

## 2.4 EARLY INTERVENTION FOR PARENT-INFANT INTERACTION WITH LBW PREMATURE BABIES

### 2.4.1 Introduction

According to Schaffer (1990 p.57) and Cunningham (1993 p.133), the relationship between mother and baby forms the basis for the relationship between mother and child later. A second assumption of Schaffer's study is that the mother-baby relationship lays the foundation for the child's development in general. Finally, one may assume with Freud (1991 p.67) that, since the mother-baby relationship is the child's first relationship, it is a formative influence on the infant's personality, and provides the basis for all subsequent social interactions.

O' Shea, Goldstein, DeRegnier, Sheaffer, Roberts and Dillard (1996 p.832) state that parent-child interaction is an important determinant of mental development. The developmental outcome of infants born prematurely has been assessed in a number of studies (Liw & Brooks-Gunn, 1993 p.1032; Thoman & Ingersoll, 1993 p.692). There is general agreement that preterm infants, particularly those with medical complications, may show developmental deficits (Blanchard, 1991 p.83). However, it is likely that medical issues associated with prematurity are not the only factors that contribute to developmental deficits. According to Grieve (1990 p.36), the development of preterm infants is influenced by three major groups of factors: (i) the parents (their history, personality and the social context) (ii) the infant (physical substrates and temperament) and (iii) medical interventions. It has been shown that the infant's biological risk status influences development (Salamy, Davis, Eldredge, Wakeley & Tooley, 1988 p.241), but there is also considerable evidence that factors relating to the parents and the home environment play an important role in determining developmental outcome (O'Callaghan *et al.*, 1996 p.918). The general conclusion seems to be that biological risk can be ameliorated by a supportive and stimulating caregiving environment, or exacerbated by a lack of it (Reynolds, 1998 p.523).

### 2.4.2 A positive caregiving environment

One of the most important aspects of the caregiving environment is the quality of the interaction between parent (mainly the mother) and infant. There is evidence that the nature of the interaction between mothers and their LBW premature infants differs from that between mothers and their full-term infants. The level of interaction with preterm infants is generally lower (Grieve, 1990 p.51).

Mothers who show signs of depression should have further assessment and intervention. Mothers of premature infants exhibit higher rates of depression than mothers of full-terms (Gennaro, York & Brooten, 1990 p.107). It is well known that depressed mothers are less responsive and affectionate to their infants, and poor maternal psychological well-being, particularly depression, is related to poor developmental outcome in infants (Miles & Holditch, 1997 p.263). Mothers who appear depressed need additional support and need someone to listen to their concerns and feelings. However, antidepressants may be used for prolonged depression. Psychotherapy is seldom needed if adequate support is provided, but it may be needed by some mothers.

According to Ainsworth, Blehar, Waters and Wall (1978 p.102), the main reason for qualitative differences in children's attachments lies in the nature of their interactive experiences with the mother. On the basis of a longitudinal study of infants throughout the first year, Ainsworth *et al.* (1978 p.102) show that mothers who respond in a sensitive manner to their infants' signals in situations such as feeding, face-to-face play and physical play, will have securely attached children; failure to provide such responsive handling will result in one of two types of insecurity. Each type of attachment is thus said to be associated with a particular kind of mothering, as well as with specific behaviours shown by infants by the age of one year, as indicated in Table 2 (adapted from Schaffer, 1996, p.144 and Cunningham, 1993, p.131).

Infants rated as securely attached often become children who are more independent at school, more cognitively and socially competent, more sought out as friends and leaders, less likely to have behaviour problems, easier to manage and reason with in a classroom, more empathic to other children and adults, and more mature and complex in their play behaviours (Cunningham, 1993 p.133; Brooks-Gunn, Klebanov, Liaw & Spiker, 1993 p.747).

This means that the nature of the attachment appears to significantly influence a child's social relationships inside and outside the family. Securely attached children show more positive social interactions with other children (such as looking, touching and imitating) than those who are insecurely attached (Cunningham, 1993 p.133). They are also more likely to comfort a distressed or crying adult or child (a sign of altruistic or pro-social behaviour) (Schaffer, 1996 p.100).

Several intervention programmes have been designed to enhance the developmental outcomes of preterm infants (Goldsmith, 1990 p.399 and Johnson & Johnson, 1996 p.3). Some programmes consist of direct stimulation of the infant, while others concentrate on improving caregiver-infant interaction and/or social support systems, which are believed to facilitate all

aspects of infant development (Belt & Abidin, 1996 p.1022; Bernbaum & Hoffman-Williamson, 1992 p.170 and Kang *et al.*, 1995 p.177).

**Table 2: Kinds of mothering and behaviour of securely attached and insecurely attached infants in Ainsworth's Strange Situation at one year of age**

Attachment	Kind of mothering	Infant behaviour
Securely attached	Able to pick up child's signals and communications. Responds to them promptly and appropriately. Readily accessible to the child and warm, cooperative and accepting in all exchanges.	Child shows low to moderate levels of proximity-seeking with mother; does not avoid or resist contact if mother initiates it. When reunited with mother after absence, child greets her positively and can be soothed if upset. Clearly prefers mother to stranger
Insecurely attached (insecure/avoidant)	Mothers are psychologically unavailable. They are not tuned to the child's signals and are withdrawn and neglectful. General style of interaction is marked by insensitivity and rejection.	Child avoids contact with mother, especially on reunion after an absence. Does not resist mother's efforts to make contact but does not seek much contact. Treats stranger and mother about the same.
Insecurely attached (insecure/resistant)	Mothers are insensitive, but in an inconsistent fashion, sometimes responding positively to and at other times rejecting the child's bids for attention.	Dazed behaviour, confusion or apprehension. Child may show strong avoidance, followed by strong proximity-seeking; may show conflicting patterns simultaneously, such as moving toward mother but keeping gaze averted; may express emotion in a way that seems unrelated to the people present.

### 2.4.3 The reciprocity of parent-infant interaction and infant stimulation

#### (1) Introduction

The discussion and evidence of the previous section suggest that the initial opportunity for contact between infant and mother immediately after birth may be extremely important for their early adjustment to each other, as well as for infant stimulation and development. Cunningham (1993 p.74), Abidin (1980 p.13-19) and Ensher and Clark (1994 p.53-80) suggest that the infant is tuned to accept stimulation from his environment and that such stimulation is typically provided by the mother. Evidence exists that the baby is responsive to socially-produced sensory and perceptual information (olfactory, auditory, visual, tactile and vestibular) provided by people in his environment (Louw, Van Ede & Louw, 1998 p.159).

The most appropriate and natural form of stimulation usually occurs when parents visit their baby (Davis *et al.*, 1983 p.47). They are likely to have more time and motivation than the nursing staff. As the parents gain confidence during their visits, they begin to talk, touch, stroke, cuddle and rock their baby. As awareness of their baby's responsiveness increases, the parents respond accordingly, stimulating their baby's senses in appropriate ways.

