CHAPTER 2

AN OVERVIEW OF BEST PRACTICE IN EARLY COMMUNICATION INTERVENTION

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Aim: The chapter aims to present a literature review of current research on best practice in Early Intervention, which applies to Early Communication Intervention as well, in order to provide the theoretical underpinnings for the empirical research of the study.

2.1 INTRODUCTION

A critical review of research is an essential element in the social science process as it serves to integrate the present study into a wider framework of relevant theory (Mouton & Marais, 1990). A review of the literature will also provide guidelines for a valid and systematic description of the spectrum of concepts, theories and their clinical applications that serve as the building blocks of Early Communication Intervention (ECI) as a discipline.

Since ECI has made such remarkable progress in recent years the question now arises whether a common philosophy about the optimal practice of ECI can be gleaned from the many concepts, theories and their clinical applications that constitute the discipline. According to Rossetti (1996) optimal or best practice represents an effort to integrate and synthesise emerging empirical data into everyday applications in order to bring about qualitative changes in the lives of young children and their families requiring ECI services.

With rapid advances in research and new discoveries integrated into existing knowledge, ECI strategies and methods must be continuously adapted to facilitate best practice in ECI. Improved clinical practice therefore relies on the scientific process of the accurate and reliable interpretation of research findings in order to provide the maximum of benefits to the different populations of young children at risk for communication disorders. According

to Rossetti (1992) understanding the particular time frame and the population being studied is critical in interpreting ECI research in order to glean guidelines for best practice. This is of particular importance in the South African context since the populations of infants and toddlers and their families requiring ECI services differ from those in the USA or other countries (See Table 1.4).

The populations of young children at risk for developmental delays world-wide have shown significant changes over the past four decades and new knowledge about the effects of risk status on infant development has emerged. New populations are appearing, such as infants of mothers who abused substances during pregnancy, and especially in Africa, infants with HIV infection (Bobat, Coovadia, Moodley & Coutsoudis, 1999; Eley & Hussey, 1999). Certain populations, such as infants with cerebral palsy are increasing as the survival rates of those with low birth weight and prematurity improve (Mutch, Alberman, Hagberg, Kodama & Perat, 1992). On the one hand the use of vaccines have sharply reduced the number of infants born with the effects caused by rubella (Sparks, 1984), although on the other hand the figures could be increased in developing countries such as South Africa. According to Christianson (1998), rubella vaccination was never extensively administered to pre-adolescent girls in the racially segregated black schools of the past and it appears that no studies to date have been conducted to determine the numbers of infants affected by prenatal rubella exposure. These changes in populations of young children at-risk demand continuous research for documentation and constant revision of the whole ECI process in order to ensure best practice and improve its effectiveness in different contexts.

As the discipline of ECI has already produced much research and clinical tools the aim of the chapter is to investigate and carefully select those strategies and methods which can be used as a framework for best practice in ECI. The importance of investigating best practice in ECI is to provide underpinnings for the current empirical study to design a database system for ECI.

2.2 THE EFFECTIVENESS OF ECI

Since the aim of ECI is to prevent communication disorders or to decrease their effects as early as possible in the lives of infants and toddlers at-risk or with disabilities and their families, proving its effectiveness has gained increasing attention in the literature of the past decade. According to McLean and Cripe (1997) one of the major challenges in the field of communication disorders is the persistent gap between the knowledge base and current clinical practices which must be bridged in order to improve the effectiveness of ECI services.

2.2.1 Introduction

Demonstrating the effectiveness of ECI has always been important, as questions to prove the justification of ECI have been asked since the emergence of the discipline (Rossetti, 1996). So-called first generation research in early intervention (EI) concerned itself with the feasibility of EI programmes for young children born at-risk as well as for those with established disabilities (Guralnick, 1997). For example, during the 1970's and 1980's a whole body of research was directed at documenting the development of infants with low birth weight and prematurity in order to find evidence for their need for intervention (Kritzinger, 1994). The questions raised in earlier studies were whether the development of infants with low birth weight and prematurity was significantly delayed to warrant intervention and whether they would not spontaneously catch up on their delays. This led to the further question whether *infants, including neonates,* at-risk or with disabilities require intervention and if they do, will it make a significant difference to their future development? (Field, 1980; Guralnick & Bennett, 1987; McCormick, 1989; Scott, 1987).

As similar questions will continue to be asked every time ECI is established in a new context, such as in South Africa, it is important to state that it is now generally accepted and affirmed by authorities such as Rossetti (1998) and

Guralnick (1997) and many others, that infants with established conditions or displaying developmental delays and those who are at risk for developmental delays, require EI and that it has positive effects on their developmental progress. EI, capitalising on the sensitive period of early life, is effective in decreasing the effects of disabilities and preventing developmental delays in certain circumstances. The consensus regarding the efficacy of EI and ECI is not a matter of academic concern only, but is also reflected in public policy of which the USA legislation is an example. The agreement regarding the efficacy of ECI services came as a result of the early research efforts in EI.

Guralnick (1997) coined the phrases *first generation* and *second generation research* in EI to indicate the differences in research conducted prior to the passage of USA legislation (PL 99-457) and afterwards. First generation research answered the question of effectiveness of EI and indicated guidelines for best practice by providing the context for developing and evaluating approaches, curricula and specific therapeutic techniques.

EI research conducted in the 1970's and 1980's therefore tended to be exploratory and descriptive in nature. Recent studies, benefiting from the knowledge gained in earlier findings, are explanatory and determine the effects of EI (Blair, *et al*., 1995; Haney & Klein, 1993; Kurdahi Zahr, Parker & Cole, 1992; McCarton, *et al*., 1997; McDowell, Saylor, Taylor, Boyce & Stokes, 1995; Norris, 1991; Olswang & Bain, 1991; Smith, Landry, Swank, Baldwin, Denson, Wildin, 1996). The question therefore no longer is whether infants at risk for communication disorders require ECI as soon as possible after birth, even when they may not yet display the sequelae of their risk condition. The question regarding the efficacy of ECI is now whether these infants will continue to demonstrate progress over an extended period of time (Rossetti, 1996).

One of the best examples of the effectiveness of EI is the positive results of developmental appropriate care in the neonatal intensive care unit. Research findings on the efficacy of EI in the neonatal intensive care unit, the earliest intervention possible, indicate short-term and long-term benefits for both the

infant and the family (Als 1997; Rossetti, 1996). According to Als (1997) the move away from protocol- and procedure-driven care to a relationship-based, family-centered developmental care approach in the neonatal intensive care unit has brought about far-reaching changes. Research indicates positive medical and developmental outcomes in the graduates of the neonatal intensive care units who follow a developmentally appropriate care approach (Rossetti, 1996).

Longitudinal studies employing large numbers of subjects demonstrate the effectiveness of EI for various populations of infants at-risk. For example the results of *The Infant Health and Development Program* (McCarton *et al*., 1997) for premature infants with low birth weight showed improved cognitive functioning in the intervention group when compared to the control group at three years of age. The intervention group did, however, not retain their advantage over the follow-up group at eight years of age, indicating that intervention should continue beyond the toddler years. To date this was one of the largest follow-up studies to evaluate the efficacy of early intervention for infants born with low birth weight and prematurity, with a total of 985 children participating in the programme across eight sites in the USA (McCarton, *et al*., 1997).

The same pattern of results was found in follow-up studies evaluating the effectiveness of EI for infants and their families living in poverty. Results from *Project Head Start* which was launched nation-wide in the USA in 1964 (Smith & McKenna, 1994), the *Carolina Abecedarian Project* (Ramey & Ramey, 1992) and *Project CARE* (Wasik, Ramey, Bryant & Sparling, 1990) confirmed that early educational intervention beginning shortly after birth and continuing throughout the nursery school years for infants from poor families, can significantly improve the children's intellectual performance and academic achievement. It is now generally accepted that EI for infants at risk for developmental delays associated with poverty, has long-term effects which result in improved school success and reduced dropout figures (Gomby, Larner, Stevenson, Lewit & Behrman, 1995). It appears that EI has immediate gains for infants and their families from various populations at-risk, but long-

term progress can only be sustained if intervention continues beyond the toddler years (Guralnick, 1997). This finding holds important implications for service delivery policy and raises further questions as to what constitutes best practice in ECI.

2.2.2 Current Questions regarding the Efficacy of EI

Second generation research in EI is typically concerned with questions as to what must be done to gain maximum benefits for the clients requiring EI services and how to measure the change in order to demonstrate the effectiveness of the services. The current debate on the efficacy of EI is not only concerned with its long-term effects on young children's development, but has expanded to include all levels of service delivery. The challenge to ECI professionals is to demonstrate which models, strategies and methods involve the most promising practices and to illustrate which of those are cost effective. These considerations are most important for the continued enhancement of the discipline of ECI in developed countries as well as the promotion and establishment of ECI policy in developing contexts. Since ECI must still be expanded and formalised as an essential component of public services to young children at-risk and their families in South Africa, it is important to take cognisance of the current questions and their solutions regarding efficacy in EI.

Based on a literature review the myriad of questions now being asked in second generation research of EI were identified and include the following:

- What form of EI is the best?
- What is the most efficacious way to conduct the assessment activity?
- How do EI programmes make their impact?
- What is the best way to measure EI effectiveness?
- Which teamwork approach contributes to successful EI outcomes?
- To whom must the intervention be directed, to the infant, the parents or both?

- Who must be the primary provider of EI services in the various stages of the child's life?
- How intensive and for how long must the intervention be continued?
- Where must the intervention take place?
- Is EI cost-effective?
- How are infants and families from diverse linguistic and cultural backgrounds served best?
- Which programme features best serve the needs of families living in poverty?

(Guralnick, 1997; Johnson, 1994; Lee & Kahn, 1997; Marfo & Dinero, 1991; Rossetti, 1990a; Rossetti, 1996; Smith & McKenna, 1994).

