2 COMMUNICATION DEVELOPMENT IN INFANTS

This chapter aims to provide an overview of the different perspectives on infant communication development, emphasising important areas of communication development and factors that influence it. Issues that are of particular relevance to the study of infant communication development in the South African context are highlighted. Finally suggestions are made for the facilitation of optimal communication development in the South African context.

2.1 INTRODUCTION

Communication is central to the human experience and the emergence of communication skills is an important part of infant development (Hess *et al.*, 1997; Seiler, 1996; Rossetti, 2001). Not only does infant communication development affect an infant's current functioning and development in various skill areas but communication development in infancy also influences long term outcomes and performance (Lindsay *et al.*, 2002; Hess *et al.*, 1997; Lewis *et al.*, 2000; Lockwood, 1994; Scarborough, 1990; Snowling *et al.*, 2001). Recent research indicates that communication functioning also affects children's estimations of self-worth (Lindsay *et al.*, 2002). The development of good communication skills is, therefore, crucial in encouraging wellness and optimal functioning in all areas. This concurs with the focus in a recent South African position statement which advocates the prevention of disorders by promoting optimal functioning and wellness (White Paper on Integrated National Disability Strategy, 1997). The study and development of infant communication skills is, consequently, important to the prevention of disorders as well as to the promotion of optimal developmental outcomes.

When studying infant communication skills both therapists and researchers frequently focus on *parent-infant interaction* (Rossetti, 2001; Whites, 1992; Fenson, Dale, Reznick, Thal, Bates, Hartung, Pethick & Reilly, 1993). This is done for two reasons, namely because parents play a pivotal role in infant communication development

(Karrass *et al.,* 2002; Hess *et al.,* 1997) and because parents have been found to be very accurate in describing their infant's communication skills (Early Intervention Update, 1997; Rossetti, 2001; Fenson *et al.,* 1993).

The interaction partner plays a crucial role in the development of communication skills and parents are frequently an infant's primary interaction partners (Owens, 2001; Rossetti, 2001). Parent-child interactions shape language use (Haynes, 1998). Research indicates that early environmental nurturing provided by the parent affects language acquisition (Hess *et al.,* 1997). Early parent-infant interactions are central to many aspects of development but are especially important to the development of infant communication skills (Karrass *et al.,* 2002). Aspects such as the establishment of joint attention, maternal encouragement, maternal verbal responsiveness and maternal stimulation of infant attention are positively correlated with communication development (Karrass *et al.,* 2002; Markus *et al.,* 2000). There is also a causal relationship between parent-infant joint book reading and early communication development (High *et al.,* 2000). It is therefore clear that parents play a significant role in infant communication development. Communication development does not, however, only reflect the influence of parent-infant interactions. Infants do not develop communication skills in isolation. Biological, environmental, socio-economic and cultural factors all influence an infant's communication development (Rossetti, 2001; Pickering *et al.,* 1998). Although parents play a pivotal role, other influences on infant communication development cannot be ignored.

The knowledge that communication skills influence many areas of infant development, that parents play a central role in facilitating infant communication development while other factors also impact upon development raises the following questions: *Firstly* if early communication development is so important then the question arises: How do infants develop communication skills? *Secondly* if communication competency, described as the degree of success in communicating (Owens, 2001), affects many different areas of development then it is imperative to understand: What critical aspects need to develop in order for a child to become a competent communicator? *Thirdly* if no skill area develops in isolation then it is important to recognise: What factors influence early communication development? *Fourthly* if environmental, socio-economic and cultural factors influence

communication development then it is critical to ascertain: How does the South African context influence communication development? *Fifthly* if we apply our knowledge of specific issues in the South African context which may impact upon infant communication development then the question is formulated: What is an applicable framework for viewing infant communication development in South Africa? *Lastly*, knowing that parent-infant interactions affect child outcomes then it is imperative to determine: How can we assist South African parents in facilitating optimal communication development in infants?

As depicted in figure 2.1 this chapter will attempt to answer these questions. This chapter aims, therefore, to provide an overview of the foundations of infant communication development and the factors that influence it. This information may serve as a theoretical underpinning for the development of communication stimulation programmes as a prevention initiative.

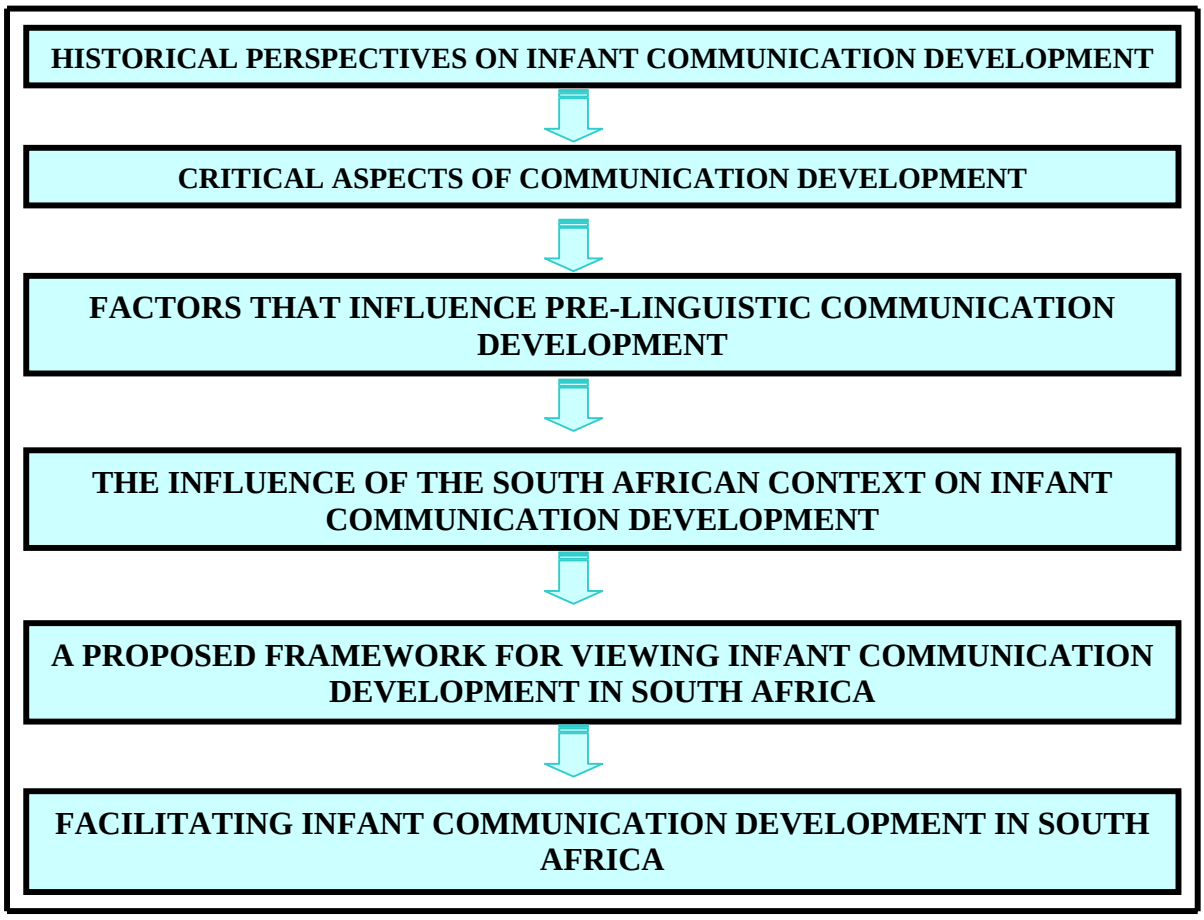

Figure 2.1 A schematic presentation of the discussion of communication development in infants

2.2 HISTORICAL PERSPECTIVES ON INFANT COMMUNICATION DEVELOPMENT

An understanding and knowledge of the models of communication development is important before aspects of communication development can be highlighted or suggestions on the facilitation there-of can be made. Models and theories on communication development guide clinicians in planning sessions, selecting materials and making moment-to-moment clinical decisions (Schneider & Watkins, 1996).

Various authors have proposed, discussed and/or supported different models which place communication development within theoretical frameworks (Skinner, 1957; Chomsky, 1965; Bloom, 1970; Vygotsky, 1978; Owens, 2001; Schneider & Watkins, 1996; Locke, 2001; Girolametto, Pearce & Weitzman, 1996; Bernstein & Tiegerman, 1991). Each of these models have made certain contributions to the study of communication development. This chapter considers existing models, comparing the contributions and possible limitations of each. The framework of critical appraisal is followed in order to highlight the value of the various models to the study of pre-linguistic infant communication.