Numerous studies have revealed (Spiker *et al.*, 1993 p.760; Davis *et al.*, 1983 p.167) that, if LBW premature babies are either touched, rocked, fondled, or cuddled daily during their stay in the neonatal unit, they may have significantly fewer apnoeic periods, show increased weight gain, pass fewer stools and manifest possible advances in certain areas of higher central nervous system functioning, which persists for at least a short time after discharge from the hospital. The mother may also benefit. The earlier a mother comes to the neonatal unit and touches her baby, the more rapidly her own physical recovery from the pregnancy and birth progresses (Parker, Zahr, Cole & Brecht, 1992 p.780).

Research (Barrera & Maurer, 1981 p.716; Anderson, Vietze & Dokecki, 1977 p.1680; Thoman & Ingersoll, 1993 p.699) also shows that normal full-term babies can see and hear, detect differences in taste and smell, and be responsive to touch and movement. These abilities enable them to respond to their parents' sensory and perceptual stimulation. Though a preterm baby's experience is clearly different from that of babies born at term, many are responsive to aspects of their new situation. Even very small babies can pay attention to some of the things happening around them (Gemelli, 1996 p.215).

## (2) Vision

At birth, neonates are equipped with a functional and complete visual system, though it is not yet fully developed. The retina and the optical nerve have not yet reached full maturity and the cells for colour perception are still underdeveloped (Louw *et al.*, 1998 p.158). By 34 weeks gestational age most LBW premature babies show a fully-mature pattern of visual behaviour, comparable to that of full-term babies. By 3 months, infants can see most, if not all, the colours of the visible spectrum (Gemelli, 1996 p.153). Neonates see the world as a blur. The muscles that control the eye lenses are still underdeveloped, with the result that the eyes are not able to focus on objects at various distances. According to Louw *et al.*, (1998 p.156) the neonate can see clearly at 6 metres what an adult with normal vision can see at a distance of 150-250 metres. It would appear that neonates pay more attention to certain objects than to others, and that the human face is high on their priority list (Stander, 1990 p.78, Carpenter, 1974 p.742; Scarr-Salopatek & Williams, 1973 p.98).

Infants are clearly able to observe the movement of an object by turning their heads and eyes in the correct direction and following it, irrespective of whether the object moves horizontally or vertically. They prefer the colour red and shiny objects (Blanchard, 1991 p.78). Studies of vision in neonates have been done nearly exclusively on populations of healthy full-term babies, and virtually no data is available on LBW premature neonates.

One of the most powerful mechanisms that stimulate maternal attachment is the mutual visual regard engendered by the *en face* position (Abidin, 1980 p.17). Abidin emphasizes the possibility that eye-to-eye contact may act as an innate releasing mechanism for maternal caretaking responses, and the fact that the amount of time that infant and mother spend looking at each other's faces correlates with positive prenatal attitudes toward infants. The mother's visual attention functions as a setting or context within which the baby may or may not establish and maintain contact. The infant seems to use his visual regard of the mother as a signal to begin communication. In addition, the visual modality also seems to serve as a signal of positive affect for mother and infant; most of the smiling within the social context occurs when the dyad members are looking at one another.

### (3) Smell

Research findings show clearly that neonates do not only perceive smells, but can actually distinguish between smells (Engen & Lipsitt, 1965 p.315). Although the neonate's sense of taste is not very sensitive, he can distinguish between various strong flavors.

Infants show a slight differential sensitivity, which seems to improve with age, to the odour of their mother's milk (Etaugh & Rathus, 1995 p.156). Substitution of bottles and formulas for breast milk may decrease the possibility of the infant and mother's adjusting to one another by means of olfactory stimulation. This does not mean that bottle-fed infants are necessarily at risk for less adequate relationships with their mothers. The mother-infant relationship, as well as the father-infant interaction, has a variety of other possible modalities by which contact can be established (e.g. vocal and auditory stimulation while the baby receives a bottle-feeding).

### (4) Hearing

During the first few days after birth, a section of the auditory canal is still filled with amniotic fluid (Louw *et al.*, 1998 p.159). Until this fluid has evaporated or has been absorbed, sounds are relatively faint to the baby (Zeskind & Marshall, 1988 p.193). It does appear that, within a few hours after birth, neonates can distinguish between specific sounds. DeCasper and Fifer (1980

p.1175) are of the opinion that a neonate can distinguish between the sound of his mother's voice and that of a stranger within 12 hours after birth. Sound localization is already present during the first few days after birth. Newborns are also able to distinguish between sounds of different pitches. They show a definite preference for high-pitched sounds, such as their mothers' voices (Berk, 1994 p.129). Low-frequency sounds increase motor activity, while harsh, high-pitched sounds cause the baby to freeze. A crying baby may be soothed, and body movements inhibited, by low-frequency sounds (Louw *et al.*, 1998 p.159).

In the realm of auditory stimulation, there are studies (Brierley, 1994 p.103) suggesting that mothers are sensitive to their babies' auditory cues, as well as research demonstrating the sensitivity of babies to maternal vocalizations. Several writers (Schaffer, 1996 p.56; De Róiste & Bushnell, 1996 p.52) have emphasized the significance of vocal behaviour in the mother-infant interactional system. Bowlby (1969 p.37), in his presentation of attachment theory, has pointed out that infant vocalizations serve to elicit and maintain proximity with the caregiver, which is important for the development of infant attachment. In turn, maternal vocal behaviour stimulates additional infant vocalization, which may enhance the value of both interaction and mother-infant proximity.

A number of theorists in the area of language development (Anderson *et al.*, 1977 p.1678; Keller & Scholmerich, 1987 p.64) have begun to recognize the dependence of the ontogeny of communicative behaviour on the preverbal behaviour of infants in interaction with their caregivers. It has become evident that the structure of expressive language is built on the foundation of the structural interchange between infant and parent that occurs as early as two months, when regular vocal production begins to appear.

#### (5) Cutaneous and kinesthetic sensations

When a baby cries, the most likely maternal response is to pick up the child. Abidin (1980 p.19) suggests that crying is one of the most powerful signalling behaviours that the infant uses to establish or maintain contact with his mother. However, once the infant has been picked up, a variety of possible events can occur. The mother can talk to her baby or she could rock him. She might merely pat or caress the baby to soothe him. Infancy researchers (Anderson *et al.*, 1977 p.1679; Goldberg, Corter, Lojkasek & Minde, 1990 p.115) have included such behaviours as touching, rocking, jiggling, caressing and playing as part of the tactile and vestibular stimulation of healthy development in infants. It has been shown that infants who have been carried around by their mothers experience greater stimulation. Being carried around allows them to have visual contact with a variety of objects in their environments and might enhance their motivation to

interact with objects. Infants that are carried about by their mothers for many months are provided with both vestibular stimulation, and access to many visual experiences. Studies suggest further that being carried about may facilitate development in the early months, but may interfere with development later, when the infant should be moving around on his own.

