Early Identification and Intervention for Infant Speech and Language Delays: A Narrative Review

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Abstract

Language is one of the most basic communication tools for human social and behavioral activities. Language is a form of cognitive expression that reflects the thinking and psychological processes of the human brain. Because language is central to so many aspects of human life – cognition, social interaction, education and vocation – valid identification, prevention, and treatment of language disorders is a high priority for the therapeutic professions. Delay and/or difficulty in beginning to use the language is one of the most common causes of parental concern for young children brought to pediatricians and other professionals. The importance of early intervention is acknowledged by professionals and non-professionals alike. It advocates promotion of positive assets and development of the child and the family. The major purpose of early intervention is prevention of disability and developmental delays. The ultimate goal in intervention is to enhance normal development and independent functioning of the child. Intervention may focus on the child, parents, family, and community.

Keywords: Early Identification; Early Intervention; Children

Abbreviations: ASHA: American Speech and Hearing Association; SELD: Slow Expressive Language Development; DLD: Developmental Language Disorder.

Introduction

Language is one of the most basic communication tools for human social and behavioral activities. The brain is the foundation of the language function, which not only stores a large amount of information (e.g., memory and intelligence) but also decodes and codes language. Language is a form of cognitive expression that reflects the thinking and psychological processes of the human brain [1,2]. The Diagnostic and Statistical Manual of Mental Disorders (1980) provides a definitive classification system widely used in the United States. It includes under Axis II 'Specific Developmental Disorders', Developmental Language Disorder, which in turn is divided into three groups:
- Failure to acquire any language
- Acquired language disability
- Developmental language disorder

The first of these is normally associated with severe mental handicap, and the second with trauma or neurological disorder. Both could be considered language disorders secondary to a clearly defined medical condition. The third category is further subdivided into expressive type, and receptive type. Although expression and comprehension

are frequently affected in cases of mental retardation, developmental language disorder, as used in the DSM classification system, clearly indicates that these children do not have general learning difficulties. The DSM classification also includes category Development Articulation Disorder in which speech difficulties cannot be attributed either to mental handicap or developmental language disorder [3]. According to the American Speech and Hearing Association (ASHA) speech and language deficits are the most common of childhood disabilities and affect about 1 in 12 children or 5 percent to 8 percent of the preschool population. In addition, the OSEP "25th Annual Report to Congress on the Implementation of IDEA" lists speech and language impaired as the most common disability label for young children. Speech and language impairments include a wide range of conditions that impact effective communication. As the term implies, they include speech disorders, which refer to impairment in the articulation of speech sounds, fluency, and voice as well as language disorders, which refer to impairments in the use of the spoken (or signed or written) system and may involve the form of language (grammar and phonology), the content of language (semantics), and the function of language (pragmatics). A more general way of describing these speech and language impairments is to classify them as communication disorders and their impact on both receptive (i.e., ability to understand what is said or to decode, integrate and organize what is heard) and expressive (i.e., ability to use sounds, rate, and rhythm during speaking, use appropriate tone and resonance and use sounds, word, and sentences to convey meaning) skills. There is a distinction between speech and language delay and a language difference. A language delay is the emergence of language in typical patterns but it emerges late in development. A language difference is characterized by a variation in vocabulary, grammar, or sound structures. Often the language difference occurs as a result of shared social and/or cultural, ethic factors and should not be considered a disorder [4].

Because language is central to so many aspects of human life – cognition, social interaction, education and vocation – valid identification, prevention, and treatment of language disorders is a high priority for the therapeutic professions. Delay and/or difficulty in beginning to use the language is one of the most common causes of parental concern for young children brought to pediatricians and other professionals.

Delay may indicate specific difficulty with language, or it may be an early indicator of a broader problem such as developmental delay or autism. Early identification of language delay must resolve two fundamental problems. The first is the problem of obtaining valid information at an age when children are often not sufficiently compliant for direct testing, especially those with limited communication skills

who are the primary focus. Furthermore, the assessment technique must be cost-effective with respect to professional time and broadly applicable across a range of social classes and language backgrounds, including bilingualism. Language sampling and analysis have substantial time and expertise requirements. The second problem is one of interpretation. Many children whose language is delayed at 24 or 30 months will catch up over the next few years, and do not warrant intervention [5].

The challenge is to identify and use other relevant information to improve decisions about individual children. The solution to the first problem above has been the revival of an older, but neglected technique: parent report [6,7]. Parents have much more experience with their children than professionals, and their experience is more representative of their child's experiences and interests. Vocabulary checklists and related questions for parents have proven to be highly valid measures of early language development [8-14]. Solving the second problem has required two programs of research: first, large-scale norming studies to provide a basis for judgment of the relative status of a child's language (delayed or not) [7] and second, longitudinal studies of outcome of early delay to identify predictors of "spontaneous recovery" or continued delay [5]. Toddlers who have not attained the expressive language skills exhibited by most children the same age can be identified as having slow expressive language development (SELD). Among English-speaking children, studies suggest that 90% of 24-month-olds have an expressive vocabulary of at least 40-50 words and about 85% are combining words [10] Based on these findings, two criteria for identifying SELD among 24-month-olds are commonly used:

- Small expressive vocabulary (less than 40-50 words, or below the 10th percentile, depending on the tool used)
- No word combinations [10,12]. The 10th percentile criterion can be extended to other ages. Children with SELD at age 2 are at 2 to 5 times higher risk for language impairment persisting into the late preschool to elementary school years than children without SELD [5,15] Even though at least half of the two-year-olds with SELD will have language skills that are within the normal range [13,14] by school age early expressive language delays should not be ignored given the elevated risk of persisting language impairment. Longitudinal studies of two-year-olds with SELD have examined a variety of potential predictor variables for persisting difficulties. Those variables which most regularly are found to make some prediction include parent concern about possible problems with the child's speech/language development or hearing, family history of language impairment or dyslexia (especially first degree relatives: parents, full siblings), receptive language delays, frequent ear infections, limited vocalizations, and delayed pretend

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play [16-18], Although none of these is a highly accurate predictor by itself, parental concern has been the most consistently associated with language impairment [5,14]. Combining predictors has improved accuracy of predictions, but the optimal combination of predictors is not yet known [14].