These questions serve to illustrate the complexities and inter-relatedness of EI issues currently being investigated to provide guidelines for best practice. In an overview of EI research in the past, Guralnick (1997) identified a dearth of information regarding certain topics and proposes that second generation EI research should concern itself with three critical issues, namely:

- Child and family characteristics
- Programme features
- EI outcomes

These three issues indicate the conceptual as well as practical challenges the early interventionist is currently confronted with and are concerned with every step of the EI service delivery process. In order to provide a literature overview of current research in best practice in EI, which applies to ECI as

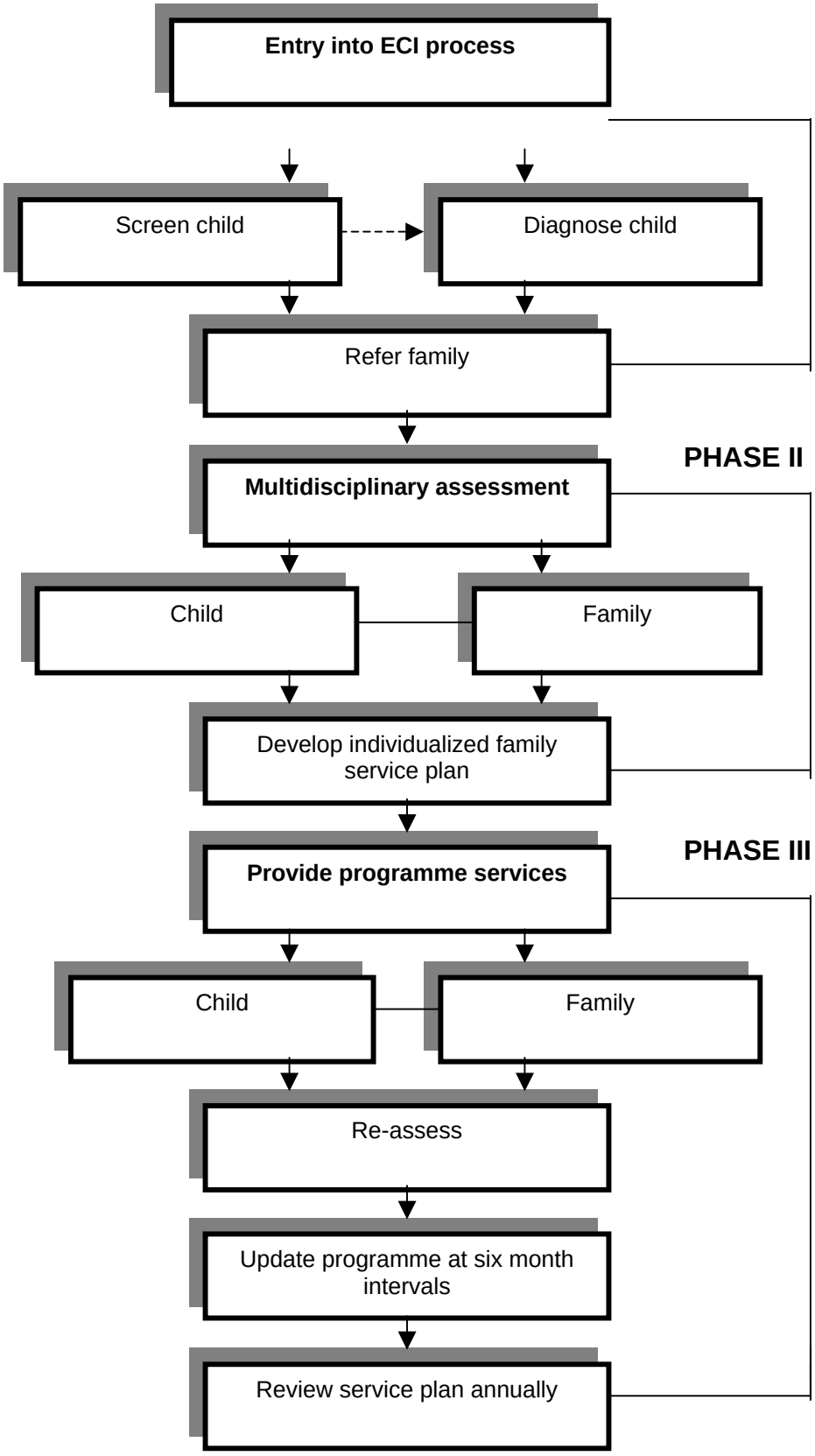

Figure II.I **The early communication intervention process**
Adapted from Hutinger, 1994

well, the different components of the EI service process as proposed by Hutinger (1994) and depicted in Figure II.I will be used as a framework.

Figure II.I was selected as a framework for the discussion of best practice in ECI as it provides a systematic dissemination of the essential processes related to identification, assessment, programme planning, implementation and monitoring in ECI. The flow diagram contains the widely accepted elements of ECI in a logical sequence and will allow a comprehensive discussion of the issues relating to each of these processes. Although Figure II.I reduces ECI to a two dimensional flow diagram, the discussion of each element will allow a multidimensional perspective on second generation research issues on best practice in ECI.

2.3 FRAMEWORK FOR BEST PRACTICE IN ECI

The aim of the discussion is to present an overview of best practices in ECI in order to formulate guidelines which can be used in the empirical component of the current study.

2.3.1 PHASE I: Entry into the ECI Process

The manner in which a family with an infant with a disability or at risk for a communication disorder enters into the ECI service delivery process is by way of identification of the risk condition. The early identification of infants eligible for ECI and the extent of parental involvement in the ECI process are the two strongest factors proven to significantly enhance the efficacy of the services (Rossetti, 1993). The importance of early identification of communication disorders is based on the assumptions that the successful treatment of all communication disorders depends on early detection and treatment of the disorder or risk factors leading to a delay (ASHA, 1991a) and that a strong correlation exists between communication skills and future school success (Capute, *et al*., 1987). *An active identification programme to ensure entry of*

all infants eligible for ECI at the youngest age possible is now widely advocated (Eddey, Robey, Zumoff & Malik, 1995). Yet the early identification of infants with communication disorders or at risk for delays is still one of the biggest challenges of ECI which threatens its efficacy (Bland, 1996; Squires, Nickel & Eisert, 1996). One of the problems which still requires clarity is the nature of formalized identification programmes and the identification strategies to apply to different populations of young children at-risk.

2.3.1.1 Developmental Screening

As indicated in Figure II.I, Hutinger (1994) suggests two different approaches to identify infants eligible for ECI. The one approach involves *developmental screening* with the aim to separate those who need ECI from the population of typically developing infants (Hock Long, 1996). The other approach is the *diagnostic evaluation*, which is a medical process and aims to describe the symptoms and determine the aetiology of the communication delay displayed by the infant.

Various strategies and measures for screening are used for different age groups in the infant-toddler population, but the desirable characteristics of screening instruments should include the following:

- High sensitivity: The test succeeds in identifying children with delays.
- High specificity: The test succeeds in identifying children without a delay.
- High levels of reliability: Different examiners will administer, score and interpret the test in the same way (Glascoe, 1995).

The choice of screening strategies depends largely on the specific population of infants at-risk being targeted and the different clinical settings where infants at-risk may be detected (Squires, *et al*., 1996).
An example of a screening strategy is universal screening programmes which imply the rapid individual testing of all the members of a whole population. This approach, however, can only be an effective identification strategy if

indeed all infants can be screened and if an efficient referral system for follow-up services can be guaranteed (Fowler & Fowler, 1994).

The universal screening of all neonates for hearing loss appears to be the best strategy for early identification of this population as epidemiological studies indicate that the application of a high risk register, which acts as a guideline for hearing screening of at-risk populations (ASHA, 1994), fails to identify those infants with a hearing loss of unknown origin (Northern, 1993). It is estimated that screening programmes employing high risk registers for infants at risk for hearing loss, overlook 50% to 70% of all children born with hearing loss (Boswell, 1998). Reported problems experienced in hearing screening programmes are also low return rates for follow-up evaluations, which implies a time lapse between identification and intervention (Roush, 1991). It is clear that well planned and managed screening programmes is of critical importance in ECI as late identification of infants requiring intervention seriously undercuts the efficacy of the whole process. Rossetti (1993) pointed out that the age of identification is one of the most important factors determining the success of ECI. According to Downs (1994) it was found that the age of identification of hearing loss determined the level of a child's language proficiency and not the degree of the hearing loss. *The goal therefore is to identify and treat infants at risk for communication delays already at birth as this determines their school performance and their future.*

The use of a risk register, although found to be ineffective to detect hearing loss of all origins, can be used in other populations of infants such as those at risk for communication delays.

The use of a checklist of risk factors known to be associated with delayed communication development is another strategy for the early identification of infants requiring ECI services. According to Rossetti (1996) knowledge about infant mortality rates and the causes of death, provide valuable information about infants eligible for ECI. As the causes of infant death are also the causes of infant morbidity or disability, early communication interventionists should be involved in medical contexts such as the Neonatal Intensive Care

Unit (NICU) and primary health care clinics to screen and monitor those infants whose health and development are under threat.

Knowledge of specific predictors of communication disorders, such as prolonged feeding problems in infants at biological risk (Kritzinger, 1994) can improve the reliability of screening measures employed. In this regard Rossetti (1986) listed a useful risk register for infants with low birth weight and prematurity who are at risk for major neurological and cognitive sequelae. The risk register indicates the increasing percentage of risk when birth weight decreases as well as the increased risk percentage when the infants experience conditions such as respiratory distress syndrome, seizures, meningitis, small-for-gestational age and broncho-pulmonary dysplasia. The increased risk percentages are depicted as follows:

- Birth weight higher than 2 500g: Less than 5% risk
- Birth weight 1 501-2 500g: 10% risk
- Birth weight lower than 1 500g: 10-30% risk

(Rossetti, 1986)

A risk register may be used by all health care professionals, provided that the information is available to them and that they are aware of the importance of identification of infants at biological risk already at birth. Best practice for the identification for infants at risk for communication disorders is at birth, but a risk register should not be the only screening strategy employed in ECI.

2.3.1.2 Developmental Surveillance

Another strategy for early identification of infants at risk for communication disorders is developmental surveillance which has been adopted by the American Academy of Pediatrics and the British Working Party on Child

Health Surveillance (Squires, *et al.,* 1996). Developmental surveillance entails brief evaluations of developmental skills over a period of time and applied to the total population of children with the aim to monitor child progress. *This strategy, carried out by medical practitioners and nursing staff, could play a most important role in recruiting infants and toddlers at risk for communication disorders, provided that the surveillance is carried out routinely and sensitive screening instruments are used.*

According to Ensher (1989) earlier screening tests, some of which are still being used, concentrated on motor milestones and were therefore not reliable to identify delayed communication and cognitive development. The sensitivity and specificity of screening instruments for communication disorders are still a concern. The late identification of children with autism and pervasive developmental disorders (PDD) is a concern being raised in the current literature (Golding, 1998). As the early indicators of autism and PDD relate to a limited range of communication functions, difficulty in acquiring conventional means of communicating and a restricted ability to develop symbolic play (Wetherby, Prizant & Hutchinson, 1998), communication-based screening instruments will be the only screening measurements to identify these infants early enough for effective ECI.