The different models on communication development support one of three theories, namely: the *behavioural theory*, the *psycholinguistic theory* (first the syntactic model and later the semantic / cognitive model), or the *sociolinguistic theory* (Owens, 2001; Bernstein & Tiegerman, 1991). As depicted in Figure 2.2 the emergence of the different models of communication development may be viewed on a time-line. Each successive model that emerged reacted to the underlying assumptions of the previous models.

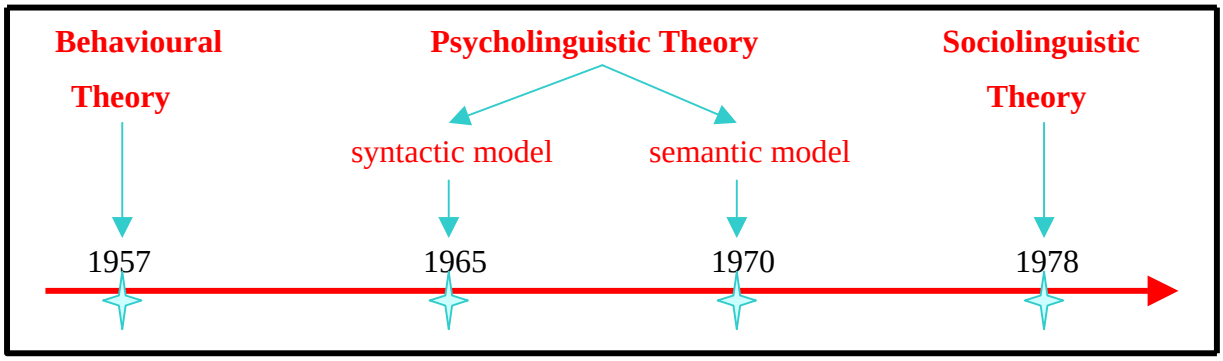

Figure 2.2 A time-line perspective on models of communication development

According to Figure 2.2 the first model of communication development appeared in 1957 and was supported by psychologist Skinner (Owens, 2001). The underlying principles of this model support a *behavioural approach* to communication development and the model proposes that the development of communication skills depends on *environmental variables* (Skinner, 1957). Children learn specific language skills through the principles of operant conditioning where imitation, practice and selective reinforcement serve to enhance communication skills and the parents and significant others are regarded as crucial to communication development as they are central to the process of modelling, correcting and reinforcing the child's communicative attempts (Skinner, 1957).

It is currently an accepted tenet that parents are important, central figures in the process of communication development and that providing a correct language model as well as appropriate feedback is crucial to communication development (Karrass *et al.*, 2002; Haynes, 1998; Hess *et al.*, 1997). The linguistic input that a parent provides is indeed important to the child's language development. Parents who provide optimal input positively influence their infant's communication development (Murray & Yingling, 2000; Salmon, Rowan, & Mitchell, 1998). The parents of young, pre-verbal infants play an important role, therefore, in their child's communication development.

Infants are, however, much more active in the process of communication development than the behavioural model would suggest. Infants influence the communication of others by means of verbal and non-verbal feedback whether intentionally or unintentionally (Seiler, 1996). A responsive, alert child may also elicit more frequent communication and more complex interactions from adults than a quieter child (Popich & Alant, 1997). This implies that the frequency and level of adult interactions are influenced by the child's level of responsiveness. An infant who vocalises more often may be perceived by adults as understanding more, which may result in the adult interacting with the infant more frequently and on a higher level.

Children also actively seek information and are not passive recipients of adult input (Owens, 2001). A model that proposes that a child's communication development will reflect only *adult language input* ignores the child's ability to actively manipulate the environment. An infant as young as 8 months may voluntarily cough in order to gain

attention (Wetherby & Prizant, 1989). A cough carries no meaning and it is, therefore, unlikely that the infant would have learnt this from imitating the adult example.

In reaction to the behavioural model of communication development by Skinner (Skinner, 1957) psycholinguistic theorists such as Chomsky (Chomsky, 1959) criticised the reliance on operant conditioning as a means of developing communication. In reaction to the behaviourist theory Chomsky later suggested a new framework from which to view communication development (Chomsky, 1965). As displayed in Figure 2.2, this model proposed a *psycholinguistic or syntactic approach* to communication development (Owens, 2001). This model suggests that infants are *biologically "pre-wired"* for the acquisition of language and that children are born with a *Language Acquisition Device* which is situated in the brain and is activated by exposure to linguistic input (Chomsky, 1965). The Language Acquisition Device processes the linguistic information that children are exposed to and generates rules for the language (Chomsky, 1965). There is a strong emphasis on the acquisition of *syntactic rules* while the nature of parental input and feedback is not central to this model (Owens, 2001).

Infants do indeed seem to be "pre-wired" or biologically predisposed to developing communication. Infants appear to have a biologically based set of abilities that predispose them to developing communication (Paul, 1999). The visual and auditory senses of infants are developed in such a way that the infant is tuned in to and prefers the parent's face and voice to other stimuli (Owens, 2001). Infants attend to the interaction partner and make eye contact during interactions almost from birth (Owens, 2001). This certainly suggests that there is a biological, inborn tendency to do this in contrast with the emerging of learnt behaviour. Furthermore, even young infants are actively involved in the communication process and are judged by mothers to be responsive in interactions (Bernstein & Tiegerman, 1991).

Recent findings regarding the plasticity of the brain and the ability of the brain to compensate for early left or right hemisphere brain injury (Bates, 1999) suggest, however, that it is unlikely that there is an inborn language acquisition device situated in a specific area of the brain. Research has found that left or right hemisphere injuries during the first six months of life are usually not associated with any permanent

effects on language acquisition (Bates, 1999). Unlike adults, young infants do not demonstrate lesion-specific symptoms of brain injury (Bates, 1999). The young infant brain appears to indicate high levels of plasticity (Bates, 1999). This advantage seems to grow less as infants get older which may indicate that neural pathways and synaptic connections have been formed. If infants were, in fact, born with a language acquisition device then injury to that area, regardless of how early in life, would result in permanent consequences to the development of communication. The concept of a specific, inborn language acquisition device is, therefore, rejected in this discussion.

In contrast to the previous model of communication development, namely the behavioural model, it is positive to note that the psycholinguistic or syntactic model views the infant as an *active participant* in the process of communication development. This notion is an accepted tenet regarding infant communication development and is supported in this discussion.

As a result of trying to apply Chomsky's syntactic model of communication development to child language in the late 1960's, the linguist Bloom proposed a *semantic or cognitive* model in 1970 (Owens, 2001), as illustrated in Figure 2.2. This model focuses on the acquisition of *semantic units* and the development of *cognitive pre-requisites* to communication (Bloom, 1970). This model focuses, amongst other things, on development in the first year of life and supports the notion that certain critical skills and pre-requisites must first develop (Bloom, 1970). This notion concurs with current tenets in early communication development which state that certain skills must first emerge in the pre-lingual child before mature language can develop (Oller, Eilers, Neal & Schwartz, 1999). In the semantic or cognitive model the development of language is related to expressing meaningful relationships based on prior cognitive knowledge and sensorimotor experiences (Bloom, 1970). This model emphasises the value of prior cognitive experiences in communication development (Owens 2001; Bernstein & Tiegerman, 1991). The value of play and a stimulating physical environment is also explored in this model (Bernstein & Tiegerman, 1991).

Current tenets support the notion that early cognitive development and the emergence of certain cognitive skills are important for the development of adequate communication (Owens, 2001). It is widely accepted that the development of

communication skills is influenced by other areas of development such as cognitive, socio-emotional and physical development (Kritzinger *et al.*, 1995; Klass, 1999). Cognitive skills such as object permanence, cause and effect as well as means-end certainly do influence a child's ability to develop communication skills (Owens, 2001). An example of the value of prior cognitive knowledge to communication development is the fact that infants are more likely to be actively involved in communicative routines that are familiar to them (Bernstein & Tiegerman, 1991). It follows, therefore, that familiarity with a situation enables an infant to make certain predictions about events which, in turn, allows an infant to initiate an appropriate communicative action. Furthermore the value of a stimulating physical environment for infant communication development is also important (Klass, 1999).

Focusing on the emergence of semantic units rather than the development of syntactic rules, as in the psycholinguistic or syntactic models, is also of greater value to the study of communication development in infants and younger children. Although cognitive precursors are important to communication development, as emphasised by the semantic or cognitive model, cognition is not the only precursor to communication. Communication is primarily a means of interaction, rather than a translation of cognition into language (Locke, 2001). The cognitive or semantic model loses sight of the intrinsic social nature of language (Bernstein & Tiegerman, 1991).

