. Rather, assessment takes place during the process or within the context of intervention in order to learn how more effective intervention can be achieved (Meisels, 1996).

Among the common criticisms of performance assessments are their high cost and time consuming administration. Particularly, however, issues of reliability and validity have been of special concern; for example, in performance-based assessments, the domain appraised is often under represented. Also, because their scoring is complex, relying on the judgement of observers or teachers, an element of subjectivity is introduced (Sarouphim, 1999).

Clearly, different approaches to assessment and the use of assessment data are represented by these different types of assessment.

5.7 Developmental tests utilised with infants and young children

Various assessment measures utilised by psychologists to assess infants and young children will be discussed in this section, as well as international methods and tests that are, in general, used in the diverse South African context. Some of the shortcomings of these measures will also be highlighted.

5.7.1 Developmental tests used in an international context

There are several measures that are currently leaders in the developmental assessment field, which are also well established in the international context. This section will look at the most prominent of these.

5.7.1.1 The Stanford-Binet Intelligence Scale

The Stanford-Binet Scales, 5th edition (SB5), are widely used for the assessment of intelligence of children and young adults. As with the original Binet Scales, many revisions have appeared since Lewis M. Terman (1916) completed his revision of the 1908 Binet Simon Scale (Stanford-Binet Intelligence

Scales, 2004). The SB5 provides norms from the age of 2 years to beyond 90, and reflect several improvements on previous editions. This edition (SB5) has since been standardised, by using a wider, more representative sample, thus eliminating the previously criticised gender and race inequalities (Simeonsson, 1986). Taking 45 to 60 minutes to administer, the SB5 asks the child to define words, string beads, build with blocks, identify the missing parts of a picture, trace mazes and show an understanding of numbers. The child's score is supposed to measure fluid reasoning (the ability to solve abstract or novel problems), knowledge, quantitative reasoning, visual-spatial processing and working memory. The fifth edition, revised in 2003, includes non-verbal methods of testing all five of these dimensions of cognition and permits comparisons of verbal and non-verbal performances. In addition to providing a full-scale IQ, the Stanford-Binet yields separate measures of verbal and non-verbal IQ, plus composite scores spanning the five cognitive dimensions. Although the SB5 retains the wide age range which has been one of its major strengths, as noted by Simeonsson (1986), it is not suitable for the assessment of infants from birth up to 2 years of age.

According to Bhamjee (1991), the major criticism of earlier versions was that their use was limited with respect to handicapped persons with typical verbal deficits. These weaknesses of earlier editions, such as its highly verbal nature and the impossibility of constructing a profile of strengths and weaknesses (Allan, 1992; Simeonsson, 1986), have been addressed in the SB5, but according to Van Rooyen (2005) it continues to be a test of mainly cognitive development rather than overall development.

5.7.1.2 The Wechsler Scales

The Wechsler Intelligence Scale for Children (WISC) was developed in 1949, and it was replaced by a standardised version known as the Wechsler Intelligence Scale for Children – Revised (WISC-R) (Wechsler, 1974). The WISC-R measures the intelligence of children between the ages of 6 years and 16 years 11 months (Wechsler, 1974). Anastasi (1982) reports that the most significant criticism levelled at the Wechsler Scales, in general, has been the lack of sufficient empirical data to support their reliability and validity.

The Wechsler Intelligence Scale for Children-III (WISC-III) is basically an updated version of the WISC-R and measures verbal and performance abilities, yielding separate scores for each as well as a total

score. As with the other Wechsler Scales, the subtests are grouped in verbal and performance scales, measuring verbal conceptual abilities, spatial abilities, succession memory and acquired knowledge (Smit, 2008). The Wechsler Intelligence Scale for Children – fourth edition (WISC-IV) was released in 2003, and is basically an update of the WISC-III (Wechsler Intelligence Scale for Children – Fourth Edition (WISC-IV), 2004). Very little (if any) independent research is available on the WISC-IV (Van Rooyen, 2005).

The Wechsler Pre-school and Primary School Scale of Intelligence (WPPSI) was designed in 1989 as an extension of the WISC. The Wechsler pre-school and primary scale of intelligence, revised (WPPSI-III) is an individual test, taking 30 to 60 minutes. It has separate levels for ages 2½ to 4, and 4 to 7, yielding separate verbal and performance scores as well as a combined score. The 2002 revision includes new subtests designed to measure both verbal and non-verbal fluid reasoning, receptive versus expressive vocabulary and processing speed. The WPPSI-III has been re-standardised on samples of children representing the population of pre-school children in the United States. The WPPSI-III also has been validated for special populations, such as children with intellectual disabilities, developmental delays, language disorders and autistic disorders.

According to Bhamjee (1991), the test is considered to be advanced in terms of the technical quality of the test construction procedures, but fails to be validated due to inadequate available empirical data. According to Van Rooyen (2005) there remains a lack of independent research with regard to the WISC-IV and the WISC-IV also does not contain a sub-scale for testing the motor skills of children. Rather, it is aimed at verbal testing to determine IQ. Therefore, not all the divisions of developmental assessment are encompassed.

5.7.1.3 Gesell Developmental Schedules (Gesell Schedules)

The most important early contributor to the testing of infants was Arnold Gesell (1934). He developed a measure that separated babies with normal functioning from ones with abnormal functioning. According to Brooks and Weinraub (1976) these scales provided standardised procedures for observation and assessing development of human conduct as perceived in children's daily lives. The most recent revision was published in 1980, the age range for examination being from 1 week to 36 months

(Aylward, 1994). Gesell's examination was used widely for many years and still is frequently employed by paediatricians to distinguish between normal and abnormal functioning in infants.

The current version of the Gesell test measures the following domains of development:

- Adjustment; includes intelligence, diligence and constructive investigation of the environment
- Gross motor skills; referring to aspects of balance, ability to sit and moving postures
- Fine motor skills; also manual dexterity
- Language; such as facial expression and vocalising
- Personal social abilities; such as the ability to feed oneself, to play and being able to control one's bowel and bladder.

The developmental quotient (DQ) combines subscores in the above-mentioned categories to provide an overall score (Santrock, 2011). Drawbacks include instructions that are brief and subjective, as well as small normative samples (Aylward, 1994; Aiken, 2000; Bhamjee, 1991), which may be the reason why the test is typically used by physicians rather than psychologists.

Gesell's contribution towards developmental assessment is, nevertheless, regarded to be a good effort, aimed at providing a meaningful assessment profile to parents, by integrating theory and research (Luiz, 1994b). Luiz is also of the opinion that the results of the Gesell tests provide a thorough description of children's motor skills, social behaviour and personality traits. A self-limiting aspect is that the scales are only aimed at children up to age 3 years.

5.7.1.4 McCarthy Scales of Children's Abilities (McCarthy Scales)

The McCarthy Scales were published in 1972; a measure comprising 18 tests grouped into six subscales. It measures five categories, namely verbal, perceptual-performance, quantitative, motor and memory (Bhamjee, 1991). The McCarthy Scales are constructed for children between the ages of 2 years 6 months to 8 years 6 months, but are most useful in the age range of 3 years to 5 years due to floor and ceiling levels (Aylward, 1994; Van Rooyen, 2005).

The general cognitive score is expressed as a general cognitive index (GCI) and indicates the child's functioning at the time of the testing, with no implications of immutability or etiology (Van Heerden, 2007). According to Bhamjee (1991) the GCI is reported to come closest to the traditional global measure of intellectual development, namely the Intelligence Quotient (IQ).

Van Rooyen (2005) reported that the GCI is statistically comparable to IQ scores, but not interchangeable. Anastasi (1982) asserts that the McCarthy Scales show high split-half and test-retest reliabilities. Reported data, however, demonstrated poor validity. Aylward (1994) further contends that, while the normative data is old and possibly obsolete, the test is well constructed and psychometrically sound. According to Nuttal, Romero and Kalesnik (1992) this test should be used cautiously when testing children that are handicapped, gifted or under the age of 5 years, due to the inadequacy of the floor and ceiling levels. These scales also do not provide for assessment of infants from birth up to the age of 2 years.

5.7.1.5 The Bayley Scales of Infant Development-II (BSID-II)

The widely used Bayley Scales of Infant Development were developed in 1933 in order to assess infant behaviour and predict later development. According to Anastasi (1982), these scales initially only provided test procedures and scores for the first 18 months, which is why the scales did not comply with important psychological testing pre-requisites. It was re-standardised as the BSID-II in 1993 (Bayley, 1969; 1993), towards providing for assessment of children between one and forty two months. Scores on the Bayley-III indicate a child's strengths, weaknesses and competencies in each of five developmental areas, namely cognitive, language, motor, social-emotional and adaptive behaviour (Bayley, 2006).

The tests consist of three divisions:

- A cognitive scale in which a cognitive index provides norm scores. Sensory-perceptual skills, discrimination, object constancy, memory, learning, problem solving, early verbal communication, early abstract thought and numbers comprehension are tested.

- A psychomotor developmental index provides a standard score and fine and gross motor skills are tested.
- A behavioural assessment scale supplements the above scales. A qualitative assessment of attention and orientation, emotional status and cognitive skills are indicated by these scales (Brown, 1994).

Separate scores, known as developmental quotients (DQs), are calculated for each scale. DQs are most useful for early detection of emotional disturbances and sensory, neurological and environmental deficits and can help parents and professionals plan for a child's needs.

According to Moosajee (2007) the Bayley Scales test self-control, not social development. It also does not test language development as is the case with the Revised Griffiths Developmental Scales. The Bayley-III is also more appropriate for use in clinical settings than were the two previous editions (Lennon, Gardner, Karmel, & Flory, 2008).

Anastasi (1982) considers the test construction procedures to be of a very high technical standard, with an average reliability coefficient of 0.88 being reported. Although concurrent validity studies with the original BSID and McCarthy Scales have been undertaken, recent studies suggest that more concurrent and construct validity studies on the BSID-II as well as further studies investigating the BSID-II's suitability with special populations (Barnard, 2000; Schröder, 2004) should be conducted.

According to Richter-Strydom and Griesel (1988) the Bayley Scales have only been standardised for black children in South Africa and it has not been followed up with further validity and reliability studies.

5.7.1.6 Denver Developmental Scale

According to Nuttal, Romero and Kalesnik (1992), the Denver Developmental Scales, which originated in 1976 and was subsequently revised in 1990, since then known as the Denver-II (Frankenberg, Dodd & Archer, 1990), are widely used. It is a standardised measuring instrument to especially test the motor development of children from 0 to six years.

The Denver-II contains 125 test items to indicate the child's skills in four areas, namely; linguistic skills, fine motor skills, gross motor skills and personal-social skills. Test results classify a child's current level of development in three categories, namely; abnormal, risk or normal development (Nuttal, Romero, & Kalesnik, 1992). Although research on the applicability of the scales is under way in South Africa (Luiz, Collier, Stewart, Barnard, & Kotras, 1999), there are, as yet, no norms available for South African children.

5.7.1.7 Kaufman Assessment Battery for Children (K-ABC)

The K-ABC was developed in 1983 and is applicable from the ages of 2 years 6 months to 12 years, 6 months (Van Rooyen, 2005). The test consists mainly of non-verbal items and requires that the child perform a variety of information processing tasks. The test is designed to evaluate cognitive abilities in children with diverse needs (such as autism, hearing impairments and language disorders) and from varying cultural and linguistic backgrounds. It has subtests designed to minimise verbal instructions and responses as well as items with limited cultural content (Papalia et al., 2009). The K-ABC is based on a well-developed theory of intelligence (Bhamjee, 1991), and according to Murphy and Davidshofer (1988, 1994), technically excellent in several aspects. Aylward (1994) notes, however, that the test produces only two meaningful factors before the age of 4 (sequential and simultaneous processing) and that the floor and ceiling prove to be problematic with very young children or retarded children and children above the age of 10 years. He further considers the lack of assessment of expressive language to be a major drawback in the assessment of pre-schoolers. Bhamjee (1991) also states that evidence regarding construct and predictive validity is sparse.

The KABC-II, which was released in 2004, provides updated norms, as well as a dual theoretical approach (Van Rooyen, 2005). According to Fletcher-Jansen (2004) the test is relevant to scores that rely on processing abilities rather than those based on integrated knowledge. The K-ABC only assesses children from age 2-12 years of age. Once again, there is a gap in the assessment period from birth to 2 years.

5.7.1.8 The Cattell Infant Intelligence Scales (The Cattell Scales)

Cattell (1966), while relying heavily on the Gesell schedule, developed an infant scale, the Cattell Scales. These scales measure mental development from 3 to 30 months, evaluating motor control and verbalisations. Motor control is assessed by a series of tasks that involve manipulating various objects, such as cubes, pencils and pegboards. During the motor control subtests, the examiner takes notes on the infant's attempts to communicate (Van Rooyen, 2005). Recent studies reveal conflicting findings regarding the reliability and validity of the Cattell Scales (Schröder, 2004). Aylward (1994) argues that the test is not the most appropriate developmental test, as no personal-social or gross motor items are included.

5.7.2 Developmental measures utilised in South Africa

Two of the most frequently used measuring instruments in South Africa, will be discussed below.

5.7.2.1 The Junior South African Individual Scales (JSAIS)

The JSAIS were initially developed and standardised in 1979 for the assessment of White children in the age group 3 to 7 years (Madge, 1981). According to Van Rooyen (2005), the JSAIS is a comprehensive test that provides a profile of the child's abilities, but it does not assess gross motor and personal-social development. The main aim of the battery is to establish the general intellectual level of children and to evaluate the relatively strong and weak areas of functioning of the child (Madge, 1981).

The JSAIS consists of verbal and performance tests. The verbal scale provides an indication of verbal intelligence, whereas the performance scale provides an indication of visual/perceptual organisational ability. The scales contain four subscales, namely; a verbal IQ subscale, a performance IQ subscale, a numbers subscale and a memory subscale. The verbal subscale involves subtests for vocabulary, word association and story memory. The performance scale includes subtests for shape discrimination, absurdities, block patterns and form boards (HSRC, 1981).

The JSAIS was adapted and standardised for Asian children (Swart, 1987) and norms were published specifically for Coloured children between the ages of 6 years and 8 years 11 months (Robinson, 1989). The measure is further standardised for English and Afrikaans speaking children who have received a

number of years of pre-school or school instruction in these languages (Van Rooyen, 2005; Van Heerden, 2007).

According to Van den Berg (1987), Black children can only be included in the norm population once parallel forms of the test have been developed for South African Black languages. He further asserts that children from a deprived socio-economic background are explicitly excluded, with specific reference to the South African Black languages.

The major limitation of the JSAIS, therefore, is its lack of norms for the contemporary South African population. The JSAIS is a very verbally based measure and among its major drawbacks are criticisms that it does not consider context and is not comprehensive enough as it does not focus on all the domains of development (Van Heerden, 2007).

5.7.2.2 The Herbst Measure

In 1994, the Herbst assessment measure was constructed by Herbst, designed to specifically suit the developmental assessment of Black children in South Africa (Schröder, 2004). The measure consists of a battery of items to determine the progression of the various aspects of development, namely; cognitive aspects, fine motor development, and gross motor development in 3-to 6-year-old Black children (Schröder, 2004). It provides a quantitative depiction of the child's ability as well as possible neurological indicators (Van Rooyen, 2005). It gives limited information regarding procedures and psychometric properties. It is only applicable to Black children, no additional studies are available and it also has not found its way into mainstream testing (Schröder, 2004). It, therefore, does not meet the general developmental assessment needs of the South African context.

There are, as seen above, a multitude of developmental assessment measures available, but it is problematic that the majority of them exclude developmental assessment of infants from birth to 2 years of age. Thus, although a variety of assessment measures to assess the development of young children exist, the measures that assess the development of infants from birth to 2 years are limited. Most of the available assessment measures focus on assessing the development of children from 2 years of age and up. This is a huge problem, seeing that the early years of childhood are crucial in infant development; the growth and development that occur during those years have a significant impact on

later development (Luiz, 1994a). 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, and hence, the sooner a child can be assisted (Foxcroft & Roodt, 2009).

5.8 Limitations and challenges in evaluation

There are many challenges to be faced in generating an optimal system of assessment for infants and young children. Challenges related to the assessment approach, the child and the context (environment) will be discussed in more detail below.

5.8.1 Limitations and challenges related to the assessment approach

Despite widespread awareness of the importance of a systematic, contextually based approach to the developmental assessment of infants and young children, demands for "immediate expertise" combined with the pressures associated with enormous service challenges, present formidable barriers to 'best practice.' Professionals may feel that they have to act quickly, leading to the phenomenon of using a fragmented, piecemeal, occasionally undermining approach to assessment rather than using an effective approach that reflects a comprehensive, integrated understanding of infants / young children and their relationships within their families and larger communities and cultures (Meisels & Fenichel, 1996).

Under pressure to produce quick formulations or "scores," professionals have often called on their experiences with procedures and instruments developed for assessing selected competencies and skills in older children, which often yields misleading information. Not being built on a model of how the infant and young child develop within the family, they neither reflect an understanding of the specific types of difficulties and developmental challenges that children and families face in the first three years of life, nor do they represent the best ways to observe and assess the dynamic developmental process as it occurs in infancy and early childhood (Greenspan & Meisels, 1996).

In addition, there has been a tendency to reassess the functions of infants and young children for whom tests or scales are already in existence. Generally, less emphasis is placed on those aspects of development that are hard to measure, and, as indicated earlier, the social and family contexts within which the infant or young child develops has been under-emphasised (Garcia-Coll & Magnuson, 2000).

The most important factor is that the challenge of working with the infant's or young child's individual differences in the family context to elicit the best level of functioning has not been met. Indeed, it is commonplace for assessment approaches to overlook some of the capacities of the infant or young child, particularly those associated with social interactions, especially when an infant or young child has severe relationship and communication difficulties that may be interfering with his or her demonstration of seemingly hidden emotional or cognitive strengths (Greenspan & Meisels, 1996).