Developmental language disorder (DLD) in children refers to the inability of children in the language development period to understand and express language with language symbols due to various reasons compared to normal children in the expected period. Children's language development lags behind their actual age level, which is one of the most common language disorders in children. Language development delay hinders the development of children's social skills and affects their physical and mental development [19-21]. DLD is the most common developmental disorder in children. Children with DLD have difficulties understanding or using oral language, written language, and other signaling systems.

Children with DLD have a far lower level of language ability than normal children of the same age. A population-based prospective cohort study found that severe cognitive or social communication disorders at school age or adolescence usually originate from developmental disorders in early childhood [20]. If the language disorder or language development delay in infants and young children is not managed in a timely and effective manner, it seriously affects children's language understanding and expression ability and increases the incidence of attention deficit and learning difficulties at school age.

This group will have a high-risk of developing various emotional and behavioral disorders, anxiety, depression, social withdrawal, communication disorders, irritability, hyperactivity, aggression, self-injury, and other psychological and behavioral problems [19-21].

DLD has attracted significant attention from researchers around the world, and children's language development has become a hot topic in pediatric research [21]. Language is an important medium for information transmission and social communication. Research has shown that 50% of children with DLD have a language impairment that does not improve with age, which seriously affects their language expression ability and has a serious and lasting impact on their lives and their ability to learn later in life [22]. It proved useful for preschool teachers to refer children with language difficulties between 5 and 6 years of age to the speech language services. Further research is, however, needed on larger samples also including children younger than 5 [23]. Language barriers in children are associated with poor academic performance, limited employment in adulthood, and social communication barriers to a certain extent. School-age children have to accept special education or suspend their studies due to learning difficulties and behavioral problems, which has serious adverse effects on them and their caregivers [24]. The period from 0–3 years old is critical for a child's language development. Before 3 years old, children spend most of their time at home, and caregivers do not realize the adverse consequences of language disorders and the importance of early intervention and miss the most effective period for language intervention [2,25].

Early Identification

Considerable time and energy has been devoted both to designing and to carrying out a wide variety of procedures for identifying children with language impairment.

Screening

Screening often appears to be a relatively straightforward concept that is a means of checking whether someone does or does not have a problem. There has been some discussion recently as to whether 'screening' is a suitable description of the process [26]. The potential confusion arises, in part, from the need for those involved in such processes to share a common terminology when describing the process. There are at least three commonly used terms which need to be considered:
- Screening,
- Examining,
- Surveillance.

Screening: One of the most widely accepted definitions of screening has been given by the American Committee on Chronic Illness (1957): the presumptive identification of unrecognized disease or defect by the application of tests, examinations and other procedures, which can be applied rapidly (to) sort out apparently well persons who may have a disease from those that probably do not. Cochrane and Holland [27] stipulate six widely accepted conditions which must be met if a screening test is to be described as such:
- Easy and quick to administer.
- Acceptable to subjects.
- Accurate in measuring any attribute being tested.
- Precise, giving consistent results in the hands of different testers.
- Sensitive in the hands of different testers.
- Specific, giving a high percentage of negative results when the subjects do not have the disease.

As the use of the term 'disease' suggests, the term 'screening' carries distinctly medical connotations. It is important to understand that the term is conventionally used for clearly defined medical conditions such as phenylketonuria, and although its use has spread into developmental pediatrics it has done so rather uneasily. A number of authors have

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expressed reservations about the term 'screening'. Court (1976) for example dismissed the use of the term completely as being inappropriate for all but a handful of very specific cases [28], Whitmore and Bax (1988) maintain that it is not suitable for any complex behaviors, amongst which language is an obvious example [29]. Hall DMB, et al. [26] similarly feels that the term should be discarded for all but the most specific measures. He maintains that for many conditions there is insufficient agreement as to what is and what not a clinical case is. He uses this argument to suggest reducing the extent to which primary health care professionals in the UK actively look for cases [26].

Examining: In their paper 'Screening or Examining', Whitmore and Bax (1988) point out that the American Commission on Chronic Illness only advocated the use of screening as a substitute for routine clinical examination at a time of shortage of medical manpower. They distinguish between screening for PKU as a specific and preventable cause of mental handicap and identifying developmental delay of an uncertain etiology. In other words there is a difference between looking for disease and anticipating disability. They accept the need to search for cases of children with disability, but are convinced that the measures which are used should not be construed as screens at all. Rather they should be seen as a part of the overall examination [30].

Surveillance: In the report 'Fit for the Future' Court (1976) rejected 'the very notion of a developmental screening program'. Instead the report advocated a program of 'health surveillance'. Whitmore and Bax take issue with this use of terminology maintaining that 'surveillance' actually means to watch or guard over a suspected person, prisoner, or the like, suggesting the very paternalism which the health service was trying to discard at the time (30). We are left with the term 'screening' being commonly used as a term to describe the process of looking for cases in whatever forms it may take. Unfortunately this very loose use of the term is, in the end, rather unhelpful. There is a clear distinction between one professional actively assessing a child's abilities and another talking to a parent in the street in an informal fashion and making a clinical judgement as to whether a child needs to be referred on. It is justifiable to retain the term 'screening test' for any test which has been developed within the framework outlined by Cochrane and Holland but it should be discarded unless these conditions have been met. Clearly the term 'screening' is inappropriate as a generic term for any procedures which helps the doctor or health visitor to pick out new cases. For this reason 'early identification procedures' is recommended.