According to Figure 2.2 the *sociolinguistic theory* of communication development emerged in the late 1970's. This theory developed in reaction to the previous models and was supported by Vygotsky (Schneider & Watkins, 1996). This model is also described as a pragmatic model of communication development (Bernstein & Tiegerman, 1991). This model focuses on the development of communication skills within a *social framework* with the caretaker-child interactions being central to the acquisition process (Vygotsky, 1978; Schneider & Watkins, 1996). The child is motivated to interact by the desire to make a social connection with the interaction partner rather than necessarily conveying information (Locke, 2001; Schneider & Watkins, 1996). In other words this model proposes that children learn to communicate in order to socialise (Locke, 2001). Language use is central to these models and the child is seen as an active participant in the process of developing meanings (Schneider & Watkins, 1996). Other interaction partners are, however, also

viewed as important contributors to the development of communication skills (Schneider & Watkins, 1996). This theory on communication development also gave rise to new developments in clinical practice, with important consequences for the training of interaction partners to provide optimal language input (Girolametto *et al.*, 1996). The formulation of the interactive model of language intervention is based on the underpinning that positive social experiences and interactions between infants and caregivers promote optimal development and have a long-term effect on cognitive, social and linguistic development (Girolametto *et al.*, 1996).

Although the assumptions in the sociolinguistic theory concur with findings on the importance of caregiver-infant interactions to the development of communicative competence (Haynes, 1998; Hess *et al.*, 1997), the proposal that exchanges are exclusively aimed at making and maintaining social connections and that infants are not capable of exchanging information (Locke, 2001) does not explain why an infant who is already connecting and interacting with the caregiver would interrupt an exchange to gesture to something of interest (Manolson, 1992; Owens, 2001).

Furthermore, none of the afore-mentioned models of communication development adequately explain why certain children develop communication disorders while other children, with the same caregivers, inherent abilities or environment, do not (Bernstein & Tiegerman, 1991). Each of the afore-mentioned models has some value and truth but none are sufficiently comprehensive. Communication development is a complex process that is influenced by a multitude of factors (Kritzinger *et al.*, 1995). Caregivers and significant others, the physical and social environments as well as inherent biological and cognitive abilities all influence the development of communication skills (Werner, 2000; Owens, 2001; Kritzinger *et al.*, 1995). According to Rossetti (2001) and Werner (2000) there are external and internal factors which influence infant development. External factors are certainly easier to manipulate. Physical environmental factors, caregivers and significant others are external variables that could be manipulated to provide both a more *physically ideal and cognitively stimulating environment* as well as *a better communication model* (Gerber, 1998; Rossetti, 2001). If caregivers and significant others are viewed as key external variables in the process of communication development, prevention efforts

that promote optimal communication development and the prevention of communication disorders should also be focused on them (Locke, 2001).

The fact that internal and external factors influence development highlights the need for models on infant communication development to consider the multitude of factors that impact on communication development. A model that limits itself to the influence of inherent abilities without considering the role of the caregiver and the impact of the environment (or vice versa) is therefore incomplete.

Although the various models on communication development differ significantly in the proposed reasons for and methods through which infants develop communication skills, all the models concur that there are certain critical aspects and communication skills which need to emerge in infancy.

2.3 CRITICAL ASPECTS OF COMMUNICATION DEVELOPMENT

Developing communication competence implies passing through various stages in development and acquiring a variety of skills. The study of communication development is, therefore, not complete without considering those critical aspects of communication development which must first emerge in order to achieve communication competence.

It has long been accepted that infants start to communicate long before the first word is uttered (McCarthen, 1999; Owens, 2001). The normally developing pre-linguistic infant is moving progressively towards speech through the emergence of aspects such as *intentionality*, *social interaction* and *non-linguistic communication skills*, *oral-motor control*, *vocalisations and babbling* and *language comprehension* (Owens, 2001; Rossetti, 2001; Paul, 1999; McCarthen, 1999; Papaeliou, Minadakis & Cavouras, 2002; Girolametto, Pearce & Weitzman, 1997; Green, Moore & Reilly, 2002; Green, Moore, Higashikawa & Steeve, 2000; Oller *et al.*, 1999). The development of these skills is addressed in the following discussion.

2.3.1 The Development of Intentional Communication

Communication development in the first year of life is divided into two phases, namely the *perlocutionary phase* during which infants do not communicate intentionally, which lasts approximately from 0 to 8 months, and the *illocutionary phase* during which infants communicate intentionally (Owens, 2001). This phase lasts from approximately the 8th to the 12th month (Ogletree & Burns Daniels, 1993).

.1 Communication development during the pre-intentional phase

During the first phase of communication development, the *perlocutionary phase*, parents interpret their infants' vocalisations, gurgles, laughs, facial expressions and cries as if they were intentional and meaningful (Owens, 2001; James, 1990). Easily interpreted expressions such as anger, sadness, surprise and fear develop by approximately 4 months (Owens, 2001). However, infants are not intentionally communicating at this phase (Owens, 2001; James, 1990). During the first phase infants affect the actions of those around them without intending to (Ogletree & Burns Daniels, 1993).

Many of the actions of young infants are actually as a result of involuntary reflexes (Owens, 2001). Reflexes such as the rooting reflex (which helps the infant to latch on and feed) may lead parents to believe that the infant is communicating eagerness to drink milk, while the infant is actually not intentionally communicating anything. However, the fact that the infant is not voluntarily communicating pleasure to the parent does not mean that the infant is not deriving joy from the experience.

Communication exchanges between young infants and parents are maintained because of the sensitivity of caregivers to their infants' needs (Prizant & Wetherby, 1990). However, infants also affect the level of caregiver sensitivity (Locke, 2001). Infant vocalisations may help promote and maintain the relationship with the caregiver, promoting caregiver sensitivity and the meeting of needs (Locke, 2001).

The young infant is involved in the communicative exchange by voluntarily making eye contact with the parent. It is clear that this is a voluntary involvement on the part

of the infant as infants are known to break eye contact and turn their heads away when they are tired (Rossetti, 2001). Although infants have a predisposition to human faces, and in particular the caregivers' faces, and will voluntarily make eye contact, the young infant is not trying to intentionally convey any particular message. Both the infant and the adult are active participants in social exchanges (Owens, 2001). One must, therefore, differentiate between making social contact voluntarily and intentionally communicating a message. During these early social interactions infants progress from merely showing interest in objects to conveying their interest to a communication partner (Pinder & Olswang, 1995). During the pre-intentional phase infants learn the rules of communication and the foundations are laid for the development of later, intentional communication (Owens, 2001).

.2 The emergence of intentional communication

In the second phase, the *illocutionary phase*, infants develop improved cognitive skills for predicting the outcome of behaviour and are, therefore, able to take part in a two-way interaction (Owens, 2001; James, 1990). This phase lasts from *approximately* 8 to 12 months (Wetherby & Prizant, 1989; Owens, 2001). It is during this phase that infants develop intentional communication skills (Wetherby & Prizant, 1989; Owens, 2001). Intentionality develops as infants begin to encode messages for others (Owens, 2001). At first infants merely look at objects of interest but later they will reach for objects and, finally, infants will reach and look while engaging an adult in an exchange (Pinder & Olswang, 1995).

It has been suggested that infants do not communicate in order to express thoughts and, furthermore, that there is some doubt as to the possibility that infants are capable of expressing thoughts (Locke, 2001). According to those who support this notion early communication is not aimed at conveying or receiving information but rather at *reducing emotional discrepancies and achieving sympathetic engagement* (Trevarthen, 1997). If infants cannot express thoughts or convey meaning then they would, by definition, not be capable of intentional communication as intentional communication involves the deliberate pursuit of a goal (James, 1990).

However many authors propose that infants as young as 8 to 10 months *do* demonstrate intentional communication and the deliberate pursuit of goals (Bloom & Lahey, 1978; Pinder & Olswang, 1995; Prizant & Wetherby, 1993). Infants exhibit intentionality by being aware of a goal, such as a ball that is out of reach, and then engaging an adult and communicating the need for reaching it, for example by pulling on a caregiver's dress and then looking and pointing at the ball (Pinder & Olswang; Owens, 2001; Rossetti, 2001). The hypothesis that infants are *not* capable of expressing thoughts or conveying meaning is, therefore, rejected in this discussion.

The development of intentional communication does not require that infants use words (James, 1990). The establishment of successful communication between infant and caregiver depends on the infant's ability to produce a readable signal and the caregiver's ability to respond appropriately to that signal (Prizant & Wetherby, 1990). Infants use a number of non-linguistic methods in order to communicate, including vocalisations, gestures, facial expressions, body posture, eye contact and referential eye gaze where the infant turns to look at the same object as the interaction partner (Rossetti, 2001; Prizant & Wetherby, 1993). Verbal communication is therefore not essential to successful communication between the infant and the caregiver. The development of intentional communication is, however, crucial to the ability to successfully express needs and desires and forms the foundation from which early verbal communication develops (Owens, 2001). Furthermore, the emergence of intentional communication is also closely linked to the development of improved social interaction skills (Rossetti, 2001).