Some assessment approaches may, inadvertently, be stressful or even undermining for the infant or young child and his or her family. Not infrequently, for example, infants are expected to deliver quick performance for a person that is a stranger to them. More often than not, they are not adequately observed in interaction with parents or caregivers and at times infants and young children are even separated from parents for the purposes of assessment (Greenspan & Meisels, 1996).

Screening, assessment and evaluation of infants, toddlers and pre-schoolers are particularly challenging and tremendous variability exists in the quality of the tools that are available. Limitations and challenges particularly related to infants and pre-school children in the evaluation process will be discussed below.

5.8.1.1 Infants

Due to infants' level of maturity (e.g. inability to follow instructions) and responsiveness (e.g. inability to verbalise), testing is a daunting task (Louw & Louw, 2007). Very young children are hard to assess reliably and validly because of the relatively undifferentiated nature of their capabilities. Also, infants are less differentiated than older children, who express their developmental status in increasingly differentiated ways as they mature (Shonkoff & Phillips, 2003).

Constitutional variables such as fatigue, hunger, illness and temperament can easily overshadow the abilities of an infant. The time of day, setting, testing materials and other situational factors may also affect performance. The younger the child, the more likely he or she is to fall asleep, become distressed and refuse to comply with directions, or be distracted from assessment activities (Slentz, Early, & McKenna, 2008).

In infancy, biological homeostasis, autonomic regulation and organisational properties of behavioural development are important indicators. These might be informally assessed by observing how long it takes for an infant to calm down after a stressful event, such as an injection; whether an infant turns away from highly stimulating events before becoming over-excited; or whether a 14-month old turns to a caregiver when confronted by an unfamiliar or frightening stimulus. By the time a child reaches 2 years of age, autonomic regulation is typically under control. Then, the developmental challenges associated with gross and fine motor control, receptive and early expressive communication skills, and socio-emotional regulation of affective states become more important and more susceptible to assessment (Snow & Van Hemel, 2008).

The child's expanding repertoire of behavioural and social abilities, including linguistic communication skills, opens up more options for assessment during the toddler years. Assessing infants permits only a relatively global appraisal of level of functioning. Infant assessment is, therefore, rather focused on optimal performance and the testing of limits than on assessing whether the infant can pass a minimum threshold of performance in any particular domain. For infants, even more than older children, optimal performance is dependent on state of arousal (Snow & Van Hemel, 2008).

Prediction of later outcomes would be much easier if developmental assessments used with infants had a one-on-one correlation with measures taken later. Under such circumstances, the timing of early developmental milestones, such as when the child sits unassisted, begins to grasp objects, crawl, babble, and declare wants and intentions, would lead to accurate predictions of later walking, handedness, speech development, and emotion regulation. There is no practical or reliable measure of any specific domain in early infancy that gives a precise prediction about the child's performance in that domain several years later; in part this fact reflects the enormous plasticity of the developing child and susceptibility to environmental influences (Snow & Van Hemel, 2008).

5.8.1.2 The pre-school child

Generally, pre-schoolers' social behaviours are not conducive to psycho-educational assessments. They often follow their own impulses, and may be unaccepting of the constraints of the testing situation.

Young children also often express their feelings easily and can be quite uninterested in their own performance (Bracken, 2000).

Young children's verbal and perceptual-motor response capabilities are limited and they have a restricted ability to comprehend assessment cues. Some types of questions in assessment measures require complex information-processing skills that young children do not as yet possess. They may also have difficulty understanding what is being asked of them in an assessment situation and they may not be able to control their behaviour to meet these demands (Bracken, 2000).

Evaluations and assessment of infants, toddlers, and pre-schoolers are conducted differently from those of older children. During development, a young child will act differently from one situation to another and even from one time of day to another. Changes in the environment, the child's physical state and the interactions that a child has with significant people in his or her life may have a critical impact on how that child will react to evaluation settings and procedures (Ong & Broms, 2000). Younger children present complex challenges and require flexible procedures for gathering meaningful and useful assessment information. Thus, the examiner needs special skills and understanding to work with the pre-schooler, namely; patience and creativity are essential, interacting both positively and confidently with the child. Finally, the examiner must be capable of modifying the assessment towards accommodating changes in a child's behaviour. Professionals should be prepared to modify activities, explore alternative procedures and / or reschedule rather than risk gathering faulty information that compromises assessment results (Slentz, Early, & McKenna, 2008). Generally, a departure from the more traditional methods followed for school-age children is required (Bagnato & Neisworth, 1991; Romero, 1992; Bracken, 2000).

5.8.2 Limitations and challenges in evaluation related to the environment

In the following section limitations and challenges in evaluation specifically related to culture and the South African context will be discussed.

5.8.2.1 Culture

Even under ideal circumstances, assessment is a complicated process, becoming even more complex when the evaluated individual is from a background that is culturally diverse or has limited English speaking ability. Additionally, with the unique age-related problems inherent to the testing of pre-school children, it becomes crucial to conduct an assessment with even greater diligence and attention given to both accuracy and an awareness of those social, cultural and linguistic factors that can influence test performance (Bracken, 2000). “Unrecognised diversity can generate behaviours that interfere with learning and mimic those generated by disabilities.” (Barrera, 1995, p.54).

The more the assessment team understands the cultural values of the family involved, the more successful the interactions and assessments for that assessment will be. In addition, each assessment team member naturally brings his or her individual sets of beliefs, customs and values to any situation. It is important to recognise one's own values and assumptions, first, before one can begin to attempt to understand the cultural differences of another family. Lowenthal (1996) cites important issues for staff to recognise in working with families of diverse cultures, namely; differences in family structures, divergent child-rearing practices and styles of communication, different perspectives about the cause of the disabilities and the value of intervention and socio-economic difficulties (Ong & Broms, 2000).

The culturally different pre-schooler can differ from a mainstream peer on a number of important dimensions. If from an economically disadvantaged environment, the child from a minority group may be less attentive and less persistent on tasks because of differences in the demand characteristics between home and school and, therefore, less likely to do well on tasks with an academic orientation. Solutions to social intervention problems may be more limited in variety or more aggressive. Provided with learning environments where more appropriate learning styles were reinforced, marked improvements in reflection and problem-solving strategies occurred (Garcia-Coll & Magnuson, 2000; Bracken, 2000).

Expressive skills and style of interaction with an adult can differ among culturally different pre-schoolers. Vocabulary for pre-schoolers revolves around their experiences. A culturally different child may have experienced significantly different events (either from the mainstream child or from the areas covered by the assessment materials) and that child might be unable to respond in a similar manner of his or her

peers, who may have had more exposure with the general subject matter (Garcia-Coll & Magnuson, 2000; Bracken, 2000).

The differences in styles of interaction that exist among children of varying cultures have even more significance. Furthermore, in some cultures it is considered impolite (even challenging) for eye contact to be maintained between a child and an adult, or for a child to contradict an adult or to express a differing opinion, or even to speak to an adult unless directly spoken to (Garcia-Coll & Magnuson, 2000; Bracken, 2000).

In the pre-school assessment situation, in particular, these differences may require special intervention or the selection of alternative assessment procedures to maximise the usefulness of the obtained information. Such procedures may supplement or if necessary replace more formal or traditional approaches. The process of assessment of multicultural pre-school children has the potential for error or problems in a number of arenas. Considerable skill, sensitivity and collaboration are required (Garcia-Coll & Magnuson, 2000; Bracken, 2000).

5.8.2.2 Developmental assessment in the South African context

There is considerable evidence that development assessment measures can be used effectively for the early identification and prevention of learning and development difficulties in early childhood. As a result, increased interest has been shown in early assessment and intervention in order for children to realise their full potential. However, in order to achieve these goals effectively, assessment measures used need to be applicable within culturally diverse contexts, particularly within South Africa, with its broad range of cultural and socio-economic groupings (Foxcroft, 1997a).

♦ Testing and assessment

Testing and assessment have been heavily criticised as possessing limited value for culturally diverse populations. Despite these criticisms, it has also been pointed out that, regardless of its flaws, testing remains more reliable and valid than any of the limited number of alternatives. It is argued that the focus should be on valid and reliable tests for use within multi-cultural and multi-lingual societies, since testing plays a crucial role within assessment internationally (Foxcroft, 1997a; Foxcroft, 1997b).

During the past several decades, the unique challenges of cross-cultural testing and assessment have received considerable attention. Cross-cultural assessment has become a sensitive issue due to specific concerns regarding the use of standardised tests across cultures. Given that when one lives in a multi-cultural society, it is imperative that one considers how culture affects the assessment process. South Africa, where this research is situated, has a multi-cultural society with an eventful history, which makes this aspect even more important. Its inhabitants, both individuals and groups, are in various stages of adaptation to a generally Western society, made up of the interesting but complex diversity of all the people inhabiting it (Foxcroft, 1997a; Foxcroft, 1997b).

♦ **Poverty and inequality**

South Africa, as in most of the developing world, is a developing country characterised by high levels of poverty and inequality. The proportion of the population comprised of young children is considerably higher than that in developed countries (Tomlinson, Cooper & Murray, 2005). At present, South Africa may present the picture of a middle-income developing country, but a darker side, one of endemic poverty, became clear when *apartheid* was officially abandoned. Due to its *apartheid*-tainted past, conditions of adversity disproportionately affect the Black South African population. The effects of poverty and inequalities in South Africa are evident across all aspects of child development, being apparent in the high infant mortality rate, stunted growth, high rates of early school drop-out rate and generally low levels of educational attainment, high levels of homelessness and the high incidence of crime. In many instances, children have lost either one or both parents to AIDS. The occurrence of such hardship is associated with high rates of psychological disturbances and developmental problems among such children (Tomlinson, Cooper & Murray, 2005).

♦ **The impact of *apartheid***

In South Africa, the impact of *apartheid* continues to influence testing and assessment. Psychological tests were developed along racial lines, as there was little specific need for common tests because the various groups did not compete with each other. While many tests were developed or adapted for the White population, considerably fewer tests were developed for Black South Africans. As a result, it has

become common practice to use tests developed for White, westernised populations with other population groups (Amod, Cockcroft, & Soellaart, 2007).

While the norms and cautiously applied, the price of such practice may be inaccurate levels of over- or under-identification of children at risk for developmental difficulties. The over-identification of at-risk children is of specific concern when assessing Black South African children. The cost of over-identification can be high, such as, for example, being labelled as mentally handicapped because of barriers to learning and development (Amod, Cockcroft & Soellaart, 2007).

♦ **Rejection of existing western tests within South Africa**

While the current rejection of existing western tests within South Africa stems from genuine concern for cultural differences between groups, Shuttleworth-Jordan (1996) points out the problems associated with an indiscriminate rejection of all such tests. Firstly, such an attitude fails to acknowledge those brain-behaviour relationships and cognitive processes that are common to all humans, and secondly, research resources may be profitably spent on the modification of existing tests for use with urbanised and educated South African populations.

This would be preferable to embarking on the path of separatist test development which has limited international relevance and which may well amount to activity, which is not fruitful. A general disregard of all western tests does not take into account the different levels of urbanisation, westernisation and education that exists in Africa. Even within particular cultural groups, differences exist (Amod, Cockcroft & Soellaart, 2007)

♦ **Alternative options**

While the development of culturally relevant tests is likely to be long and costly, possibly even “an unattainable goal”, in view of the many different cultural groups at differing stages of westernisation in South Africa, each with their own different linguistic and educational abilities.

As an alternative it is, therefore, proposed that the use of internationally available, relevant tests is maximised as far as possible across all colour groups rather than attempting to develop new test material. Existing tests, which have the advantage of being familiar and supported by a vast body of

research, can serve as a “baseline for modification of culturally loaded test items in the South African context and the gradual development of test norms” (Shuttleworth-Jordan, 1996, p.102). Several researchers in South Africa have employed this alternative method.

It is a reality that the development of a new, culturally fair, infant assessment instrument in South Africa is not a possibility in the near future. As a result, it is imperative that the resources that are to hand are utilised to address the needs of the children of South Africa.

5.8.3 Limitations and challenges encountered with existing developmental measures in a multi-cultural society

There are existing developmental measures to be utilised with clinical sensitivity and greater understanding, as they are capable of playing a meaningful role in illustrating specific learning styles, skills, strengths and deficits in a child competing in a western-influenced, multi-cultural South Africa (Bhamjee, 1991).

Many shortcomings are, however, found in existing developmental measures that are relevant today. Allan (1992) has summarised some of the most prominent shortcomings, namely;

- The existing developmental assessment measures are not comprehensive with most measures focusing on specific aspects of development or merely being screening in nature.
- Specific tests are standardised for specific ethnic groups to the exclusion of others and there are only a limited number of standardised tests available to assess the development of Black pre-school children.
- Specific tests are standardised for specific age groups to the exclusion of others.

According to Bhamjee (1991) the existing measuring instruments could, were these tests ethically correctly and sensitively applied, have played a significant role towards indicating certain risk or problem areas and also to highlight certain strengths in the functioning of children in the current South African context. This statement is, however, questioned in the context of the shortcomings mentioned above. It remains to be seen whether it is possible for tests that were developed for a certain culture group to be applied rightfully and correctly to all the diverse cultural groups in South Africa.

5.9 Revised Griffiths Mental Development Scales: applicability in the South African context

Several researchers agree that the Revised Griffiths Developmental Scales can successfully be applied in the South African context to provide a comprehensive profile of children's abilities (Van Heerden, 2007; Stewart, 1997; Allan, 1992). Test information is obtained by means of direct observation, reports regarding other disciplines and biographical data (Kotras, 2001). This measuring instrument is discussed fully below, reflecting the relevance in the South African context.

5.9.1 Background of the GMDS-ER

In view of the above, the Extended Revised Griffiths Mental Development Scales (GMDS-ER) is suggested as a test that attempts to bridge the gap and create the balance within developmental assessment of all young South African children. Ruth Griffiths (1954; 1967; 1970) made one of the most valuable contributions to the assessment of developmental delays in young children with her construction of the Griffiths Scales of Mental Development, and more specifically with her construction of the developmental profile. Griffiths's purpose was to develop an instrument containing a comparative profile of abilities across various domains of development, which would facilitate early diagnosis of deficits in child development (Amod, Cockcroft & Soellaart, 2007). This diagnostic instrument was designed to assess the development of babies in the first 2 years of their life. She indicated that, by means of developmental profiles, illustrated in the form of graphs or histograms, the differential diagnosis of the mental status of babies could be demonstrated (Van Heerden, 2007). According to Thomas (1970), the Griffiths Infant Scales were regarded as being one of the most carefully constructed infant scales and one of the best-known tests developed in England. This is still the case today (Van Heerden, 2007).

Due to the popularity of the Griffiths Scales, Griffiths received many requests for an extension to the infant scales, for use in clinical practice with older children. To meet this need, a revised and extended version of the scales was published in 1970, which covered the period of development from birth to 8 years and 4 months (Stewart, 1997; Amod, Cockcroft, & Soellaart, 2007). Griffiths later realised that for certain skills and items learning could not be logically built into any of the five subscales. As a result, a

sixth subscale, namely; the practical reasoning subscale (Subscale F) was added to the test for children aged 2 years and older. This provided a more comprehensive coverage of the young child's emerging problem solving and logical reasoning skills (Griffiths, 1970). Consequently, the extra subscale resulted in the development of the Griffiths Extended Scales.

By 1994, the findings of various research studies indicated that a need existed for a further revision of the Griffiths Scales (Allan, 1988; Allan 1992), several items were obsolete and certain items were culturally biased and confusing. A provisional version of the revised infant scales from birth to 2 years was submitted during the conference of the association for research in infant and child development (ARICD) taking place during March 1994. Arising from resolutions made during this congress, a project was launched by Professor D.M. Luiz of the University of Port Elizabeth, to revise and re-norm the extended scales in Britain and Ireland. The process consisted of several phases and the studies were aimed at the identification of problematic items, development of new experimental items, adaptation and amendment of existing items, and ultimately, to test the totally extended scales (Van Heerden, 2007).

According to Schröder (2004), a survey was carried out among a group of registered Griffiths users who regularly utilised the test in their work. Respondents were requested to assess the items in nine categories as good or poor. A number of items that caused problems were identified by the respondents and certain new items were identified and tested in pilot studies. Thereafter, the new experimental items were submitted for comments during the ARICD taking place in 2004 (Schröder, 2004).

The revised version was accepted and the standardising of the revised Griffiths developmental scales were finalised in 2006 in Britain. New items were included and the original manual adapted to include the latest instructions.

5.9.2 Description of the five subscales of the Griffiths Scales for infants

Chapter 6 contains a further discussion on the subscales of the GMDS-ER, as it applies to this study.

❖ The Locomotor Scale (Subscale A)

Subscale A assesses gross motor skills, including the ability to balance and to co-ordinate and control movements. It allows for the observation of physical weakness or disability or defects of movement

(Foxcroft & Roodt, 2006). The scale measures to some extent all the series of developing skills that result in the achievement of an upright posture leading on to learning to walk, run, climb etc. "The scale was first placed in sequence, in order to provide an opportunity to gain an initial impression of the overall maturity of the child." (Sweeney, 1994, p.94) "The items challenge the child's regular physical strength, skill in speed and movement, rhythm and poise to a degree which corresponds with their age" (Kotras, 2001, p.23). Locomotor skills differ in kind from 'intellectual' activities, but in the early years while the child is still learning the skills that comprise this area, he or she must draw greatly on mental energy and ability to concentrate. Items include age-appropriate activities such as kicking and rolling (in the first month), walking up and down stairs, running and jumping (in the second year).

♦ **The Personal-Social Scale (Subscale B)**

Subscale B provides the opportunity to assess personal and social development (Foxcroft & Roodt, 2006) at a level which corresponds with the child's age. Some degree of social interaction is necessary from the child as is co-operation in play with older children. Some of the items for the early months include visual recognition of mother, following moving people with eyes and holding a spoon. Items at the older end of the 0-2 range include using a spoon competently to feed self, personal cleanliness, asking for things at table, ability to wash his/her hands and face, helping to dress or undress self and to fasten buttons. According to Kotras (2001, p. 23): "emotional factors affect performance on all scales; however, they usually have a more explicit influence on this scale." According to Griffiths (1984), neglected children as well as overly protected children usually do badly on this scale. Overly protected children are usually slower in learning self-help and personal care.