Examples of screening tools to detect infants and toddlers at risk for communication delays are the *Denver Developmental Scale-R* (Frankenburg, Dodds & Fandal, 1988 In Hess, Dohrman & Huneck, 1997), the *Pediatric Language Acquisition Screening Tool for Early Referral (PLASTER)* (Schulman, 1991, in Sherman, Schulman & Trimm, 1996) and the *Early Language Milestone Scale (ELM Scale)* (Coplan, 1983). These instruments are published and some evidence of their use reliability and validity could be found in the literature.

According to Hess, *et al*. (1997) the *Denver Developmental Scale-R* (Frankenburg, Dodds & Fandal, 1988 In Hess, *et al*., 1997) is a popular screening tool and used in pediatric offices in the USA. The test can be administered by either the pediatrician or a nursing professional in a short

period of time, as the test items relating to communication development focus on basic observable behaviours. In a study to determine the concurrent validity of *PLASTER* (Schulman, 1991 In Sherman, *et al*., 1996) it was found to be a quick and efficient tool and comparable to the *ELM Scale* (Coplan, 1983) in its use to identify infants and toddlers at risk for communication delays.

Even though these useful screening instruments are available, it appears that the use of formal screening tools to detect communication delays is not widely encountered. Mulder (1998) found that only 9% of the pediatricians participating in a survey in South Africa used formal screening instruments for developmental surveillance. Hess, *et al.* (1997) found the same trend in a study conducted in the USA. The paediatricians made limited use of formal screening tools and mostly asked informal questions to parents regarding their young child's communication development. Although the use of parental opinion about their children's development was found to be reliable (Rossetti, 1998), not all parents are concerned about their infants' communication development and infants requiring ECI can be overlooked if this is the only identification strategy employed.

It is clear that multiple strategies such as developmental screening, the use of a high risk register and developmental surveillance, utilised by various health care professionals in contact with neonates, infants and toddlers should be applied to detect those at risk for communication disorders as early as possible. These identification strategies should be well co-ordinated and part of a comprehensive ECI programme. The use of epidemiological data can greatly enhance such a programme to provide guidelines for prioritisation in local contexts.

2.3.1.3 Epidemiological Data

Epidemiological data, if available, can provide estimates of the total number of infants in certain communities to be at risk for communication delays. Epidemiological data presented in Table 1. 4 (See Chapter 1) as well as a

study by van der Merwe (1999) who found an increased prevalence of risk conditions and poverty in the Eersterust community outside Pretoria, alert the early communication interventionist of the high prevalence of risk conditions for communication delays in certain communities in South Africa which should be targeted in early identification programmes. Much research needs to be carried out in South Africa in order to plan and conduct effective identification programmes in contexts where infants with established, biological and environmental risks are most likely to be found. Data on the distribution of different risks found in young children is essential to provide guidelines for best practice regarding clients from different contexts in ECI in South Africa.

2.3.1.4 Diagnosis of Infants with Established Risk Conditions

According to Figure II.I another way an infant can enter the ECI process is by way of diagnosis. Since the diagnosis of infants with established risk conditions are often carried out by health care professionals not directly involved in the ECI process, the diagnostic tests employed are considered as identification procedures for entry into the ECI process and not as ECI assessment procedures *per se*.

The process of diagnosis entails an assessment to *diagnose* or label a specific condition in an infant with the aim of finding the cause of a developmental disorder. The process often involves the use of diagnostic tools, such as computed tomography (CT scan), magnetic resonance imaging (MRI), single photon emission computed tomography (SPECT scanning), ultrasonography, different types of X-rays, angiography, echocardiography, enzyme or hormone assays or tissue biopsy (Louw & Kritzinger, 1998). The objective is to identify perpetuating factors (variables which are currently continuing the condition), precipitating factors (agents which brought the condition to its present state) and predisposing factors (agents such as genetic factors which inclined the infant toward a specific condition) (Nicolosi, Harryman & Kresheck, 1996).

The two processes, screening and diagnosing, are not mutually exclusive but complement one another. The purpose of screening is only to identify and refer infants at risk for communication disorders and not to determine the cause of the disorder, i.e. to diagnose or to describe the nature of the disorder in detail, i.e. to assess. Developmental screening involves larger numbers of infants than the process of diagnosis, as not all infants eligible for ECI require a medical diagnostic procedure.

According to Rossetti (1996) it is, however, the minority of infants and toddlers in the ECI caseload who display established risk conditions and require medical diagnostic procedures. Established risk conditions include the following nine categories proposed by the State of Michigan, USA (Rossetti, 1996): Chromosomal anomalies or genetic disorders, neurological disorders, congenital malformations, inborn errors in metabolism, sensory disorders, atypical developmental disorders, severe toxic exposure, chronic medical illness and severe infectious disease. Although the cause of 40 – 60% of all congenital anomalies is still unknown, the diagnosis of an established condition implies that the risk of recurrence is known (Sadler, 1995).

The knowledge about an established risk condition in a young child directly impacts on the family of that infant as they are now in an empowered position to make informed decisions and the recurrence of the condition in the same family can be prevented. Rapid advances made in the location of specific genes on human chromosomes and their function and dysfunction are increasing knowledge about genetic disorders which will result in improved genetic services to families in the near future (Hayes & Northern, 1996; Louw & Kritzinger, 1998).

The other advantage of diagnosing an established condition implies that known patterns of developmental delay can be detected in the infant which will guide ECI decision making and extends the ECI team to involve members from the medical disciplines and paediatric audiologists.

For the majority of infants who require ECI no precipitating biological events, such as the nondisjunction of chromosome 21 during meiosis resulting in Trisomy 21 and one of the aetiologies of Down syndrome, can be traced back as causes of their communication disorders. The majority of infants eligible for ECI do not display the sequelae of concluded biological events that cannot be altered, but display communication developmental delays as a result of the continuous transactions between the environment and the child's constitution. The transactional model of causation, first described by Samerhoff (1986), proposes that biological as well as environmental factors impact on the development of an infant at-risk which results in continuous changes of which a negative or positive outcome cannot be predicted. Hence the population of infants referred to as at risk for communication disorders constitutes the largest section of ECI clients (See also Chapter 1, 1.2).

The important aspect in early identification of infants requiring ECI is therefore not to *diagnose* them as early as possible, as the cause for the communication delay can often not be attributed to an established risk factor, but the issue is to *identify* as early as possible their delayed communication development or the different risk factors that could still lead to such a delay so that intervention can start without interruption. This ideal is, however, not possible without the active participation of the caregivers of the infants requiring ECI.

2.3.1.5 Caregiver Participation and Prevention of Communication Disorders

Identification strategies would, however, be ineffective if the caregivers of these infants are not actively involved. As stated earlier, active parental involvement holds the second key to ECI efficacy (Rossetti, 1993). Recent studies from the medical field as well as ECI recommend the tapping of parents' knowledge of their infants' development (Hall, 1991). It is now generally accepted that parents are reliable informants on their infants' behaviour and that they could be the first to detect developmental delays

(Squires, *et al*., 1996). Delayed identification of communication disorders often results when professionals do not act on parents' suspicions and when both professionals and parents are not aware of ECI and its benefits. Parents' expertise and concerns about their developing infants are currently used as the motivation for screening, parents are employed to complete screening questionnaires and to assist in the screening process of their infant (Bland, 1996; Eddey, *et al*., 1995).

If parents are to participate in the early identification of their infants with communication delays, they must be well informed and educated. ECI has an important role to play not only to convince potential clients of its efficacy, but also to prevent conditions contributing to communication disorders by promoting health and normal communication development in the general public. Issues relating to drug and alcohol abuse, the prevention of HIV/AIDS, safety measures to prevent trauma, the serious effects of smoking and other environmental toxins on fetal development and child health and the control of infectious diseases such as measles and poliomyelitis by universal vaccination programmes, should be targeted in public awareness programmes (ASHA, 1991a). The ideal situation would therefore be well-informed families and communities pursuing healthy life styles and a decrease in the prevalence of preventable conditions associated with disabilities. As programme features is one of the issues in second generation research (Guralnick, 1997), a publicly supported ECI case-finding programme would be the first step towards effective service provision.

The discussion on the entry of infants and their families into the ECI process emphasises the pivotal role of family participation from the initial stages of intervention. This has led to the adoption of a family-centred approach which permeates through all ECI service delivery processes (ASHA, 1989; Beckman, Robinson, Rosenberg & Filer, 1994).

In summary, the implication is that best practice in ECI case finding is not possible when relying on one identification strategy only. As all the different strategies described have merit, it appears that a comprehensive programme

for the early identification of communication disorders would actively involve parents, employ universal neonatal screening for hearing loss, the use of a high risk register, routine developmental surveillance carried out by different health care professionals, screening in the neonatal intensive care unit and at primary health care clinics, using epidemiological data and specific predictors of communication delays as well as the process of diagnosis (Hock Long, 1996; Boswell, 1998; Squires, *et al.,* 1996; Rossetti, 1986).

2.3.2 PHASE II: Assessment in ECI

As indicated in Figure II.I the next phase in the ECI process is the assessment of the infant and its family. In developed countries, the timely assessment of an infant and its family is supported by a co-ordinated and functional referral system. The ideal situation would be that primary referral sources, such as hospitals, primary health care clinics and physicians direct infants and their families to ECI (Hutinger, 1994) as a country's entire population of infants are seen by these health professionals at least once early in their lives. Yet, the most effective method seems through community referral sources (Rossetti, 1986) which include individual community members and private agencies such as parent support groups and churches (Hutinger, 1994). Referrals from non-medical sources demonstrate a community's level of understanding of disability, trust in ECI and the family's adaptive response to an infant who may have a communication disorder.

Since timely referrals can lead to the early assessment and commencement of ECI services of young children and their families, it must be seen as one of the key aspects of best practice in ECI. In order to provide further guidelines for best practice in ECI an in depth discussion of current assessment approaches and assessment procedures in ECI will be presented.