For babies, the sense of touch is an extremely important avenue of learning and communication. Not only does the skin provide information about the external world, but the sensation of skin against skin also appears to provide feelings of comfort and security that may be major factors in the formation of bonds of attachment between infants and their caregivers (Louw *et al.*, 1998 p.171).

The reciprocal nature of parent-infant interaction and infant stimulation should be clear. The more positive the interaction, the more, and the more natural, the stimulation. This increases the possibility of normal development. According to Etaugh and Rathus (1995 p.237), it must be kept in mind that positive developmental outcomes may be caused not only by secure infant attachments, but also by the continuation of good parent-child relationships throughout childhood.

#### **2.4.4 Stimulation of the LBW premature infant in the NICU**

The LBW premature baby's environment may provide sensory overstimulation rather than sensory deprivation. Fragile and medically-compromised LBW premature babies need treatment that takes their needs into consideration. Studies (Blanchard, 1991 p.83) show that while much of the parent's activity is aimed at encouraging more activity or responsivity from the LBW premature baby, this approach may be counter-productive. They suggest that early intervention programmes should be careful about recommending increased stimulation for the LBW premature baby. Instead, it would appear to be more appropriate to suggest that the mother attempt to establish her baby's level of stimulation and act accordingly.

According to Van den Berg (1993 p.197), the strongest indicator of improved developmental functioning later on in high-risk infants has occurred when positive psychological support is available to families. The next section describes the behavioural repertoire and developmental needs of the LBW premature infant, in order to provide caregivers with strategies to meet these developmental needs throughout the infant's NICU stay, and to support and enhance his recovery.

Van den Berg (1993 p.196) recommends that parents go slowly with the stimulation of their infant at first, taking time to observe their baby and watch his responses to various types of stimulation. Parents should learn what upsets the baby, what soothes him, and how he shows distress and comfort. They should also notice the length of time it takes the baby to regain his equilibrium after a stressful procedure. A premature baby may not cry when he is uncomfortable, the way a full-term baby does. Instead, his distress signals often involve physical changes, such as:

- shifts in skin colour from pink to grey (especially around the lips),
- gagging, grunting, spitting, hiccupping
- abrupt variations in muscle tone - either sudden limpness or flailing, startled-looking motions,
- sneezing, yawning, sighing
- a rapid change in heartbeat and breathing rate, often followed by
- apnoea and bradycardia

A baby on a respirator cannot have apnoea, since the machine controls his breathing, but he can show the other physiological signs of stress. A sudden drop in blood oxygen is one indication of stress that is easily observed if the baby is on an oxygen monitor. The baby may also show discomfort or fatigue through gestures and facial expressions. A stressed baby may:

- look exhausted
- grimace (a crying expression without sound or tears)
- avert his eyes, or
- cover his face with his hands, as if to say, "enough!"

A study by Howard and Thurber (1998 p.167) reveals indicators used by neonatal nurses to recognise the experience of pain in infants in a NICU. Listed in increasing order of frequency were: fussiness, restlessness, grimacing, crying, increasing heart rate, increasing respirations, wiggling, rapid state changes, wrinkling of forehead, and clenching of fist. These findings are compatible with the stress cues identified in Als' synactive theory of development (Als & Gilkerson, 1997 p.180), and lend support to the use of such measures for the assessment of infant pain.

An understanding of the behaviour of LBW premature infants is necessary in order to provide a protective, nurturing environment that will help them conserve energy and achieve physiological stability. Als (1994 p.854) describes a model of preterm infant development that characterizes the unfolding early behavioural organization of the preterm infant. This model is based on the assumption that the infant's primary route of communicating both his stress limits, and his functional stability, is that of his behaviour. The synactive theory of development specifies



various levels of preterm behaviour, and describes the infant's ability to organize and control his own behaviour. It sees the infant as being in continual interaction with his environment via five subsystems: autonomic, motor, state, attention/interaction and self-regulation (Als & Gilkerson, 1997 p.180).

According to Als (1994 p.854), the autonomic system can be seen in the pattern of respiration, in colour changes, and in various visceral signs. The motor system is observed in the infant's posture, his specific movement patterns, and his level of activity. The state system is seen in the available range of states of consciousness (from sleeping, aroused, awake and alert to crying). The attention system is seen in the infant's ability to orient himself in term of and focus on such sensory stimuli in the outside milieu as face, sounds or objects. The self-regulatory system is visible in the behaviours the infant uses to maintain the integrity and balance of the other systems. In the premature infant, a much less mature level of balance exists between the subsystems, making developmental requirements different than in full-term infants.

Als (1994 p.856) categorizes the behaviours of the premature infant as either approach (those that move toward the stimulus) or avoidance (those that withdraw from the stimulus). Approach behaviours indicate organizational stability, and form part of the autonomic, motor and state system behaviours. Avoidance behaviours indicate stress, and are also manifested through the subsystems (also see the distress signals listed previously).

A goal of neonatal caregiving is to avoid stress in LBW premature infants and promote more stable, calm states. Sensitivity to their infant's individual signals of stress and stability will provide the parents with an understanding of their infant's threshold for stimulation (Schaffer, 1996 p.51).

Observing and quantifying the behaviours of premature infants should become a central component of care in the NICU (Spiker *et al.*, 1993 p.761). Reducing stress in NICU infants through observation and provision of appropriate intervention strategies can optimize medical status and developmental outcome. According to Van den Berg (1993 p.201), the objectives for developmentally-appropriate care of the LBW premature infant should include the following:

1. Altering environmental, treatment and caregiving events that cause stress and interfere with physiological homeostasis.
2. Promoting neurobehavioural organization by identifying and enhancing stable behaviours and reducing the incidence of stressful behaviours in order to support the emergence of maturation, energy conservation, and eventual recovery from acute illness.

3. Promoting parents' understanding of infant behaviour and giving parents a role in the life of their infant even at a very early stage of development.

Specific behavioural intervention recommendations for premature infants are summarized in Table 3 (Lawhon, 1996 p.48-61). These include preventing stress through environmental modifications, specific handling techniques, positioning, and early recognition of cues of stress or stability, so that the infant can maintain state control and self-regulation.

Planning interventions for LBW premature infants will requires attention to individual differences. Infants demonstrate considerable variations in all behavioural patterns, including length and patterns of sleep/wake cycles, activity levels, and tolerance for sensory input. Attention to variations within each infant is also essential. What may be appropriate one day may be inappropriate the next. Parents need to be flexible and ready to adapt caregiving routines and procedures to their infants' individual needs.