♦ **The Hearing and Speech Scale (Subscale C)**

Subscale C is considered the most intellectual scale. The subscale allows the assessment of hearing (in the sense of active listening), receptive language and expressive language. The active listening stage at first precedes and then accompanies early pre-speech. It evaluates the development of language by measuring responses to environmental sounds and speech, as well as the production of sounds and words. According to Kotras (2001), this scale requires the comprehension of language and also specific verbal expressive skills in terms of vocabulary, the use of different parts of speech and the use of

sentences and paragraphs. At the younger end of the scale items include being startled by sounds, searching for sounds with eyes, vocalisation other than crying and responding when called. Age-appropriate items for the latter months of the second year include listening to stories, identifying objects and use of word combinations. Children who perform poorly on this subscale, relative to their own performance on the other subscales, may have speech and/or language deficits or may possibly be suffering from a hearing loss (Schröder, 2004).

❖ **The Eye and Hand Co-ordination Scale (Subscale D)**

Subscale D focuses on fine motor skills, manual dexterity and visual monitoring skills. There is an early period of attentive ‘looking at’ or visually examining the immediate physical environment. This visual exploration later accompanies reaching for objects, grasping and other manipulative activities. The items in this scale reflect this process with early items assessing visual adjustment; the ability to focus on and fixate objects keeping them in view when they move. Thus, early items include following a moving light with eyes, looking at a ring or toy momentarily when it is held up and glancing from one object to another. In the second month the items start to include grasping and reaching for things. Age-appropriate items at the top of the 0-2 range for this scale include pouring water from one container to another, building a tower of bricks and throwing a ball into a basket.

❖ **The Performance Scale (Subscale E)**

Subscale E evaluates manipulation skill, speed and precision of work. It assesses the application of developing skills in novel situations and examines simple object exploratory behaviour, object permanence and manipulation and form-board items (Amod, Cockcroft, & Soellaart, 2007). Co-ordination between the eyes and hands, persistence in a task, conception of space and form relations, and information on the child’s personality can also be obtained from this scale (Luiz, 1994a). Age-appropriate items include clasping objects placed in hand, dropping one cube for a second, unwrapping to find a toy or cube, putting a lid back on a box and opening a screw toy. It, therefore, requires that the child handle the material and perform the practical tasks on the scale.

The Griffiths Scales provide a general development quotient in addition to measure of six domains of functioning, each of which is assessed on a separate subscale. Each one of the six subscales has an

age equivalent and by combining the subscales, a comprehensive score called the general quotient (GQ) is obtained. Thereby, any one process of development can be measured independently and as completely as possible. The GQ represents general intelligence as the child's general level of development and is derived by taking the average of the quotients of the six subscales of the child's total performance (Sweeney, 1994). The Scales do not only assess the general or overall development of the child but also specific areas of development integrated by the basic avenues of learning (Kotras, 2001).

The subscales are equal in difficulty at each age level and performance on the different subscales can be compared to the norm of each developmental area (Van Rooyen, 2005). Thus, a developmental profile is accessible, demonstrating a range of abilities and relative strengths and weaknesses. The developmental profile is of particular use in clinical practice and programmatic intervention as it allows for the planning of interventions based on strengths, which are much needed in South Africa (Amod, Cockcroft & Soellaart, 2007).

5.9.3 Standardisation of the Extended Revised Griffiths Scales

A multi-faceted team of international researchers headed the standardisation of the extended revised scales and included an international director of research, assisted by two researchers in South Africa (SAGRT), regional co-ordinators and examiners (Schröder, 2004). The standardisation of the Extended Revised Griffiths Scales was conducted in the UK on a stratified random sample of 1100 children between the ages of 2-years and 8-years old and from various socio-economic groups from England, Wales, Scotland, Northern Ireland and Southern Ireland. The recruitment of children to participate in the standardisation of the extended revised scales occurred in two phases. Luiz et al. (2004) and Van Rooyen (2005) stressed that the necessary ethical procedures were adhered to at all stages of recruiting the children. Finally, the standardisation sample consisted of 1026 children between the ages of 2 years and 8 years of age, representing children from Wales ($n = 107$), Scotland ($n = 61$), Northern Ireland ($n = 120$), Southern Ireland ($n = 103$) and England ($n = 653$). A quota-sampling technique was utilised to select even proportions of children in terms of age, gender, urban/rural, and SES (Van Rooyen, 2005).

5.9.4 Main features of the re-analysed GMDS-ER

Following the 2004 statistical analysis, there were concerns about the reliability of the scoring results in clinical practice. For this reason, a complete re-analysis was undertaken from the raw clinical data in the hope that greater accuracy in describing the developmental progression of the children being tested using the GMDS-ER would be provided.

In May 2006, the re-analysed, extended, revised version of the Griffiths 2-8 year scales, the GMDS-ER, was launched. In terms of the practical use of the test, only the scoring (and interpretation) of the test results was updated and some adjustments were made from the 2004 version. Although minor improvements were made to the administration manual, the test remained the same. Furthermore, both the number and difficulty order of the items in the 2004 presentation were found to be correct and have, therefore, remained the same.

A new analysis manual was produced, which replaces the 2004 technical manual, containing the previous description of the clinical fieldwork but with a totally new statistical analysis and scoring tables. By incorporating the most advanced statistical practices, a presentation that demonstrates a child's profile of achievements from the six different subscales directly, as percentiles and z-scores (standard scores) was created. A range of confidence intervals and explanations of their meaning and use are given in the analysis manual. The examiner uses the standard scores to interpret the child's performance on individual subscales according to the qualitative descriptive categories prevalent in the child's societal context. For example, a z-score of 0 would place the child's performance on any subscale within the average range, whereas a z-score of below -2 would indicate a significant degree of developmental delay or learning disability on that subscale.

Consequently, low performance on all subscales is indicative of a general developmental delay or significant learning difficulties. Similarly, relative discrepancies in the percentile score from a mean of the 50th percentile by more than two standard deviations, or by comparison between subscales or over several assessment occasions, should be noted. These give valuable indications of the child's strengths, weaknesses and rate of progress (ARICD, 2006b).

In addition, an age-equivalent score in a subscale, also known as the “mental age” or “developmental age”, can be obtained by finding the score most closely corresponding to that of the child in the 50th percentile column of a table given in the analysis manual (ARICD, 2006b, p. 21). A general development score can also be obtained by taking the average of the raw scores for the six subscales; also, by using the appropriate table in the analysis manual, a percentile, z-score and age equivalent can be established for this score. Furthermore, a general intelligence quotient and sub-quotients for each of the six subscales can still be calculated and used in describing a child's performance on the GMDS-ER (ARICD, 2006).

These amendments to the technical manual in turn necessitated changes being made to the GMDS-ER record book. The GMDS-ER record booklet changes the labelling of what was previously reflected as *Years 3 to 8* in the original Griffiths scales record book to *Section III for Years 3 to 5*, and to *Section IV for Years 6 to 8*.

Consequently, the numbering of the items in Sections III and IV are now continuous per section and not per year group as was previously reflected in the original scales. This, in turn, necessitated changes being made to the 2006 administration manual, in order to accurately reflect the re-labelling of Years 3 to 8 in Sections as well as the renumbering of the respective test items (ARICD, 2006a). Only in the final stage of the revision process were the item numbers revised.

5.9.5 Reliability and validity of the GMDS-ER

“The reliability of a measure refers to the consistency with which it measures whatever it measures” (Foxcroft & Roodt, 2001, p.41). However, consistency always implies a certain error in measurement. Cronbach's Alphas were calculated for each subscale independently, as well as for the GQ as an indication of the reliability of the subscales as a measure of mental development (Van Rooyen, 2005). The overall reliability of the GMDS-ER is 0.993 which is highly satisfactory. On the whole, the reliability of the individual subscales ranges between 0.90 and 0.99 which is indicative of a high level of internal consistency (Luiz, Foxcroft, & Povey, 2006).

Griffiths (1970) affirmed that each subscale was devised to be a separate and complete scale in itself. It can, therefore, be expected that there are low inter-correlations between some, seemingly unrelated

subscales of the GMDS-ER. Therefore, as Van Rooyen (2005) highlighted, for an indication of the common factor of “general intelligence”, the quotients obtained on each subscale were correlated with the GQ instead. The results obtained from the correlations of the subscales of the GMDS-ER with the GQ indicate moderate to high correlations between the subscales and the GQ, thus confirming the presence of a broad spectrum underlying factor of general intelligence as was gathered by Griffiths (1970). Furthermore, the two most intellectual subscales (Subscales C and F) have similar correlations to the GQ, namely, 0.76 and 0.78 respectively (Van Rooyen, 2005). The two more manual subscales (Subscales D and E) have correlations of 0.55 and 0.53.

The other requirement of any measure is validity: a basic definition of validity is that it concerns what the test measures and how well it does so (Foxcroft & Roodt, 2001; 2006) and is thus not a specific property of a measure. As the Griffiths Scales are a diagnostic measure, content based evidence 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, Barnard, Knoesen, & Kotras, 2004).

Furthermore, the six subscales of the Griffiths were developed to be used independently, therefore, construct related evidence which measures the theoretical construct it is suppose to measure (Foxcroft & Roodt, 2006) was explored. Luiz et al. (2004), found that applying factor analytic techniques to the GMDS-ER generated important information regarding the underlying constructs assessed by the six subscales. Factor loadings of the items on the particular construct(s), together with the amount of variance and its Cronbach’s Alpha, are provided in the technical manuals of the GMDS-ER (Luiz et al., 2004; 2006). The variance is found to range between 64.5 % and 99.9 % as explained by different factors (Van Rooyen, 2005).

5.9.6 Revised Griffiths Mental Development Scales – applicability in the South African context

The need for a measuring instrument that meets all the important aspects of child development in a contemporary South Africa could be satisfied by the Griffiths Mental Development Scales – extended revised (GMDS-ER) should the norms of the standardisation sample be comparable with those of a South African population.

The Griffiths Scales are criterion-referenced in nature, thus the child is compared to an established criterion and not to another child. This is important for cross-cultural assessment, as it assesses the degree of mastery of the individual, thus describing rather than comparing performance. The GMDS appear to be suitable for use within the South African context as they are well researched, appear to be culture-fair and have for several years provided a meaningful assessment of the development of the young South African child. In addition, when resources are limited, the GMDS provides a method of brief assessment of a child's abilities and needs, which can be communicated easily to other workers. This is of great importance in the South African context, where resources are limited and the need for early identification is high (Amod, Cockcroft, & Soellaart, 2007).

Norms for South African children are, however, not yet available for the extended revised version of the GMDS, and studies have not yet confirmed that the revised British norms are suitable for use in the contemporary South African context. Previous studies (e.g., Allan, 1988, 1992; Bhamjee, 1991; Luiz et al., 2004; Knoesen, 2005; Van Rooyen, 2005) have nevertheless found the Griffiths scales to be both a relevant and appropriate measure of choice in the assessment of the development of South African children. Furthermore, South African researchers have recognised the need for accurate and comprehensive measures to assess a child's developmental status in order to obtain a clear picture of developmental strengths and weaknesses (Knoesen, 2003). Van Rooyen's 2005 study and Van Heerden's 2007 study are two of the numerous efforts made by previous South African researchers to justify a suitable assessment measure that can satisfy the developmental assessment needs in South Africa.

Studies in various parts of the world have demonstrated that the Griffiths Scales are applicable to diverse populations and that they tap experiences that are common to different cultures (Luiz et al., 2001). Van Rooyen (2005), however, has stressed the fact that caution should be taken with regard to the use of British-based norms in the South African context as a normal South African profile may differ extensively from that of a normal British profile. It is well known that South African children are culturally diverse; they vary in cultural heritage, degree of acculturation, language, rural/urban location, socio-economic background, parents' educational level, health, preparation for schooling and many other influences that shape human development (Foxcroft, 1997a). It can, therefore, not merely be assumed

that the Griffiths Scales will be applicable to the contemporary South African context. Considering the developmental assessment needs in the current South African context, the GMDS-ER could possibly meet these needs if the results of research studies done on the GMDS-ER are found to be applicable to a South African context. More specifically, it is important for research to ensure that developmental assessment is up to date in the current South African political and societal ethos, but also to ensure a comparative fit to a current standardisation sample. By exploring the applicability of the British norms of the GMDS-ER on a current South African sample, a comparative fit could possibly be identified, as this would strengthen the use of the GMDS-ER in the assessment of South African children (Van Heerden, 2007). The reality that the GMDS are regarded as a culture-fair test (Victoria & Baros, 1990; Luiz, 1994 & Griffiths, 1970) seems to present ample reason to pursue further research in their adoption and standardisation with various population groups in South Africa. The GMDS have the added advantage of being underpinned by a vast amount of international as well as local research, which confirms its usefulness and appropriateness in South Africa (Luiz et al., 2001).

5.10 Comparison of developmental measures on certain key criteria with the GMDS-ER

Considering all that has been said about the developmental assessment needs in the South African context, it becomes clear that none of the above tests have all the required criteria. The table below reflects a comparison between the various instruments. A black cell indicates that the criterion has been met and if a particular criterion is partially met, the relevant cell is greyed out (Van Rooyen, 2005).

Table 1: Comparison of developmental measures on certain key criteria

TESTS	South African Measurement Needs						
	Comprehensive	Functional Assessment rather than abstract concepts	Standardised for all South African groups	Culture-fair potential	Covers age range birth to 7 years	Sufficient knowledge base within South African context	Easy administration in field conditions
JSAIS						■	
Herbst							■
SB5							
WISC-IV							
WWPSI-III							
Gesell	■	■					
McCarthy	■						
BSID-II	■	■					■
KABC-II				■			
Cattell							
GMDS-ER	■	■	■	■	■		■

It is important to note that not all the criteria related to good psychometric instruments are included in Table 1 (Van Rooyen, 2005).

From the above table it is clear that, when compared with other developmental measures on certain key criteria, the GMDS-ER has the potential to fulfil the greatest number of needs of the South African developmental assessment landscape. The standardisation criterion above has been greyed out because relevant research has already done on the original Extended Griffiths Scales in this area. Thus, there are thus some indications of the performance of normal South African children on the Scales as compared to their British counterparts (Allan, 1988; 1992; Bhamjee, 1991; Mothuloe, 1990).

The Griffiths is an instrument that assesses the most important domains of child development. It is child-friendly in nature and is based on activities that occur naturally in most cultures. Items are ordered according to increased difficulty and the individual subscales are comparable (even though this comparison should be done according to standard scores rather than raw scores). The GMDS-ER links the clinical and normative approaches to developmental assessment.

The above, in conjunction with what has been explored in this chapter, naturally progresses to the conclusion that the GMDS-ER is the most applicable existing test for the South African developmental assessment context.

5.11 Summary

The developmental assessment of infants and young children should be based, and expanded on the current understanding of young children's development. The cornerstone of assessment should be the observation of the child in interaction with trusted caregivers and the appreciation of the child's core functional capacities. Assessment involves multiple sources of information, organised and integrated in a continuous growth model of development. Incorporating these approaches into assessment should help parents and professionals to deepen their shared understanding of children's competencies and resources, as well as their understanding of the caregiving and learning environments most likely to help children make fullest use of their developmental potential. Most importantly, to gain a thorough understanding of a child's development, it is necessary to understand child and family in relation to both the immediate and larger socio-cultural environment, including his or her neighbourhoods, communities and societal structures.

In overview, it can be said that this chapter focuses on the development and assessment of children, especially in the context of the new South Africa. Various available measuring instruments in use both internationally and in South Africa, were discussed, with the Revised Griffiths Developmental Scales being discussed extensively, in order to demonstrate that the Griffiths Scales are indeed capable of providing for the assessment requirements of the contemporary South African child.

Chapter 6: Research methodology

6.1 Introduction

This chapter presents the problem statement and the research methodology of the present study. The methodology employed in conducting the study including the research design, the participants, the sampling method, the assessment measures, and the procedure is further discussed. This is followed by a description of the statistical analysis and ethical considerations relevant to the study.

6.2 Aims

The main aim of the study was to explore the performance of 9-month-old South African infants on the Griffiths Mental Development Scales – Extended Revised (GMDS-ER). In order to achieve the above, the current study specifically aimed at the following:

- a) To establish the reliability of the measuring instrument used to this end.
- b) To measure the performance of South African infants on five of the six subscales of the GMDS-ER (the sixth subscale not being applicable to infants (babies)).
- c) To compare the performance of South African babies on the GMDS-ER with that of the British normative sample.
- d) To study the interaction between gender and ethnicity on the Locomotor Scale (Subscale A), Personal-Social Scale (Subscale B), Language Scale (Subscale C), Eye and Hand Co-ordination Scale (Subscale D), Performance Scale (Subscale E) and with respect to the GQ.
- e) To determine whether differences exist in relation to the performance on the Locomotor Scale (Subscale A), Personal-Social Scale (Subscale B), Language Scale (Subscale C), Eye and Hand Co-ordination Scale (Subscale D), Performance Scale (Subscale E) and the GQ of the genders being tested.
- f) To determine whether differences exist in relation to the performance of the various ethnic groups on the Locomotor Scale (Subscale A), Personal-Social Scale (Subscale B), Language

Scale (Subscale C), Eye and Hand Co-ordination Scale (Subscale D), Performance Scale (Subscale E) and the GQ of the GMDS-ER.

6.3 Methodology

6.3.1 Research design

A cross-sectional design was used. Cross-sectional studies involve data collected at a defined time. The main advantage of the cross-sectional design in comparison with the longitudinal design is its timesaving character, whereby the maximum amount of information can be obtained in a relatively short period of time. All participants are tested simultaneously, thus the researcher can finish in a short period, with no need to worry about participants dropping out or relocating before all the information has been gathered. Also, the researcher does not have to wait for the research participants to grow up or become older (Santrock, 2011). This design also avoids other problems such as the effects of repeated practice and constancy of the sample.