2.3.2.1 Critical Elements of the ECI Assessment Process

The importance of the assessment process in ECI and its unique characteristics of a multidisciplinary team approach, family-centred perspective and assessment procedures are described by various authors (Hammer, 1998; Linder, 1993; Rossetti, 1991; Rossetti, 1996; Teti & Gibbs, 1990). According to Rossetti (1996) the most challenging clinical activity in ECI is to obtain reliable and accurate assessment results. Since assessment results provide essential baseline data upon which the entire intervention programme will be designed, a discussion of the critical elements of the ECI assessment process is warranted.

Figure II.II was compiled to provide a diagrammatic presentation of the assessment process defined by Lahey (1988) and to illustrate the adaptations for assessment currently being implemented in ECI. Lahey (1988) includes the following four operational steps in the assessment process and refers to assessment as *describing* a child's language behaviour for the purpose of *identifying* a problem, *planning* intervention and *estimating* a prognosis. The broad framework of the Lahey assessment model is relevant to communication-based infant-toddler assessment, as the rationale for both assessment processes is to make inferences relating to a child's developmental level and not to diagnose the cause of the problem. However,

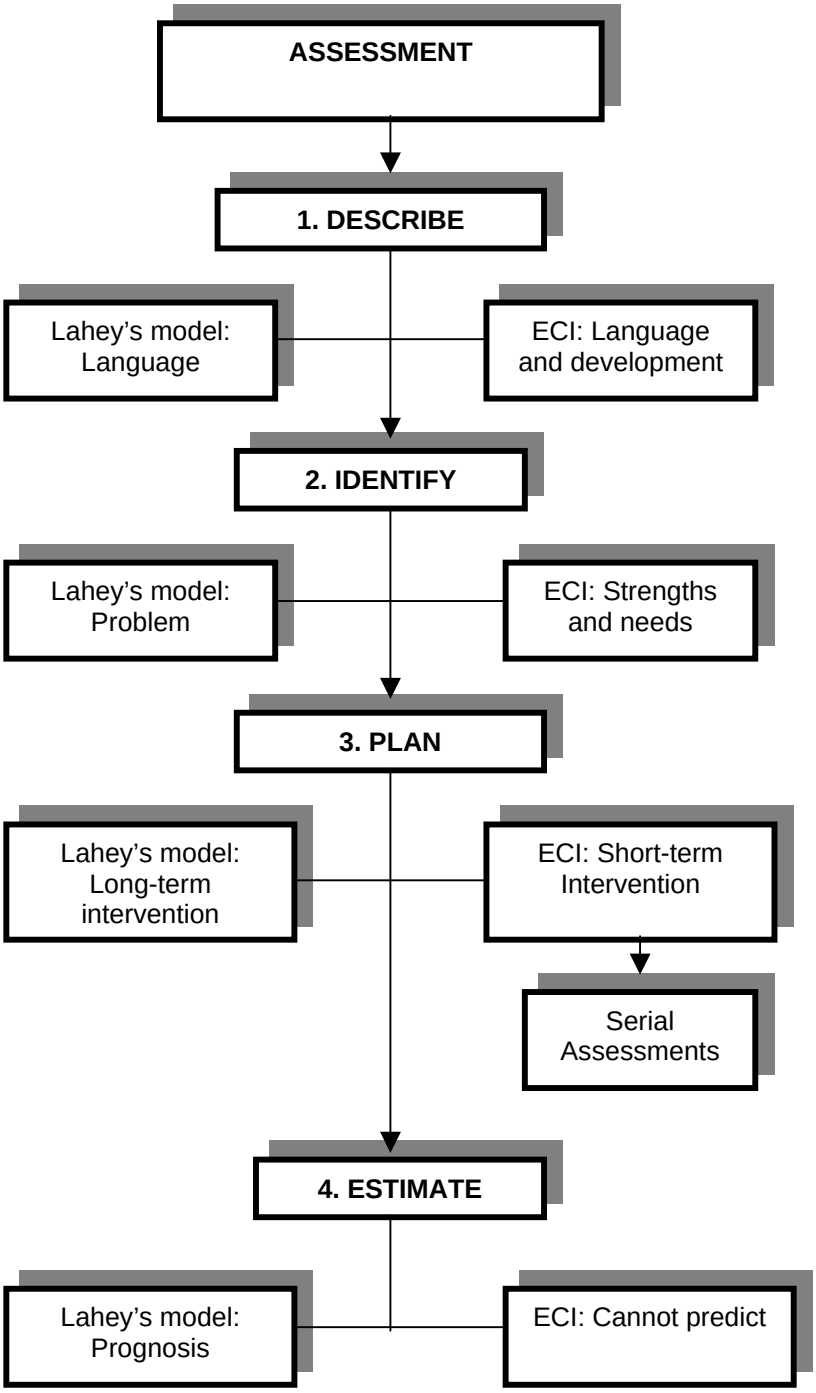

Figure II.II Diagram to indicate the difference between Lahey's assessment model (1988) and assessment in ECI

there are certain critical differences, developed mainly by Rossetti (1990a; 1991; 1996), in the assessment process when applied to ECI. There is a stronger emphasis on including the different developmental domains i.e. the language, motor, cognitive domains and family assessment in communication-based infant-toddler assessment than in the Lahey model.

The ECI assessment is not limited to the language domain only, as a holistic approach to development is the objective of the multidisciplinary team involvement. The language domain, however, remains the focus of a communication-based infant-toddler assessment and is not seen as a function of the cognitive domain as reflected in assessment instruments of infant mental ability such as the *Bayley Scales of Infant Development* (Bailey, 1969), the *Batelle Developmental Inventory* (Newborg, Stock, Wnek, Guidubaldi & Svinicki, 1984) and the *Cognitive Abilities Scale* (Bradley-Johnson, 1987).

A further difference of assessment in ECI, indicating the strong partnership with families, is to identify, build on, and reinforce family and infant strengths and not to focus on the problems only (Briggs, 1997). The emphasis on strengths signifies a move away from the deficit model which only identifies problems with the aim of remediating deficits (Bailey & Simeonsson, 1988).

Another element to be added to the ECI assessment process is that infant-toddler assessments bear limited predictive value (Gibbs & Teti, 1990; Rossetti, 1990a) and the estimation of a prognosis or long-term predictions about treatment outcomes does not apply to the same extent in ECI as in the assessment process according to the Lahey model. The variability of day to day infant behaviour implies that only a sample of an infant's overall skill repertoire is observed during one assessment occasion and Rossetti (1991) proposes a series of assessments over a period of time which will produce more examples of behaviour upon which short-term intervention decisions could be made. The assessment process of ECI therefore relies on a developmental perspective to monitor the effectiveness of treatment, again indicating the multidisciplinary team involvement which will be discussed in the next section.

2.3.2.2 Multidisciplinary Team Approach to Assessment in ECI

The multidisciplinary collaborative team approach to infant assessment has evolved from the realisation that no single profession can provide in the diverse and complex needs of a family with an infant at-risk or with a disability (Butler, 1993) and a movement away from the medical or biological model to explain the aetiology of disabilities. The emergence of the medical model of causation, in contrast with the prevailing moral model of that time which ascribed diseases and abnormal behaviour to moral wrongs, marks the advent of modern scientific understanding of the biological basis of disabilities in the second half of the 19th century in the western world (Foley, 1990).

As indicated earlier, the medical model provides the basis for the diagnosis of conditions of which the risk for communication disorders is well-known and established, but cannot adequately explain conditions with no direct and immediate relationship between causal factors and their effects. The transactional model of causation, implicating that infant developmental outcome is the result of ongoing child and family change over time (Samerhoff, 1986), is now widely accepted. This model more effectively reflects the developmental and educational perspectives of the array of disciplines, such as child development, special education, social work, psychology, nursing and medicine, speech-language therapy, audiology, occupational therapy and physiotherapy collaborating in the assessment process of ECI.

In the light of so many different disciplines representing various perspectives on teamwork, different team models for service delivery in ECI have emerged in an attempt to provide the most effective assessment and treatment services for families with infants at risk for communication delays.

The transdisciplinary model of team collaboration has gained much support in the current literature (Foley, 1990; Briggs, 1997), as the implications of a family-centred approach to ECI have become clearer. From a family's

perspective, the direct and personal involvement of all team members, as in the case of the multidisciplinary and interdisciplinary team models, can be intrusive, disempowering and confusing when not well co-ordinated. The transdisciplinary team model as applied to the assessment process in ECI is an integrative approach and has the following characteristics and advantages:

- The philosophy of team collaboration is multi-competency. Team members commit themselves to teach, learn and work across disciplinary boundaries to plan and provide integrated services. In this way the services can be cost effective as more tasks can be performed without assigning a large number of specialised people.
- The transdisciplinary team model is fully family-centred as families are always members of the team and are able to determine their roles on the team. Families do not meet with different disciplines separately. The team and family develop an intervention plan together based on the family's concerns, priorities and resources.
- The lines of team communication are formalised as the team meets regularly to share information and to teach and learn across disciplines. In the case of multidisciplinary and interdisciplinary teamwork the contact between team members is *ad hoc* and often only through reports.
- Team development across disciplines is formalised and critical to role release. This implies that the team meets on a regular basis.
- The assessment process is characterised by the simultaneous participation of team members in the arena assessment and no separate or parallel assessments are conducted by the different disciplines as in the multidisciplinary and interdisciplinary team models.
- The treatment plan is implemented by one team member (the implementer), together with the family under the supervision of another team member as case manager.

(Adapted from: Briggs, 1997; Foley, 1990; McGonigel, Woodruff & Roszmann-Millican, 1994; Rossetti, 1990a).

According to Rossetti (1990a) the transdisciplinary approach in infant-toddler assessment appears to be the most effective way to provide intervention to

the increasing populations of infants and their families who require these services. Moreover, the transdisciplinary team approach is viewed by Johnson (1994) as a model to achieve authentic family-centred EI services. Since EI service providers search for effective ways of relating to families, the transdisciplinary team model is increasingly seen as well suited to the demands of family-centered EI services (McGonigel, *et al.,* 1994).

2.3.2.3 A Family–Centered Approach to Assessment in ECI

The family's initiative to report for an assessment marks the beginning of a client-professional relationship that is unique to ECI. The role of families in ECI programmes have undergone a remarkable transformation in the past two decades and they, and not their children, are now regarded as the primary clients in ECI service provision (Krauss, 1997). One of the reasons for the prominence of the family in ECI can be attributed to the notion described by Guralnick (1997) as the unique opportunity of early childhood to influence children's development and to support their families to do so. This opportunity is now believed to deliver long-term positive outcomes for both the family and the infant at-risk or with a disability (McCollum & Hemmeter, 1997).