	<ul style="list-style-type: none"> <li>- Maintain a neutral body position</li> <li>- Maintain a neutral head position</li> <li>- Maintain a neutral neck position</li> <li>- Maintain a neutral arm position</li> <li>- Maintain a neutral leg position</li> <li>- Maintain a neutral torso position</li> <li>- Maintain a neutral pelvic position</li> <li>- Maintain a neutral respiratory position</li> <li>- Maintain a neutral circulatory position</li> <li>- Maintain a neutral digestive position</li> <li>- Maintain a neutral excretory position</li> <li>- Maintain a neutral reproductive position</li> <li>- Maintain a neutral endocrine position</li> <li>- Maintain a neutral immune position</li> <li>- Maintain a neutral nervous position</li> <li>- Maintain a neutral muscular position</li> <li>- Maintain a neutral skeletal position</li> <li>- Maintain a neutral integumentary position</li> <li>- Maintain a neutral sensory position</li> <li>- Maintain a neutral motor position</li> <li>- Maintain a neutral cognitive position</li> <li>- Maintain a neutral emotional position</li> <li>- Maintain a neutral social position</li> <li>- Maintain a neutral cultural position</li> <li>- Maintain a neutral spiritual position</li> </ul>
Positioning	<ul style="list-style-type: none"> <li>- Maintain a neutral head position</li> <li>- Maintain a neutral neck position</li> <li>- Maintain a neutral arm position</li> <li>- Maintain a neutral leg position</li> <li>- Maintain a neutral torso position</li> <li>- Maintain a neutral pelvic position</li> <li>- Maintain a neutral respiratory position</li> <li>- Maintain a neutral circulatory position</li> <li>- Maintain a neutral digestive position</li> <li>- Maintain a neutral excretory position</li> <li>- Maintain a neutral reproductive position</li> <li>- Maintain a neutral endocrine position</li> <li>- Maintain a neutral immune position</li> <li>- Maintain a neutral nervous position</li> <li>- Maintain a neutral muscular position</li> <li>- Maintain a neutral skeletal position</li> <li>- Maintain a neutral integumentary position</li> <li>- Maintain a neutral sensory position</li> <li>- Maintain a neutral motor position</li> <li>- Maintain a neutral cognitive position</li> <li>- Maintain a neutral emotional position</li> <li>- Maintain a neutral social position</li> <li>- Maintain a neutral cultural position</li> <li>- Maintain a neutral spiritual position</li> </ul>
Caregiving	<ul style="list-style-type: none"> <li>- Maintain a neutral head position</li> <li>- Maintain a neutral neck position</li> <li>- Maintain a neutral arm position</li> <li>- Maintain a neutral leg position</li> <li>- Maintain a neutral torso position</li> <li>- Maintain a neutral pelvic position</li> <li>- Maintain a neutral respiratory position</li> <li>- Maintain a neutral circulatory position</li> <li>- Maintain a neutral digestive position</li> <li>- Maintain a neutral excretory position</li> <li>- Maintain a neutral reproductive position</li> <li>- Maintain a neutral endocrine position</li> <li>- Maintain a neutral immune position</li> <li>- Maintain a neutral nervous position</li> <li>- Maintain a neutral muscular position</li> <li>- Maintain a neutral skeletal position</li> <li>- Maintain a neutral integumentary position</li> <li>- Maintain a neutral sensory position</li> <li>- Maintain a neutral motor position</li> <li>- Maintain a neutral cognitive position</li> <li>- Maintain a neutral emotional position</li> <li>- Maintain a neutral social position</li> <li>- Maintain a neutral cultural position</li> <li>- Maintain a neutral spiritual position</li> </ul>

**Table 3: A guide for prevention and management of stress in LBW premature babies in NICU**

Problem	Method
Environmental	Protect infant from environment by reducing light, (darken incubator or crib, place blanket over end of table bed, shade infant's eyes when handling), noise (remove telephones, lower loudspeakers and radios, pad all trash receptacles, pad noisy doors, give shift reports away from bedside, close incubator doors quietly), and activity around bedside
Handling	<ul style="list-style-type: none"> <li>• Handle in ways which help avoid stressful reactions such as flailing, arching, and fluctuating heart and respiratory rates</li> <li>• Handle in ways that allow return to calm state after each segment of a caregiving event, such as bathing or feeding</li> <li>• Provide a stable, consistent routine that all caregivers implement in a similar way</li> <li>• Provide a consistent caregiver for familiarity and predictability of handling, positioning, touch, and other sensory experiences</li> <li>• Adjust daily routines so that they are offered at the best time for infant and in conjunction with appropriate state changes: for example, wait until infant is aroused to feed; avoid bathing after stressful procedures; do not feed, bathe, dress, and handle at same time</li> <li>• Be aware of and responsive to subtle cues that indicate readiness, impending disorganization, or stability (see stress signals)</li> </ul>
Positioning	<ul style="list-style-type: none"> <li>• Position to avoid supine and promote prone, sidelying tucked postures</li> <li>• Wrap body; hold hands or feet alone if body not wrapped.</li> <li>• Provide sucking and grasping opportunities</li> <li>• Contain infant with hands or by wrapping or placing rolled blankets around sides/back/feet/head; maintain containment during procedures and caregiving events (bathing, feeding, dressing, suctioning)</li> </ul>
Caregiving	<ul style="list-style-type: none"> <li>• Allow 2-3 hour periods of undisturbed rest</li> <li>• Cluster nursing activities</li> </ul>

## 2.5 INFANT DEVELOPMENT

### 2.5.1 Introduction

Child development studies is a discipline that attempts to gain knowledge of the processes that govern the appearance and growth of children's physical structures, psychological traits, behaviour patterns and ways of adapting to the demands of life (Etaugh & Rathus, 1995 p.95). Testing procedures for any assessment of the newborn or infant are not part of its field of inquiry. The sense of loss and anxiety parents of LBW premature babies may experience may be lessened if the individual developmental aspects of their baby are highlighted to enhance their uniqueness.

The following section covers human development from birth up to the age of two years. Louw *et al.*, (1998 p.150) characterize of the first two years of life as follows: it is a period of rapid change, a critical period for psychosocial development, a period when individual differences emerge, and a period during which socialization begins. The focus is on six areas of competency or types of skill that infants develop during this period. These are: (i) motor-physiological tasks and motor skills/physical development, (ii) perceptual/sensorial skills, (iii) cognitive development, (iv) communicative/linguistic skills, (v) personality development, and (vi) social/interactive development.

Theories are intended to be explanations of facts, but they go further than that: they indicate which facts should be examined (Thomas, 1992 p.10). They are organized into frameworks which serve as formal guides in research. The major theories that have guided child psychology are psychoanalysis, behaviourism, social learning theory, Piagetian theory, and ethnology. Currently, such meta-theories are less influential than explanatory efforts focussing on more limited topics (Thomas, 1992 p.10).

Some approaches to developmental theory will now be integrated into the outline of each aspect of infant development.

## 2.5.2 The first month of life

### (1) Apgar score

The newborn's physical well-being is generally determined by means of the *Apgar score*. Dr. Virginia Apgar designed this scale in 1953, for the quantitative evaluation of certain critical physical characteristics of newborn babies. The scale is applied twice (directly after birth and five minutes after birth), in order to evaluate the following five factors: body colour, heartbeat, reflex irritability, muscle tone and breathing (Louw *et al.*, 1998 p.153). A score between naught and two is given for each of the above aspects, after which the respective scores are added together (the maximum score is 10). Approximately 90% of all normal babies achieve a score of seven or higher, which is regarded as the norm. A score of 4-6 is poor and a score of 0-3 dangerous (Louw *et al.*, 1998 p.153).