2.3.2 The Development of Social Interaction

Infants frequently participate in social interactions with their environment in order to keep caregivers in close proximity and to achieve emotional closeness with the caregiver (Locke, 2001). Even though infants may not be exchanging information at this stage they do attend to the communicator and are, therefore, participating in social interaction (Locke, 2001; Seiler, 1996).

Infants attend to their caregiver's face from birth and are especially tuned in to the human voice (Locke, 2001; Owens, 2001). They are, therefore, pre-programmed to

participate in communication even before they can intentionally send a message. This is in agreement with the basic tenets of communication which state that communication is social in nature and can be intentional or unintentional (Prizant & Wetherby, 1990; Wetherby & Prizant, 1989; Owens, 2001).

Infants display social skills early in their development (Bernstein & Tiegerman, 1991). Initially infants make eye-contact with their caregivers and actively listen to speech (Locke, 1998; Rossetti, 2001). They also display a wide variety of facial expressions (Owens, 2001). Even though infants are not intentionally communicating with their caregivers, many adults recognise and interpret infant facial expressions (Devine, 1991; James, 1990; Rossetti, 2001). At first expressions of interest, distress or disgust will be noticed (Owens, 2001). A month or two later smiles and expressions of fear appear and infants of only a few months of age express anger, sadness and surprise (Rossetti, 2001; Owens, 2001; Devine, 1991).

It is also at a few months of age that rituals and game playing become enjoyable to infants (Locke, 1998; Prizant & Wetherby, 1990). Games such as peek-a-boo teach important aspects of communication. Interaction is initiated, turns are taken according to certain rules, there are predictable slots for words and actions and participants indicate when the game is over (Owens, 2001; Johnson & Heinze, 1990). Infants take an active part in these exchanges (Owens, 2001).

Initially infants participate purely on an unintentional level and exchange information about their current emotional and physiological state by using vocalisations and a combination of voluntary and involuntary body movements. Later intentional communication emerges and infants communicate about themselves and the world around them by using vocalisations, gestures, body posture and eye contact on a voluntary basis. This is done for the purpose of developing shared meaning with the primary caregivers and other significant interaction partners (Locke, 2001).

At about 8 months of age, when infants are able to intentionally communicate a message, various methods are used to engage in social interaction. Infants can use vocalising, hand and arm gestures, facial expressions, body posture and eye-contact to participate in a communicative exchange and to indicate a turn (Pinder & Olswang,

1995; Owens, 2001). The development of social interaction is important as infants learn the rules of communication during these exchanges.

Older infants are able to interact by producing a wide range of different vocalisations and by producing strings of sounds which approximate adult intonation patterns (Bernthal & Bankson, 1998). Younger infants, however, rely primarily on non-verbal methods of communication such as gestures (Rossetti, 2001; Pinder & Olswang, 1995).

2.3.3 The Development of Non-verbal Communication Skills

Infants use gestures, such as waving or pointing, and vocalisations to interact intentionally before they use words (Rossetti, 2001; Prizant & Wetherby, 1993). Gestures develop naturally (Manolson, 1992). Examples of gestures are when infants point to things they want or point to things that interest them in order to make an adult talk about it (Owens, 2001). Infants also tug on clothes to gain an adult's attention and wave hello or good-bye or push away food that they do not like (Rossetti, 2001; Owens, 2001). These are all examples of naturally occurring gestures that infants use to communicate a message (Manolson, 1992; Owens, 2001).

Gestures, facial expressions, body posture and eye contact are important interaction skills that infants use during prelinguistic development (Owens, 2001; Prizant & Wetherby, 1993). Infants successfully communicate messages long before speech develops. As infants' communication skills improve, the ability to repair communication breakdowns also emerges (Wetherby & Prizant, 1989). Infants will try several different ways of getting a message across. When an infant's communication attempts are understood and responded to the feelings of success and the accomplishment of a goal will encourage the infant to continue to communicate (Owens, 2001; Wetherby & Prizant, 1989).

In contrast to the notion that infants can communicate messages it has been proposed that they are not able to express thoughts or obtain information from others as this relies on an understanding that other people have mental lives differing from ones own (Baldwin & Moses, 1996). It is suggested that even speaking infants can only

name objects or repeat stereotypical information (Locke, 2001). But even considering the *possibility* that infants do not grasp that their thoughts are unique to themselves, their interactions may still be conveying information. For example even if an infant assumes that the adult shares his dislike for the food the infant is still conveying information by shaking his head and pushing the spoon away when the adult tries to feed him. In contrast to this theory (Locke, 2001; Baldwin & Moses, 1996) other authors have indicated that infants as young as 6 to 12 months are able to use vocalisations to express emotions and communication functions (Papaeliou *et al.*, 2002; Owens, 2001; Prizant & Wetherby, 1993). Furthermore, infants also use gestures to engage in social interactions and to communicate intentions (Pinder & Olswang, 1995; Owens, 2001). The notion that infants are not able to express thoughts or obtain information from others is, therefore, rejected in this discussion. The development of non-verbal communication skills is important for the expression of intent and, furthermore, participation in non-verbal communicative exchanges provides infants with important opportunities during which they can learn conversational rules such as turn-taking (Oren & Ruhl, 1997).

The following section looks at the development of vocalisations and babbling as a communication means of infants as well as it's important for the emergence of meaningful speech.

2.3.4 Oral-Motor Control and the Development of Vocalisations and Babbling

Along with increasing levels of motor control, the diminishing appearance of oral reflexes (Green *et al.*, 2000; Green *et al.*, 2002) and improvements in auditory language-specific discrimination abilities (Jusczyk, 1999) comes increasing skill and clarity in infant vocalisations (Oller *et al.*, 1999). Infant vocalisations develop systematically, reflecting a maturing speech capacity with the eventual outcome of the first clear words (Oller *et al.*, 1999).

Oral-motor control has an intrinsic link to speech development (Green *et al.*, 2002). Initially infants do not have the necessary neuromuscular control necessary for adult-like speech sounds (Green *et al.*, 2002). Furthermore infant jaw stability develops much sooner than upper or lower lip control making sounds such as /b/ which are

formed against the mandible easier to produce than sounds such as /f/ which require graded lip control (Green *et al.,* 2002). During the first year spatial and temporal aspects of jaw control for speech appear to be more easily controlled than the magnitude of the movement, resulting in complete opening or closing of the jaw rather than graded movements (Green *et al.,* 2000).

Hence, due to biologic constraints and pre-dispositions caused by biases in co-ordination, there appear to be language universals in the acquisition of speech sounds and phonology (Green *et al.,* 2002; Green *et al.,* 2000). Infants from different languages appear to produce a similar limited set of speech sounds (Green *et al.,* 2002). Furthermore infants from the same language appear to acquire and become proficient in sounds in the same order (Green *et al.,* 2002). There is also a universal, restricted repertoire of phonemes in babble and early speech (Green *et al.,* 2000). A final indication of language universals in the acquisition of speech is the use of similar phonological processes in striving to produce intelligible speech (Green *et al.,* 2002). The oral-motor system consequently appears to have an important influence on determining the nature of infant babbling.

As the oral-motor system matures, infants develop increasingly mature speech (Green *et al.,* 2002). The basic trends in the development of vocalisations and babbling are as follows: During the first year of life infants develop *control over the use of their voices*, enabling them ultimately to produce adult speech sounds (Oller *et al.,* 1999). This is due in part to improvements in oral-motor control and also to increased opportunities for the infant to practice new speech sounds (Green *et al.,* 2002; Green *et al.,* 2000). Four sub stages of vocal development can be identified: namely, stage one or *phonation stage;* stage two or *primitive articulation stage;* stage three or *expansion stage* and stage four or *canonical stage* (Oller *et al.,* 1999; Ferguson, Menn & Stoel-Gammon, 1992).

During the first two months of life, in the *phonation stage* of vocal development, infants will produce quasivowels (Oller *et al.,* 1999). These quasivowels are produced with normal phonation (Oller *et al.,* 1999). These vowel-like vocalisations can be used to express pleasure or cries to express displeasure (Ferguson *et al.,* 1992; Banigan, 1998). Early utterances and sounds may be hard to describe or transcribe

because there boundaries are difficult to determine and the sounds vary a great deal with each production (Van Riper & Emerick, 1990). These early productions of vocalisations and crying provide practice for the basic synergies of respiration and phonation (Van Riper & Emerick, 1990).

The second stage of vocal development, the *primitive articulation stage*, occurs during 2-3 months of age (Oller *et al.*, 1999). During this time infants produce normal phonation while moving the supraglottal vocal tract or articulating (Oller *et al.*, 1999). Other authors have described vocalisations during this stage as throaty cooing with a nasal quality (Ferguson *et al.*, 1992).