Marking the issues of second generation research in EI (Guralnick, 1997) and for the purpose of assessment, the characteristics of the family with an infant at risk or with a communication disorder are currently described within the framework of the family systems theory, first advocated by Minuchin in 1974 (Briggs, 1997) and the ecological theory, as developed by Bronfenbrenner in 1979 (Hammer, 1998) and applied to ECI.

According to family systems theory the infant is never assessed in isolation, but always seen as a member of a dynamic family system, progressing through life-cycle transitions. Family characteristics are transmitted down generations and combined with cultural patterns of behaviour, fashion beliefs, values, celebrations, everyday rituals and expectations which contribute to the uniqueness of a specific family as ECI client (Hammer, 1998; Schuck & Bucy, 1997).

In criticism of prominent exponents of developmental psychology, such as Piaget whose views regained popularity at that time, Bronfenbrenner (Hammer, 1998) stressed the importance of exploring the context in order to understand child development and behaviours. Ecological theory emphasises the different degrees of complexity of interrelated systems within which a child develops. The first system represents the immediate relationships of the infant and includes parents, siblings, relatives, day care personnel and early interventionists. The second system refers to the relationships among these settings of which the infant is a member, i.e. the home, day care and ECI programme. The third system includes settings where the infant is not directly involved, but can influence development, namely the parents' workplaces, community agencies and ECI policy. The last system is the broadest and involves the social-cultural environment of the infant (Hammer, 1998).

The first system, particularly the family, is considered the infant's most valuable resource for learning, especially for communication development (Gulker, 1992; Lester, 1992). According to Guralnick (1997), the following three family patterns of interaction are strongly associated with a child's developmental outcome, irrespective of that child's disability or risk status:

- The quality of parent-child transactions. Contingent, encouraging, affectively warm, nonintrusive, appropriately structured, discourse-based and developmentally sensitive patterns of caregiver-child interactions enhance a child's development.
- Family-orchestrated child experiences increase the stimulation value of the environment enriched by toys and learning materials.
- Ensuring the child's health and safety.

As depicted in Figure II.III the interaction patterns to be considered in assessment represent two levels of proximity to the child. Parent-child interactions represent the closest interactional pattern provided by the family, stressing the necessity of an intimate relationship in a child's life which cannot be replaced by any other distal relationship but can be facilitated when

deficient. Parent-child interaction patterns evolve before birth and form the intimate relationship of attachment between the parent and the newborn to become the platform for communication development. The provision of stimulation and protection as well as the promotion of health by the family represent the broader context of interaction between the child and the environment and can be augmented when insufficient (Billeaud, 1998; Guralnick, 1997).

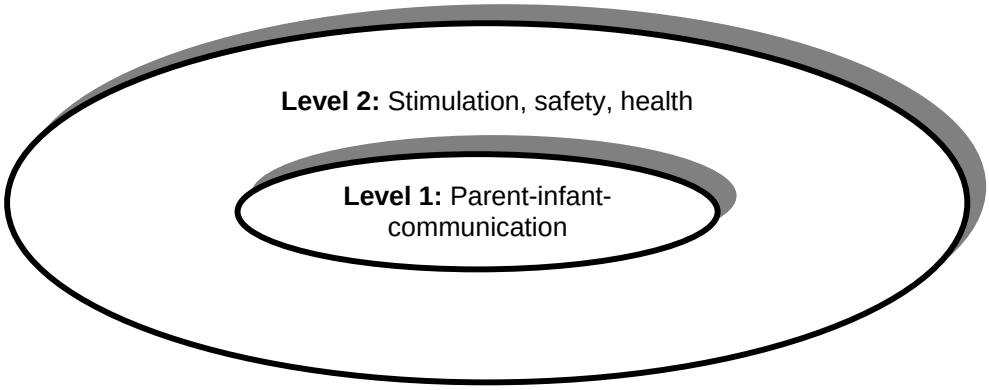

Figure II. III Levels of family interaction patterns
Based on Guralnick, 1997.

The extent to which parents are able to effectively perform these child-rearing roles depends on the following factors, which can also be the sources of stress:

- The personal characteristics of the parents
- Aspects not related to the child's disability or risk status, such as social support, marital relationship, financial resources and child temperament
- Stressors created by the child's disability or risk status

(Guralnick , 1997)

Various stressors are viewed as centrifugal forces contributing to move the family apart and interventions are seen as centripetal forces operating to organise and bring the family together (Bailey & Simeonsson, 1988; Briggs, 1997). Centrifugal forces acting as stressors are directly related to the degree

and severity of the infant's disability, the degree of specialised care required, the visibility of the disability and the family's coping ability (Rossetti, 1990a).

According to Hammer (1998) multiple sources of information must be used in assessment to form a "thick" description of the family, a term derived from anthropological sources. This implies that observations of the family and infant are made in natural contexts and reported from the family's perspective, resulting in clinicians and families beginning intervention from the same point of view. This clearly suggests a departure from the deficit model of assessment towards an assets model of assessment. Ammerman & Parks (1998) propose the identification of assets and capacities of individuals and their contexts to foster better collaboration and culturally responsive services.

As pointed out earlier, Rossetti (1990a) views the assessment of parent-infant-interaction as part of a comprehensive assessment of language functioning in the infant. Various instruments have been developed to assess different aspects of parent-infant communication interaction patterns, such as the *Infant-Parent Social Interaction Code* (Baird, Haas, McCormick, Carruth & Turner, 1992), *Observation of Communicative Interaction (OCI)* (Klein & Briggs, 1987), *Mother/Infant-Communication Screening (MICS)* (Raack, 1989), interaction-attachment (Rossetti, 1990b) and guidelines to identify specific language facilitation techniques used by the parent (Gulker, 1992). According to Krauss (1997) first generation research in EI concentrated extensively on the dyadic relationships between mother and infant, but has now shifted focus to describe the capacities of parents to meet the general needs of the entire family. Characteristic of these parent-infant interaction assessment strategies was that, while providing valuable and essential information, data collection was fully controlled by the ECI clinician and parents have limited participation in offering information and decision making.

The challenge is now to offer families increased choices and control in preparing for the assessment process, participating in assessment activities and the sharing of assessment results (Crais & Wilson, 1996). According to Krauss (1997) the mechanisms for achieving the goal of family-friendly

assessment are not yet clear. Crais (1993) suggests alternative roles or families in infant assessment but cautions that it is important to honour whichever roles are chosen by family members and to avoid pressuring them into other roles. The different roles can be viewed on a continuum from the lowest level of participation to the highest level of involvement. The different roles are: Receiver, observer, informant, describer, interpreter, validator, participant and evaluator (Crais, 1993). Involving parents on all these levels of participation in the assessment process is attainable as recent findings demonstrated a high correlation between parents' and professionals' judgements of a child's developmental level (Crais, 1993; Rossetti, 1996).

In a study conducted to determine the effectiveness of a family-centred approach in EI Griffer (1997), reports enhanced active involvement of parents in the communication-based assessment of their infants and toddlers. The subjects were 20 families of infants enrolled in an ECI programme and they found the following family-centred strategies to be most beneficial:

- Discussing the purpose of the assessment and options for family participation in pre-assessment meetings with the team.
- Creating opportunities that facilitated active parent involvement.
- Conveying to families that their strengths, concerns and particularly their input regarding their infant's development was sought, valued and seriously considered throughout the assessment process.

Although employing a small number of subjects, the study indicates client satisfaction on family involvement in the assessment process which is an important aspect in improving the effectiveness of ECI services.

The basis of the family-centred assessment process in ECI can be summarised as a paradigm that recognises the interaction between infant, parents and the environment (Rossetti, 1990a). The unique characteristics of a family and its cultural values and beliefs as well as physical and social resources to cope with an infant with a disability or at risk for developmental delay, yet avoiding professional intrusiveness into family life, should transpire

in the assessment process. The family-centered assessment approach is clearly one of the elements of best practice in ECI. Further challenges regarding best practice in ECI assessment involves the question of the most efficacious way to conduct the assessment activity.

2.3.2.4 Assessment Procedures in ECI

Rossetti, as one of the main exponents of communication-based intervention in EI, has defined infant-toddler assessment as *" …. any activity, either formal through the use of norm-referenced standardised criteria, or less formal, through the use of developmental profiles or checklists, that is designed to elicit accurate and reliable samples of behaviour upon which inferences relative to developmental skill status may be made"* (Rossetti, 1996, p77).

The definition implies that any activity is valid as an assessment procedure in ECI, provided that accuracy and reliability of the data can be assured. As a wide choice of assessment procedures are now available to the multidisciplinary team, designing a comprehensive communication-based assessment protocol is possible.

The use of criterion-referenced assessment procedures have gained preference in ECI as these instruments demonstrate the infant's mastery of the specific behaviours under observation (Rossetti, 1996). Norm-referenced instruments compare the functioning of an infant to the performance of the population at large, but provide limited information to be used for treatment goals and objectives. Norm-referenced instruments are standardised on the population of typically developing infants and can therefore only demonstrate the weaknesses and needs of infants with disabilities. This inflexible way of assessment is particularly misleading and unproductive in the case of infants with severe disabilities (Bagnato & Hofkosh, 1990; Rossetti, 1990a).

A criterion-based assessment approach is therefore more suitable for infants and toddlers as it describes the infant's functioning along a continuum of developmentally sequenced objectives. The information gained provides

developmental levels as well as curriculum guidelines. According to Bagnato and Hofkosh (1990) characteristics of effective assessment instruments for infants and toddlers include the following:

- The instruments are designed to reflect a developmental basis in their content and structure.
- Provide a profile of all the different developmental domains.
- Use different sources of information, including parents and team members
- Supply treatment links in the form of programme goals and strategies.
- Allow adaptive options of assessment procedures in order to accommodate the infant's sensory and response impairments.
- Reflect an ecological and family systems perspective to adequately describe the parent-infant communication interaction aspects of the environment that influence infant development.
- Supported by research data in terms of reliability, validity and treatment utility.