### (2) Adjustment to basic life processes

Although the neonatal stage is by far the shortest of the various life stages, a number of drastic adjustments regarding basic life processes have to be made in order to make the transition from a totally dependent existence to that of an independent individual, possible (Louw *et al.*, 1998 p.153). Blood circulation, respiration, digestion, temperature regulation, the nervous system and immunity have been discussed in this chapter (2.1), especially in relation to the LBW premature baby's situation.

### (3) Perception and stimulation

See the previous section (2.4), as well as the summary of the development of the senses (Appendix 1, adapted from Einon, 1989 p.11). Positive infant stimulation by means of parent-baby interaction will contribute to normal infant development, especially social and emotional development.

### (4) Motor development: Reflexes

Reflexes are simple, unlearned, stereotypical responses that are elicited by certain types of stimulation (Etaugh & Rathus, 1995 p.147). They do not require higher brain functions; they occur automatically, without thought. Reflexes are the most complicated motor activities displayed by newborns. According to Piaget (1971 p.24), reflexes are the first stage of sensorimotor development. (Appendix 2 gives an outline of Piaget's theory). The following are

regarded as the most important reflexes to take note of during this developmental stage (Etaugh & Rathus, 1995 p.150):

The *Babinski reflex* is seen when the sole of the baby's foot is stroked. It is characterized by the raising of the big toe, while the other toes are spread out like a fan. This reflex disappears when the baby is between six and twelve months old (Louw *et al.*, 1998 p.153).

The *tonic-neck reflex* is observed when the baby is lying on his back and turns his head to one side. The arm and leg on that side extend, while the limbs on the opposite side flex (Johnson-Martin, Jens, & Attermeier, 1991 p.31).

The *Moro reflex* occurs as a result of sudden and intense stimulus, and can be regarded as a startled reaction. It is characterized by the baby's stretching out his arms and legs, and then gradually bringing his arms back to the midline as though to embrace himself. This reflex disappears at about the third or fourth month after birth (Etaugh & Rathus, 1995 p.147).

The *rooting reflex* occurs when the baby's cheek is touched: the baby turns his head in the direction of the stimulus, tries to grasp the object that touched his cheek with his mouth, and begins sucking. This reflex enables the baby to find the nipple of his mother's breast. The mother should therefore touch the cheek that is on the same side as her breast to ensure that the baby finds the nipple. This reflex develops into a voluntary response during the first year (Louw *et al.*, 1998 p.154).

The *sucking reflex* is characterized by the fact that babies begin to suck whenever an object is placed in their mouths. This reflex becomes a voluntary response during the first year (Gemelli, 1996 p.176).

The *grasping reflex* occurs when an object touches the palm of the baby's hand. The baby automatically grasps it firmly. This reflex is strongest at the end of the first month, after which it is gradually replaced by voluntary grasping, reached between the fourth and fifth months (Louw *et al.*, 1998 p.156).

The *walking or stepping reflex* occurs when neonates are held up vertically with their feet touching a horizontal surface. They then move their feet up and down as though they are walking. The reflex involves lifting and bending the knees, but not swinging the arms. It disappears gradually after about two or three months (Etaugh & Rathus, 1995 p.148).

Swimming motions, performed when neonates are placed with their stomachs in water, characterize the *swimming reflex*. This reflex disappears at about six months after birth (Louw *et al.*, 1998 p.157).

The reflexes of LBW premature infants tend to be sluggish, weak and poorly organized (Gemelli, 1996 p.189). They do not startle in a consistent way or grasp automatically and strongly at objects. Muscles often seem flabby or overly-relaxed, which is a sign not only of immature muscle development, but also of insufficient nerve impulses to stimulate good muscle tone. Studies (Turner & Helms, 1995 p.76) show that when preterm infants are gently and slowly rocked at about the same speed as a mother's normal breathing, they seem to react more like full term infants. They become healthier and physically larger, and show fewer disturbances in their sleep. Their reflexes are also stronger than those of preterm infants who are not rocked daily.

#### (5) Cognitive development

Piaget believed that newborns lacked the cognitive skills to imitate a gesture that they could see, by making one of their own, that they could not see (Piaget, 1971 p.16). He thought this ability began only at eight or nine months of age. More recent studies have shown that infants already appear to possess this capability in the first month of life. Meltzoff and Moore (1992 p.77) studied twelve- to twenty-one day-old infants' abilities to match tongue protrusion, lip protrusion, mouth opening, hand opening, and hand closing. In their study, each infant was shown a series of gestures made by the same adult. If the infant could reliably produce the same gesture following the adult's display of that gesture, the ability to imitate could be inferred.

The results show that infants can both differentiate between and match expressions. According to Fagan (1992 p.83), newborns imitate in a more or less reflexive manner, with no thoughts or awareness of an attempt to copy. Even though the early imitations do not prove that newborns can think, the results show that they can move, look and act like those around them. Adults' feelings about the baby's reactions towards them have important effects on their willingness to interact with the baby.

LBW premature babies tend to respond less to their parents than full-term babies do, at least at first. Perhaps to compensate, parents of these babies sometimes initiate more contacts than parents of full-term babies do (Gemelli, 1996 p.191). From the perspective of a LBW premature infant, parents may sometimes "try too hard" to interact; from the perspective of the parents, the infant may sometimes seem unresponsive.

## (6) Personality development

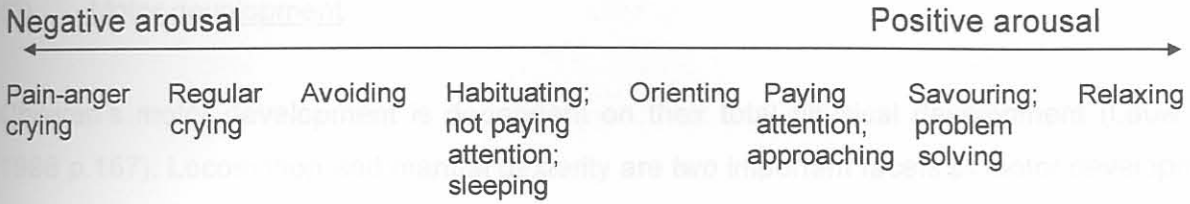
Psychologists such as Bowlby (1969 p.3) regard infancy as a critical period in the development of personality, since important foundations for later development are laid during this period. The term "personality" refers to the unique and relatively consistent way in which an individual feels, thinks and behaves (Louw *et al.*, 1998 p.202). Erik Erikson (1995 p.16) expanded on Freud's theory (Freud, 1991 p.23; see Appendix 3 for their theories), and indicated the importance of children's early experiences with their caregivers. He believed that these early experiences form the basis for social and emotional development throughout the individual's life. Two important aspects of personality that develop during the first two years of life, according to Erikson, are basic trust and autonomy (independence).