The Evaluation of Procedures

Given the resources and energy allocated to running early identification programs it is important that they are monitored as closely as possible. To a certain extent, of course, if the staff administering them and those receiving the referrals is happy with the procedure then it can be said to work. However it is often necessary to show others that the procedures are effective by demonstrating both that the children who are identified are correctly targeted and that those that are not identified have not been missed. It is rare of course that any procedure will have a one hundred percent success rate. So evaluation often becomes a discussion about levels of acceptability. There are two basic concepts - validity and reliability - which need to be borne in mind when developing any screening procedure.

As we have seen above, a variety of different formal procedures have been generated to identify children with speech and language impairment. They are basically of four types:
- Assessment
- Checklist
- Observations
- A combination

Technically any one of these approaches can be carried out by parent or professional. In practice, assessments have only been used by professionals while checklists and observations have tended to be shared between professionals and parents. Each approach has advantages and disadvantages. So, for example, the assessment approach allows direct observation of the child's elicited performance. Yet as anyone working with preschool children knows all too well they can be unpredictable and simply not perform. If this occurs more commonly with one test rather than a second it must raise questions as to the usefulness of the test in question. In fact in most cases reliability is likely to be more a function of the techniques used to elicit the child's language skills and thus of the training given to those who will be carrying out the test. The checklist approach is quick and easy to administer. The list may be filled in by parent or professional. In both cases care has to be taken to show clearly what is needed. The more complex the question and the wider the range of options the more likely results are not a function of the literacy of the parent reading the form. Checklists of specific vocabulary items may be a particularly useful approach for the younger child but after the age of two or two-and-a-half it will be too large in most cases for a checklist to be useful. Milestones may similarly be an appropriate subject for a checklist in the early years but, as Hart, Bax and Jenkins have pointed out, the further away the child is from achieving the milestone in question the less likely it is to be accurately reported [31]. The reliance on observations is likely to be the most commonly used simply because as medical staff become familiar with language development they will be more likely to know what they are looking for. Moreover they may know the families concerned and have had a variety of different opportunities to watch the child in the context of his or her

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family. It has the advantage both of avoiding the formality of testing procedures - carrying necessary equipment around, etc. - and of encouraging those concerned to develop their observational skills, incorporating new findings from developmental psychology and other disciplines in a very immediate fashion. The weakness of this approach is that it is necessary to monitor those children who are referred against a valid benchmark. The dangers with this type of referral system are that it relies too heavily on the idiosyncrasies of the observer and makes cross comparison between health districts virtually impossible. The same sort of comment may be made where a combination of approaches is used. Obviously observations are being made all the time but as soon as they are used to extrapolate beyond the measures adopted it becomes very difficult to know what standard is being used.

A combination of testing, the use of checklists and observation probably most accurately reflects the approach used by many primary health workers [3]. They may try one or two activities with the child, ask a few questions and relate what they see to their experience. The difficulty comes in evaluating this as a procedure which others can use. By contrast, although the evaluation of a single procedure is more straightforward it may be difficult to determine where the child's difficulties lie.

The Role of Parents

Given that, as a rule, parents know their children better than any professional is ever likely to do, why do we simply not hand over the responsibility for early identification to them? To do so would certainly save those involved with working with children a lot of effort and resources. Unfortunately, we simply do not know whether parents and professionals share the same expectations of child development. Miller SA [32] has examined the literature relating to parental beliefs about their children's cognitive development. He showed that there is a relationship between parental beliefs about development, their child-rearing practices and their children's development itself. The relationship is clearly complex and it would be wrong to assume causality. Nevertheless the evidence does suggest that parents with low expectations of their children's development are likely to have children who underperform [32]. Stokes has reported on a project to compare the results of a test given by nurses and a parent questionnaire with a 'gold standard" test of the type discussed previously. She found that the rates of specificity and sensitivity were comparable for the two approaches at the point at which they were carried out. The principal difference between the two was that the nurses' test had a much stronger predictive ability than the parent questionnaire. On the one hand there is a clear move now towards encouraging parents to become involved in the process of identifying children [3]. In many

districts in the UK parents are actively encouraged by means of health education literature to comment on their children's speech and language.

There have also been videos made specifically to draw parent's attention to the issues involved [33].

Some authors have even suggested that the onus be placed entirely on the parents to express their anxieties rather than any process by which professionals are actively looking out for cases [26]. Such an approach is in line with the desire to give parents the responsibility for observing their children's development, taking it out of the hands of experts. This has obvious advantages both in terms of the central role it offers the parent and in terms of the opportunity it affords to cut resources allocated to surveillance programs. On the other hand, although such a democratic approach would be welcomed by most parents, it is uncertain whether they would necessarily choose to make decisions about their children's development without easy access to professionals - of a type offered during early identification procedures. Equally there is a distinct risk that such a parent-led service would effectively reinforce the 'inverse care law' whereby better educated parents make a disproportionately high demand on the resources of the health system. Health service managers may consider such a distribution to be an economic fact of life and in such circumstances there may indeed be little call for early identification procedures. The dilemma is aptly expressed by Alberman and Goldstein [34]. In discussing a complex model for screening 'at risk' children, they observe that such an approach may be most valuably introduced in areas where there is greatest social disadvantage. In other words, in areas where there are fewer economic pressures there may be no need to actively monitor the population. Again they were not referring directly to speech and language but their position might well be adopted in providing such a service. Essentially there is a need to actively screen or search for cases of children with speech and language impairment in areas where parents do not routinely turn to their doctor or health visitor for help concerning their child's development. Thus the parent's role is not clear-cut. It is not possible to say that across the board the parent should or should not take the responsibility for early identification.

Clearly there should be materials readily available for distribution to parents to help them make their own judgements. Similarly attention should always be paid to their views. Yet health workers should be prepared to undertake surveillance and as a part of this process screening tests can be invaluable [3].