Examples of assessment instruments meeting these criteria are the *Hawaii Early Learning Profile (HELP) Checklist* (Furono, O'Reilly, Inatsuka, Hosaka, & Falbey, 1993) and a communication-based assessment scale, *The Rossetti Infant-Toddler Language Scale* (Rossetti, 1990b).

The HELP (Furono, *et al.,* 1993) is a comprehensive assessment and curriculum system, incorporating six developmental domains, i.e. cognitive, language, gross motor, fine motor, social-emotional and self-help, ranging from birth to 36 months of age. Each of the developmental domains were designed by an interdisciplinary specialist most expert in the area, thereby facilitating its acceptance as a useful assessment instrument for the whole team. The curriculum invites parent participation by means of easily implemented instructional strategies. This assessment instrument is therefore valuable in ECI as it in provides developmental information regarding a child's general development and does not focus on one developmental domain only. The following assessment instrument provides an in depth analysis of one developmental domain, i.e. communication development.

The Rossetti Infant-Toddler Language Scale (Rossetti, 1990b) is currently the most widely used infant-toddler communication assessment instrument (Rossetti, 1998) and was designed in accordance with his philosophy that socio-communicative skills represent the only developmental domain that consistently separates low-risk from high-risk children (Rossetti, 1996). The scale is a comprehensive assessment instrument, involving high levels of parent participation by including a parent questionnaire, an interview guide and parent report is added next to observation and elicitation of communication behaviour as a valid method of data collection. The three dimensions of language, i.e. use, content and form (Lahey, 1988) are embedded in the six sub-scales which include interaction-attachment, pragmatics, gesture, play, language comprehension and language expression. The scale is a criterion-based assessment instrument and provides a comprehensive description of socio-communicative skills of infants and toddlers, which can be implemented as intervention goals, objectives and strategies. Of all the communication assessment instruments currently available, this instrument is one of the most comprehensive scales and most valuable in any ECI programme.

Both these assessment instruments are flexible to suit various settings such as the arena assessment which is based on a transdisciplinary team approach where information, knowledge and skills are deliberately exchanged and pooled in the simultaneous assessment of the infant.

The transdisciplinary play-based assessment procedure as developed by Linder (1993) has gained acceptance in ECI as its design accommodates the arena assessment. Within the context of the arena assessment the infant is engaged in structured and instructional play situations which provide opportunities for functional, natural and transdisciplinary observation of behaviours across developmental domains.

The question arises whether the transdisciplinary play-based arena assessment is the most effective model to assess infants and toddlers at risk

for communication delays. A comparative study between a play-based assessment format using *The Rossetti Infant-Toddler Language Scale* (Rossetti, 1990b) and a formal standardised measurement instrument, conducted by Calhoon (1997), indicates a favourable outcome for the play-based model. Four subjects with a language delay were assessed employing both assessment methods and the results indicated that the play-based assessment produced higher performance scores and provided a broader picture of the toddlers' emerging skills (Calhoon, 1997).

It therefore appears that a play-based arena assessment model using criterion-referenced instruments could be advantageous to the infant or toddler at risk for communication delays. The play-based transdisciplinary arena assessment model is currently regarded as an appropriate approach for obtaining an accurate view of an infant or toddler's strengths and needs. According to Parette, Bryde, Hoge and Hogan (1995) the specific advantages of the model include the following:

- Team participation is enhanced as a unified approach is achieved.
- Fatigue is limited as the infant or toddler is assessed in one session only.
- More reliable samples of behaviour can be obtained as the team member with the best rapport with the infant is utilised as the facilitator.
- The whole team is available to the family at one time.
- The team members benefit as all information is immediately available, leading to improved programme planning.
- This approach is cost-effective as multiple separate assessments are not necessary.

The guidelines for best practice regarding communication assessment in ECI are clear and involves the utilisation of criterion-referenced assessment instruments and a play-based transdisciplinary arena approach. There is empirical support for the play-based transdisciplinary arena approach in the assessment of infants and toddlers at risk for or with communication disorders and its benefits are known.

As pointed out in Figure II.II the content of infant-toddler assessment covers all the different developmental domains. Rossetti (1990a) indicated the specific assessment domains as the language, motor and cognitive domains and family assessment, with the primary focus on language in order to obtain comprehensive information to plan a communication-based curriculum for an infant or toddler requiring ECI.

According to Prizant and Wetherby (1995) infant-toddler language assessments tend to focus on communication milestones and forms, i.e. appearance of first words, gestures, phonology and vocabulary and give limited attention to the functions or purposes of communication. Early communication functions include those signals of an infant which have the intention of affecting another person's behaviour in specific ways, such as:

- To regulate another person's behaviour by means of protesting and requesting objects and actions.
-
- To interact socially with another person by means of requesting social routine, requesting comfort, calling, greeting, showing off and requesting permission.
-
- To give attention to another person in turn-taking communication interaction events, by means of commenting, requesting information and providing information on an object, event or a topic.

(Prizant & Wetherby, 1995; Wetherby & Prizant, 1989)

Even though these early signals are not yet intentional, research indicates that parents spontaneously respond to infant cues as if they express different functions, thereby fostering interactive communication development (Pearce, Girolametto & Weitzman, 1996; Prizant & Wetherby, 1995). This implies that communication assessment instruments should be sensitive to evaluate emerging prelinguistic behaviours as they provide important guidelines for parent training in ECI.

Table 2.1 was compiled to provide a framework for infant-toddler communication-based assessment which describes the assessment areas and procedures to be utilised. The framework for assessment provides valuable guidelines for best practice in ECI.

Table 2.1 A framework for infant-toddler communication-based assessment

Assessment Area	Assessment Procedures
1. Expressive Language and Communication - Communicative means - Communicative functions - Phonological development - Range of vocabulary - Semantic complexity of utterances - Morphologic complexity - Reciprocity in communication	- Play-based procedures: Interactive routines, toys and books - Observation of parent-infant communication interaction - Parent report - Eliciting of behaviours by assessor - Parent's developmental diary of infant
2. Receptive Language and Communication - Orientation to sound and speech - Non-linguistic response strategies - Linguistic comprehension	- Hearing screening test - Play-based procedures: Interactive routines, toys and books - Parent report
3. Speech Production - Quality of vocal production - Phonetic repertoire - Structure of babbling patterns - Quality of speech - Oral structure - Oral-motor function and feeding skills - Speech function	- Interactive play-based procedures Interactive routines, toys and books - Eliciting of behaviours by assessor - Observations by assessor - Observation of parent-infant communication interaction - Observation of feeding skills
4. Language related cognitive abilities - Symbolic play and object exploration - Constructive play - Attentional capacities - Imitation	- Play-based procedures: Interactive routines, toys and books - Observation of parent-infant communication interaction
5. Social-Affective Behaviour - Use of gaze for social referencing - Expression of positive affect - Expression of negative affect	- Play-based procedures: Interactive routines, toys and books - Observation of parent-infant communication interaction - Parent report
6. Motor Abilities - Fine motor skills - Gross motor skills	- Play-based procedures: Interactive routines, toys and books - Parent report

Adapted from Prizant & Wetherby, 1995.

As illustrated in Table 2.1 all developmental domains are included in the framework for communication-based assessment. The developmental domains are interrelated and communication acts observed during assessment are the result of the integration of them all. As the aim is to determine the functionality of an infant's communication skills, detailed information requiring accurate observation is necessary. It is therefore clear

that a combination of criterion-referenced assessment instruments as well as sampling procedures (to determine the phonetic, babbling, gestural and expressive language inventories) and formal measurements (audiological measurements) need to be implemented for a comprehensive infant-toddler communication-based assessment.

The quality of the multidisciplinary assessment of an infant and family contributes to the effectiveness of the intervention programme to be implemented. The goals for assessment present some of the greatest challenges in ECI, i.e. the early detection of communicative delay, deciding on appropriate intervention, monitoring of child and family change, monitoring of programme effectiveness and predicting infant progress by means of serial assessments (Rossetti, 1996).

The initial assessment is a crucial step in ECI as it initiates the process of treatment. Best practice in infant toddler assessment depends on multidisciplinary team involvement, a family-centred approach, the quality of assessment procedures employed and the skills of the early communication interventionist.

Assessment is not an end in itself. It is the starting point for further activities designed to enhance the young child's performance level (Louw, 1997), i.e. the provision of an ECI programme.

2.3.3 PHASE III: Provision of ECI Programme Services

The last phase in the ECI process illustrated in Figure II.I involves the provision of ECI programme services. Based on the wealth of information gathered from different sources during the assessment process, an individual family service plan is designed, which forms an integral part of the treatment programme rendered by an ECI service provider. The importance of a discussion on ECI programmes is also stressed by Guralnick (1997), who

regards EI programme features as one of the characteristic themes of second generation research in EI.

Within the USA context, with legislation to support the provision of EI services, Guralnick (1997) suggests that an effective EI programme should closely match the needs of individual families and should assist them on three different levels:

- Resource supports which include financial assistance, respite care and the co-ordination of all services.
- Social supports in the form of parent to parent groups, family counselling and mobilising community networks.
- Information and services constitute the most visible component of the EI programme and include the formal intervention programme carried by parent-professional relationships.

In order to determine to what extent existing EI programmes assist families on these three levels a literature survey was conducted to identify a variety of different EI programmes. The aim of including EI programmes in the discussion was to investigate to what extent the special needs of the different populations of young children at risk for communication disorders are incorporated in examples of currently available EI programmes. Twelve programmes were selected on the basis of clear and comprehensive descriptions of their aims, approaches and contents in order to allow analysis and identify indicators for effectiveness.
Table 2.2 provides a summarised description of the twelve EI programmes which were selected for analysis.