Despite its efficiency, though, the cross-sectional approach has its drawbacks. It gives no information about how individuals change or about the stability of their characteristics. It can obscure the increases and decreases of development; the hills and valleys of growth and development (Santrock, 2011).

The aim of the present study was to measure the performance of 9-month-old South African infants on five of the six scales of the GMDS-ER, as well as to compare the performance of South African infants on the GMDS-ER to that of infants in the British normative sample, and to determine whether certain subject variables influence performance on the scales. The subject variables such as age, gender and ethnic group could, therefore, be described as being independent variables.

The extraneous variables which were controlled for by holding them constant or balancing them were:

- a) Age; which was held constant by only selecting 9-month-olds
- b) Normality; being a constant achieved by selecting only infants who enjoyed uneventful birthing processes and subsequently, developmental progress.
- c) Gender; an approximately equal numbers of boys and girls were selected in view of the possibility that the performance of girls and boys on the GMDS-ER could differ.

- d) Ethnic groups; which was balanced by selecting equal numbers of infants from each of the four ethnic groups.

6.3.2 Participants

A hundred and twenty 9-month-old infants, residing in Potchefstroom and Klerksdorp in the North West Province, were included in the sample, and selected on availability. The subject variables of gender and ethnic group were controlled by the inclusion of approximately an equal number of participants of the two genders and the four ethnic groups in the convenience test sample.

A South African sample was collected by using a non-probability sampling method. The specific type of non-probability sampling that was used is a convenience sampling method. A non-probability sampling method (convenience type) was applied in identifying suitable infants to be tested for the study. In non-probability sampling, the probability of any particular member of the population being selected is not known (Evans & Rooney, 2008). The disadvantage of non-probability sampling is that, due to the fact that the probability of an individual being selected is not known, the researcher cannot make a general claim that the sample is representative of the larger population. As such, it will greatly limit the researcher's ability to generalise the research findings beyond the specific sample being studied. Furthermore, the researcher cannot estimate the degree of departure from representation (sampling error).

The advantage of non-probability sampling is that it is far less complicated and more economical, in addition to the fact that it can be conducted so as to take advantage of available (and possibly unanticipated) participants without the statistical complexity of a probability sample. A non-probability sample may, of course, prove to be entirely adequate if the researchers do not intend to generalise the findings beyond the studied sample, or if the study under review is merely a trial run for a larger study (Bailey, 1994).

In convenience sampling, the researcher has sampled whatever individuals were readily available without any attempt to make the sample representative of a population. Although such samples can be used to test research hypotheses, they may not be used to draw inferences about populations. Whatever may be lost in sampling accuracy is recovered in time and money (Stangor, 2011).

Convenience sampling was employed in the present study, because all infants who were easily available at the identified institutions, and who met the criteria, were included in the sample.

6.3.3 Procedure

The following list of procedures was followed during the course of the study:

- 1) The research proposal was submitted to the ethics committee at the North West University (NWU) and permission was obtained to continue with the present study. Ethic approval certificate number (NWU-0094-08-A1) was allocated to the researcher.
- 2) The Department of Health (DoH), managers at the relevant health clinics and principals of the daycare centres and pre-schools were contacted and informed with regard to the purpose of the study and their permission gained to conduct the methodology; that is, to assess 9-month-old infants.
- 3) Letters informing parents of the purpose of the research (Appendix A) were either handed to clinic visitors, or sent to the various clinics, as well as to the teachers at the relevant pre-schools. Persons in charge were asked to distribute these letters as well as a consent form (Appendix B) to the caregivers of infants falling into the relevant age categories. Parents were then asked to complete a biographical / parent questionnaire (BQ - Appendix C) relating to the relevant biological information, and also to indicate their willingness. From these a pre-selection was made to exclude infants not considered to be "normal"; that is, according to the criteria used for normality in terms of this study.
- 4) 120 readily available babies were chosen to participate, using the lists of available infants at clinics and pre-schools.
- 5) The parent(s) of the identified infants were contacted. Written consent to assess their children was then sought, by means of the aforementioned bilingual covering letter and consent form (Appendix A and B).
- 6) Appointments were set up at times that were convenient for the parents and children.

- 7) Testing took place at the relevant clinics and schools. Although the venues were different, all the infants were assessed under the same conditions (for example, no distractions in the environment), with test performance, therefore, not affected in any way
- 8) Testing was carried out by one examiner, the present researcher, who completed a Griffiths training course prior to conducting the study.
- 9) The test was administered during a single test session, to the infants whose parents had given permission for their participation in the study. Prior to the assessment the researcher / assessor informed the parent(s) of the assessment process.

The parent (as well as child) was free to either refuse to participate, or withdraw or be withdrawn from participating, at any stage of the assessment.

- 10) Individual feedback was given by the researcher to the parent(s) of each infant that was assessed on the GMDS-ER. Where applicable, recommendations for intervention were given.

When the study is finalised, written feedback regarding the overall findings of the study will be given to the participating clinics and schools, in addition to the feedback given after the testing process was completed.

6.3.4 Assessment measures

The GMDS-ER was used towards assessing the infants' development. The Griffiths Scales and their revision were discussed in Chapter 5 and will not be dealt with in depth again in this section. Another instrument used was the biographical / parent questionnaire (BQ) (Appendix C).

6.3.4.1 The Griffiths Mental Development Scales – Extended Revised (GMDS-ER)

As already discussed in Chapter 5, the Griffiths Scales were developed in the United Kingdom in 1954 by Ruth Griffiths. They were developed by observing children in their natural environments while engaged in everyday activities (Griffiths, 1970). Griffiths's purpose was to develop an instrument containing a comparative profile of abilities across various domains of development, which would facilitate an early diagnosis of deficits in child development.

6.3.4.1.1 Rationale

This test is used to determine the development of infants from birth to the age of 2 years.

6.3.4.1.2 Subtests

The Griffiths Scales consist of five scales for children from birth to the age of 2 years (Scales A-E), with a separate raw score being allocated to each for the purposes of this study. The raw scores of the various subtests are then added up and processed to obtain quotients, towards determining the absolute level of development. In this manner, it can be determined in which section of each separate subscale of the measuring instrument the infant is manifesting a developmental delay, as well as its total development, whereby delays may be highlighted. The GMDS-ER contains the following subtests:

- **Locomotor Scale (Subscale A)**

Subscale A measures the child's gross motor skills and his / her ability to balance, co-ordinate and control movements. Items on this scale include crawling, sitting, standing, pulling itself up by using furniture, and walking.

- **Personal-Social Scale (Subscale B)**

Subscale B measures the child's skills in everyday activities, as well as his level of independence and personal-social development. Some of the activities in this scale include, *inter alia*, smiling, holding a spoon, drinking from an open cup, reaction to strangers, finger feeding, giving affection and playing interactive games.

- **Hearing and Language Scale (Subscale C)**

Subscale C enables the investigator to assess the infant's receptive and expressive language. The development of language is tested by measuring responses to environmental sounds and speech, as well as the production of sounds and words. Items included here are babbling, singing of tunes, the number of words the infant can utter, identifying and naming of objects.

- **Eye & Hand Co-ordination Scale (Subscale D)**

Subscale D tests the infant's co-ordination between eyes and hands and its ability to skilfully manipulate objects. Items on this scale include the holding of objects, throwing of objects, pointing with the index finger, the holding of pencil as if to mark on paper, and pushing cars along.

- **Performance Scale (Subscale E)**

Skills regarding manipulation, speed and precision are tested by subscale E. Items on the scale includes activities such as manipulation of more than one object, reacting to paper, rattling of box, open lid of box, and completion of form boards.

For the purpose of this study the scale designed for children aged 0 to 2.0 years were used. This scale differs from the scales designed for children aged 2.1 to 8.0 months as only Subscale A to E is administered for children below the age of 2. Every subscale is formulated in such a way that it can be used as separate and complete scale in itself (Luiz et al., 2001). The items in each scale are diverse and gradually increase in difficulty level. Bondurant-Utz and Luciano (1994) point out that the objective in assessment is to gather data that are representative of the child's typical functioning. The items of the Griffiths Scales meet this criterion as it was compiled from natural activities that can be seen in any culture. It includes activities such as walking, playing, responding to own name and identifying objects. Such an assessment requires the employment of a comprehensive measure, which encourages the child to demonstrate his or her abilities.

6.3.4.1.3 Reliability

According to Foxcroft and Roodt (2009) the reliability of a measure refers to the consistency with which it measures whatever it measures. The Cronbach-alpha coefficient was calculated separately for each of the subscales, and a mean coefficient was also calculated, thus indicating the reliability of the subscales as an instrument to measure development (Van Rooyen, 2005). Reliability and validity studies have been conducted on the original GMDS-ER and found that the overall reliability of the GMDS-ER was highly satisfactory (0.993). It was also found to be a valid diagnostic developmental test in that content-based and construct-related evidence was established.

6.3.4.2 Biographical / Parent questionnaire

When individuals are assessed, sufficient background information should be gained, a fact also attested by Foxcroft and Roodt (2001, p.135): "Assessment practitioners need a thorough knowledge of the individuals whom they assess, prior to assessing them." For this reason the biographical / parent questionnaire (Appendix C) was used to obtain and summarise relevant biographical and developmental information about each of the participants in the study.

Prior to the assessment of the infants, the parent(s) were asked to fill in a biographical / parent questionnaire (Appendix C). The purpose of this questionnaire was to obtain relevant information to aid in the research project by, firstly, ascertaining certain subject variables necessary for the correct subject selection, and, secondly, to identify extraneous variables that could be controlled. Such information was required, as it may have influenced test performance and results.

The information categories included in the biographical / parent questionnaire (Appendix C) are as follows:

Infants' age:	Only 9-month-old infants included in present study
Sex	Boy:girl ratio approximately the same
Nationality	Black, Coloured, White, Indian infants included in sample
Parents' occupation and education levels	Factors influencing child development on multiple levels
Infants' birth history	Only normal* infants included
Variables to rule out	E.g. prematurity, difficulties during birth, history of epilepsy, conditions e.g. meningitis, encephalitis, convulsions (fits), head injury / concussion, anaemia, very high temperatures, allergies, being on medication at time of assessment

* Normal: Deemed to have had a typical, uncomplicated birth and an on-course, uneventful developmental history (milestones reached on time).

The biographical / parent questionnaire (Appendix C) was based on a questionnaire used by Bhamjee (1991), adapted to accommodate the aspects included in the present study. Bhamjee's study included children in the older age groups and as a result included items that were irrelevant to the ages of the subjects in the present study, including for example, school performance and developmental mastery that is far beyond the levels of the participants included in the present study. These were eliminated from the original questionnaire and the current customised questionnaire (Appendix C) was created for use in this study.

6.3.5 Research hypotheses

The research hypotheses are as follows:

*** First hypothesis**

The null hypothesis (H0):

The measuring instrument that has been used in this study is not reliable.

The alternative hypothesis (H1):

The measuring instrument that has been used in this study is reliable.

*** Second hypothesis**

A hypothesis could not be made due to the exploratory nature of this objective.

*** Third hypothesis**

A hypothesis could not be made due to the exploratory nature of this objective.

*** Fourth hypothesis**

The null hypothesis (H0):

No interaction exists between gender and ethnicity on the various scales and with respect to the GQ.

The alternative hypothesis (H1):

Interaction occurs between gender and ethnicity on the various scales and with respect to the GQ.

* **Fifth hypothesis**

The null hypothesis (H0):

No differences indicated in the performance of the respective genders as measured by the GMDS-ER.

The alternative hypothesis (H1):

Differences are indicated in the performance of the respective genders as measured by the GMDS-ER.

* **Sixth hypothesis**

The null hypothesis (H0):

No differences exist in the performance of the various ethnic population groups as measured by the GMDS-ER.

The alternative hypothesis (H1):

Certain differences in the performance of the various ethnic population groups are indicated as measured by the GMDS-ER.

The purpose of this research is to reject the null hypothesis, as stated above, thus accepting the alternative hypothesis.

6.3.6 Statistical analysis

The required data processing relevant to this research was carried out by the Statistical Consultation Services of the North West University (Potchefstroom Campus). For this purpose, the Statistica (Version 8) software package was used (StaSoft, 2007). Various techniques were used in processing the data and this will be discussed below.

6.3.6.1 Statistical techniques

The following techniques are used in the study:

6.3.6.1.1 Mean

In order to compare the performance of the infants in this research group with that of the British normative group, the mean scores of the research group will be converted to age-equivalent British norms (Luiz et al., 2006a). The arithmetic mean, commonly known as the average, consists of the sum of all items divided by the number of items (Stangor, 2011).

6.3.6.1.2 Two-way analysis of variance (ANOVA), for simultaneous determining of the differences between the gender groups and the ethnic groups and the interaction between the groups

Two-way ANOVA will not only assess both gender and culture effects in the same test, but also whether there is an interaction effect between gender and culture. A two-way analysis generates three F-tests, one for each effect independently. For each effect, 2-way ANOVA results are calculated using a sum of squares decomposition. The total sum of squares for a data set is a measure of the variability among all the data. The idea behind an analysis of variance (ANOVA) is to divide this total variability into variability between groups (i.e gender, ethnicity and the combination of gender and ethnicity) and variability within groups (also referred to as error variability). If the variability between groups is large compared to the variability within groups, as determined via a statistical test, one concludes that there are significant differences between groups.

In the case of a 2-way ANOVA, the total variability is divided up into three components:

- Variability among the levels of the two factors (gender and ethnicity)
- Variability due to interaction of the two factors
- Variability within cells (error variability).

There is an F-test for each of the hypotheses of no effect, and the F-test is the mean square for each effect divided by the within variance. The numerator degrees of freedom come from each effect, with

the denominator degrees of freedom being the degrees of freedom for the within variance in each case.

In each test, the resulting p-value allows one to determine whether that specific effect is significant.

A significant gender effect (i.e. $p < 0.05$) implies that the null hypothesis of no gender difference in averages is rejected and that any difference between the sample means is not coincidental. Similarly, a significant ethnic effect indicates that the null hypothesis of no ethnic difference in mean is rejected. In order to determine the extent of the difference between the four ethnic groups, a Tukey *post hoc* test for independent groups will be used. This is to carry out a statistical, pair-wise comparison of the ethnic groups' population averages, following up on the testing of the ethnic effect in the two-way ANOVA.

6.3.6.1.3 Practical significance (effect sizes) of differences

Effect sizes (Cohen, 1988) will be used to determine the practical significance of differences between the groups. Although the focus will not be on the p-values, more emphasis will be given to the effect sizes, as a convenience sample (readily available participants) was used in this study. Further, statistical significance does not necessarily indicate that a clinically important difference between averages exists. The APA (2001) strongly recommends the use of effect sizes. For practical significance of a difference between two independent groups' average where the population standard deviation is not necessarily equal, the effect sizes of the differences between the averages may be presented as follows:

$$d = \frac{|\bar{X}_1 - \bar{X}_2|}{S_{max}}$$

where the numerator is the difference between the two groups' averages, without taking into account the sign, and S_{max} is the maximum of the two standard deviations (Ellis & Steyn, 2003).

The following cut-off points for the above, according to Cohen (1988), apply when interpreting the effect sizes:

Type of effect	Effect size	Indication
i. Small effect:	$d = 0,2$	The research should rather be repeated to ensure that an effect indeed exists
ii. Moderate effect:	$d = 0,5$	The results may be significant
iii. Large effect:	$d = 0,8$	Significant results that are of practical importance

For the purpose of this research, attention will be given to effect sizes that indicate a moderate or large effect.

6.3.6.1.4 Cronbach-Alpha

In order to determine whether the measuring instrument is reliable, the Cronbach alpha coefficient is used. This coefficient indicates the internal consistency of the scales within the test. Cronbach alphas are used for dichotomous items, indicating items with values 0 or 1 for incorrect or correct responses, and also for multi-valued items, i.e. items to which more than two values can be ascribed (Allen & Yen, 2002). The latter, for instance, is used in the case of assessment scales. In this study, Cronbach alphas will be used for dichotomous items. According to Huysamen (1996) Cronbach alpha coefficients reflect the degree to which all possible split halves of items measure the same aspect, thus indicating internal consistency. The deduction may be made that alpha coefficients will decrease when different groups of items measure different concepts in a scale. In this study, the performance of the research group was assessed at the hand of the following:

An alpha coefficient with values 0.5 and larger will be used as indicative of reliability.

6.4 Ethical considerations

The following steps were taken to ensure that the research complied with ethical standards:

- * The proposal was submitted to and approved by the ethics committee of the North West University.

- * The parents of all potential participants received an information letter in which the purpose and method of the research were explained, thus enabling them to make an informed decision regarding participation.
- * All the participants' parents gave written consent prior to participating in the testing.
- * Each parent had the right to at any time to withdraw his or her infant's participation
- * All data obtained in the project was handled confidentially.
- * Following the assessment, the parents received feedback regarding their infants' development, and possible problem areas, where applicable, were identified and pointed out
- * The assessor is a registered Clinical Psychologist, who underwent training in the use of the GMDS-ER.
- * No physical discomfort or harm was sustained by any participant during the evaluation process.

6.5 Summary

In this chapter, the research method was discussed, outlining the research design, participants and assessment measures. Subsequently, the process of implementation of the research and the methods for analysing the data were expanded upon. Finally, ethical considerations, and the manner in which they were managed in the current study, were highlighted. The results of the gathered data will now be discussed and interpreted.

Chapter 7: Results and discussion

7.1 Introduction

In this chapter, the research results were interpreted and described. In order to determine whether the performance of the study group of South African infants can be compared with that of the British normative sample, the raw mean scores of the South African groups were converted accordingly. To determine whether the gender groups and various ethnic groups significantly differed from each other, the results of a two-way ANOVA, as well as effect sizes were interpreted statistically. The data was depicted in tables to present the information meaningfully and a key explaining the abbreviations was provided. The research results indicated whether the GMDS-ER could be considered to be a reliable measuring instrument.