There are three possible interpretations of the discussion of the most appropriate age at which to identify

children with speech and language impairment. The first, advocated by Stark and Tallal, maintains that the noise of normal development is so great that any reliable diagnostic assessment before eight years of age is impractical [35]. While there may be some truth in this in so far as it is often not possible to use precise diagnostic categories before this age, it is little use to those involved with the clinical issues surrounding screening. Concern is often expressed before the child is three and so it would not be very helpful to tell parents to wait until the child is eight. Indeed Werner asked parents of language delayed preschoolers when they had first become concerned about their children's speech and language.

The median age given was 2 years 3 months. The second suggests that any measure should be able to cater for any developmental age. This is essentially prompted by clinical considerations. Children may present in clinics at any time [36]. Having a specific measure which has been shown to identify children correctly at three is of little use if the child who comes to the clinic is 21/2 or four. The third possibility is that primary health workers should attempt to identify the appropriate children at a series of specific ages, ages which have been shown by the literature to be particularly significant in the development of language. These have yet to be clearly defined but a good example would be a vocabulary check at two years by which time children should have made their 'vocabulary burst'. If Werner is correct in noting parental concerns by 2 years 3 months it makes sense to attempt to identify the appropriate children at this age. Finally a simple test of the child's ability to retell a story at four years has been shown to be predictive of subsequent performance [37]. In practical terms the real option is between the second two interpretations. There are a variety of considerations which may affect the choice.

Developmental Expectations: Clearly a child of six months will be unlikely to be referred for speech problems. It is, of course, possible that referrals to speech therapy may be made at this age. But it is highly unlikely that any screening procedure as such would be appropriate. By sixteen to eighteen months it should be becoming clear that language is emerging. Any screen at this age - i.e. a measure which is used consistently by a group of staff- would have to be carefully evaluated. The earlier the age of identification the greater the likelihood of over-referral. The optimum age:- commended is 2 to 3 years by which time it is reasonable to assume that the majority of children will be well on the way to language. Wells (1985), for example claims that by 2, 90% of children will be able to classify verbally, will be able to use verbs for wanting and making directional quests, will be able to express meaning relations such as static and changing locations and possession and will use two constituent declaratives and simple past tenses [38].

Other Skills which will be Assessed at the Same Time: It is likely to be an uneconomic use of resources to evaluate each aspect of behavior on separate occasions. Parents will not be prepared to continually bring their children to a clinic. This then raises the question of which behaviors should be scrutinized at which ages. It may be necessary to choose between identifying speech and language impairment at two years and optimally assessing hearing and vision at three years.

Parental Expectations can Vary about their Children's Development in General: There is little point in specifying a referral age if parents' expectations do not coincide with the age in question. Herein lays one of the complications of early identification. Advances in developmental psychology and psycholinguistics have led us to understand more about the range of child development. However our understanding is not necessarily mirrored in the expectations that families and indeed cultures have of their children. In many cases this may be a matter of health education but in others there may be cultural explanations for this. It is a largely un researched area but one which, in the end, will play a large part in determining when parents will bring their children to the clinic.

The Most Appropriate Age for Treatment: There is now some evidence that speech and language-training techniques can work. The problem lies in determining the most appropriate time for treatment. Although there is no reason to discard the 'earlier the better' maxim there is equally little evidence to support it. Clearly any program for early identification should be dovetailed into such information as it becomes available [3].

Prevalence And Incidence

Prevalence: Prevalence refers to the total number of cases in a given population at a given time. By contrast, incidence refers to the number of new cases of a condition occurring in a given period. The two are obviously related but prevalence is not simply a question of summing the number of new cases and adding them to an existing total. The numbers of those children whose communication difficulties have resolved spontaneously or for whom intervention has proved effective need to be excluded. A great many studies have been carried out purporting to examine the prevalence of speech and language problems. In many cases the divergence in the figures given is quite baffling. There are two principal reasons for this. On the one hand, there is a lack of consensus as to the degree of severity warranting clinical attention. Terms such as mild, moderate and severe are used without adequate definition. On the other hand, the imprecise categorization of different types of language impairment makes direct comparison between studies difficult. The results, such as they are, indicate three levels of difficulty although it should be recognized that this classification is also subjective.

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Examples of studies within each category will be given and the variability between them will be discussed.

The Most Severe Cases: Ingram (1963) found 0.071% and 0.075% with 'severe language retardation' in Edinburgh and Aberdeen respectively. Rutter, Tizard and Whitmore (1970) similarly found 0.08% of children with 'specific developmental disorder of language' [39]. These figures suggest a level of consensus for the more severe disorders.

Pronounced Cases: Five studies have specifically targeted three-year-olds. Randall et al. (1974) found nine out of a sample of 160 (5.6%) to be 'severely language retarded'. They defined as having a standard score below -2 standard deviations on a scale of expression, comprehension or articulation [40]. Fundudis, Kolvin, and Garside (1979) studied a screened population of 3300 three-year-old children in Newcastle, England, and identified 4% with moderately or severely retarded speech [41]. In Dunedin, New Zealand, Silva, McGee and Williams (1983) looked at 1027 three-year-olds and found a total of 7.6% with delays in expression and comprehension [42]. Richman, Stevenson and Graham (1982) examined a screened population of 705 children in the London Borough of Waltham Forest and found 3.1% with 'general expressive language delay' [43]. Finally, Bax, Hart and Jenkins (1983), looking for language impairment in children at two years, three years and four years, found that the proportions changed across time [44]. A study in the Ottawa-Carleton region in Canada examined a population of 1655 five-year-olds to establish what proportion had speech impairment, language impairment or both together. Furthermore they used standardized measures and compared the numbers when cut-off scores of -1 and -2 standard deviations were used [45]. The numbers are highly dependent on the criterion used. Thus the more severe the condition sought and the more specific the skill under examination, the smaller the number identified. By contrast, definitions which include speech and those which attempt to identify children with milder problems inevitably identify more children.