Table 2.2 Characteristics and components of a selection of EI programmes

Programme	*The Portage Home Teaching Model of EI* (Cameron, 1997)	*Mother-Infant Communication Project* (Haney & Klein, 1993)	*Hanen Early Language Parent Programme* (Giralometto, *et al.,* 1986)
Location	Started in Wisconsin (USA), then UK, now international	Los Angeles, USA	Toronto, Canada, international
Target group	Families with pre-school children with disabilities	Mothers and families and their high risk NICU graduate infants	Families with infants with communication delays; early childhood educators
Programme approach	* Educational service * Parent mediated intervention	Facilitate mother-infant communication interaction	Child-centred conversational model of language intervention
Years in operation	20 years	3 years	Since 1974
Service delivery options	Home visiting	* Home visiting * Centre-based * Small neighbourhood groups	2 week long evening group training programme for parents, home visits
Frequency of programme input	Weekly	Weekly	Regular follow-up
Team approach	Transdisciplinary: Teachers, health visitors, community nurses, therapists, volunteers	Interdisciplinary: Infant developmental specialists, speech-language pathologists	Speech-language pathologists and trained group leaders
Content of programme	Self-help, motor, language, social, cognitive	Communication and general development, health, nutrition	Communication-based
Training of personnel	* Basic 4 day in-service training * Advanced training	In-service training	* In-service training * Training group leaders (Weitzman, 1994)
Intervention materials	* *Portage Checklist* * *Portage Teaching Cards* * *Portage Activity Chart* (Cameron, 1997)	*Observation of Communicative Interaction* (Klein & Briggs, 1987)	*It Takes Two to Talk* (Manolson, 1993) *Learning Language and Loving it* (Weitzman, 1992)
Management	Service delivery structure; supervisors	Service delivery structure	Service delivery structure
Monitoring	* Regular assessment of child progress * Team meetings * The Portage Code of Practice and Ethical Guidelines	*Quarterly developmental assessments * Staff meetings * Evaluation of services	***** Evaluations by programme participants ***** Monitor family progress
Research	More than 20 studies	4 studies	Various publications
Achievements	* Best-known EI programme in UK * Widely respected approach * Influenced government policy	* Advanced language development and home environments * Peer learning in parent groups	* Effective, widely used approach * Numerous publications of intervention and training materials
Special emphasis	Educational services to families in their homes with various social and cultural backgrounds	* Mother-infant-communication interaction * Mothers: Single, low income and education	Facilitate dialogue skills that support language development

Table 2.2 continued Characteristics and components of a selection of EI programmes

Programme	*The Carolina Curriculum for Infants and Toddlers with Special Needs* (Johnson-Martin, *et al.,* 1991)	*Early Childhood Research and Intervention Program* (Baxter & Kahn, 1996)	*NIDCAP: Newborn Individualized Developmental Care and Assessment Program* (Als, 1997)
Location	North Carolina and internationally available	Chicago, USA	Boston and 10 centres in USA
Target group	EI personnel, children with disabilities 0-24m developmental range	Families with infants at risk and disabilities living in poverty	Families with infants in the NICU
Programme approach	Curriculum to be used under professional supervision	* Parent training * Direct intervention with child	Observation of infant behaviour as a guide to support primary care team and family
Years in operation	Since 1986	Not stated	Not stated
Service delivery options	No direct service delivery	* Home visiting * Centre-based	Daily interventions in NICU
Frequency of programme input	Daily activities of curriculum	Weekly	Full time
Team approach	Transdisciplinary: Educators, day-care workers, psychologists, therapists, nurses	Transdisciplinary: Early childhood educators, social workers, community workers	Multidisciplinary: Developmental specialist, developmental care nurse educator
Content of programme	Cognition, fine motor, communication, social adaptation, gross motor	Developmental activities, family support	Behavioural observation, care-giving, feeding, positioning, family comfort, soothing environment
Training of personnel	Instructions included in curriculum	Not stated	In-service training
Intervention materials	* Curriculum * Assessment Log * Developmental progress Chart * Adaptations for infants with multiple disabilities	* Family Support Services Interview * Questionnaire on Resources and Stress	* *Assessment of Preterm Infant's Behaviour* * *Newborn Individualized Developmental Care and Assessment*
Management	None	Service delivery structure	Service delivery structure
Monitoring	* Updating of curriculum 1986 to 1991 * Field-tested in 22 EI programmes	* Participants evaluate services * Developmental assessments	***** Ongoing research * Parent council * Monitoring process
Documented research	Various studies	4 studies	More than 10 studies
Achievements	* Well-known and widely used EI programme	* Descriptive information on needs, stresses and resources low income inner-city families	* 10 NIDCAP Centres * Salaried positions for personnel * Lower mortality rate
Special emphasis	Sensory motor development	* Unique strengths, resources and needs of families living in poverty in the inner-city	Relationship-based developmental Care in the NICU

Table 2.2 continued Characteristics and components of a selection of EI programmes

Programme	*Infant Health and Development Program* (Blair, *et al.,* 1995)	*Communication intervention in the NICU* (Jacobson & Shubat, 1991)	*Hawaii Early Learning Profile (HELP)* (Furono*, et al.,* 1993)
Location	USA, 8 different sites	Kansas City, USA	Hawaii and internationally available
Target group	Infants and toddlers at biological and environmental risk	Families with infants at risk in the NICU	Families and infants at environmental risk
Programme approach	* Parent training * Direct intervention with child	* Parent training * Direct intervention with infant	* Parent training * Direct intervention with infant
Years in operation	1985 to 1988	1983-1987	First published 1979
Service delivery options	* Home visiting < 12m * Centre-based > 12 m * Parent group meetings	Daily interventions in NICU and follow-up after discharge	Daily activities for home and centre
Frequency of programme input	Weekly at home Daily at centre	Daily	Full time
Team approach	* Transdisciplinary: EI team * Multidisciplinary: Medical team	Interdisciplinary: Speech-language pathologist member of NICU team	Can be used in a transdisciplinary EI team
Content of programme	All developmental domains and medical follow-up	Developmental activities, family support, identification of hearing loss and other disorders, care-giving	Social-emotional, cognitive, language, gross and fine motor, self-help
Training of personnel	Professionals specialising in EI	Self-training	Instructional manual
Intervention materials	* Curriculum for very low birth weight infants (Early Partners) * Curriculum for infancy and early childhood (Partners for Learning)	* No formal intervention material developed for programme	* Developmental Assessment Record and Checklist * Activities for Family Participation * Charting Progress * Curriculum Activities * Adapted home activities
Management	Service delivery structure including research component	Service delivery structure	None
Monitoring	* Child assessment at 12, 24 and 36 m * Control group: No EI, only medical care	* Careful documentation * Evaluation of programme	***** Ongoing research
Documented research	Numerous publications	3 publications	Numerous publications
Achievements	* Largest EI study ever done: 985 subjects * Proved effectiveness of EI after 3 years in programme	* One of the first articles on role of speech-language pathologist in NICU	* Widely used programme * Numerous resources for professional use * Parents with special needs
Special emphasis	Cognitive development of infants at biological risk	Communication-based intervention in NICU	Comprehensive and integrated approach to EI

Table 2.2 continued Characteristics and components of a selection of EI programmes

Programme	*SKI-HI Programme for families with infants and children with hearing impairment* (Glover, *et al*., 1994)	*Communication Intervention Programme for Infants with Down Syndrome* (Kumin, *et al.,* 1991)	*Early Communication-Based Intervention for Infants Born with Clefts* (Savage, 1997)
Location	Logan, Utah and through-out USA and Canada	Maryland, USA	Pennsylvania
Target group	Families with infants and pre-school children who are deaf and hard of hearing	Families with infants and toddlers with Down syndrome	Families and infants with cleft lip and palate
Programme approach	* Family-centred * Intervention with child	* Parent training * Intervention with child	* Parent training and support * Intervention with infant
Years in operation	Since early 1970's	Since 1980's	Since 1980's
Service delivery options	* Home intervention * Family support groups * Centre-based	* Centre-based individual therapy and parent training	Craniofacial team management, centre-based intervention
Frequency of programme input	Weekly contacts at home	Weekly therapy sessions	* Feeding therapy as required, monitor communication skills
Team approach	* Multidisciplinary: Parent advisors, trainers, audiologists	Therapy done by 2 speech-language pathologists	Multidisciplinary craniofacial EI team
Content of programme	Program components: Hearing aid, communication, auditory, language (cued speech, total communication, aural-oral, sign language)	Treatment protocol: General behaviour, oro-motor, pragmatic, receptive and expressive language ability	Early feeding and socialisation, family counselling, monitor speech and language development
Training of personnel	Formal training in SKI-HI approach	In-service training	In-service training
Intervention materials	* SKI-HI parent training programme * SKI-HI Resource Manual for Family-Centred Home-Based programming for Infants, Toddlers and Pre-school-aged Children with hearing Impairment	* Diagnostic evaluation report * Therapy lesson plan * Progress report * Programme published	* No specific materials developed for programme
Management	Service delivery and training structure	Service delivery structure	None
Monitoring	* Regular assessment of child * Evaluations of programme effectiveness	* Documentation of intervention	***** Ongoing research
Documented research	Numerous publications	4 publications	3 publications
Achievements	* Well-known approach * Proved effectiveness of EI for infants with hearing impairment	Widely used programme for infants with Down syndrome	Continuity in assessment/intervention planning
Special emphasis	Early identification followed by appropriate intervention programming	Total communication to facilitate expressive language	Promote development despite biological and environmental risks

The three programmes designed for specific populations with established conditions for communication disorders, include the *SKI-HI Programme for Infants and Pre-school Children with Hearing Impairment* (Glover, Watkins, Pittman, Johnson & Barringer, 1994), communication intervention for infants with Down syndrome (Kumin, Goodman & Councill, 1991) and communication-based intervention for infants born with clefts (Savage, 1997).

The two communication-based programmes for infants with low birth weight and prematurity, are for communication intervention in the NICU (Jacobson & Shubat, 1991) and a programme for their follow-up, the *Mother-Infant Communication Project (MICP)* (Haney & Klein, 1993). The last programme has the added advantage to provide in the needs of single mothers with low income and limited education, thus including infants with biological as well as environmental risks. In a study to evaluate the effectiveness of the *Observation of Communicative Interaction* (Klein & Briggs, 1987), the assessment scale designed for the MICP, Whites (1992) found the instrument to be a valuable tool in assessing the quality of caregiver interactions with infants and providing treatment guidelines.

The sixth communication-based EI programme, *the Hanen Early Language Parent Programme* (Giralometto, Greenberg & Manolson, 1986), was not designed for a specific population of infants at risk, but is one of the best family-centred EI approaches to be implemented for infants with disabilities and at risk for communication delays. The theoretical underpinnings of the programme ascribe to the central role that early reciprocal interactions between parent and child play in facilitating the child's communicative and linguistic development. The programme, administered from the Hanen Centre in Toronto, trains parents to use naturalistic interaction strategies associated with accelerated language development in normal children (Pearce, Girolametto & Weitzman, 1996).