The results are discussed according to the aims and each research question is, therefore, answered separately. A concise finding will be provided after the discussion of the data of each specific aim.

The aims of this study are as follows:

1. To establish the reliability of the measuring instrument used in this study.
2. To measure the performance of South African infants on five of the six levels of the GMDS-ER.
3. To compare the performance of South African infants on the GMDS-ER with that of the British normative sample.
4. To study the interaction between gender and ethnicity on the Locomotor Scale (Subscale A), Personal-Social Scale (Subscale B), Language Scale (Subscale C), Eye and Hand Co-ordination Scale (Subscale D), Performance Scale (Subscale E) and with respect to the GQ.
5. To determine whether differences exist in relation to the performance on the Locomotor Scale (Subscale A), Personal-Social Scale (Subscale B), Language Scale (Subscale C), Eye and Hand Co-ordination Scale (Subscale D), Performance Scale (Subscale E) and the GQ of the genders being tested.

- To determine whether differences exist in relation to the performance of the various ethnic groups on the Locomotor Scale (Subscale A), Personal-Social Scale (Subscale B), Language Scale (Subscale C), Eye and Hand Co-ordination Scale (Subscale D), Performance Scale (Subscale E) and the GQ of the GMDS-ER.

7.2 Discussion of the research group

The research group consisted of a sample of 9-month old infants (n=120). Table 2 below reflects the composition of the sample:

Table 2: Frequency distribution of ethnic group and gender

Ethnic Group	Boys	Girls	Total
Black Infants	15	15	30
Coloured Infants	11	19	30
Indian Infants	12	18	30
White Infants	13	17	30
TOTAL	51	69	120

As mentioned previously, a non-probability sampling method (convenience type) was used. The male portion of the participants was smaller, with a total of 51 male participants compared to 69 female participants.

7.3 Descriptive statistic results

The descriptive statistics provide an indication of the distribution of the data, which is important when selecting techniques for data processing, as well as the interpretation of the data.

The results are then presented and discussed.

7.3.1 Results on the reliability of the measuring instrument in this study

Aim 1 was to establish the reliability of the measuring instrument (GMDS-ER) used in this study. The results will graphically be depicted in Table 3.

Table 3: Reliability indices for the GMDS-ER (n=120)

Subscales	Cronbach-α
A	0.840
B	0.680
C	0.722
D	0.589
E	0.664

Key:

- A** Cronbach-alpha-coefficient
A: Locomotor Scale (Subscale A)
B: Personal-Social Scale (Subscale B)
C: Hearing and Language Scale (Subscale C)
D: Eye-Hand Co-ordination (Subscale D)
E: Performance Scale (Subscale E)

The Cronbach-alpha coefficient, being an index of internal consistency, was used to determine the reliability of the measuring instrument. As discussed in Chapter 6, the following applies when interpreting the data. A Cronbach-alpha coefficient of 1 indicates definite reliability with reference to the measuring instrument, whereby Cronbach-alpha coefficients of between 0.5 and 0.8 indicate satisfactory reliability and scores lower than 0.5 raises doubt in respect of the reliability of the measuring instrument (Huysamen, 1998).

The results as reflected in Table 3 can be interpreted as follows:

▪ **Subscale A**

In Subscale A of the GMDS-ER, which measures locomotor skills, a Cronbach-alpha coefficient of 0.84 was achieved. The value is > 0.5 indicating a reliable variable.

▪ **Subscale B**

The Cronbach-alpha coefficient on Subscale B of the GMDS-ER, which tests personal-social skills, was 0.68 – a value that also indicates > 0.5 , indicating reliability.

- **Subscale C**

On Subscale C of the GMDS-ER, which tests linguistic skills, a Cronbach-alpha coefficient of 0.722 was indicated. Reliability of this variable is indicated with a value of > 0.5.

- **Subscale D**

The Cronbach-alpha coefficient of Subscale D of the GMDS-ER, which measures eye-hand co-ordination, was 0.589. This variable also achieved a value of > 0.5, which may be seen as reasonably reliable.

- **Subscale E**

Subscale E of the GMDS-ER, which measures performance, indicated a Cronbach-alpha coefficient of 0.664. The reliability of this variable is indicated with a value of > 0.5.

The results of this study indicated average reliability indices for the GMDS-ER for this specific research group. The Cronbach-alpha reliability indices varied between 0.589 to 0.84 on the various subscales, implying that the findings have moderate to high reliabilities. A possible reason for the variation of the reliability indices can lie with the inter-item correlations on the different subscales. For example, on Subscale D where the Cronbach-alpha indice was 0.58, the correlation between the items was lower and not as consistent as the items on Subscale A where the indice measured 0.84. According to Luiz et al. (2006), the overall reliability score of the GMDS-ER reads 0.993, which is highly satisfactory in the opinion of this researcher. A possible reason why the reliability scores in this study were lower than the 0.993 reported by Luiz et al. (2006) could be due to the smaller sample used in this study.

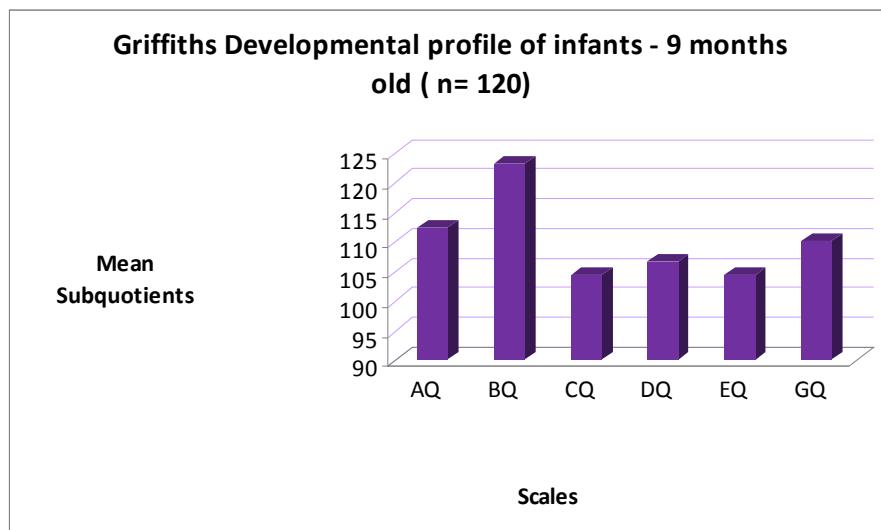
7.3.2 Results of the performance of South African infants on five of the six levels of the GMDS-ER

The second aim was to measure the performance of 9-month old South African infants on five of the six levels of the GMDS-ER.

Table 4: Mean developmental profile of South African 9-month old infants (n=120)

Griffiths Scales	Mean	Standard Deviation	Minimum	Maximum	Range
AQ	112.27	12.08	84.15	139.87	55.72
BQ	123.06	9.85	91.56	147.76	56.20
CQ	104.30	8.86	85.75	135.63	49.88
DQ	106.47	6.76	92.78	125.95	33.17
EQ	104.23	6.95	88.24	123.07	34.83
Raw GQ	110.07	7.17	93.91	127.13	33.22

Fig 2: Griffiths developmental profile of 9-month old South African infants (n=120)



This section presents and discusses the findings of the study in relation to Aim two, namely; to explore and describe the performance of 9-month old infants (n = 120) on each of the five subscales of the GMDS-ER, as is summarised in Figure 2 and Table 4 above. Descriptive statistics were employed and included measures of central tendency (e.g., arithmetic mean) and variability (e.g., standard deviation)

(Stangor, 2011). Figure 2 is a graphically presented profile, depicting the performance as measured by the mean scores of the 9-month old infants on the GQ and across the five subscales of the GMDS-ER.

As depicted graphically in Figure 2 and quantitatively in Table 4, the mean general quotient (GQ) for the 9-month old infants ($n=120$) was 110.07 indicating average general performance. The results for the total sample indicate that the mean GQ and mean subscale quotients varied (i.e. from 104.23 to 123.06) and had different variables with the standard deviations (SD) ranging from 6.76 to 12.08. The results further indicated that the mean score of Subscale B (Personal-Social) was higher compared to the other scales. The present study found that the South African sample overall obtained the highest scores in the Personal-Social Subscale, with second highest scores obtained in the Locomotor Subscale.

Results on the Locomotor (AQ) ($X_{AQ} = 112.27$), and Personal-Social (BQ) ($X_{BQ} = 123.06$) subscales revealed above average performance. Average performance was noted on the Hearing and Language (CQ) ($X_{CQ} = 104.30$), Eye-Hand Co-ordination (DQ) ($X_{DQ} = 106.47$), and Performance (EQ) ($X_{EQ} = 104.23$) subscales. The largest range was found within the Personal-Social Subscale (range 56.2), with the highest developmental sub-quotient of 147.76 and the lowest developmental sub-quotient of 91.56. The lowest range was found within the Eye and Hand Co-ordination Subscale (range 33.17) with the highest developmental sub-quotient of 125.95 and the lowest developmental sub-quotient of 92.78. The greatest variability in scores occurred within the Locomotor and Personal-Social Subscales, as reflected by their large ranges.

❖ **Performance of 9-month old infants on the Locomotor Scale (AQ)**

Subscale A, the Locomotor Scale, provides the opportunity to observe physical development in young children. Items include age-appropriate activities such as general movements, ability to balance as well as the ability to co-ordinate and control movements. The mean quotient for the 9-month old infants on Subscale A was 112.27 indicating *above average* performance on this scale. On locomotor performance, the minimum score recorded was 84.15, while the maximum score was 139.87, thus indicating a range of 55.72. The results indicate that some of the participants appeared to be rather well developed when completing locomotor activities, while others appeared to struggle in this area.

A possible explanation for this sample's above average performance on the Locomotor Subscale could be genetic predisposition. According to Smyth and O'Keeffe (1998) fundamental motor development primarily indicate gross motor skills such as crawling, walking, running and skipping. These skills (which compare with the Locomotor Scale of the GMDS-ER) are primarily genetically predisposed.

In South Africa, more opportunities may be available for outdoor play and to engage in physical activities in the early years. Therefore, greater exposure to opportunities could have influenced development of the South African infant in this domain. Skills in large muscle usage also develop through vigorous, active play, which usually takes place outdoors (Read, Gardner, & Mahler, 1993). Weather conditions in South Africa, for the greater part of the year, are conducive to playing outside and engaging in the gross-motor activities that are quantified by the GMDS-ER Locomotor Subscale. Gallahue and Ozmun (2006) further assert that play greatly influences the rate of development of locomotor, manipulative and stability abilities. Although the research group consisted of 9-month old infants who are not yet capable of outside play, it must be remembered that infants experience less discomfort when it is less cold and that it may, due to their being dressed in less bulky clothes, be possible for them to be able to move and explore more freely. Early "formal handling experiences" such as stretching exercises, introducing activities such as making them sit up, or playing games that promote walking and jumping skills by South African parents could have influenced and stimulated physical and motor developmental skills of the infants.

During the early years, children grow at a rapid rate. Bodily changes are co-ordinated by a continuously growing brain and central nervous system, in order to enhance motor skills (Papalia et al., 2009). Coupled with this, favourable living conditions and a safe environment are required to ensure positive physical development of children. Although many researchers aver that South Africa may be seen as a vulnerable environment, with the path from infancy to adulthood being a fragile one, due to the extent of HIV/AIDS (UNICEF, 2007), poverty (Louw & Louw, 2007), the lack of pre-school education (Knoesen, 2003), malnutrition (Louw & Louw, 2007) and the high frequency of crime, it would appear that these factors did not have a significant inhibitory effect on the development of the locomotor skills of the research group yet.

Although the somewhat similar studies on the original Griffiths Scales (Allan, 1998; 1992; Bhamjee, 1991; Mothuloe, 1990; Knoesen, 2003; Van Heerden, 2007) tested children from different age ranges than the present study, it is still useful to review their findings as a benchmark against which to measure and compare this sample's performance. In Van Heerden's 2007 study, the Locomotor Subscale was elevated above the other five subscales. Similarly, Knoesen (2003) and Smit (2008) also found their sample's performance on the Locomotor Subscale to be better than its performance on the other subscales.

❖ **Performance of 9-month old infants on the Personal-Social Scale (BQ)**

Subscale B, the Personal-Social Scale, together with the Locomotor Subscale (Subscale A), can be considered the least cognitive of all the subscales of the GMDS-ER. The Personal-Social Subscale gives opportunity to assess personal and social development and concurs with emotional development. The child's ability to take part in everyday activities and to interact with other children in addition to his / her level of independence is measured by means of this scale. These items include the ability to react to a mirror image, helping to dress and undress oneself, holding of a cup for drinking, using a spoon, pointing with a finger, clapping hands, or displaying interest in other children and adults. On Subscale B, the Personal-Social Scale, the mean quotient (BQ) was 123.06 indicating above average performance on this scale. This was the highest subquotient achieved by the participants. On personal-social performance, the minimum score recorded was 91.56 while the maximum score was 147.76. The results indicate that all participants appeared to perform at average, above average and rather advanced levels on Subscale B (personal-social development).

The high mean quotient (BQ) may reflect that infants raised in lower SES environments are at times left with little or no supervision and they could, therefore, be more independent in personal-social tasks such as holding a cup for drinking or using a spoon for feeding. Van Rooyen (2005) suggested that the economic situation in South Africa may encourage earlier independence as a result of the cost and availability of day care facilities, which may imply that many South African children have to, at an early age, take responsibility for personal hygiene, eating and dressing. Early adult-child interactions are also measured by Subscale B.

On the other hand, it is also a fact that, due to economic hardship in South Africa, the mother may have to start working early in the child's life, necessitating early independence due to the lesser amount of attention received. Here, however, the contrary is also true: when the mother or extended family members don't work (due to high unemployment in South Africa), they are able to spend more time with the infant and stimulate his development, for instance by showing him how to clap, encouraging him to hold a mug and play games such as peek-a-boo or play by means of facial expressions. There is considerably less pressure on parents and other care givers who don't work, thus resulting in greater patience levels and more time being available to spend with the infants. In this regard, Papalia et al. (2009) indicates that parental presence at home is essential during the early childhood years, to enable children to model personal-social conduct.

Deacon (2008) emphasises that home conditions play an important role in personal and social development. Despite high levels of alcohol abuse, unemployment, crime, poor housing conditions and incomplete family structures in the South African context (Moosajee, 2007), this group in the present study still performed above average. It is, however, important to keep in mind that a non-probability sample was used and that the infants in the research sample were not necessarily exposed to low socio-economic circumstances, crime or inadequate education. It may, therefore, not be a true reflection of the broad group of South African infants.

South African infants in day care centres are surrounded by many other infants and children, or, if at home, they are surrounded by siblings, or cousins (extended family). It may be that South African infants, therefore, fare well on this subscale because they imitate other babies and children and by repetition they may acquire and master the relevant skills earlier, which in turn serves to promote their development. Infant development researcher Meltzoff (2004, 2005, and 2007) has conducted numerous studies on infants' imitative abilities. He concluded that 9-month old infants could imitate actions that they had seen performed 24 hours earlier, such as pushing a recessed button in a box, which produced a beeping sound. Also, in a recent study, engagement in deferred imitation at 9 months of age was a strong predictor of more extensive production of communicative gestures at 14 months of age (Heimann, Strid, Smith, Tjus, Ulvund, & Meltzoff, 2006).

❖ **Performance of 9-month old infants on the Hearing and Language Scale (CQ)**

Subscale C, the Hearing and Language Scale, can be considered the most cognitive of the subscales, providing an opportunity to study growth and development of language. Infants' use of expressive language (manifesting as age-appropriate different sounds, babbling of monologue / short sentences, and sometimes even definite and meaningful words) and receptive language is measured by means of this subscale. In the case of infants, the items for this subscale include listening to sounds, familiarity with its own name, interest in pictures and making use of sounds and words. On Subscale C, the mean quotient (CQ) was 104.30 indicating average performance on this scale. On hearing and language performance, the minimum score recorded was 85.75 while the maximum score was 135.63 indicating a range of 49.88.

Although those infants in the sample group scored average on the Language Subscale, their performance on this subscale when compared to other subscales was the poorest together with the performance scale. This may be due to various reasons. The new South Africa has 11 official languages, which comprises another set of influences that may impact on the development of infants and young children. As it is not uncommon for children to be exposed to more than one language from an early age, this situation may easily result in language confusion. Research studies have indicated that children who are forced to acquire more than one language necessarily have to fragment the resources available to them in the process of first language acquisition (Louw, Van Ede & Louw, 1998). Of course, the infant participants in the sample used in this study may or may not have achieved poorer performance on the language subscale due to the fact that they may or may not have been obliged to learn to understand and communicate in more than one language at a very early stage of development. It does not follow that the participants were indeed exposed to multiple languages. This researcher concurs with Van Rooyen (2005), however, in that further exploration is required and that speculation must be applied cautiously as to causal influences.

Lack of stimulation is one of the major negative influences on child development. Where lower scores in this group were achieved, stimulation may be lacking, if for instance the infants in the group were not exposed to music, or subjected to rhyme exercises and object games. These types of games encourage

infants to recognise and name objects, thereby enhancing vocabulary, and, therefore, language development. Reading to the infants / children also encourages language development.

Another possible explanation may be the parents' level of education. Many parents in South Africa have not acquired the literacy levels required to adequately provide stimulation for their children. There is also a certain level of insight required to be able to assess and provide the necessary stimulation.

Poverty in South Africa could also be a contributory factor, as it may possibly force both parents to work longer hours, again leaving less time for interacting with their infants. These are only some of the possible factors that may have influenced the poorer performance of part of the South African infants on this subscale.

Kotras (2001) in a similar study to the present one, with a sample of HIV+ infants at 1 and 2 years old indicated that the 1 year old infants scored average on the Hearing and Language Scale, while, in comparison the 2 year old infants showed a mildly retarded performance on this scale.