Babies are completely dependent on others for sustenance, physical care and safety. According to Pharoah, Sterenson, Cooke and Stevensonl (1994 p.272), the newborn makes both approach and avoidance responses, which are related to either pleasurable or annoying experiences. Infants are capable of a number of different avoidance responses, such as turning the head away from an impending object, and actively struggling to remove any obstruction to breathing, but they still require a great deal of attention. According to Erikson, it is necessary for babies to develop basic trust during this stage, which implies that their basic needs should be satisfied consistently. As a result, babies learn to trust their environment, because they can depend on the compassion and nurturing of others. From this basic trust babies develop the necessary self-confidence to explore their environment. The quality of the mother's behaviour is crucial in the development of this trust (Erikson, 1995 p.26). Caregiving should be consistent, sensitive and responsive, which means that the mother should respond in an appropriate manner towards the baby's needs.

Lipsitt (1990 p.126) depicts the newborn's emotional responses on a one-dimensional continuum (see Figure 3 below). At the extremes of this continuum are relaxation and anger, and in the middle, mild orienting and aversive reactions, such as turning the head toward and away from a stimulus. Complex emotions like ambivalence, fear, pride and shame are several months, and, in some cases, years down the developmental road (Bremner, 1994 p.178).



**Figure 3: Newborn emotional responses**



The first social smile appears at approximately three weeks of age, and is usually non-selective in nature, as the baby smiles at everybody (Louw *et al.*, 1998 p.206).

(7) Social development

The earliest interactions revolve around the infant's need for biological regulation of basic processes, such as feeding and sleeping. Mutual adaptation of infant and caretaker begins at birth, and develops with surprising speed during the early weeks of life. The main developmental theme during the next phase is the regulation of mutual attention and responsiveness, as found primarily in the context of face-to-face interactions. Certain biologically-based cycles of attention are introduced to these interactions, and parents adapt their behaviour to these. In this way a synchronization of the baby's and the parents' two sets of actions is ensured, e.g. in early turn-taking behaviour (Schaffer, 1996 p.21).

By the age of two weeks, the baby watches the mother's face as she feeds and talks to him, and he soon starts to recognize her (Cunningham, 1993 p.115). Four to six week-old babies begin to smile. They smile to show pleasure when people look at them (Louw *et al.*, 1998 p.166).

According to Field (1990 p.156), parents and their LBW premature babies smile at each other less than usual. If the parents also face other stresses, they may lack the time or energy to overcome the initial difficulties in establishing contact with their baby. To avoid forming a permanently poor relationship, such parents may need help in understanding their infant's development, so that they can enjoy that development as it unfolds.

### 2.5.3 One to four months

#### (1) Motor development

Children's motor development is dependent on their total physical development (Louw *et al.*, 1998 p.167). Locomotion and manual dexterity are two important facets of motor development.

Turner and Helms (1995 p.98) explain the different stages of locomotion through which babies go before they can walk (see Appendix 4). The initial development of the ability to move forward begins at about two and a half months. At this age, babies are able to raise their chests by pushing their arms upward (Louw *et al.*, 1998 p.167). By the time they are two or three months old, half of all babies can roll over in bed (Gemelli, 1996 p.180). When a newborn baby is picked up or lifted into a sitting position, his head falls backwards. By the age of three months, the baby is beginning to control his neck (Bremner, 1994 p.127).

When a three-month old baby is held in a standing position the legs begin to take a little of the weight, although they tend to sag at the knee and hip (Gemelli, 1996 p.188).

After about four months, babies approach an object with open hands.

#### (2) Perceptual development

Three-month old babies have a greater focusing range, and can therefore see further than newborns. There is also more control over the movement of the eyes. Babies can now follow nearby movement (Etaugh & Rathus, 1995 p.187). At this age, a baby spends time watching his own hands as he lies on his back. On the basis of an experiment in which he conditioned babies to react to the sizes and shape of cubes, Bower (1966 p.91) came to the conclusion that size and shape constancy is already present at six weeks.

After one month, the baby begins to notice continuous sounds, and pauses and listens to them when they begin. Particular types of music and singing often soothe young babies. At four months, a baby quietens down or smiles at the sound of his mother's voice even when he cannot see her (Bremner, 1994 p.97). The infant of three months old reacts too much softer sounds.

(3) Cognitive development

Infants' memory seems to be a predictor of childhood IQ. Infants who perform better on tests of memory at the age of two to nine months, also score higher on intelligence tests later in childhood (Fagan, 1992 p.84). Younger infants forget faster than older infants (Rovee-Collier, 1993 p.133).

(4) Language development

The baby can make more sounds at three months old, since he is beginning to learn to control the muscles of his lips, tongue and larynx (Etaugh & Rathus, 1995 p.217).

Babies from about two months old use various sound patterns and pitches to indicate their different needs, which makes crying a much more effective means of communication. It does not, of course, imply that anyone who hears crying will be able to associate a specific need with it, but research does indicate that the mother, in particular, is able to make such distinctions (Zeskind & Marshall, 1988 p.194).

Babies coo and babble from about the ages of two and five months respectively (Louw *et al.*, 1998 p.186).

(5) Personality development

When infants are one month old, their faces seem to be able to register only levels of attention and arousal, and degrees of distress. The number of distress expressions significantly decreases during the next few months, at the same time giving way to the appearance of more complex expressions.

The third phase in the development of smiling behaviour, according to Gewirtz and Peláez-Nagueras (1992 p.1418), is known as the selective social smile. It develops at about three and a half months as a response to familiar social stimuli. Babies start to laugh out loud at approximately four months of age.

(6) Social development

Social development involves the behaviour patterns, feelings, attitudes and concepts that children manifest or apply in relation to other people, as well as the manner in which all these things change with age (Gemelli, 1996 p.256).

The psychologist who first drew attention to the importance of attachment was the British psychoanalyst John Bowlby (1969 p.22). Attachment is not automatically present at birth; it develops gradually after the first contacts. Bowlby (1969 p.35; see Appendix 5) describes the various phases in the development of attachment. The pre-attachment phase (indiscriminate responsiveness to humans) is the first phase. During this phase, which lasts for approximately two to three months, the baby's behaviour is mainly characterized by genetically-determined reflex responses. Babies' reactions towards strangers and familiar persons tend to be the same: they smile at everybody and can be comforted by anybody (Bronfenbrenner, 1979 p.27).

**2.5.4 Five to eight months**

(1) Motor development

Babies have total head control at six months of age. By then the baby uses straightened arms to lift his head and chest off the ground. Around five months, the baby is usually able to roll over from his front onto his back. It takes about a month more before he can roll over from his back to his front (Etaugh & Rathus, 1995 p.169).

By the age of five to six months the baby is able to sit up straight but still needs support (Louw *et al.*, 1998 p.167). He can now also take weight on his legs when being held up, and enjoys bouncing up and down.