The numbers are also dependent upon the age at which the skills are assessed. In terms of the milder cases, at least, the numbers tend to decrease with age.

Variation may be a function of the original screening test adopted. For example, the differences between the four studies of three-year-olds may have been a function of the methods used for identifying the children. The Fundus's study (1979) asked health visitors to identify children who were not stringing three words together into a sentence to make some sort of sense [45]. In Dunedin there was no screening measure as such because each child was assessed using the Reynell Developmental Language Scales and a cut-off of the fifth centile was adopted [42]. In Waltham Forest part of the expressive section of the same test was used. In the Bax study

the authors used a clinical judgement which had previously been validated against the Reynell Developmental Language Scales, such that children definitely failing scored below -1.5 standard deviations [44].

Variation in these figures may reflect real differences in the populations concerned, Silva et a/. (1983), for example, admit that their sample was slightly skewed in favor of more privileged groups [42], while it would be fair to say that the Bax et al. (1983) group was probably skewed the other way [44]. The authors of the Waltham Forest study maintain that they chose the district in question precisely because in demographic terms it was representative of the country as a whole [43].

The use of standardized tests in itself poses problems. The nature of the standardization procedure means that 2.8% of any population will score below -2.0 standard deviations below the mean; the equivalent figures for -1.5 standard deviations and -1 standard deviations are 6.68% and 15.87% respectively. To use tests which have been standardized necessarily suggests circularity. It should be noted that not all the figures above did come from standardized assessments. Barker and Rose (1984) have noted that in many medical conditions, the normal distribution is naturally skewed so that there is an abnormally high number of a clinical case [3].

There are, in essence, two methods of identifying the difficulty. These are as follows:

Defining The Population in Terms of the 'Normal' Population: This relies on the use of standardized testing procedures. This allows us to make accurate comparisons with other children. The problem is that the tests themselves do not determine what level constitutes a problem. Snyder-McClean and McClean (1987) and Lahey (1988) estimate a figure of 6.5% with difficulties. This corresponds to a level of -1.5 standard deviations referred to earlier [46,47].

Clinically this seems to be a reasonable solution to the problem of where to apply a cut-off point. Yet what does this mean in terms of specific linguistic behaviors? Once an agreed level of acceptability is reached, it should technically be possible to reintroduce this into data samples which have examined the different ages at which populations of children acquire certain forms. But before this approach can be usefully adopted it needs to be shown that, without intervention, this group is more likely to have persistent difficulties than a group with less pronounced difficulties. Although intuitively this would seem to be correct, it has yet to be shown to be the case.

Defining the Population in Terms of Clinical Symptomatology: Clinical evidence suggests that a given group of children have a poor prognosis and that therefore this group should be identified. This is comparatively

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easy if we describe the performance of children who have speech or language difficulties associated with other more clearly defined medical conditions - severe mental handicap or cleft palate, for example. The problem comes when speaking of children in the normal population who have no clinical features with which to identify them, other than their communication. The difficulty here is that for symptomatology to be seen as such it must be possible to show that the classification can be reliably made. In the final analysis, these two approaches should identify the indication that this may be the case. It is interesting, for example, that the 19% figure identified by Beitchman et al. (1986)[45] corresponds to the figure given by Morley (1957)[48] from a study carried out thirty years earlier, in Newcastle, UK, with much less clearly defined parameters. The subject is further confused by the plethora of terms used to describe different types and presentations of language impairment. There have, for example, been a number of attempts to introduce neurological terminology, e.g. congenital aphasia and developmental dysphasia. Although there is now some indication of abnormal cerebral activity in some cases, such terms are not generally considered appropriate for more than a narrow band of children presenting with very low levels of language. Ingram (1972) looked forward to the day when 'classification will primarily be on the basis of linguistic and phonetic criteria' and there is no doubt at all that advances in linguistics in the 1970s highlighted the importance of a variety of features of child language [49]. There are now extensive systems available for describing language in terms of linguistic features [50]. Some authors have attempted to define a range of subcategories on the basis of an interaction between psychological and linguistic characteristics. Aram and Nation (1975) used factor analysis to examine a group of 47 children (aged 3 years 2 months to 6 years 11 months) with developmental language disorders and identified six patterns of language performance based on high and low performance on three factors (51). The factors identified were:

- Comprehension
- Formulation
- Repetition.

A similar classification system has been identified by Bishop and Rosenbloom (1987) but it still remains to be seen whether necessary and sufficient conditions can be generated to place children unequivocally in one group or another. The pattern which emerges is one of such diversity of difficulties, on the one hand, that it is difficult to see how any two children can be satisfactorily compared [52]. Yet, on the other hand, authors such as Beitchman (1985) and Bishop and Edmundson (1987b) are increasingly stressing an underlying neurodevelopmental delay of which language is the more prominent if not the only manifestation [37,53].

Persistence

Implicit in the need to identify language impaired children at an early stage is the understanding that the problems which they experience are not simply transitory. If the problems do not persist and children invariably 'grow out of it', there would be little point in trying to affect their course through intervention.

So it is necessary to examine these children prospectively. Early follow-up studies of children in specific units for the language impaired have indicated that many children continue to have difficulties well after leaving the unit concerned. Griffiths (1969) and Garvey and Gordon (1973), Weiner (1972, 1974) and Aram, Ekelman and Nation (1984) all indicate that such children go on to have a poor prognosis in terms of all aspects of their performance, i.e. reading, writing, social adjustment etc. These studies were dealing with children who were clearly experiencing the most severe of problems and may not be representative of the language impaired population which would include a great many with milder presentations. For this reason it is important to look at studies that have examined populations which are more representative. The same general pattern emerges [54-58]. Richman, et al. (1982) found that three-year-olds with poor language development had a consistently poor outcome at eight years. This poor performance extended beyond speech and language to behavior problems, poor reading skills and low overall IQ. This last point is particularly interesting because their language impaired group was identified as expressively impaired [43]. Silva, Williams and McGee (1987) found that when children of the same initial age were followed up at eleven years, those with early language problems were also likely to experience low IQ scores, poor progress in reading and writing and behavior problems [59]. Bishop and Edmundson (1987a) have provided some contradictory evidence which needs to be considered. They followed up a group of language impaired children between the ages of four and 51/2 and found that their language development increased at the same rate as the normal children who were used as controls.