The remaining six programmes in Table 2.2 were included to illustrate the advantages of general EI programmes which curricula comprehensively cover all developmental domains and offering a wealth of intervention materials and

multiple service delivery options. These programmes are also applicable for young children at risk for communication disorders and each programme's strong points are as follows:

- *The Portage Home Teaching Model* (Cameron, 1997), focuses on home-based services.
- *The Carolina Curriculum for Infants and Toddlers with Special Needs* (Johnson-Martin, Jens, Attermeier & Hacker, 1991) emphasises sensory motor development.
- *The Hawaii Early Learning Profile* (Furono, et al., 1993) provides additional materials to assist parents who have disabilities.
- The Infant Health and Development Programme (Blair, *et al.*, 1995) with a strong research basis emphasises the health care needs of infants with low birth weight and prematurity.
- *The Newborn Individualized Developmental Care and Assessment Program* (Als, 1997) includes all aspects of NICU care and provides a new model for the traditional NICU team management.
- The Early Childhood Research and Intervention Program (Baxter & Kahn, 1996) draws attention to the most needy families and infants at double risk for communication developmental delays in the USA, i.e. those living in poverty in the inner cities.

According to Table 2.2, there is a wealth of programme components available for selection to design an individualised family service plan. As language and communication skills represent the most important developmental domain to facilitate school readiness and ensure school success (Capute, *et al*., 1987), the vantage point of any individualised family service plan is a strong focus on communication development. This implies that, irrespective of the infant's disability or risk factors or the parents' resources and needs, a communication-based programme will improve the effectiveness of any EI treatment plan (Rossetti, 1996).

After establishing the focus of the programme content, other ECI service delivery parameters can be considered. As indicated in Table 2.2 and also suggested by Guralnick (1997), parameters to be considered are the

programme approach, different service delivery options, the frequency of the programme input, the team model, the role of the parent, the degree of structure that should exist when implementing the curriculum and specific intervention materials. The selection of intervention materials can be guided by background information on the development of the material, research, experience in the ECI field, programme achievements, training of personnel and monitoring for quality control. Evidence of the quality of the programmes can be found in the various studies and publications carried out by most of the twelve programmes reviewed in Table 2.2.

According to the three levels of support required by families (Guralnick, 1997) the strong point of the programmes in Table 2.2 appears to be the support families receive regarding information and services directly related to the child's needs. None of the programmes clearly stated that they provide financial assistance, respite care or how all services are co-ordinated. It is therefore not clear to what extent resource supports are provided in the programmes.

Social supports are provided by two programmes namely *The Mother-Infant Communication Project* (Haney & Klein, 1993) and the *SKI-HI Programme for Infants and Pre-school Children with Hearing Impairment* (Glover, *et al*., 1994) in the form of family support groups and small neighbourhood groups. It therefore appears that the programmes reviewed mostly focus on programme content regarding the intervention needs of the child and not so much on the wider needs of the family concerning resource and social supports. These two important progamme components relate to the family's quality of life, their ability to cope with an infant with a disability and their integration into the community where they live. It appears that the twelve programmes reviewed do not adequately attend to stressors impacting on families. Since low family risk can have moderating effects on stressors which can disrupt family interaction patterns, provision of social supports is one of the components of best practice in EI.

As the family-centered approach is at the core EI, meeting the family's needs on all levels is indeed a challenge for best practice in EI. If a family is socially supported and has sufficient resources EI will be able to meet its own goals. As stated by Rossetti (1990) family goals in EI include reducing stress and anxiety associated with parenting a young child with disabilities and to increase the amount of responsibility that parents take for educating that child.

Figure II.I and the ensuing overview of the literature presented a framework for best practice in ECI which included the different phases of the service delivery process, starting with the identification of infants at risk for communication disorders, followed by assessment and the provision of family-centered services. In order to ensure best practice throughout the intervention phase of ECI, certain measures for quality control to increase effectiveness are included in the remainder of the ECI process. The provision of programme services is followed by re-assessments, updating of the programme at regular intervals and the annual review of the service plan. Once the individualised family service plan is in operation, the scheduling of serial assessments at six month intervals is of vital importance to update programme goals and to review the service plan annually (Rossetti, 1996). As ECI programme outcomes are one of the issues of second generation research, the practice of regular programme monitoring to improve effectiveness is of critical importance.

2.4 CONCLUSION

The initial question regarding a common philosophy of best practice in ECI can now be answered. An overview of the literature provided extensive guidelines to identify those strategies and methods which can improve the effectiveness of ECI and address the challenges of matching child and family characteristics to provide effective ECI programmes, selecting and implementing critical programme features to provide individualised services and producing positive ECI outcomes (Guralnick, 1997). Based on second generation research of best practice discussed in the chapter, Figure II. IV was compiled to present the most important parameters which are considered

to influence the effectiveness of ECI. The 14 parameters are displayed on a continuum as it is not always possible to indicate programme effectiveness on discrete points.

As depicted in Figure II.IV one parameter regarding the consideration of culturally sensitive programmes was added since it was not sufficiently dealt with in this chapter, but constitutes one of the current challenges of best practice in ECI which cannot be ignored (Heath & Levin, 1991). The need for appropriate ECI services to culturally diverse families in different contexts is one of the demands of second generation research which must be investigated further. Figure II.IV therefore illustrates the progress of ECI in finding solutions to the challenges of second generation research and can be used as an underpinning for a conceptual model for best practice in ECI. The parameters for effective service delivery in ECI can now be used to provide guidelines for further research to develop the field of ECI in order to improve existing ECI programmes and adapted develop new programmes in new contexts such as South Africa.

Figure II.IV was conceptualised from: Als, 1997; Briggs, 1997; Cameron, 1997; Gomby, *et al*., 1995; Guralnick, 1997; Haney & Klein, 1993; Heath & Levin, 1991; McCarton, *et al.,* 1997; Ramey & Ramey, 1992; Rossetti, 1996; Smith & McKenna, 1994; Squires, *et al.,* 1996; Wasik, *et al*., 1990.

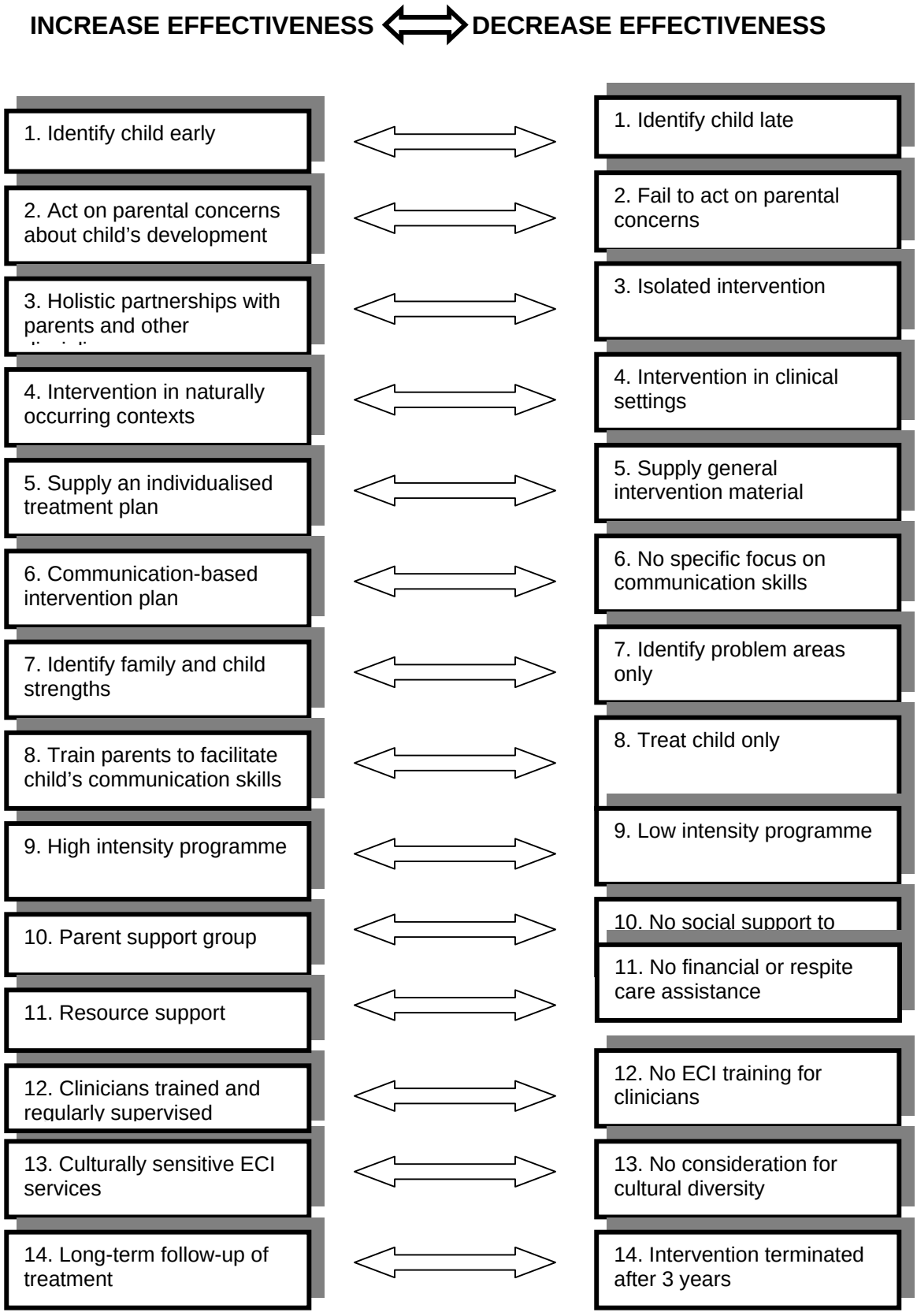

Figure II.IV Continuum of parameters for efficacy in ECI service delivery

2.5 SUMMARY

The chapter provides an overview of current research on best practice in ECI and indicates that the question regarding the effectiveness of services is characteristic of second generation research in ECI. Using the ECI process as a framework for best practice, the effectiveness of identification of infants at risk for communication disorders, assessment and the provision of ECI services is discussed. The new role of parents as the primary clients in ECI, the transdisciplinary team model, different assessment procedures and current EI programmes features are highlighted in order to provide guidelines for best practice in ECI. The chapter concludes with a set of parameters, presented on a continuum, to provide the underpinnings of a model of best practice in ECI.