The third stage of vocal development, the *expansion stage*, lasts from the end of stage two at about 3 months until the appearance of canonical babbling which usually occurs between 6 and 10 months (Oller *et al.*, 1999). During this stage infants start to babble (Ferguson *et al.*, 1992; Banigan, 1998). At this stage the babbling is described as marginal babbling as the rapid transition from consonant-like sounds to vowel-like sounds is still missing (Oller *et al.*, 1999). Infants will produce long strings of vowels and consonants. In these babbling, consonant-vowel sequences the consonant remains the same like in the babbling series "bababa" (James, 1990). Furthermore these consonants are produced in the front of the mouth, for example /b, p, m, t/ and /d/ (James, 1990). This may be due to the relative stability of the jaw (Green *et al.*, 2002). The syllables produced at this stage are referred to as *rudimentary syllables* because they lack the timing and duration characteristics of adult speech syllables (Ferguson *et al.*, 1992).

During the fourth stage of vocal development, the *canonical syllable stage*, the babbling syllables start to closely resemble adult speech in terms of timing and duration characteristics (Ferguson *et al.*, 1992). Canonical babbling is the production of well-formed syllables, frequently with reduplication, that parents easily recognise and often attribute meaning to (Oller *et al.*, 1999). It has been proven that the phonetic characteristics of late babbling and early speech are very alike (Oller *et al.*, 1999). At this stage infants will take conversational turns by making a variety of vocalisations (Banigan, 1998). Furthermore infants can use their voices to show pleasure or displeasure by varying the volume, pitch and rate (Banigan, 1998). Nearly all

normally hearing infants use canonical babbling by 10 months (Oller *et al.,* 1999). There is a connection between the age at which infants start producing canonical babbling syllables and the age at which they produce their first words as well as the rate at which they acquire vocabulary (Ferguson *et al.,* 1992; Oller *et al.,* 1999). One of the possible explanations for this is the fact that the production of canonical syllables provides a foundation for oral-motor practice, auditory-vocal matching and the production of forms to which meaning can be attached (Ferguson *et al.,* 1992).

Delays in the development of canonical babbling are viewed as a predictor of disorders (Oller *et al.,* 1999). Research results indicate that infants with delayed canonical babbling have smaller expressive vocabularies at 18, 24 and 30 months (Oller *et al.,* 1999). Furthermore limited syllable structures and sound types in pre-speech vocalisations may contribute to delays in the emergence of meaningful speech (Girolametto *et al.,* 1997).

After canonical babbling is established infants develop a *larger repertoire of sounds* (Banigan, 1998; James, 1990). In this phase infants produce long sequences of jargon (Banigan, 1998). Infants babble a lot and the consonant and vowels may change within one sequence like in the babbling series “mateba” (James, 1990). Infants are communicating intentionally in this phase and the production of strings of jargon may be used to actively gain attention in order to get the message across (Devine, 1991). In this phase of development infants may even try to imitate words (Banigan, 1998). More complex babbling patterns, rather than frequency of babbling, have been linked to greater expressive language growth later on (Girolametto *et al.,* 1997).

The sounds infants produce in this phase reflect the language/s they are exposed to (Ferguson *et al.,* 1992) and during this phase in development infants frequently vocalise to songs and rhymes (Banigan, 1998). Research indicates that, although infants produce a wide variety of sounds, certain sounds are produced more frequently and these sounds reflect the first meaningful words that the infant will produce (Ferguson *et al.,* 1992). This may be a reflection of the fact that speech is a skill which improves with practice (Ferguson *et al.,* 1992). Infants therefore need to practice the sounds that will make up the first words in their vocabulary. Over time babbling becomes increasingly similar to the adult language model and at the end of

the first year there is a gradual transition from the use of vocalisations, babbling and gestures to the use of words (Owens, 2001). Once the first words are acquired there is a rapid growth in vocabulary but initial word meanings are limited and by 18 months many infants start to string two words together (Owens, 2001; Rossetti, 2001).

In contrast to the discussion above it has been proposed that vocalisations and babbling are only a means of obtaining and maintaining adult attention and care and that speech evolves as result of an infant's desire to be more like the caregiver (Locke, 2001). It is therefore projected that language acquisition is the unintended outcome of more basic social processes and that infants do not practice vocalising in order to learn to speak (Locke, 2001). Infants do, however, frequently engage in vocal play when they are *alone* (Owens, 2001). Consequently it seems unlikely that vocalisations and babbling only serve the purpose of obtaining and maintaining *adult attention* or evolve only as a result of the infant trying to be more like the caregiver. Although the importance of social interactions in the development of communication is recognised, the view that language is the unintended result of social actions is a very restricted view of communication development which is not supported in this discussion.

2.3.5 The Development of Language Comprehension

Besides developing social interaction skills and non-verbal means of communicating infants also develop an increasing comprehension of language (Devine, 1991). During the early months, in the prelocutionary stage, infants demonstrate various examples of a growing understanding of language (Leonard, 1991). Infants of only a few months of age will cease crying in response to a mother's soothing words (Rossetti, 2001). Furthermore infants as young as three months will show fear at an angry voice (Rossetti, 2001). This indicates that even very young infants understand the supra-segmental cues that are expressed in communication. Between three and six months infants may demonstrate an understanding of the words *up* and *bye-bye* (Rossetti, 2001). Eye-gaze studies have also suggested that infants as young as six months are able to categorise words into groups (Leonard, 1991). The development of comprehension, therefore, precedes words by some months.

Further examples of the development of language comprehension can be observed during the illocutionary phase. During this phase of communication development infants start responding to their names and the word “no” (Rossetti, 2001; Prizant & Wetherby, 1993). Later infants in the pre-verbal phase of communication development may use gestures such as nodding yes or shaking the head no (Rossetti, 2001). Infants may also recognise certain familiar words such as “hot” or “so big” (Rossetti, 2001). Familiar words are associated with familiar contexts (Owens, 2001; Rossetti, 2001). Even though infants are not yet speaking, they do demonstrate an understanding of simple instructions like “wave bye-bye now” (Rossetti, 2001). An example of an indication of comprehension is when an infant reacts to a scolding by frowning (Rossetti, 2001). By eleven months babies respond to about half of the requests that parents make (Owens, 2001).

In contrast it has been proposed that children between the ages of 12 and 18 months are not capable of much more than naming objects or repeating stereotyped phrases (Locke, 2001). This proposal does not concur with other theories on communication development and it does not seem possible that infants of 11 months of age are capable of understanding and following instructions and yet children of 12 to 18 months of age are not able to express thoughts. The view that young children are only capable of naming objects or repeating stereotyped phrases is, therefore, rejected in this discussion.

Communication development is, therefore, a complex process that occurs in stages. In normally developing infants there is a steady progression from reflexive, involuntary participation in communication to the emergence of intentional, social interaction during which infants use nonverbal means, vocalisations and babbling to communicate intentional messages. Increasing abilities in prelinguistic skills such as turn-taking and vocalisations together with improved comprehension of language leads to closer and closer assimilations of actual words. The end result of the improved prelinguistic skills is the emergence of the first words towards the end of the first year. Research, such as this, which proposes to develop a tool for parents for the stimulation of communication skills in infants and, in so doing, contribute to the prevention of communication disorders, must therefore consider the development of important prelinguistic skills.

2.4 THE INFLUENCE OF THE SOUTH AFRICAN CONTEXT ON INFANT COMMUNICATION DEVELOPMENT

In South Africa there are different cultures but also a multitude of languages, creating a multi-cultural, multi-lingual language learning environment (Pickering *et al.*, 1998; Fair & Louw, 1999). There is, however, a strong relationship between culture and the attainment of language (Louw & Avenant, 2002; Madding, 2000; Crago, 1992; Battle, 1998) and an infant's development of communication skills cannot be considered outside of a cultural framework (Louw & Avenant, 2002). It is important, therefore, to consider the impact of aspects such as cultural beliefs and parenting styles as well as the impact of multi-lingual environments and caregivers on infant communication development in South Africa.

Aspects such as child-rearing beliefs and practices and ideas on child development, as well as the meaning of child and parent behaviour affect child development outcomes (Garcia Coll & Magnuson, 2000). Different cultures promote different parenting styles (Madding, 2000). Certain cultures, for example, believe that parents should not follow the child's lead but rather that younger children should learn by observing older, competent speakers (Crago & Eriks-Brophy, 1993). Some traditional Black South African cultures believe that adults should not play with children as this may lead to disrespect (Hansen, 1999) therefore influencing the way in which parents engage their children in interactions.

Cultural beliefs regarding disability will also affect the decisions which parents from culturally diverse families make during child rearing and service provision (Zhang & Bennett, 2001). Within some cultures disabilities are seen as a punishment for past wrongs while other cultures value disabled members of the community as blessings (Zhang & Bennett, 2001). Furthermore, cultural beliefs influence parental expectations regarding the social roles that children must fulfil as well as the value which is placed on a child of a particular gender (Zhang & Bennett, 2001). These cultural beliefs will influence the decisions which parents make as well as the parenting styles employed (Madding, 2000).