❖ **Performance of 9-month old infants on the Eye and Hand Co-ordination Scale (DQ)**

Subscale D, the Eye and Hand Co-ordination Scale, assesses the child's visual perception skills, physical dexterity and fine motor skills. Items include visual tracking, reaching and grasping, pen and paper skills and object manipulation. On Subscale D, the mean quotient (DQ) was 106.47 indicating average performance, the minimum score recorded was 92.78 while the maximum score was 125.95 indicating a range of 33.17.

Both Knoesen (2003) and Van Heerden (2007) found their sample's performance on the Eye and Hand Co-ordination Subscale to be one of the weakest. In the present study, a similar trend is found. Reasons that are often provided to explain the poorer performance of South African children on this subscale revolve around inadequate day care facilities and pre-schools in the disadvantaged areas, which entails having a weak foundation when the children later enter their formal schooling stage (Davidson, 2008).

Poverty in South Africa is another possible factor, as so many people are mainly concerned with survival (Maslow's (1954) hierarchy of basic needs, for example, shelter, food and water (Craig, 1996). So, for

example, many children in South Africa simply do not enjoy the luxury of paraphernalia such as pencils and crayons or small toys to stimulate their fine motor development. The lack of toys might further influence test administration; the child being exposed to toys for the first time might feel overwhelmed, just wanting to play with them instead of finishing a test item. Also, a lack of exposure to a stimulating environment that facilitates and encourages developmental skills in the area of eye-hand co-ordination and performance may have influenced the South African sample's performance on this subscale.

Similar to the present study, Kotras (2001) indicated an average performance by the 1-year old infants in that sample on the Eye-Hand Co-ordination Scale.

Furthermore, fine motor skills depend more on environmental influences such as exercise, learning and education (Smit, 2005).

❖ **Performance of 9-month old infants on the Performance Scale**

Subscale E, the Performance Scale, is very largely a visual-spatial performance test which allows the examiner to observe and measure skill in manipulation, speed of working and precision. Constructs that form part of this subscale include the ability to skilfully manipulate objects and execute a task with precision, as well as visual abilities (Kotras, 2001). Items include the infant's ability to lift the lid off a box, remove cubes / blocks from a box and form-boards. On Subscale E, the mean quotient (EQ) was 104.23 indicating average performance on this scale. The minimum score recorded was 88.24 while the maximum score was 123.07 indicating a range of 34.83. Although performance on this subscale was the poorest together with the Language Subscale, their performance is still classifiable as average.

7.3.3 Results of the performance of South African infants on the GMDS-ER compared with the British normative sample.

The third aim was to compare the performance of South African infants on the GMDS-ER with that of the British normative sample.

Table 5: The performance of South African infants on the GMDS-ER compared to the British normative sample

Griffiths Subscales	n	Mean	Standard Deviation	Age in months	Age Equivalent Scores (AES)
A	120	112.27	12.08	9.15	10.0
B	120	123.06	9.85	9.15	10.0
C	120	104.30	8.86	9.15	10.5
D	120	106.47	6.76	9.15	9.50
E	120	104.23	6.95	9.15	10.0
GQ	120	110.07	7.17	9.15	12.25

Key:	
A:	<i>Locomotor Scale (Subscale A)</i>
B:	<i>Personal-Social Scale (Subscale B)</i>
C:	<i>Language Scale (Subscale C)</i>
D:	<i>Eye-Hand Co-ordination Scale (Subscale D)</i>
E:	<i>Performance Scale (Subscale E)</i>
n:	<i>Sample size</i>
GQ:	<i>General Quotient according to norm tables</i>
AES:	<i>Age Equivalent Scores</i>

Table 5 provides a breakdown indicating the average performance of the research sample on each subscale, as well as a mean quotient indicating the average scores on the subscales. The age-equivalent scores are reflected in the last column, as provided in the norm tables of the GMDS-ER (Luiz et al., 2006).

In this study, the research group achieved the highest age-equivalent score on the GQ and on the Language Scale (Subscale C). The lowest age-equivalent score was achieved on the Eye and Hand Co-ordination Scale (Subscale D).

The performance of the research group on each of the subscales will be discussed in the following section.

- **Locomotor Scale (Subscale A)**

As seen in Table 5, the research sample performed slightly better (advance of 0.85 months) on the Locomotor Subscale compared to the British normative sample. This implies that the motor skills of the infants in the current study with regard to general strength, balance, rhythm, and movement compared similarly to that of the British infants.

Van Rooyen (2005) found that the South African sample in his study performed significantly better than the British sample on the Locomotor Scale, confirming by Allan's 1992 study, which provided evidence that the locomotor development of South African children was significantly more mature than that of their British counterparts. These differences in performance on the Locomotor Scale seem to have become less significant as reported in Van Rooyen's 2005 study, which indicated that, although South African children consistently scored better than their British counterparts, these differences were seemingly smaller for the later year groups (children aged 6-years to 7-years of age) with no significant differences detected. On the other hand, Van Heerden (2007) did not find any statistical significant differences on Subscale A between the South African sample and the British sample. Also, a more recent South African study by Smit (2008) found that the South African sample showed a 3.5 month delay in comparison to the British sample on the Locomotor Subscale.

- **Personal-Social Scale (Subscale B)**

The group of South African infants in the present study performed similar to the British norms in terms of personal and social development as well as independence. It appears that there is a slight advance of 0.85 months in the performance of the South African infants on the Personal-Social Scale.

Van Rooyen (2005) suggested that the economic situation in South Africa may encourage earlier independence as a result of the cost and availability of day care facilities, which may imply that many South African children have to take responsibility at an early age.

Cultures have inherited different patterns of child-rearing. Differences in child-rearing practices (i.e., allowing more independence) may, therefore, be another reason for the slightly better performance of the South African sample on the Personal-Social Subscale (Gallahue & Ozmun, 2006). In South Africa, it is common for both parents to have to work in order to provide a higher income for the family, resulting

in parents often having to leave children at day care centres or family members from as young as 6 months of age. In Britain, there is an added factor influencing child-rearing practices, which is the duration of maternity leave available to British mothers. They are allowed up to two years of maternity leave, which may give rise to problems (i.e., separation anxiety and difficulty relating to two sets of disciplinary norms) once the child is looked after by differing care givers (day care or family) thereby possibly influencing the British child's personal-social development.

Van Rooyen (2005) found that the South African sample performed significantly better than the British sample on the Personal-Social Subscale. In contrast, Van Heerden (2007) and Smit (2008) found no significant difference in the performance of the South African and British children. The results of the present study agree with the findings of Van Heerden (2007) and Smit (2008).

- **Language Scale (Subscale C)**

Comparing the developmental profiles of the contemporary South African sample and the British standardisation sample on the Language Subscale revealed no differences in terms of expressive and receptive language as well as an overall understanding of language. As can be seen in Table 5 the South African sample was slightly (1.35 months) in advance of the British sample on this scale.

A possible reason for the phenomenon of no differences between the South African sample and the British sample on the Language Subscale may be that language acquisition is seen as a robust process with a great deal of resilience, even in the face of wide environmental and biological variation (Bishop & Leonard, 2000). Another possible reason may be that the current study's sample consisted of 9-month old infants, who are still in the early stages of language acquisition, thus significant differences do not as yet occur between the two groups.

Studies by Van Heerden (2007), Van Rooyen (2005) and Smit (2008) revealed significant differences between South African and British children on the Language Subscale. The research conducted by Allan (1992) also found a significant difference in the performance of Black South African children and British children at 6 years of age, namely; better performance by the British children.

- **Eye and Hand Co-ordination Scale (Subscale D)**

The group of South African infants in the present study showed similarities in their performance of visual perception skills, physical dexterity and fine motor skills when compared to the British sample. As seen in Table 5 the South African sample was slightly (0.35 months) in advance of the British sample on this scale.

Although early childhood programmes in South Africa are diverse in nature and not geared to meet the individual needs of infants and children in South Africa, it would appear that it does not have such a huge influence on infants at 9 months of age. Infants may be stimulated to a large extent by their parents and they may not yet be that dependent on pre-schools and trained teachers to develop optimally.

A comparative study done by Van Rooyen (2005) revealed no significant differences between the British sample and its South African counterpart. Furthermore, studies done on the original Griffiths Scales (Allan, 1988; 1992; Bhamjee, 1991) found no differences between the performance of South African and British children on Subscale D. As highlighted by Van Rooyen (2005), however, the British children in the sample from Hanson and Alridge-Smith (1987) were found to perform significantly better than the South African Black 5-year and 6-year olds and Coloured 5-year olds. Previous research in this regard thus tends to indicate better performance by British children, but this does not reach significant proportions (Van Rooyen, 2005). Studies by Van Heerden (2007) and Smit (2008) found that British children fared significantly better on this subscale.

- **Performance Scale (Subscale E)**

The developmental profiles on the Performance Subscale of the South African sample and the British normative sample revealed similar performances in terms of visual-spatial awareness, speed of performance and precision. As seen in Table 5, the South African sample was slightly (0.85 months) in advance of the British sample on this scale.

Smit (2005) confirmed that fine motor skills such as manipulation of objects, and executing a task with precision, depended on environmental influences such as practice, learning and education. It, therefore, emerges that South African babies in the study are stimulated and exposed to fine motor activities, which in turn leads to satisfactory performance and development. At the same time, it appears that the

influences of poverty and a poor environment, with the concomitant shortage of victuals, do not yet have such a large influence on the development of a 9-month old infant.

Previous researchers done on the original Griffiths Scales (Allan, 1988; 1992; Bhamjee, 1991) all showed a tendency for British children to perform better in year group VI. Smit (2008) also reflected that the British children performed better on the Performance Scale than the South African children. Although Van Rooyen's (2005) study did not find any significant differences, the study did, however, contradict previous research as it revealed that South African children performed slightly better than their British counterparts in year VI. This is also the case in the present study, where the researcher found that South African infants at 9 months of age performed slightly better than the British group.

- **Raw GQ**

The general quotient is obtained by calculating the average of the five scales. As this group of South African infants showed a slight advance on all the scales, it is to be expected that the average age-equivalent score for this group also show an advance. This research group achieved an average age-equivalent score of 12.25 months against a chronological age of 9.15 months.

- **Conclusion: Aim 3**

The performance scores on all five subscales as well as on the GQ were similar for the present study sample as well as for the British sample. The South African sample performed slightly better on all the subscales as well as on the GQ.

It deserves mention that Smit (2008) conducted a study with similar aspects to this research, in which it was found that South African pre-school children (five and six years old) showed a minor to severe backlog on all the subscales of the GMDS-ER in comparison with the British normative samples. The current study also compared a South African sample with the British normative sample, but in this case, the development of a research group of 9-month old infants was evaluated. Also using the GMDS-ER to evaluate the sample participants, the current study found no significant differences between the development of the British sample and that of the South African sample.

It is important, however, to focus on possible reasons and to arrive at a conclusion as to why significant differences occurred in the development of the pre-school children, but no such differences occurred at an early age such as 9 months, which was the age of the current study group.

The fact that no differences could be reported between the development of this group of South African infants and the British normative sample in this study could be an indication that many typical developmental changes of infancy and early childhood, such as the ability to walk and talk, are tied to maturation of the body and brain; the unfolding of a natural sequence of physical / developmental changes and behaviour patterns. Infants and young children mostly develop similarly, with later influences exerted on the individuals as the children grow older, impacting much more on their development, such as environmental factors and life experiences (Papalia et al., 2009).

It appears that various factors in the child's environment, such as poverty, which could contribute to a non-conducive environment, inadequate day care, crime, and ethnic and cultural differences may significantly influence child development as they age. Although infants are exposed to all these factors, there has not at 9 months of age been any significant, perceivable result. It is also a fact that infants do not yet interact significantly with the factors that influence their immediate environment, as do older children to an ever-increasing extent as they grow, who do display a noticeable reaction to their environment and those factors that markedly influence that environment.

In South Africa, by the very nature of its everyday life, children are exposed to conditions such as poverty, violence, AIDS and its convoluted influences, and food and housing shortages, all of which pose a risky background against which development must take place. All these factors may contribute to promote developmental problem situations.

HIV-Aids, poor infrastructure and the locus of policy-making agencies in South Africa are well known factors that could possibly result in a situation of insufficient stimulation of the developing child (such as a lack of exposure, lack of opportunities and lack of attention), which could pose further possible reasons for the poor performance of the South African sample in the Smit study (2008).

7.3.4 Results of the interaction between gender and ethnicity on the various scales and with respect to the GQ on the GMDS-ER

The fourth aim was to study the interaction of gender and ethnicity on the various scales and with respect to the GQ.

A two-way factorial analysis of variance (2-way ANOVA) was performed to study the separate and combined effect of gender and ethnicity on the various scales and with respect to the GQ.

The findings regarding the combined effect of gender and ethnicity on the various scales and on the GQ reveal the following:

- **Subscale A: Locomotor Scale**

No significant interactional effect [$F (3; 112) = 0.39, p = 0.76$] was found between gender and ethnicity on this scale. This means that the way in which the means differ between the ethnic groups are the same for males and females. The gender groups can, therefore be pooled to test for a significant ethnic effect.

- **Subscale B: Personal-Social Scale**

No significant interactional effect [$F (3; 112) = 0.72, p = 0.50$] emerged between gender and ethnicity on Subscale B.

- **Subscale C: Hearing and Speech Scale (Language)**

No significant interactional effect on a 5 % level [$F (3; 112) = 2.51, p = 0.06$] emerged between gender and ethnicity on Subscale C.

- **Subscale D: Eye-Hand Co-ordination Scale**

No significant interactional effect [$F (3; 112) = 0.10, p = 0.96$] emerged between gender and ethnicity on Subscale D.

- **Subscale E: Performance**

No significant interactional effect [$F (3; 112) = 0.58, p = 0.63$] emerged between gender and ethnicity on Subscale E.

- **Raw GQ: General Quotient**

No significant interactional effect [$F (3; 112) = 0.25, p = 0.86$] emerged between gender and ethnicity on the general quotient.

These findings indicated that there was no significant interaction on a 5 % level between gender and ethnicity, on the five subscales and with respect to the GQ (except possibly for Subscale C where almost significant on a 5 % level). For this reason, the researcher investigated gender and ethnicity as separate entities.

7.3.5 Results of the performance of the genders being tested with the GMDS-ER

The fifth aim was to determine whether differences exist between the performances of the two genders being tested with the GMDS-ER.

Table 6: Comparison of the descriptive statistics for each individual subscale and the general quotient for 9-month old South African boys and girls on the GMDS-ER

	Boys (n=51)		Girls (n=69)		F	df	p	d
	Mean	SD	Mean	SD				
A	108.97	12.31	114.71	11.38	5.50	1;112	0.0208*	0.4659
B	120.13	9.09	125.22	9.88	7.27	1;112	0.0081*	0.5150
C	101.76	7.73	106.18	9.21	7.33	1;112	0.0078*	0.4796
D	106.00	6.30	106.83	7.10	0.13	1;112	0.7228	0.1168
E	103.05	6.88	105.10	6.92	1.97	1;112	0.1637	0.2959
GQ	107.98	6.79	111.61	7.09	6.92	1;112	0.0097*	0.5114

Key:

- A:** Locomotor Scale (Subscale A)
- B:** Personal-Social Scale (Subscale B)
- C:** Hearing and Language Scale (Subscale C)
- D:** Eye & Hand Co-ordination (Subscale D)
- E:** Performance Scale (Subscale E)
- GQ:** Raw General Quotient
- * Statistical significance on a 0.05 level
- n:** Sample size of study group
- SD:** Standard Deviation
- F and df:** F-value and degrees of freedom in a two-way analysis of variance (ANOVA) with gender and population group as factors
- p:** p-value of F-test ($p \leq 0.05$)
- d:** The effect size is the criterion for practical significance

Statistically significant ($p \leq 0.05$)

- +: Practically significant with a small effect size ($d \geq 0.2$)
- ++: Practically significant with a medium effect size ($d \geq 0.5$)
- +++: Practically significant with a large effect size ($d \geq 0.8$)

The findings presented in Table 6 as a result of a two-way ANOVA reveal statistically significant gender-based differences on Subscales A, B, C and for the GQ, as well as practically significant differences of medium effect on Subscales A, B, C and the GQ. The data analyses reflected that girls performed significantly better than boys on scales A, B, C and the GQ.

A comparison between the means of the test results for boys and girls on the various subscales at 9-month old evaluation is shown graphically in Figure 3.

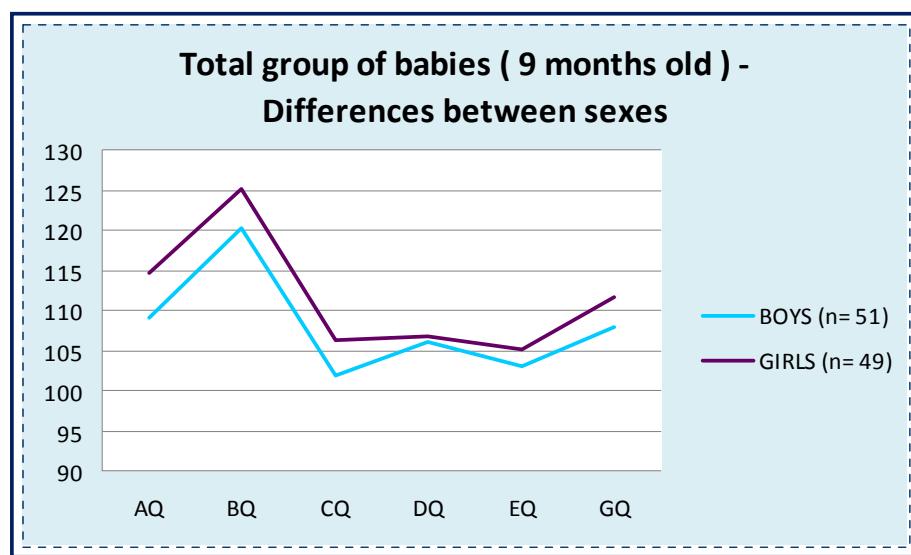


Fig 3: Comparison between the means of test results for boys and girls on the various subscales, at 9 months of age

In reviewing the above results, statistical and practical significant differences were found in respect of the performance of girls and boys respectively, on the Locomotor (Subscale A), the Personal-Social (Subscale B) and the Language (Subscale C) of the GMDS-ER, as well as on the GQ. The girls constantly performed better where significant differences were found. According to the d-values, all these differences were of medium effect.