The authors suggested that this should be considered evidence that these children do catch up in the end. Any variation in the speed at which children catch up will be determined by the interaction between the various components of language. They found a single measure of sequencing ability to be the best predictor of language performance at 51/2 years. In other words there are salient aspects of communicative ability which may serve as indicators. One of the models which they suggest consists of a set of mountains which are submerged or exposed depending on the water level. Each mountain corresponds to impairment in an area of functioning. The more a mountain

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is exposed the more severe the impairment, and the higher the mountain the more vulnerable the function. Thus the severity of the impairment is analogous with water level [60]. As the children improve the pattern changes to one higher in the series. From the perspective of early identification it would therefore follow that children with phonological problems alone would have a better prognosis and would, therefore, not is a target while those with a combination of semantic and syntactic problems would be. The children in the Bishop and Edmundson study have been followed up through to eight years and reassessed for their language and reading skills. The results indicate that those children who had pervasive language difficulties at 5 years continued to have poor oral language and were experiencing difficulties with their literacy skills at eight.

The authors found only a weak association between phonological development at the younger age and subsequent reading performance. Yet this issue has still to be satisfactorily resolved [61]. Shriburg and Kwiatowski (1988) followed up a number of children with phonological disorders alone and found that their problems persisted into the school years and detrimentally affected reading and writing performance. These results suggest that a large proportion of children who have difficulties with language in the preschool years go on to have persistent problems [62]. It may be that those problems initially presenting in the form of language impairment go on to 'translate 'to other areas of development, and that language itself does improve to a reasonable level with time. Clearly, as a population, the language impaired group is at risk in the long term [3].

Early Intervention

The importance of early intervention is acknowledged by professionals and non-professionals alike. It advocates promotion of positive assets and development of the child and the family. The major purpose of early intervention is prevention of disability and developmental delays. The ultimate goal in intervention is to enhance normal development and independent functioning of the child. Intervention may focus on the child, parents, family, and community. Since the child's development is dependent on the genetic endowment and its interaction with the environment, it is imperative to focus on the child and the environment in early intervention. Intervention programs are either child focused or psycho social in nature, where the focus is family and environment. The best outcome however, is expected when both of them are combined and implemented. Early intervention is defined as the introduction of planned programming deliberately timed and arranged in order to alter the anticipated or projected course of development [63]. The existence of critical periods or most sensitive periods for specific learning. Even though it

is difficult to clearly demarcate the critical periods of specific learning for each development and skill areas, it is generally accepted that the most critical periods of learning in the child are the first few years. If the child misses out on opportunities of learning during these periods, further learning may be delayed and deficient. Therefore, it is of utmost importance and urgency to important early intervention in the first few years of the child's development. Early intervention includes children from 0-3 years who are at risk or having established developmental delays of various degrees and associated conditions. It is imperative to identify those children who are likely to develop delays. In this filed, it is important to identify factors or variables adversely affect the development of the child and cause developmental delays or mental retardation.

Growing evidence suggests that potential risk factors include a family history of speech and language impairments, a low level of parental education and/or socioeconomic status (SES), male gender, and pre- or peri-natal factors such as being born preterm or with low birth weight. However, the role potentially played by such factors in screening is still unclear since many investigations considered heterogeneous populations with different types of delay or disorder. Besides risk factors, several studies have focused on identifying the early predictors of DLD, such as a limited expressive vocabulary, absence of word combinations, poor comprehension, and absence of gestures between the second and third year of life. Nonetheless, a consensus on the predictive power of these early indicators is still missing [23].

Effective Tests and Optimal Time to Avoid Diagnostic Bias

Another highly relevant issue for clinical purposes concerns the need to identify effective tests for language assessment in children with language impairments. The effectiveness of diagnostic tools is usually measured in terms of: (a) validity, i.e., whether a tool measures what it claims to measure; (b) accuracy, identified by productivity measures such as sensitivity (proportion of clinical cases correctly classified by the test), specificity (proportion of normal cases correctly classified by the test), Likelihood Ratio (LR = sensitivity/1-specificity), and Positive Predictive Value (PPV, proportion of screen positives that are true cases = number of true positives/number of true positives + number of false positives); and (c) reliability, i.e., the degree of stability of measurement when repeated under different conditions or by different observers. Effective tests might allow clinicians to minimize potential diagnostic biases to avoid issues of over diagnosis (i.e., when a child, who does not have a linguistic impairment, is mistakenly identified as a child with DLD) or underdiagnosed (i.e., when a child, who does have a linguistic impairment, is mistakenly identified

as a child with typical language development). In addition, for an accurate diagnosis, it is advisable to also include tasks assessing spontaneous speech with multilevel procedures of analysis that have proved highly sensitive to linguistic difficulties [23].