As parents play an important role in communication development in the first years (Karrass *et al.,* 2002; Markus *et al.,* 2000), parenting beliefs and typical parenting styles within a specific culture may influence the development of infant communication within that community. Cultural beliefs may, consequently, impact upon decisions which are made during the provision of services as professionals need to be sensitive to cultural values and aim to meet the unique needs of individual families (Bennett *et al.,* 1998).

Another factor which may influence communication development in South Africa is the fact that many parents work, resulting in infants being placed in day care facilities or with other care givers (Klass, 1999). However, in South Africa many of the staff members at day care facilities as well as other care givers are not from the same culture as the infant's parents and may speak a different language to the child. This results in a scenario where infants are exposed to multiple languages or language models from adults who are not mother tongue speakers.

Research has indicated that infant vocalisations which are made in response to speech are affected by the adult model (Kuhl & Meltzoff, 1996). The findings suggested that infants who are exposed to language models from an adult who is not a mother tongue speaker do not learn the suprasegmental characteristics of vowel sounds correctly (Kuhl & Meltzoff, 1996). Furthermore, local research (van Rensburg, 2002) has indicated that day care staff do not provide adequate language stimulation. Being exposed to other languages at day care, without adequate support for mother tongue language acquisition could result in compromised linguistic proficiency in all languages (Heugh, 2002).

It is important to recognise the unique needs of South African infants. Many South African communities have a higher prevalence of debilitating conditions such as low birth weight and cerebral palsy (Kritzinger, 2000). Furthermore many communities within South Africa are also affected by poverty (Pickering *et al.*, 1998; Kritzinger, 2000) which is frequently associated with delays in communication development (Hughes, 1992; Klass, 1999; Hoffman & Norris, 1994). Poverty affects the health care and nutrition of the mother and infant, affecting development (Hughes, 1992). This

creates concern for an increased risk for communication delays and disorders in South African communities.

There is therefore an increasing need for culturally congruent programmes that are sensitive to the needs of specific communities. Professionals need to become culturally competent (Madding, 2000). This does not mean becoming part of the community but rather building up knowledge on the community, resulting in an increase in awareness, insight and receptiveness (Madding, 2000). Professionals in South Africa should, consequently, aim to improve their knowledge and understanding of the unique needs, assets and limitations within the communities they serve.

From the discussion above it becomes apparent that communication development in South African communities is influenced by cultural aspects, multi-lingualism and poverty as well as an increase in risks for conditions associated with communication disorders, resulting in an increased need for professionals to be culturally competent.

2.5 A PROPOSED FRAMEWORK FOR STUDYING INFANT COMMUNICATION DEVELOPMENT IN SOUTH AFRICA

Based on the overview of the theoretical models of communication development, the critical issues which impact upon communication development as well as the influence of the South African context, a framework for studying infant communication development in South Africa is proposed. This framework reflects insights from various models on communication development as well as characteristics of the South African context.

The assumptions that are made and the relationships that are suggested in the proposed framework are based on the different theories and models that are discussed and compared in 2.2. The content of the multi-factorial model reflects information that was gleaned from the following authors: Skinner (1957), Chomsky (1965), Bloom (1970), Vygotsky (1978), Owens (2001), Bernstein and Tiegerman (1991), Locke (2001) as well as Schneider and Watkins (1996). This framework is schematically presented in figure 2.3 and described forthwith.

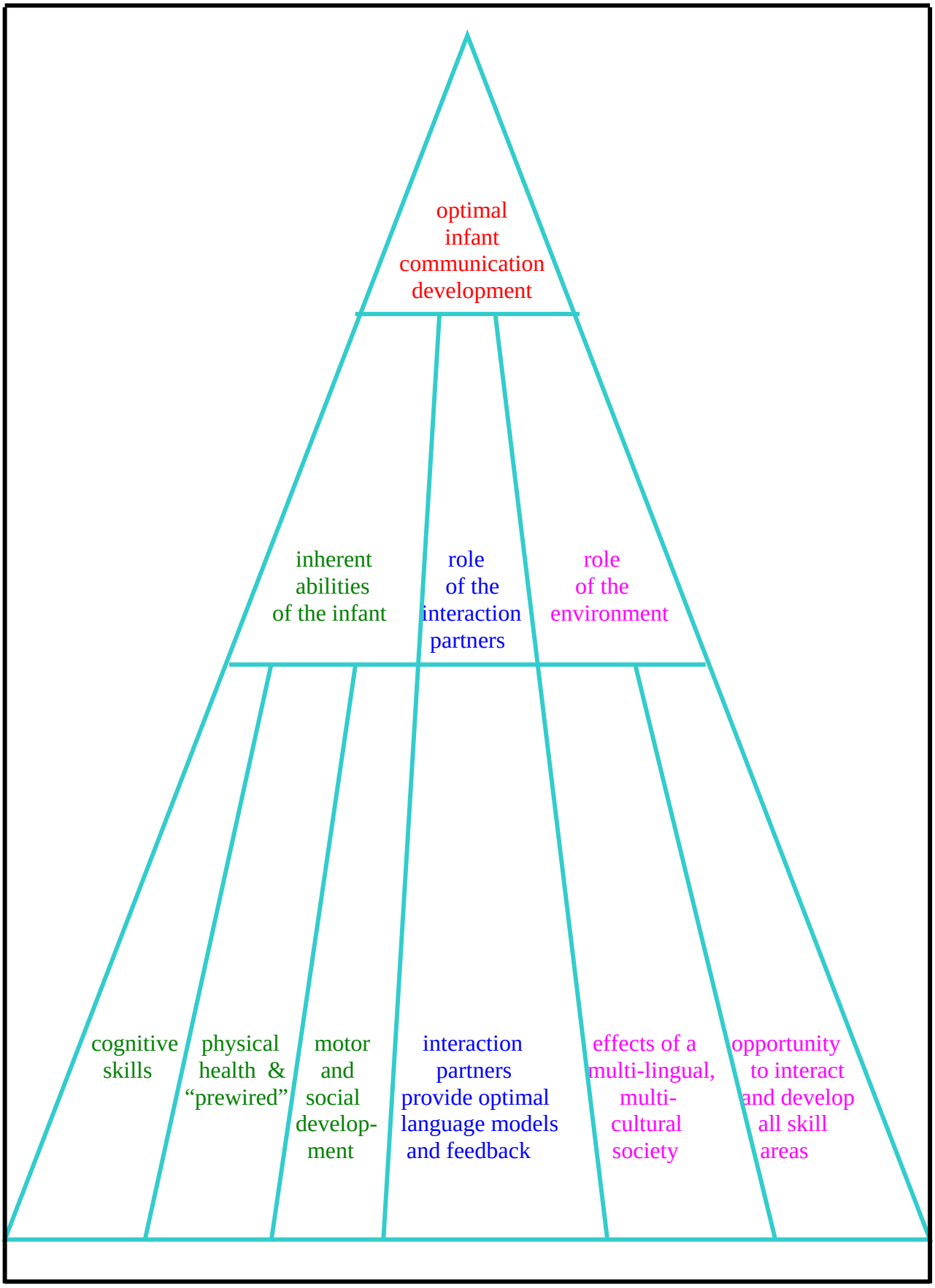

Figure 2.3 A multi-factorial framework for viewing infant communication development in South Africa

According to the framework presented in figure 2.3, optimal communication development in an infant is a product of three factors, namely *the inherent abilities of the infant*, the role of the *interaction partners* and *the environment*.

The *inherent abilities of the infant* include the emergence of certain cognitive skills. According to *the multi-factorial framework*, skills such as object permanence, cause and effect as well as means-end, which are acquired during sensorimotor experiences, equip the infant to participate in communicative exchanges. Furthermore, this framework proposes that the infant is biologically "pre-wired" for communication. The fact that infants are visually and auditorily attending to communicative exchanges makes it easier for the communication partner to interact with the infant. Finally, this framework suggests that development in other skill areas, such as motor and social, have a reciprocal influence on communication development. Examples of this are the importance of oral muscle tone for the development of vocalisations and the importance of motor imitation for the emergence of gestures.

When considering the importance of inherent abilities to communication development it is important to consider the higher prevalence of low birth weight, Down syndrome, cleft lip and palate, cerebral palsy, fetal alcohol syndrome and significant bilateral sensori-neural hearing loss in South African infants (Kritzinger, 2000). The presence of one of these conditions would affect the inherent ability of an infant, resulting in an increased risk for a communication disorder.