- **Locomotor Scale (Subscale A)**

The boys and girls in the research group display a statistical as well as a practically significant difference in their performance on the Locomotor Scale. Generally, the girls appeared to perform better than the boys, with the implication that the girls in this research group performed better in respect of physical strength, speed, balance and movement. The results were somewhat surprising, as boys generally performed better than girls in large motor tasks, according to the research of Khail and Cavanaugh (2007).

Possibly, girls might perform better than boys initially, in view of the fact that boys are generally heavier, taller and clumsier at birth and during infancy than girls, and this may influence their locomotor skills such as crawling, standing up and walking as measured by the Locomotor Scale of the GMDS-ER.

Another possible reason for above mentioned differences could be that the mothers of the infant girls stimulated their infants' motor skills more and used handling exercises such as stretching, making them sit up or playing games that promote gross motor skills (Gardiner & Kosmitzki, 2005).

Differences could also be due to specific child-rearing practices that differ from boys to girls, such as mothers' feeding patterns, physical contact and method of carrying, as well as different expectations for development which may be influencing infant development.

Boys and girls are often treated differently by their parents. This behaviour of parents is often apparent even at their child's birth. For instance, it is common for baby boys to be dressed in blue and baby girls in pink. Typically, parents' differential treatment includes gender-typed play and activities, which implies boy / girl-oriented different activities, whereby boys and girls are exposed to different objects and environments that, in turn, can stimulate different skills. Possibly, these activities can also be responsible for the poorer performance of the boys on this particular scale.

Although the sample in the research actually contained more girls than boys, Van Heerden (2007), did not find any significant difference in the performance of the different genders. In Van Rooyen (2005) sample, boys obtained a higher sub-quotient than the girls, on the Locomotor Subscale of the GMDS-ER. Although it was not significantly different, it was found that boys did perform within the superior range. Knoesen (2003) also found that the boys in that sample performed better than the girls on the Locomotor Subscale of the GMDS-ER. Knoesen (2003) did not, however, perform any testing as to whether the differences were statistically significant. According to Smit (2008), the boys and girls in that sample group showed no differences in respect of their performance on the Locomotor Scale. Although the findings reported by the above-mentioned studies do not support the conclusions of the present study, namely; that girls perform better throughout on gross-motor skills and activities, there are other studies that do indeed support this researcher's work. Hence, for instance, Mothuloe (1990) found poorer performance by Black South African boys than Black South African girls on the Locomotor Scale.

Also Tukulu (1996) found that the girls in that sample obtained a higher sub-quotient on the same subscale, which was in the average range.

- **Personal-Social Scale (Subscale B)**

Significant differences, statistical as well as practical, were found between the functioning of boys and girls with regard to their ability regarding self-help skills, social interaction, as well as general personal and social development. Girls performed better on this subscale. According to Khail and Cavanaugh (2007) girls generally perform better in tasks requiring co-operation, emotional sensitivity and conformance to social expectations related to personal and social development. These constructs are not specifically revealed in the GMDS-ER.

Van Rooyen (2005) found that the girls within that sample obtained a superior sub-quotient to the boys on the GMDS-ER. Similarly, the girls within Knoesen's (2003) study performed better than the boys on the GMDS-ER. Tukulu's study (1996) on the original Griffiths Scales revealed that the girls within that sample performed better than the boys. Similarly, Bhamjee (1991) found that South African girls performed significantly better than the boys on Subscale B.

All these results appear to strengthen the argument put forward by Kendall et al. (1988), namely; that gender differences observed can be as a result of cultural influences rather than constitutional and biological predisposition. The findings obtained in the present study on the Personal-Social Subscale are supported by all these studies.

Previous studies conducted on the original Griffiths scales paint a different picture, however. In Allan's study (1988), the boys obtained a higher sub-quotient on Personal-Social Subscale when compared to the girls. In addition, Ward (1997) also found a difference in favour of the boys on the Personal-Social Subscale. These differences, however, were merely descriptive observations noted by the respective researchers, with none of them reaching the required significance level. More recently, Smit (2008) and Jakins (2009) reported no significant differences between boys and girls in their studies using the GMDS-ER.

Again, as mentioned earlier, it often occurs that boys and girls are treated differently by their parents. It must be emphasised, however, that not all parents differentiate in the treatment of their offspring, and

even that such differentiating is not necessarily constant. It could be that this differential treatment by parents can influence children's independence, social interaction and relations with other people.

- **Hearing and Language Scale (Subscale C)**

In this study, on the Hearing and Language Scale, a statistically significant, as well as a practically significant, difference was found between boys and girls, with the girls performing better than the boys in respect of language development (expressive and receptive language skills).

Possible reasons for the difference may also be found in the gender role expectations with which children grow up. According to Papalia et al. (2009) the gender role determined the behaviour, interest, attitude, skills and personality traits that are considered to be important in a specific culture. For instance, the gender of the infant can influence the mother's speech with the baby, as found in a study by Leaper, Anderson, and Sanders (1998) that mothers were talking more and using more supportive speech with their daughters than with their sons. Also, differences in cultural practices may be responsible, in part, for gender differences in the rate of language acquisition (Bjorklund, 2005).

Research findings obtained on both the original Griffiths Scales and the GMDS-ER support the findings of the present study. On the GMDS-ER, Van Rooyen (2005) found that the girls performed significantly better on the Language Subscale than the boys. On the GMDS-ER, the girls in Knoesen's study (2003) also obtained a higher sub-quotient than the boys on this subscale. As mentioned, the differences found in Knoesen's (2003) study were not, however, tested for significance. On the original Griffiths Scales, the girls performed only slightly better than the boys (Allan, 1998; Tukulu, 1996). A clear trend reflecting a female advantage in verbal ability was observed in the results of the present study.

The phenomenon of gender differences in verbal abilities is often found in psychological research. Bornstein et al. (2004) found that girls between the ages of two and six were consistently ahead of boys on almost all of the language development measures on which they were tested. Bjorklund (2005) arrived at the conclusion that gender differences in language development do indeed occur amongst younger children, but that these differences disappear as children age. This supports the findings in this study, where gender differences were found to be statistically significant amongst the infants that

comprised the sample used in this research. Further research is indicated to determine whether this trend persisted in the study sample's infants as they age.

There are, of course, also several research studies that yielded no evidence of a substantial gender difference in verbal ability, such as those of Feingold, 1988; Hedges and Nowell, 1995; Hyde, 1981; Hyde and Linn, 1988; Marsh, 1989, and Plomin and Foch, 1981.

- **Eye and Hand Co-ordination Scale (Subscale D)**

Regarding the results of the Eye and Hand Co-ordination Scale, no significant differences occurred in the performance of girls and boys. This, therefore, implies that the various genders in this study group functioned at the same level with regard to handwork and visual ability, manipulation skills and co-ordination between eye and hand.

Research findings obtained on both the original Griffiths Scales and the GMDS-ER continue obtaining different results. On the GMDS-ER, Van Rooyen (2005) found a significant difference in that sample's performance on this subscale, with the girls performing significantly better than the boys. On the GMDS-ER, Knoesen (2003) also found that girls performed better than boys, but could not comment on whether this difference was significant. This trend dates back to the studies conducted on the original Griffiths Scales, in which girls were found to achieve higher sub-quotients than the boys, yet these differences were not significant (Allan, 1988; Ward, 1997). Smit (2008) found no significant differences in the performance of boys and girls on the Eye and Hand Co-ordination Scale. Furthermore, Jakins (2009) also found no significant difference in scores on the Eye and Hand Co-ordination Scale.

Papalia et al. (2009) are also of the opinion that girls generally perform better than boys on tasks involving verbal tasks and tasks related to fine motor and perceptual skills. Similarly, Blakemore, Berebaum and Liben (2009) are of the opinion that girls mostly perform slightly better in assessments where children's fine-motor skills are assessed. The eye and hand co-ordination subscale also assesses a child's visual-perceptual and perceptual-motor skills as well as sensori motor ability. According to Maccoby and Jacklin (1974) gender differences were well established in the area of visual-spatial ability. A large body of research conducted over the last 25 years has revealed substantial gender differences for some, but not all, of the measures that reflect visual-spatial information processing (Halpern,

Benbow, Geary, Gur, Hyde, & Gernsbacher, 2007). LeVine, Huttenlocher, Taylor and Langrock (1999) concluded that gender differences in favour of boys are present on spatial tasks by age 4 years 5 months. Hyde (2005) reviewed the major meta-analyses that have been conducted on psychological gender differences and included studies conducted on the visual-spatial abilities with children on areas of spatial relations, spatial perception, mental rotation, spatial visualisations, and the progressive matrices. It appears from these studies that the effect sizes ranged between close to zero to small. This adds additional support for the findings obtained with regard to the sample on this subscale.

- **The Performance Scale (Subscale E)**

Regarding the results on the Performance Scale, no significant difference was reported in the results of either gender. It can, therefore, be assumed that the skills of boys and girls in this study group correspond in respect of visual-spatial skills such as manipulation of objects, also co-ordination between eyes and hands and perseverance in completing tasks.

In contrast, Van Rooyen (2005) reported a significant difference on the Performance Subscale of the GMDS-ER, where the girls performed better than the boys. The differences on this subscale emerging in Knoesen's study (2003) on the GMDS-ER show a female advantage, although significance was not tested for (as mentioned previously). This trend showing female advantage on the Performance Subscale is also apparent when reviewing findings of studies on the original Griffiths Scales, where girls appeared to perform better than boys (Allan, 1998; Tukulu, 1996). Furthermore LeVine et al. (1999) showed that boys display better skills in manipulation of figures and objects in early childhood. It could be that the constructs measured in the research by LeVine et al. (1999) are not reflected by the GMDS-ER. Kendall, Verster, and Van Mollendorf (1988) have also indicated from their studies in Africa that boys performed significantly better than girls on the spatial reasoning ability test.

All of the above-mentioned research was done on pre-school children and, therefore, it may have been that manifestation of significant differences in infant boys' and girls' eye and hand co-ordination and manipulation skills had not yet emerged.

- **Mean GQ**

Statistical and practical significant differences were found in the overall performance of the 9-month old boys and girls in this study, with the girls performing better than the boys.

Previous South African studies conducted, using the original Griffiths Scales, done by Allan (1988), Tukulu (1996) and Ward (1997) investigated the influence of gender on the performance of their samples, finding that the mean GQs of the two gender groups did not differ significantly. Jakins (2009) found no significant difference between the mean GQ scores of the 5-year old and 6-year old boys and girls in that sample. Van Rooyen (2005), however, compared a South African and British sample and discovered a significant difference between the GQ performance of the South African boys and girls. Despite the fact that these studies have also considered the influence of gender on the Griffiths Scales, it must be pointed out that none of these studies, including the present study, focused solely on comparative performances of their samples, and as such have not checked for extraneous variables such as SES and culture.

- **Aim 5: Conclusion**

A significant difference can, therefore, be assumed in the performance of boys and girls in respect of the Locomotor, Personal-Social as well as Hearing and Language Scale of the GMDS-ER, which also applies to the GQ. Girls in this research group fared better than boys, which could, according to various researchers, *inter alia* be attributed to different gender role expectations. Performance on the other subscales (eye-hand co-ordination and performance) of the GMDS-ER did not significantly differ from each other.

In general, no differences were found between South African boys and girls on the original Griffiths Scales (Allan, 1988; 1992). Where differences were perceived, they appear to have been confined to Subscales A (Mothuloe, 1990) and B (Bhamjee, 1991). These are also the two subscales that did indicate differences in the present study. Between the present and previous research, the similarity perceived is that the girls performed better where significant differences were seen.

The research into the relationships between gender differences and measured abilities report contradictory findings (Beery, 1967, 1982; Jensen, 1980; Kannegieter, 1970). The majority of Western

studies, as well as some South African studies (Allan, 1988), report no significant gender differences beyond the 0.05 significant level, whereas other African literature appears to indicate that boys are usually ahead of girls on most abilities (Irvine & Berry, 1988).

Judging by the results presented in this study, one sees definite gender differences between boys' and girls' mental development during the first 9 months of life. Girls, as a group, show higher development levels than the boys.

7.3.6 Results of the performance of infants from various ethnic groups on the GMDS-ER

The sixth aim was to determine whether any differences exist between the performances of infants from various ethnic population groups.

Table 7: Performance of South African infants from various ethnic groups on the Revised Griffiths Mental Development Scales (GMDS-ER).

	Black n = 30	Coloured n = 30	Indian n = 30	White n = 30			
Subscale	Mean	Mean	Mean	Mean	df	F-value	p-value
A	105.34 b#	114.23 a	113.16 a	116.35 a	3;112	4.85	0.0033 *
B	117.48 b	122.17 ab	124.62 a	127.97 a	3;112	5.75	0.0011 *
C	99.05 b	102.70 ab	107.60 a	107.87 a	3;112	7.04	0.0002 *
D	102.40 b	105.12 ab	109.04 a	109.33 a	3;112	8.11	<0.0001 *
E	100.27 b	103.10 ab	107.31 a	106.24 a	3;112	6.73	0.0003 *
Raw GQ	104.91 b#	109.46 a	112.35 a	113.55 a	3;112	9.73	<0.0001 *

Different letters following any pair of mean values indicate statistical significance on a 0.05 level between that pair, using the Tukey post hoc test (for example ab).

Table 8: Effect sizes for the differences between ethnic groups

Subscales	Coloured & Black	Indian & Black	White & Black	Indian & Coloured	White & Coloured	White & Indian
A	0.78	0.689	0.970+	-0.09	-0.186	0.281
B	0.521	0.795	1.168+	0.273	0.646	0.373
C	0.467	1.094+	1.129+	0.627	0.661	0.034
D	0.431	1.055+	1.101+	0.623	0.669	0.046
E	0.436	1.087+	0.921+	0.651	0.485	-0.165
Raw GQ	0.719	1.175+	1.365+	0.455	0.646	0.190

Key:

- A** - Locomotor Scale (Subscale A)
- B** - Personal-Social Scale (Subscale B)
- C** - Hearing and Language scale (Subscale C)
- D** - Eye-Hand Co-ordination Scale (Subscale D)
- E** - Performance Scale (Subscale E)
- n** - Size of research group
- p** - p-value of a two-way variable analysis
- * - Statistical significance ($p \leq 0.05$)
- + - Practical significance ($d \geq 0.8$)

The results of the 2-way ANOVA performed on each of the subscales, as well as on the general quotient (GQ), are presented in Table 7 and 8. These results indicate that the four ethnic groups differed significantly on the GQ and in their performance on all five subscales. In view of this, the null hypothesis can be rejected. The Tukey test was performed to clarify the nature of the differences that were found and the results are presented in Table 7 and 8.

The White, Indian and Coloured infants performed statistically significantly better than the Black infants on the Locomotor Scale. There were no significant differences in performance between the White, Indian and Coloured groups on the Locomotor Scale. The White and Indian group showed statistically significant differences from the Black group on all of the five subscales (A to E). Practically significant differences were found between the white group and black group on all of the five subscales and between the Indian group and black group on subscale C, D and E. In terms of the GQ, the performance of the White, Indian and Coloured respondents was statistically significantly better than the Black group.

The mean scores suggest that there were performance differences between the ethnic groups and a consistent pattern emerged. Significantly higher scores were found for infants from the White and Indian ethnic groups. In respect of scale B, C, D and E the Blacks and the Coloureds did not differ significantly from each other. However, the blacks performance differed statistically from that of the White and Indian groups. There were no significant differences between the performance of the Indian and White groups in respect of the five subscales and the GQ.

The results of each of the subscales are discussed below.

- **Locomotor Scale (Subscale A)**

Black infants performed statistically significantly lower than all the other groups on the Locomotor Subscale (AQ). In respect of the Locomotor Subscale no statistically significant or practically significant differences emerged between the Coloureds, Indians and Whites. A statistical significant difference, however, was found between the Blacks and the other three groups (Coloureds, Indians and Whites), and a practically significant difference were found between the white group and the black group. This implies that the three ethnic groups (Coloured; Indian; White) did not differ in their ability regarding physical strength, movement skills, speed or rhythm, but that, the Black group did not compare favourably with the other groups, although it deserves mention that their performance was still in the average range. The scores achieved by this group were merely lower than those achieved by the other groups.

It can be speculated that the child rearing practices used by some Black parents may have contributed toward this finding, in that some cultural groups in South Africa are not in favour of certain types of stimulation, or development, such as putting infants on their stomachs, which promotes muscle tonus in the neck and upper body, *inter alia* (Jareg & Jareg, 1994). It may sometimes be perceived by more traditionally inclined parents as a potentially harmful practice, departing from tradition. Vigorous, active play also develops skills in using large muscles. Here, the early formal parental handling may possibly also have influenced the Black babies' motor development. In South Africa, Black infants are often carried on their mothers' (or care givers') backs, sometimes for hours on end, and they are seldom put down for physical activities or play. Therefore, as free movement is severely curtailed, it is possible that infants from the Black ethnic group may not have been equally familiar with tasks like crawling, rolling,

standing and walking, hence, their poorer performance on this scale. Many South Africans live in small and overcrowded households which are not conducive to the vigorous movements and active play that is such a large requirement for the physical development of the infant (Read, Gardner & Mahler, 1993). Similarly, poor infant nutritional status (stunting and under-weight) because of poverty in the Black group can also be a risk factor that may have contributed to the poorer performance of the Black group on the Locomotor Subscale.