The Goal of Intervention

Before intervention takes place the goal of therapy needs to be identified. A decision has to be taken as to whether its purpose is to provide a cure or to limit the effects of the difficulty. Parents often expect a cure when they bring their children to the department of the speech and language therapist. But for the therapist the issue may be more a question of damage limitation than cure. Both views presuppose an understanding of the process of language development. The concept of cure derives largely from the medical model and suggests that there is an imbalance which may be rectified by training in a way that an ailment may be remedied by means of a course of pills. It assumes that by directing intervention towards the most salient symptom - notably language - a normal course may be re-established. In addition, it assumes that a language impaired child's use of linguistic structures can be taught in the absence of any strong evidence that this happens in normal development. The communicative development of the child appears programmed to follow a particular course given a basic level of input from the parent. An alternative approach is to concentrate on improving the child's adaptation to his environment and thereby preventing the development of secondary symptoms. This approach resembles the ecological approach. It involves focusing less on the symptoms of the child's language development and more on the parents' response to them. It recognizes that the sickness/health dichotomy is inappropriate for developmental conditions such as language impairment. There are sound reasons for adopting this approach of damage limitation. In the first place, focusing on the principal feature of the impairment may be to home in on the primary symptom. While this is an approach common to medicine it is wrong to assume that a spectrum of behaviors as complex as language can be treated in this manner. Working on the very aspect which the child finds most difficult is likely to increase the level of stress and result in a corresponding decrease in the child's capacity to respond. Secondly, the evidence gives unequivocal support for a multiplicity of factors associated with language problems. If, in this context, we only focus on the child's linguistic behavior we may be in grave danger of missing the clinical wood for the trees.

Types of Intervention

There are a variety of options open to the clinician when treating a child referred to the speech therapy department for poor language development. The first is of course no treatment at all. Once the decision has been made to proceed, direct or indirect involvement must be selected. No further treatment needed for those working in health centers and public health clinics it is important to bear in mind that a referral is not synonymous with a need for therapy. It is likely that a proportion of children will not need further intervention beyond their first appointment. This may be for a variety of reasons. It is possible that the specificity of the measures used to identify the children concerned was insufficiently high. Some children may have improved spontaneously since referral date and no longer need intervention. Others may simply be shy or only be different from other children by virtue of linguistic background.

Indirect Intervention

Indirect intervention involves making management decisions relating to the child's communication without directly focusing on the communication itself. One such approach when faced with a language impaired child might be to refer the child for general language stimulation. Care needs to be taken that such provision is not seen as a panacea for all aspects of child's development. Although the results from major experiments in the provision of stimulating environments such as the Head start programs in the US have been equivocal in some respects there are clear links between early stimulation programs and performance at long term follow up [64]. Yet the simple equation of 'if in doubt provide general nursery input' belies the fact that some children are not able to achieve their potential when generally stimulated in this way and many language impaired children fall into this category. The difficulties that they experience in auditory processing mean that indiscriminate stimulation is not necessarily very useful.

Another indirect approach which is receiving increasing attention is the use of parents as facilitators of their child's language rather than offering therapy to the child. In such circumstances the child may not be offered therapy at all and all the emphasis may be shifted to the parent. One such program is the Hanen Program from Canada [65]. This provides the families of language delayed children with information to enable them to help their child acquire the dialogue skills that support language development. The principal vehicle for this approach is known as 'the interactive model'. The interactive model has been developed most thoroughly in the US and Canada [66]. It is one of several methods of parent training which incorporate naturalistic techniques to encourage parents to enhance children's use of language.

The emphasis is on communication rather than language per se and on promoting contingent interactions with the

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child in the context of the child's current focus of attention, interests and developmental abilities.

The approach is derived from studies of optimum communication skills which have stressed two factors crucial to language acquisition - active engagement on the part of the child and contingent responsiveness on the part of the child. Three intervention techniques are identified: Those that are child orientated such as responding to the child's focus of attention and entering the child's world; those that are interaction promoting such as taking one turn at a time and decreasing defectiveness and those that are language modelling such as commenting on the activities of the child and using repetition and short simple sentences. The interactive approach is currently attracting considerable attention. As yet little is known about the relationship between promoting interaction in this way and promoting linguistic development. Similarly little efficacy work has been carried out to date. Nevertheless it seems to be a positive approach, empowering parents to promote the interactive skills of their own children. For further discussion the reader is referred to Price and Bochner [67].

Direct Intervention

Direct intervention involves focusing treatment on the child. It may be carried out with the individual child or with groups of children depending on the age and needs of the children concerned and the facilities available.

Individual Treatment

Children who have been referred to speech therapy clinics are initially seen on their own. This allows the clinician the opportunity to take a case history from the parent and to develop a relationship with the child. Whether or not the clinician would continue to work individually in this way would depend upon a number of factors. In some cases it is clear that parents need to convey their anxiety regarding their child to someone with whom they have formed a close relationship. In such cases the therapist may decide to extend the period of individual contact to enable the parent to talk through these worries. On other occasions parents may demand individual treatment because they feel that it offers more time for their child. The therapist will then have to weigh up the pressure from the parent with the needs of the child. In other cases the needs of the child may prevail. In the case of a very shy or reluctant child, for example, individual treatment may prove to be more useful than group intervention. This is usually only a period through which children pass but it is nonetheless important to acknowledge it. Some children are in need of a particularly careful scrutiny and this may sometimes not be available within the group. Thus the elicitation of individual speech or language samples or the

detailed video analysis of behavior may call for extended individual sessions. Although it is quite possible to illustrate to parents good methods of treatment when involved in groups, this can sometimes be difficult and does not allow the therapist to monitor how far the parent has grasped the process involved. If there is uncertainty in this respect the individual session may again come into its own. Many of the children with impaired language development may also have associated developmental, social and behavioral difficulties. In such cases children may not be suitably placed in a group and the individual approach may offer more to both parent and child. In short the therapist must weigh up the advantages and disadvantages of the individual approach. The strength of peer pressure as a source of motivation within the group may have to be counterbalanced by the individual needs of the child.