Besides the inherent abilities of the infant, the multi-factorial framework also proposes that the *interaction partners*, and especially the primary caregivers, have an important role to play in the development of optimal communication skills. According to this framework, these communication partners need to engage the infant in interactions, providing appropriate language models and feedback. In today's times a large proportion of mothers work (Flores Hernandez *et al.*, 1999; Klass, 1999). This creates the need for a framework on communication development to consider the other primary caregivers. Many infants are placed in child care (Klass, 1999). As stated previously, many South African parents also leave their infants with a nanny. Care givers often speak a different language to the parents (van Rensburg, 2002). A framework on communication development should, therefore, recognise the

influences that multi-lingual environments have on communication development (Mishina, 1999; Lanvers, 1999).

The final group of factors, according to the multi-factorial framework, that influence optimal communication development, are factors relating to the *environment*. The multi-factorial framework proposes that the *social* and *physical* environments will influence communication development in infants (Scheffner Hammer, 1998; Hess *et al.*, 1997). In this framework the *quality of the social environment* is determined by factors such as the number of different communication partners, the frequency of interactions as well as whether these interactions are limited to one-to-one encounters or whether it also includes small groups. This framework promotes frequent interactions with a number of different communication partners, including both individual as well as small group interactions.

In the multi-cultural South African context the social environment has a significant impact on the development of communication skills. Consequently a framework for communication development in South Africa has to recognise the relationship between culture and language and the reciprocal influence the development of each area has on the another (Louw & Avenant, 2002; Crago, 1992; Battle, 1998). Language and culture are acquired concurrently from cues which are provided by the primary caregivers as to what is acceptable behaviour and language use within the specific culture (Crago, 1992; Ligthelm, 2001).

Lastly, the multi-factorial framework proposes that the *physical environment* also influences the development of optimal interaction. The physical environment needs to provide the infant with opportunities to explore and to play in order to promote optimal communication development (Oren & Ruhl, 1997). Factors such as available play materials, furniture and physical space are important considerations in the physical environment (Oren & Ruhl, 1997). This concurs with the previous proposal that cognitive development depends on the infant having adequate sensorimotor experiences. This is of particular concern to South African communities as there is a high incidence of poverty increasing the risk for communication disorders (Pickering *et al.*, 1998; Kritzinger, 2000). The correlation between poverty and an increase in communication disorders or delays in communication development may be due to

infants from low socio-economic communities being exposed to less stimulating physical environments, less variety in sensorimotor experiences, less communication-enriching experiences as well as less stimulating toys (Klass, 1999; Hoffman & Norris, 1994; Hess *et al.*, 1997).

The multi-factorial framework suggests that optimal communication development arises from optimal conditions in all three of the contributing areas, namely: the inherent abilities of the infant, the role of the interaction partners as well as the role of the environment. The framework proposes that, although deficits in one of the before-mentioned areas may increase the risk for problems with the development of communication skills, strengths in other areas may increase the infant's resilience to risk factors. There is, therefore, not a linear relationship between the presence of risk factors and the emergence of problems in communication development. It is proposed that there is, more probably, a transactional relationship between multiple factors (Rossetti, 2001) which is reflected in the title, namely: *the multi-factorial framework for viewing infant communication development in South Africa*.

The framework from which one considers communication development influences the decisions made in clinical practice (Schneider & Watkins, 1996). The multi-factorial framework can, therefore, serve as a guide regarding decisions, in this research, on the facilitation of communication development in South Africa.

2.6 FACILITATING INFANT COMMUNICATION DEVELOPMENT IN SOUTH AFRICA

Researchers and clinicians agree that communication development begins at birth and that communication influences many areas of development, including future academic success (Hess *et al.*, 1997; Lewis *et al.*, 2000; Lockwood, 1994; Scarborough, 1990; Snowling *et al.*, 2001). Evidence indicates that the first year of life significantly influences development in many skill areas but also, specifically, communication development (Hess *et al.*, 1997; Lewis *et al.*, 2000; Lockwood, 1994).

Accepting the fact that age-appropriate communication skills influences the adequate development of other skills highlights the need for the promotion of communication

development in infants. The facilitation of infant communication development may influence all aspects of development, promoting optimal development and wellness, which is the underpinning of a recent South African position statement for health care professionals on the prevention of disabilities in South Africa (White Paper on Integrated National Disability Strategy, 1997).

As indicated in the different models of communication development as well as the multi-factorial framework for viewing infant communication development in South Africa, the interaction partner plays a central role in the acquisition of communication skills (Owens, 2001; Locke, 2001; Schneider and Watkins, 1996). It is, therefore, important to recognise that the facilitation of communication development in the first year of life needs to focus on involving all primary communication partners as they play a central role in facilitating communication development (Schneider & Watkins, 1996). In modern societies where many mothers work outside of the home (Flores Hernandez *et al.*, 1999; Klass, 1999) this role may not only fall on the parents. It is, therefore, important to recognise other important sources of language input and involve all primary caregivers in facilitating infant communication skills (Girolametto, Weitzman, van Lieshout & Duff, 2000).

However, even if both parents do work they are still an important part of their infant's life and their infant will spend a lot of time with them. Parents are the primary source of emotional support to their children and positive parenting functions are correlated with better child outcomes (Guralnick, 1997). Furthermore poor parental language facilitation may contribute to possible delays in communication development (Hess *et al.*, 1997). Parent interactions influence their infant's speech, language, cognitive, emotional and social development (Newland, 2001; Howell, 2001; Rossetti, 2001). However, research findings indicate that parents feel ill-equipped and desire more information on development (Baxter & Kahn, 1999; Guralnick, 1997). It is, therefore, important for professionals to empower parents by providing information on infant communication development.

Information may be provided to parents regarding how they can encourage communication development by providing their child with optimal stimulation (Duncan, 1997). Optimal stimulation is not merely a reflection of the *amount* of input

that is given but is also influenced by the *quality* of parent-infant interaction (Duncan, 1997). Researchers have indicated that parents who are sensitive to their infants' needs and provide appropriate levels of stimulation may help mitigate biological risk factors (Prizant & Wetherby, 1990). The way parents interact will determine the language development of their infant (Howell, 2001). Research has indicated that providing parents with information on communication enhances the quality of parent-infant interaction (Wendland-Carro, Piccinini & Millar, 1999).

Research and clinical practice have illustrated the use of different techniques that facilitate communication development in infants and pre-schoolers, namely: *joint reference; following the child's lead; social routines; games; turn taking; verbal compliance and contingent responses; imitative responses; linguistic mapping* and *joint book-reading* (Rossetti, 2001; Karrass *et al.*, 2002; Girolametto *et al.*, 2000; Yoder & Warren, 2001; Girolameeto *et al.*, 1996; Schneider & Watkins, 1996; Markus *et al.*, 2000; Haynes, 1998; Manolson, 1992).

Joint reference or joint attention implies that both of the interaction partners are focused on and communicating about the same thing (Owens, 2001). Joint attention provides predictable learning opportunities which enhance communication development (Karrass *et al.*, 2002). Periods of joint reference are important for infant communication development as these periods represent times when the infant is most attentive and motivated to process the parent's speech (Girolametto *et al.*, 2000; Markus *et al.*, 2000). Facilitating joint engagement will optimise early interactions by giving infants the opportunity to make comparisons between linguistic and nonlinguistic contexts, inducing meaningful relationships (Girolametto *et al.*, 2000; Girolametto & Tannock, 1994). Parents can achieve this by following their infant's lead (Warren, Yoder, Gazdag, Kim & Jones, 1993).

Parents can *follow their infant's lead* by talking about things which interests their infant (Salmon *et al.*, 1998; Warren & Reichle, 1992; Owens, 2001). This creates the optimal language-learning environment (Karrass *et al.*, 2002). When parents are encouraged to take the time to enter into their infant's world and determine what interests their infant, they will have ample opportunities to give meaningful language models (Girolametto *et al.*, 1996; Warren & Reichle, 1992; Girolametto & Tannock, 1994).

It has been suggested that these characteristics, which result in improved communication development, are more closely related to the establishment and maintenance of social relationships than the infant's desire to understand language or convey meaning (Locke, 2001). Other researchers, however, suggest a strong correlation between prelinguistic communication skills and cognitive development (Yoder & Warren, 2001). Bearing in mind the complex nature of infant development it seems likely that there are many systems, including social interaction *and* cognition, involved in communication development.

Another technique that is used to stimulate communication development is the use of *social routines* (Rossetti, 2001; Duncan, 1997; Warren *et al.*, 1993; Manolson, 1992). Research shows that familiar routines are a successful means of eliciting communication (Warren *et al.*, 1993). Routines such as bath time, feeding and dressing provide predictable contexts, which allow for repetition (Rossetti, 2001; Duncan, 1997; Manolson, 1992). Encouraging parents to use the same words and phrases each time they repeat a certain ritual will help the infant to become familiar with the language and to start anticipating words (Duncan, 1997). The use of social, culturally-applicable routines makes the facilitation of communication development more relevant and meaningful as culture and language acquisition are intertwined (Mastergeorge, 2001; Hughes, 1992).