The findings of this study contradict the findings of Richter-Strydom and Griesel (1984) and Lynn (1998), namely that Black infants from the age of 2-10 months are significantly in advance of White infants of the same age in respect of motor development. On the other hand, it must be mentioned that Smit (2008) found no statistically or practically significant differences between Black, White and Brown pre-school children in that study.

- **Personal-Social Scale (Subscale B)**

With regard to the results of the Personal-Social Scale, it appears that White infants fared better on the mean scores than the Indian, Coloured and Black Infants. When the focus is on statistical and practical significance, it appears that the most significant differences occurred between the White and Black groups. A statistically significant difference occurred between the White group and the Black group, as well as between the Indian group and Black group and a practical significant difference occurred between the White and Black group.

The White infants may, in part, possibly have performed better on this scale due to the economic situation in South Africa, which could be an indication that the previously disadvantaged ethnic groups continue being disadvantaged. These groups are still not enjoying the full benefit of the changed economic structures which have now been in place for some time in the new, democratic South Africa. In the present study, the researcher made use of readily available infants (participants) at local government clinics and at day care centres. It is important to mention that, while all of the White infants and some of the Indian infants were included in the research sample after being found at day care centres, all the Black and Coloured infants were recruited at local government clinics. This could possibly be a reflection of the lower SES of Black and Coloured parents in this study. It appears that most of the White and Indian parents could afford day care centres, but that the Black and Coloured parents could not

afford this luxury and are obliged to take care of their own infants or depend on family members or neighbours to take care of their infants. Moreover, the fact that the participants' Black and Coloured parents made use of the free medical services supplied by local government could indicate that they are unable to afford private medical care or afford to pay for their infants' immunisations. This could possibly be the reason why these skills could not be acquired and / or practised to a perceivable level. Statistics show that 66.1 % of children between the ages of 0 and 4 years live below the poverty line, with the poverty rate remaining far higher among African and Coloured children than White and Indian children (HSRC, 2011). Knoesen (2005) found that children coming from poor economical circumstances performed poorer on the Personal-Social Scale than other children of the same age. The reason for this occurrence may lie in the fact that there is a lack of exposure in Black households regarding the acquisition of skills in self-help and personal grooming. Infants / children are cared for by older siblings and, therefore, have fewer opportunities to acquire and practice social skills. It may also be the case that substitute care amongst the group of black infants in the study may be of less optimal quality and it may also be that the care givers are not sensitive to the infants' emotional and cognitive needs. In view of the high frequency of HIV-AIDS-related parental deaths, there are millions of orphaned children in South Africa. This leads to a situation where older siblings, although children themselves, are forced to take responsibility for the younger siblings. In effect, this is basically a situation of children caring for children, meaning that they are being nurtured by individuals that simply do not have any know-how regarding stimulation, infant teaching and feeding; in other words, they are unable to provide optimal care, although they are, of course, doing the best they can. It, therefore, would appear that the Black community is still to a larger extent being affected by inhibitory factors than is the case with Coloured children.

All cultures have inherited and inherently different patterns of child-rearing. Differences in child-rearing practices (i.e., allowing more independence) may, therefore, be another reason for the better performance of the White and Indian group on the Personal-Social Subscale (Gallahue & Ozmun, 2006). It is common in this White culture for both parents to work in order to provide a better income for the family. Parents, therefore, may often have to leave children at day care centres from 6 months of age (or even earlier). In addition, child-rearing practices in the Black and Coloured Groups possibly may be influenced by factors such as poverty or lack of no access to day care facilities.

A further contributing aspect that may have caused the deviation may be the manner in which an infant's basic needs that require immediate attention are met, independent of its particular culture, or how it is socialised. This varies considerably across cultures and often even among ethnic groups within a single society. It is clear that culture influences patterns of parenting from the first hours of infancy (e.g. when and how parents care for infants, the extent to which they allow them to explore their surroundings, how nurturing or restrictive they might be, and which socialising behaviours they value) (Gardiner & Kosmitzki, 2005).

Allan (1992) reported that no apparent differences were found between the performances of the various cultural groups on the Personal-Social Scale. In addition, Smit (2008) indicated that White children fared better than Black children on the mean scores, with Black children in turn faring better than Coloured children.

- **Hearing and Language Scale (Subscale C)**

The results obtained on the Hearing and Language Scale (Subscale C) showed significant differences between the performances of the various ethnic groups. The White and Indian infants performed better, both statistically significantly as well as practically significantly, than the Black infants, with no significant difference emerging between the Coloured and Black infants. This implies that the White and Indian infants performed better in respect of aspects such as verbal expression and identification of objects.

Again, one of the reasons for this fact is that children from previously disadvantaged communities experience less attention, having fewer toys, less access to music, for instance, and other activities that would stimulate linguistic skill, with another possible explanation being the level of education of the parents. Many parents in South Africa simply do not have the literacy levels required to adequately provide stimulation to their infants. Lack of stimulation is one of the major negative influences on child development. It is the social interaction that helps shape the quality of mental abilities at various ages across the lifespan.

Environmental influences are also very important in the development of competence in language (Gleason, 2009; Goldfield & Snow, 2009). Children whose parents provide them with a rich verbal environment show many positive benefits. Parents who pay attention to what their children are trying to say, who expand their children's utterances, who read to them, and who label things in the environment,

are providing valuable benefits for them (Gleason, 2009). It could also be that the parents of the black infants fail to provide a rich verbal environment with optimal stimulation.

Bjorklund (2005) found that literacy and access to computers and television also significantly affect child development. Again, although much more available than previously, there may still be a lack of these media in those communities that are termed as disadvantaged. For instance, the family may expose the baby to music and various sounds; it is encouraged to form words such as mama or papa. Songs are sung, the baby is constantly being talked to and certain expectations are in place for the baby in respect of milestones. In addition, poverty among the Blacks / Coloureds could be a possible factor as it may possibly force parents to work longer hours or be far away from home, hence limiting the available time for talking or giving attention to their infants / children. These are only some of the many possible factors that may have influenced the poorer performance of the blacks and coloureds on this subscale.

Studies undertaken by Allan (1992) and Smit (2008) support these findings, which confirmed that White children performed better in the Hearing and Language Scale than did children from other ethnic groups.

- **Eye-Hand Co-ordination Scale (Subscale D)**

From the research results, a clear trend emerged (which is also clear from the results of the Eye-Hand Co-ordination Scale): White and Indian infants performed better than the Coloured and Black infants, with no significant difference occurring between the Black and Coloured groups. A statistically significant difference as well as a practically significant difference occurred between the White infants and the Black infants; as well as between the Indian group and the Black group. This implies that White and Indian infants performed better in respect of handwork, visual ability, manipulating skills and co-ordination between the eyes and hands. This possibly may be due to White and Indian infants receiving more exposure to toys and various other objects, colours and textures such as balls, blocks, pens / pencils, paper, cars and also being encouraged to play with them, such as the mother rolling the ball to the infant, or crumpling a sheet of paper and encouraging the infant to do the same. White and Indian parents tend to emphasise the importance of stimulation and schooling and attach a high value to development and performance.

Poverty in South Africa is another possible contributing factor leading to the lack of the luxury of small or educational toys, blocks or crayons being available to many infants in the Black / Coloured ethnic groups that may serve to stimulate their fine motor development. The lack of toys might further influence test administration, because an infant that is exposed to toys for the first time might feel overwhelmed and, instead of finishing the item being tested, may just want to continue playing with the interesting objects that were presented.

Smit (2008) did not find any significant difference between the ethnic groups on the Eye and Hand Co-ordination Scale.

- **Performance Scale (Subscale E)**

Yet again, the results of the Performance Scale indicate differences between the various ethnic groups. A statistically significant and practically significant difference occurred between the White infants and the Black infants, as well as between the Indian infants and the Black infants. The White and Indian group again did not show any statistical significant differences, with the performance of White and Indian infants being significantly higher than that of the Black infants in respect of the Performance Scale (EQ). No statistical significant differences occurred between the White and Coloured group as well as between the Indian and Coloured group.

Kendall, Verster and Van Mollendorf (1988) reported on the particularly weak performance of many Black African children on tasks involving spatial relations. When parents can afford to buy toys, furniture and household utensils, this may contribute to the development of manipulative and spatial-perceptual skills of a child. Differences in the material environment of the infants, may, however, have affected performance on many items in this scale. The significantly lower scores of Black and Coloured infants on the Performance Scale hence appear to be related to differences in the material environment of the infants as well as to cultural differences in respect of the value of performance.

In contrast with the findings in the present study, Smit (2008) found no significant differences between the ethnic groups on the Performance Scale in that study.

- **Aim 6: Conclusion**

It can, therefore, be assumed that significant differences exist in the performance of the various ethnic groups. The White and Indian groups performed better throughout on all five scales than the Coloured and Black groups. The group of Black infants performed poorest throughout on all five scales compared to the other ethnic groups. The reason for the poor performance of the Black group may be ascribed to environmental influences affecting their development, which include factors such as poverty, culture, different child-rearing practices and individual parenting styles.

7.4 Evaluation of Hypotheses

To summarise, the aims set in this study, as well as the concomitant hypotheses, are evaluated.

7.4.1 Aim 1: To establish the reliability of the measuring instrument (GMDS-ER) used in this study.

The hypothesis set was that the measuring instrument was indeed reliable for measuring the development of babies and children in the South African context. *The hypothesis is accepted, namely that the results of the Cronbach-alpha coefficients indicated that the measuring instrument was reliable.*

7.4.2 Aim 2: To measure the performance of 9-month old South African' infants on five of the six levels of the GMDS-ER

Due to the exploratory nature of the second aim, no hypothesis could be set. The study's finding, however, was that the group delivered an average performance on the GMDS-ER.

7.4.3 Aim 3: To compare the performance of South African infants on the GMDS-ER with that of the British normative sample.

The hypothesis set was that differences are indicated in the performance of the South African infants and the British normative sample. The hypothesis is rejected, as no differences occurred between the development of the South African infants and the British normative sample.

7.4.4 Aim 4: To study the interaction between gender and ethnicity on the Locomotor Scale (Subscale A), Personal-Social Scale (Subscale B), Language Scale (Subscale C), Eye and Hand Co-ordination Scale (Subscale D), Performance Scale (Subscale E) and with respect to the GQ.

The hypothesis set was that there is indeed an interaction between gender and ethnicity on the various scales and with respect to the GQ on the GMDS-ER. This hypothesis can, however, be rejected as no interaction was found between gender and ethnicity on the various scales and with respect to the GQ on the GMDS-ER.

7.4.5 Aim 5: To determine whether differences exist in relation to the performance on the Locomotor Scale (Subscale A), Personal-Social Scale (Subscale B), Language Scale (Subscale C), Eye and Hand Co-ordination Scale (Subscale D), Performance Scale (Subscale E) and the GQ of the genders being tested with the GMDS-ER.

The hypothesis set is that there will indeed be differences in the performance of the respective genders on the GMDS-ER. This hypothesis is partially accepted, as there were definite significant differences between the respective genders, on three of the five scales, namely; Locomotor, Personal-Social and Language as well as the GQ. No significant differences were found on the Eye and Hand Co-ordination Scale and the Performance Scale. Any differences that were found were always in favour of the girls.

7.4.6 Aim 6: To determine whether differences exist in relation to the performance of the various ethnic groups on the Locomotor Scale (Subscale A), Personal-Social Scale (Subscale B), Language Scale (Subscale C), Eye and Hand Co-ordination Scale (Subscale D), Performance Scale (Subscale E) and the GQ of the GMDS-ER .

The hypothesis set, is that certain differences will exist in the performance of various ethnic groups. This hypothesis is accepted, in that there did indeed occur differences in the performance of the different ethnic groups, on the various subscales as well as the GQ of the GMDS-ER.

7.5 Overall conclusion

Chapter 7 contains a full description of the various aims and hypotheses. This research found that South African infants were tested to mostly perform similarly to a British normative sample, in most aspects incorporated in the GMDS-ER. The South African sample performed slightly better on all the subscales as well as on the GQ.

Overall, the performance of the South African infants on the GMDS-ER in this research project has revealed very positive results. The fact that the South African sample have performed so well, is even more striking given their poorer, average socio-economic standard compared to that of the British sample. In addition, differences between the two environments in regard to educational standards, the vast disparity of wealth and its distribution, and the different geographical characteristics; all of these contribute to the striking nature of the South African infants' development.

Although this researcher indicated that infants in many respects mostly develop similarly in early infancy, further research is indicated to determine the longer-term effects that SES inequalities may have had on the performance of infants in this group, as is confirmed by the statistically significant differences that were found on the performances of the research sample reflected in some of the subscales. In addition, further research is also indicated to determine the medium and long-term effect that HIV/AIDS-related conditions may have on the development of infants and young children.

Chapter 8: Conclusion and recommendations

8.1 Introduction

In this chapter, a short summary of the literature study as well as the empirical study, and the research results are given. Limiting aspects that emerged in the investigation are discussed and recommendations are subsequently made, based on the findings of the research.

8.2 Findings based on the literature study

Studying the literature confirmed that the field of human development has became an ever-evolving scientific discipline. Its goals have expanded to include description, explanation, prediction and intervention. The questions that developmental scientists seek to answer, the methods they use and the explanations they propose are more sophisticated and more varied than they were even twenty-five years ago. These shifts reflect progress in understanding as new investigations build on or challenge those that went before. They also reflect advances in technology.

Development can be seen as age-related changes that take place in a directive, cumulative, and ordered fashion. The interaction between the various development domains (physical, cognitive, moral, personal and social) is reflected in the literature. Optimal child development aimed at prevention of physical and emotional problems, as well as the effect that the early years of childhood exert on later development, is discussed exhaustively in the available literature.

The literature highlights a host of factors (biological, maternal, family and contextual) that could potentially pose risks to children's development. In addition, the literature acknowledges the implicit role played by the environmental context in which the child develops. Child development is thought to be determined by the transaction between characteristics of the child and characteristics of the environmental context in which that child is developing. The multiple environmental systems within which an infant is developing, cannot be viewed as mutually exclusive, but rather as varied aspects of that child's life, that may determine adjustment, growth and development. The theories of Vygotsky, Bronfenbrenner, Super and Harkness all focus on the interaction between the individual and his or her environment: that rich network of environmental systems that operate in and around the child. Gender

also influences child development through a child's gender identity gradually forming in the socio-cultural context to which he / she is exposed. Here, the question is often asked: Are the differences in boys and girls biological or acquired? The answer to this question is probably that both exert an influence.

South African children are highly at risk of developmental problems, due to conditions such as poverty, AIDS, and food and housing shortages. For this reason, screening, assessment and evaluation of children should take place at the youngest possible age and intervention programs be implemented as early as possible. From the literature, it emerged that the identification of early developmental delays by means of reliable and valid measuring instruments may serve to considerably decrease the risks pertaining to children's further development. Various measuring instruments that may be utilised towards the assessment of child development were discussed critically. It was found that almost all the measuring instruments deliver certain benefits, but that there are also drawbacks in most. It emerged that the Revised Griffiths Developmental Scales are reviewed on a continuous basis. When compared to other scales, it became clear that the Griffiths Mental Development Scales is a comprehensive scale, providing in all the assessment requirements of infants and children, while providing age-equivalent norms. While these scales are internationally held in high esteem, there still appear to be certain drawbacks that warrant further research.

8.3 Findings of the empirical research

From the empirical research it appears that the South African infants' performance on the Revised Griffiths Developmental Scales compared well to that of British infants. The functioning of the South African infants, on all the subscales as well as functioning in general also compared well with the British norms.

In view of the differences in performance between the genders, the 9-month old baby girls attained a statistically- and practically- significantly higher score on the Locomotor Scale (Subscale A), Personal-Social Scale (Subscale B) and on the Language Scale (Subscale C). Among the reasons for baby girls achieving higher scores on these scales than the same age baby boys, is the very real factor of different gender role expectations, by society at large and by the particular caregivers.

The performance of the different ethnic groups showed significant differences. The White and Indian performed better throughout on all five subscales than the Coloured and Black groups. The group of black infants performed poorest throughout on all five scales compared to the other ethnic groups. The reasons for the poor performance of the Black group may be ascribed to environmental influences affecting their development, which include factors such as poverty, culture, different child-rearing practices and individual parenting styles.

The results of the empirical study confirmed that the Revised Griffiths Development Scales for this research group are reliable and reliability indices on all the subscales varied between 0.589 and 0.84.

8.4 Limitations and recommendations

The limitations of the present study need to be acknowledged. These include:

- The fact that a non-probability, purposive and convenience sampling method was applied to identify suitable infants to be tested, limits the generalisation of the results to the broader population. The research group was drawn from the North-West Province and, therefore, is not representative of all South African nine-month old infants.
- As only 9-month-old infants were included in the present study, caution needs to also be employed regarding the generalisation of the findings to older children, and a developmental perspective needs to be maintained.
- In achieving the primary objective of the present study, the research design was exploratory in nature and, therefore, the research approach was descriptive. Employing this method did not provide any opportunity to allow for appropriate cross-cultural comparisons. This has a limiting effect, as far as the generalisation of the results among different cultural groups is concerned.
- Proportional representation of the ethnic groups as it occurs per ratio in the population was not possible due to the nature of the sample.
- Only four of the diverse ethnic groups occurring in South Africa were represented in the research sample, which is not representative.

- No checks were conducted for socio-economic circumstances, and this may have influenced the results.
- The results were compared with British norms, thus outside the South African context, where different circumstances existed from those prevailing with the sample group. This may have influenced the interpretation of the results.

8.5 Conclusion

This study emphasised that the Griffiths Mental Development Scales – Extended Revised (GMDS-ER) could satisfy the developmental assessment needs in South Africa, if adapted or proved to be applicable to the contemporary South African context. The end result of this study could significantly contribute to the expansion of the information basis of the GMDS-ER. Psychologists' utilisation of this measuring instrument for measuring South African children will definitely serve to mitigate the risks mentioned, in view of the fact that developmental delays may be identified earlier.

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