At six months, babies can grasp an object without its having to be put into their hands, and can use the whole hand to do so (Bremner, 1994 p.167).

(2) Perceptual development

Babies already have reasonably well-developed auditory perception after six months (Kail & Cavanaugh, 1996 p.78). By the time a baby is seven months old, he will immediately turn toward his mother's voice across a room, or toward very quiet noises made on either side of him, if he is not occupied with other things.

(3) Cognitive development

Using the paired-comparison technique, Fagan (1992 p.83) found that five-month old infants recognize photos of faces they have seen previously, even after a 14 day delay. Liaw (1993 p.1030) also showed that seven-month old infants demonstrate this type of long-term recall.

Infants as young as six months demonstrate an understanding of cause and effect (Leslie & Keeble, 1987 p.281).

Cooper's findings (1991 p.82) indicate that infants with an average age of five and a half months can perceive and represent small numbers of items in memory.

(4) Language development

Lallation (the repetition of sounds and words heard) occurs from seven or eight months. The repetition is generally incorrect or accidental, but nevertheless forms an important basis for communication (Gemelli, 1996 p.239).

(5) Personality development

Fear of strangers appears between approximately six months and two years. Separation from the mother and strange situations can also cause fear (Etaugh & Rathus, 1995 p.246).

(6) Social development

The second phase of attachment development, according to Bowlby (1969 p.36; see Appendix 5), is the attachment-in-the-making phase (focussing on familiar people). This phase lasts from about the third to the sixth month, and is characterized by babies' different reactions to familiar and unfamiliar people. The deeper level of attachment that develops between babies and their primary caregivers is particularly noticeable. This relationship causes babies to smile at and "talk" to their caregivers more often than to other persons. Babies could also become upset if they are separated from their mothers or from other familiar people.

With the development of intentionality and planning ability, goal-directed partnerships appear. The child becomes capable of forming internal working models, which enable the attachment relationship to be represented mentally. Focussed attachments first become apparent around the age of seven to eight months. The ability to recognize familiar individuals appears much

earlier, although it is not until the age of seven to twelve months that infants become capable of person permanence, i.e. the ability to remain oriented to individuals even in their absence. This is a necessary prerequisite of attachment formation (Schaffer, 1996 p.65).

Even in infancy, attachments can be formed with several individuals. The choice depends on the quality of the interaction between the baby and the individual, rather than on such factors as the sex of the person or the total amount of time spent together (Schaffer, 1996 p.65).

According to Haviland and Lelwica (1987 p.100), interaction can take place between babies as young as six months. Such interaction is, however, very simple, and consists mainly of smiles, touching, or sounds. Nevertheless, it is the beginning of peer interaction, which is an important component of a child's social development.

### 2.5.5 Nine to twelve months

#### (1) Motor development

By the age of nine months, a baby can pull himself into a sitting position and sit unsupported for a short while. One-year old babies are able to sit unsupported for quite a while, and are able to turn sideways and stretch out to pick up an object (Louw *et al.*, 1998 p.170).

An eight to nine-month old baby can move over the floor either by pulling or pushing himself with his hands, or by rolling. By one year of age the baby crawls rapidly either on hands and knees, or like a bear on hands and feet. The baby can pull himself into a standing position at the age of nine months. A one-year-old baby can walk if one hand is held. At this stage he walks with feet apart and with steps of varying length, and the feet have a tendency to go in different directions (Louw *et al.*, 1998 p.167).

At nine months old, babies are able to use fingers and thumb to grasp an object. Babies can deliberately drop things. By the tenth month, they try to reach things with the index finger and poke at them, and pick up small objects between the tip of the index finger and the thumb. By one year of age, babies can use their hands to throw things, and can point with the index finger to the an object they want (Cunningham, 1993 p.177).

## (2) Perceptual development

When nine months old, the baby looks around for very quiet sounds made out of his sight. At the age of one, the baby responds to his own name and to other familiar words.

Research carried out by Field (1990 p.69) shows that most babies between six and fourteen months old are able to perceive depth.

With regard to touch, De Róiste and Bushnell (1996 p.52) conducted an experiment in which ten-month old babies were placed in a dark room where they had to distinguish between known and unknown objects by using their sense of touch only. The researchers came to the conclusion that babies of this age are indeed able to perform this task.

## (3) Cognitive development

Brooks-Gunn *et al.*, (1993 p.749) found that ten-month olds have an understanding of causality. Infants nine months old can focus on one class of objects, and notice objects that do not belong to it (Gopnik & Meltzoff, 1992 p.1097).

The theorist who made the greatest contribution to our knowledge of infant cognition is Jean Piaget (see an explanation of his theory in Appendix 2). However, recent research findings indicate that Piaget underestimated infants (Louw *et al.*, 1998 p.175).

Infants are able to solve problems. Leslie and Keeble (1987 p.266) presented infants with the problem-solving task of retrieving a toy that they could see, but that was out of their reach. Nine-months olds could solve the problem. This research finding illustrates that infants - at a younger age than Piaget (1971 p.40) indicated - have the ability to solve problems. According to Piaget (see Appendix 2), it is only during Stage 6 of the sensori-motor period (when infants are eighteen to twenty-four months old), that they can use a new scheme (not already known to them) to solve a problem.

## (4) Language development

Echolalia (repetition of words or sounds) occurs from about nine to ten months of age. Whereas the repetition of sounds or words in the lallation phase was incorrect or accidental, it is now more correct and "deliberate" (Louw *et al.*, 1998 p.186).

(5) Personality development

Research indicates that babies whose mothers react quickly and affectionately to their crying, cry less by the end of their first year (Hoy, Sykes, Bill, Halliday, McClure & Reid, 1992 p.140).

**2.5.6 Twelve to eighteen months**

(1) Motor development

By the time he is fifteen months old, the baby can walk alone. The average age at which babies first walk on their own is thirteen months. Craig (1996 p.81) points out that girls usually begin walking earlier than boys; the age for girls varies between ten and fourteen months, and for boys between twelve and sixteen months. Once a child has learnt to use his legs for walking, he can acquire other skills. By the age of fifteen months, the child is likely to be able to kneel and to crawl up stairs. An eighteen-month old child can walk up stairs by holding on to the rail and putting both feet on each stair (Louw *et al.*, 1998 p.170).

Children can lift a cup or spoon to their mouths by the age of fifteen months, but their judgment is not yet very good. They can place one toy brick on top of another to build a tower. An eighteen-month old child can feed himself, and make a tower of three bricks (Bremner, 1994 p.180).

(2) Cognitive development

Between fifteen and twenty-one months of age, infants can sort objects into different categories by touching first all objects that belong to one and then all those belonging to another class (Gopnik & Meltzoff, 1993 p.1110). Infants sixteen months old have demonstrated that they have a conception of basic-level categories (e.g. dogs and cars), contextual categories (e.g. bathroom things and kitchen things) and global categories (e.g. plants and furniture). According to Piaget (1971 p.38; see Appendix 2), the ability to classify does not develop until the pre-operational period (two to seven years), and therefore these research findings indicate that the infant is more competent than previously believed.