The development of play and communication are interdependent (Schneider & Watkins, 1996; Haynes, 1998; Yoder & Warren, 2001; Rossetti, 2001; Morrison, 1998; Manolson, 1992) and the use of a child-centred play context has been found to be effective in developing communication skills (Yoder & Warren, 2001). *Familiar games* can be used to enhance communication development. When parents engage their infants in games such as *peek-a-boo* or *I'm coming to get you* it teaches infants the rules of communication (Owens, 2001). Adults are seen not as teachers of language skills but as joint participants in everyday activities (Schneider & Watkins, 1996). Through the use of familiar routines and play infants learn to shift roles, to take turns and to co-ordinate signalling and acting (Owens, 2001). Interactive play is important because it is social, it encourages turn taking, it encourages infants to respond, it involves repetition and it integrates many of the senses (Manolson, 1992).

It is, however, important that adults learn to relinquish control of situations by only providing as much assistance in any particular task as is actually needed by the infant (Schneider & Watkins, 1996). Through play babies learn skills such as concentration, exploration, creativity, problem solving, perseverance, object manipulation and co-ordination (Owens, 2001; Morrison, 1998). Through the regular use of games infants will develop a sense of anticipation that may result in anxious gesturing and vocalising if the game is stopped prematurely (Rossetti, 2001).

The findings of research that was conducted in day care centres suggests, however, that the type of activity may affect the language that the adult uses, resulting in more controlling or more interactive language use depending on the activity (Girolametto *et al.,* 2000). Furthermore, the language used by day care staff is frequently not adequate for the stimulation of infant language development (van Rensburg, 2002). The adult language model either advances or inhibits child participation (Girolametto *et al.*, 2000; Whaley, 1990). It is, consequently, not enough that adults should simply engage infants in more interactions. Speech-language Therapists should assist parents and other primary interaction partners such as day care staff in selecting activities that promote interactive language use and the increased participation of the child (van Rensburg, 2002).

Encouraging *turn-taking* is another way of stimulating communication development (Girolametto *et al.,* 1996; Haynes, 1998; Parks, 1998). Sequences that focus on encouraging turn taking also abet child participation (Girolametto *et al.,* 1996; Parks, 1998). Turn taking is an important skill which forms part of the basis for the give and take of mature conversations. At the pre-linguistic stage it involves making contact with the infant in a vocal or a non-vocal manner and then pausing to allow the infant an opportunity to participate in the exchange (Parks, 1998). Parents must be made aware of the importance of reducing the number of turns that they take in order to leave the infant with more opportunities to take a turn (Girolametto *et al.,* 2000; Girolametto & Tannock, 1994). Too much turn-taking control occurs when adults dominate the conversation by taking too many turns (Girolametto *et al.,* 2000). This usually inhibits child participation (Girolametto *et al.*, 2000).

An infant may take a vocal turn by cooing or babbling and then stopping to allow the other person a turn (Parks, 1998). Infants can also take a non-vocal turn by kicking or squirming and then lying still to indicate that the turn is over and they are waiting for a response (Parks, 1998). Parents can encourage turn taking by playing games where they expect their infant to take a turn in order for the game to continue as well as by having conversations with their infant (Parks, 1998). The young infant, who is not yet imitating vocalisations, can be introduced to turn taking by the parent imitating the infant's sounds (Warren *et al.*, 1993). These pre-speech sounds are important to communication development (Manolson, 1992). Vocal play allows infants an opportunity to practice oral movements and co-ordination of breathing and muscle movements (Parks, 1998).

The use of *verbal compliance and contingent responses*, which can also be described as verbal responsiveness, are also effective techniques for facilitating communication development (Yoder & Warren, 2001; Girolametto *et al.*, 1996; Karrass *et al.*, 2002; Rossetti, 2001). This implies that the adult will respond to and comply with the presumed meaning of the child's communication act (Yoder & Warren, 2001). This maintains the child's interest and helps the child to make connections between communication and the social consequences there-of (Girolametto *et al.*, 1996; Yoder & Warren, 2001). It also enhances more adult-like communication behaviour (Rossetti, 2001).

Another technique for promoting communication development is the use of *imitative responses* or contingent imitation (Yoder & Warren, 2001; Rossetti, 2001). This implies that the adult vocally or physically imitates the child's communication behaviour (Yoder & Warren, 2001). This allows the child to regulate the amount of stimulation received, increases the chance that adult input will be correctly understood and encourages child imitation (Rossetti, 2001). The use of contingent imitation consequently encourages important prelinguistic communication skills (Rossetti, 2001).

Linguistic mapping can also result in improved communication development (Yoder & Warren, 2001). Linguistic mapping implies that adults say what the child's non-verbal communication appears to say (Yoder & Warren, 2001). This can also be

described as prompting and takes advantage of the child's natural interest in the topic (Rossetti, 2001). The use of linguistic mapping or prompting has been associated with improvements in receptive and expressive communication skills in children with and without communication delays (Yoder & Warren, 2001).

Another technique to stimulate communication development is the use of *joint book-reading* (Kritzinger & Louw, 1997; Hussey-Gardner, 1999; Garton & Pratt, 1989; Honig & Shin, 2001). Joint book-reading is an effective technique for enhancing language skills of children who are developing normally as well as children with developmental language disorders (Kritzinger & Louw, 1997). Even reading to a very young baby may enhance skills such as language, attention span, listening skills, word comprehension and pre-reading skills (Garton & Pratt, 1989; Honig & Shin, 2001). The use of joint book-reading can promote language development and foster emergent literacy skills such as early phonological awareness and a sense of story and alphabet letter knowledge (Armstrong, 1998; Roth & Baden, 2001). Parents can actively help their infant to become a book lover (Newman & Roskos, 1998). There is also a reciprocal interaction between the development of communication skills and the emergence of literacy skills. How parents interact with their infant will determine their child's later development of literacy skills (Newland, 2001). In early book-reading activities the aim is not to read the books word for word but rather to promote interactive language learning (Kritzinger & Louw, 1997). This can best be achieved by choosing books with familiar scenarios and pictures which interest the infant (Honig & Shin, 2001; Hussey-Gardner, 1999).

It is important to note that research findings suggest that story-reading activities in day care settings lead to the use of more controlling language by adults, which inhibits child participation (Girolametto, *et al.*, 2000). One should, however, note that the research results reflect adult language use with groups of children and that this may have created the need for more controlling language in order to keep the whole group's attention and participation in the activity.

Focused stimulation is another technique that can result in improved communication development (Pearce, Girolametto & Weitzman, 1996). During the use of focused stimulation parents are trained to promote optimal communication development by

increasing their responsiveness to their child by producing frequent, salient language models which are appropriate to their child's level of development (Pearce *et al.*, 1996). This technique applies methods which produce optimal communication development in normally developing children but research findings suggest that the use of this method is effective as an intervention technique for late talkers (Pearce *et al.*, 1996).

The techniques which have been described and discussed in this section reflect those that parents can employ in order to promote optimal communication development. Optimal communication development is, however, not only related to the caregiver's language model. According to the *multi-factorial framework*, a number of different factors that will impact on communication development in infants were given. It is, therefore, important that parents are aware of all of the factors that may influence an infant's risk for or resilience to developing communication problems. Providing information to parents on communication development and the facilitation thereof aims to promote normal development and prevent the development of communication disorders.

The speech-language therapist has an important role to play in providing parents with information on communication development and factors relating to development, in order to help parents optimise the child's communicative environment and benefit maximally from the plasticity and increasing development in the infant's brain (Paul, 1999; Bates, 1999). Furthermore, speech-language therapists have an important role to play in the education and training of other professionals such as day care staff by providing information on the importance of early communication development, techniques that can be used to facilitate development as well as factors that may influence development (van Rensburg, 2002; Girolametto *et al.*, 2000; Klass, 1999).

2.7 CONCLUSION

Communication development in infants is crucial, both for current functioning and skill development as well as for future performance. There are, however, many different factors which impact upon communication development. Only once we know how infants develop communication skills and which factors play an important

role in influencing development can we make suggestions for the prevention of communication disorders and the facilitation of optimal development. Information that is provided to South African infant caregivers should therefore reflect cultural-specific knowledge of infant communication development as well as current trends in the facilitation of communication skills.

2.8 SUMMARY

This chapter provides an overview of infant communication development through the lens of traditional models and current views on communication development, creating a framework within which the unique South African context was reflected. Once issues relating to the multi-cultural South African environment were highlighted it became possible to make relevant suggestions on how to address the issue of assisting parents fulfil their pivotal role in the crucial arena of infant communication development.