Group Treatment

This is an approach common to most clinical and education settings. It may be carried out by means of individually devised treatment or it may be indicated by existing treatment programs. In the UK the 'language unit' provides specific facilities for the language impaired child and offers one of the more direct forms of intervention. Children are usually identified as needing such placement following an assessment of the child's needs. This involves a statement of the child's needs drawn up by all those who have had contact with the child. This includes the parent. Children are offered specific help for predetermined behaviors whether in the field of speech, language or both. At times this involves the child being withdrawn from the class for this purpose, but in many cases children will spend a considerable part of their time integrated with other children who do not have difficulties in acquiring language. The treatment offered in such centers is largely eclectic drawing from specific schemes, e.g. DISTAR [68], The Derbyshire Language Scheme [69]. The Living Language Scheme [70]. Remedial work is carried out by therapists and teachers. The system approximates to a normal school or nursery environment. Little is known about the relative strengths and weaknesses of different treatment approaches. This is probably not surprising given the demands of both time and resources and given the potential methodological pitfalls which such an evaluation task presents. In one study Cole and Dale (1986) attempted to compare the effects of interactive and direct teaching methods to a group of randomly assigned preschool children with language impairment. The directed group was put on the DISTAR Program and they followed a predetermined sequence of teaching activities [71]. The interactive approached involved each child being allocated individual language goals and these goals were included in all classroom activities. The result indicated that the language of both groups improved to the same extent.

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Three approaches for promoting language use have been reviewed by Schwartz [72]. The first two are adult initiated and the third, child initiated.

The Mand-Model Approach: the adult observes a situation in which the child has shown interest and requires assistance. The adult offers that assistance but conditional on the verbal response of the child. If the child does not respond appropriately a verbal response is given and the child is required to imitate that response. This approach has been shown to increase the verbalization rates of children with impaired language.

Context: At a playground, adult is pushing child on the swing.
Utterance: A: Say 'push'. C: Push. A: Good. [Adult pushes child on swing.] A: Say push. C: Push. A: Good. [Adult pushes child on swing.] A: What do you want? C: Push. A: Great, I'll push you. [Adult pushes child on swing.]

The Time Delay Approach: This involves the adult again observing when the child needs assistance, going to help, but then not actively helping for a period of 5 to 15 seconds, while maintaining eye contact. This technique is useful as a means of accessing previously learned language skills.

Context: Snack in a preschool classroom, children and teacher are seated around the table. Teacher prepares snack and displays snack items on table.

Utterance: A: [Teacher holds cup of juice and looks expectantly at student.] C: Juice, please. A: Good, here's some juice. [Teacher hands student cup of juice, and displays biscuit and looks expectantly at student.] C: Want biscuit. A: [Teacher notices that student has finished juice, displays jug, and looks expectantly at child.] C: Juice, please. A: Say MORE juice. C: More juice please. A: Good, here's some more juice. [Teacher pours juice.]

The Incidental Language Teaching Approach: Thoroughly discussed in Warren and Kaiser (1986), this approach requires the adult to be ready to respond to the child's initiation. The child indicates that assistance is needed either verbally or non-verbally. The adult then specifically requires a more complex response from the child. The request for a response can take the form of a request, an instruction, a model, a time delay or a combination of these techniques [73].

Context: In the play area of a classroom. Toys are displayed and some of the preferred materials are just out of reach.
Utterance: C: [Child points to the blue truck on the shelf just out of reach.] Help. A: What do you want? C: Truck. A: What color truck? C: Blue truck. A: Here's the blue truck. [Teacher hands child the truck.]

These techniques are commonly used in speech and language therapy sessions directed towards the individual or to a group of children. They may equally be passed on to parents.

The Location of Therapy

It is sometimes assumed that the home is the most suitable place for intervention to take place. The young child will be more settled and any interaction will better reflect his or her capabilities. Stevenson, Bax and Stevenson (1982) were able to show that children responded well to a home based language therapy program in an inner city area. The expressive skills of children who received speech therapy at home improved more than those for whom parents had only received advice. Non-compliant families who failed to show up at clinic did cooperate effectively when seen at home, suggesting that treatment can be successful when programs are tailored to the needs of the client. Yet it is also true that the home may be full of distractions for both child and parents, making discussion difficult and intervention problematic.

Anyone who has tried to carry out a hearing test in a home can vouch for the difficulties in countering background noise. Where appropriate it may be useful to carry out intervention work in nursery or day care provision. Teachers or care staff will then be able to carry out any necessary remedial work at times when the therapist is not available. A speech and language therapist can provide input to schools by helping to promote appropriate language orientated activities in the classroom routine. In this way the child will receive the necessary assistance without risk of the stigma of exclusion. The clinic equally has advantages and disadvantages. In its favor it allows for a controlled environment in which there are no distractions for the child and in which the parents may discuss their own needs together with those of their child undisturbed either by the turmoil of the classroom or by the associated responsibilities of the home [74]. Drillien et a/. (1988) found that the clinic based screening procedure most accurately predicted subsequent performance [75]. Against this it may be difficult for the child to settle in a clinic and the setting may elicit unrepresentative responses on the part of both parent and child. Evidence that the clinic is, in fact, a less appropriate place for working with the preschool child is rather hard to come by although there is some indication that there is an associated difference in performance. Thus Scott and Taylor (1978) found that the language samples of children taken in clinics relied heavily on ongoing and imminent activity while those at home exhibited a wider range of utterances [76]. Olswang and Carpenter (1978) found that it was the elicitor who made the difference and that clinic samples which were elicited by the child's mother exhibited a greater number, though not necessarily a greater range, of utterances.

Clearly the clinic has advantages in terms of the use of resources and this is likely to remain a primary outlet for the provision of speech and language therapy [77]. The decision

of where to provide assistance is one that can really only be taken in the context of local resources. In essence there are three options- home, school-nursery and clinic. If we assume that there is equal possibility of access to each setting, the decision to opt for one or another will rest on the needs of the parent and the nature of the difficulty experienced by the child. In reality other mitigating factors often restrict this choice (3).

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Sakhai F and Golmohammadi G. Early Identification and Intervention for Infant Speech and Language Delays: A Narrative Review. Otolaryngol Open Access J 2024, 9(1): 000287.

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