(3) Language development

During this phase, babies begin to speak intelligible words; they use them in a deliberate way to communicate with other people. Initially their speech is holophrastic, that is, single words are used to convey complex ideas (the term *single-word sentence* is also used in this connection). Thus the single word can convey various wishes (Berk, 1994 p.101). Children have a repertoire of 3-50 words, and their understanding progresses rapidly (Etaugh & Rathus, 1995 p.217).

(4) Personality development

Fear of heights, an almost universal phenomenon, develops between the ages of thirteen and eighteen months (Lefrancois, 1996 p.189).

Research by Liaw and Brooks-Gunn (1993 p.1033) indicates that babies start to recognize themselves in a mirror when they are about fifteen to eighteen months old. Being able to recognize themselves implies that babies can draw a distinction between themselves and others.

(5) Social development

Papalia and Olds (1995 p.149) carried out an interesting study aimed at testing the reactions of babies to a crying peer. They found that babies ten to twelve months old often cried when they saw another child in tears; when thirteen or fourteen months old they stroked or embraced the crying child; and when eighteen months old they offered specific help.

**2.5.7 Eighteen to twenty-four months**

(1) Motor development

When a child is two years old he can walk up and down stairs using both feet for each stair, and kick a ball without falling over (Louw *et al.*, 1998 p.170).

He also puts on shoes, begins to draw, turns door handles and unscrews jars. He can build a tower consisting of six bricks (Johnson-Martin, Jens, & Attermeier, 1991 p.53).

Hand preference is seldom noticeable and it is only at about the age of two that one hand is definitely preferred to the other (Louw *et al.*, 1998 p.171).

(2) Language development

Children of this age show a vocabulary of more than 50 words. They begin to join vocabulary items into two-word phrases spontaneously. All these phrases seem to be their own creations. They show a definite increase in communicative behaviour and an interest in language (Louw *et al.*, 1998 p.187).

(3) Personality development

According to Erikson (1995 p.24; also see Appendix 3), the second important development in personality (after basic trust) occurs at about eighteen months of age. As children develop physically, cognitively and emotionally, they also develop a need for independence. Erikson (1995 p.25) refers to this developmental period as the crisis of autonomy versus shame and doubt (see Appendix 3). The major challenge during this stage is the development of self-regulation (control over one's own behaviour) versus external regulation (control by parent, *et cetera*). According to Erikson, this phase is important because children gradually have to come to trust their own judgments.

Between the ages of eighteen and thirty months, children start to describe themselves. Self-description is an important step in the development of self-awareness, because children would not be able to refer to themselves if they did not have an awareness of themselves as separate individuals (Louw *et al.*, 1998 p.212).

(4) Social development

According to Bowlby (1969 p.37; see Appendix 5), the third phase of attachment development is the phase of "clear-cut" attachment (active proximity seeking). During this phase, which lasts from about six months to two years, attachment to the caregivers can clearly be noticed. Because babies can crawl or walk, they always try to be where their caregivers are. They also protest when the caregiver is not in sight. Although the attachment to the primary caregiver is unique, most babies also develop an attachment to people who are not caregivers, e.g. grandparents, siblings, and even other family members and friends. According to Schaffer (1996 p.78), children form two kinds of relationships, namely vertical and horizontal. The former are with individuals of greater knowledge and power than the child's; the latter are with those having the same power, such as peers. The distinction, though not absolute, draws attention to the different kinds of contributions made to his development by the child's partners. Various orderly developmental sequences are to be found in children's contacts with peers right through from

infancy to adolescence. Their interactions become more frequent, more sustained, more complex, more intimate, and more cohesive (Schaffer, 1996 p.305).

Bronfenbrenner's ecological systems theory (1979 p.43; see Appendix 5) serves to draw attention to the multiplicity of social influences that impinge on children's development. These influences are systematized into a model with different levels; microsystems, mesosystems, and macrosystems. The model emphasizes the interdependence of these levels. Economic conditions which produce child poverty can, for example, have cumulative ill effects of a far-ranging nature on their development. Again family processes mediate many of these effects, in so far as the nature of parenting is often profoundly altered in poverty-stricken families. While affected children are thus at risk, many do escape, the crucial factor being the way in which children maintain their self-image. Another social system providing a context for development is found in ethnicity. How society is stratified and what group a child belongs to can produce multiple influences, seen most clearly in children belonging to ethnic minorities. Here too much depends on the conditions of family life, but also on the way children build up a self-identity in the face of prejudice toward minority groups (Schaffer, 1996 p.305).

Highly stressful experiences (for example being born of LBW and premature) which children may encounter may produce marked psychopathology at the time. Single episodes rarely produce long-term consequences on their own, however; their consequences must be seen in the context of more continuous experiences such as altered family climates (Schaffer, 1996 p.312).

One aspect of the self is self-awareness. As measured by the ability to recognize oneself visually, this appears by the middle of the child's second year. It is also then that self-related terms appear in children's speech, as do signs of self-consciousness. Another aspect of the self is self-concept. This is the cognitive feature of the self-system; it is constructed by children as an answer to the question "who am I?". In the course of childhood, its nature changes in terms of a number of developmental dimensions namely from simple to differentiate, from inconsistent to consistent, from concrete to abstract, from absolute to comparative and from self-as-public to self-as-private (Schaffer, 1996 p.314). A third aspect is self-esteem, i.e. the feelings children have about their own worthiness. Self-esteem is much influenced by children's social experiences; it is thus far from static and also varies according to the functional domain (Schaffer, 1996 p.312).

During their second year, children become aware of the importance of meeting particular normative standards for behaviour and appearance. This awareness, and children's interest in

violating standards, are reflected in their conversations, which parents can use to extend children's ability to understand the social rules set up to guide their behaviour (Schaffer, 1996 p.312). Children are far from passive in rule-learning; they actively attempt to make sense of their social world and how it functions, by questioning and challenging and by testing its limits through deliberate noncompliance. Interaction with siblings is a further arena for the acquisition of rule-governed behaviour. These interactions fulfil a different function than those between parents and children.

### Introduction

Children learn more about co-operation, sharing and turn-taking with siblings than they do from their parents (Schaffer, 1996 p.318).

## 2.6 CONCLUSION

Chapter One presented the main research question as well as the subquestions that would guide this research. The literature study of this chapter allowed partial answers to the first two sub-questions, namely:

- 1) What are the specific risks, needs and care requirements of LBW premature infants? and
- 2) What is the nature of the emotional reaction which parents of LBW premature babies experience during the first few months after the baby's birth, and which of their needs can the educational psychologist meet?

This chapter also provided an outline of the content, objectives, principles and implications relevant to an early intervention programme.

The following chapter focusses on factors to be considered when involving parents in such a programme, as well as on the role of the educational psychologist as a facilitator for parent support and/or counselling.