Developmental Language Impairments with Complex Origins: Learning from Twins and Multiple Birth Children

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Multiple birth children - Language development - Language impairment - Language assessment - Case-based approaches

Abstract
Various factors that make language development vulnerable in twins and multiple birth children are discussed. Researchers have investigated single explanations for language impairment in twins. However, this paper argues that in individual cases the language impairment is more often the outcome of a complex interaction of factors. Some factors play a greater part than others in some cases. It is suggested that clinicians can develop a dynamic model of language acquisition from understanding the effect of multiple birth and other exceptional circumstances on language acquisition. This model is needed to underpin investigations into individual cases of language impairment. An approach to assessment is described that identifies factors operating in individual cases of multiple birth, providing an essential precursor to implementing appropriate case-based intervention.

Die Entwicklung von Sprachstörungen mit komplexer Ursache: Erkenntnisse von zwillings- und mehrfachgeburtlichen Kindern


Troubles du développement du langage d’origine complexe: Enseignement tiré de naissances gémellaires et multiples

L’auteur discute les différents facteurs pouvant déterminer une difficulté du développement du langage chez des jumeaux et des naissances multiples. Les
recherches ont porté jusqu’ici sur des explications simples dans le cas de troubles du langage chez des jumeaux. Cependant, ce travail tend à prouver que les troubles du langage sont le plus souvent le résultat d’une interaction de facteurs complexes dont certains sont plus importants dans certains cas individuels. Les cliniciens pourraient développer un modèle dynamique d’acquisition du langage fondé sur une meilleure compréhension de l’effet d’une naissance multiple ou d’autres circonstances exceptionnelles sur l’acquisition du langage. Les investigations dans des cas particuliers de troubles du langage pourraient s’appuyer sur ce modèle. L’auteur décrit une approche permettant d’identifier les facteurs en cause dans les cas de naissance multiple et fournissant des données préalables en vue d’une intervention appropriée, adaptée à chaque cas précis.

Introduction

A professional working with a child with impaired language development is rarely dealing with a problem that has a single cause. More often the problem is the outcome of a developmental process resulting from the complex interaction of social and biological factors that influence language acquisition. In order to manage a problem effectively and provide an explanatory framework in individual cases, professionals need a dynamic understanding of the process of language acquisition. Language and speech disorders in twins and multiple birth children (MBC) are a prime example of the outcome of complex biological and social factors. This paper examines the various ways in which language development in MBC is vulnerable.

A digression is needed to explain the phrase ‘dynamic understanding of language acquisition’. A dynamic understanding of language acquisition is one that accommodates variations in the circumstances in which children are born, reared and experience language and communication as well as variations in biological endowment for language learning. The work of specialists in child language impairment is often predicated upon an account of ‘normal’ development which is derived from a rather narrow change of individuals and circumstances. For example, the standards by which most children’s language development is judged is invariably that of the monolingual singleton child. Rates or patterns of development which deviate from these standards are often seen as being pathological. Variations in the rate and pattern of language development resulting from less typical social situations are not routinely taken into account.

Such a narrow view of language development is understandable when the methods used to study language development are considered. On the whole, researchers have chosen to describe language development in homogeneous populations from which all children with any ‘complicating’ factors have been excluded. Researchers usually exclude children from social situations that are relatively atypical, who have medical histories that suggest risk factors for language, bilingual language learning environments and multicultural homes. In contrast, the experience of speech and language pathologists suggests that when language development causes concern there are frequently factors in the child’s history or circumstances that are untypical. The effects of some of these factors have been systematically studied in children whose circumstances are exceptional in some way, e.g. by Schiff-Myers [1] and Bishop [2]. These studies help to broaden the view of ‘normal’ development and to predict how language acquisition will be affected when an environmental, social or biological circumstance varies from the typical. This is discussed in Mogford and Bishop [3]. Language development in twins is one of the exceptional circumstances described [4].
The Aims of the Paper

The dual aims of this paper are to provide a brief summary of language development in MBC including possible reasons for increased levels of language impairment in MBC [5–7] and to describe the implications for assessment when MBC are referred to speech and language therapists.

What Makes Multiple Birth an Exceptional Circumstance?

In multiple births from conception or soon after there are 2 or more siblings who share a developmental niche and resources that are typically exploited by 1 individual. Although some developmental resources are elastic, others are more or less finite and this has important implications for the children’s language development.

Furthermore, the experiences of multiple birth siblings are shared in a special and intimate way, creating a distinctive set of interpersonal circumstances, which influences communication and language acquisition, especially in the early stages of development. These circumstances have been termed the twin situation [8], but this atypical sibling relationship is also found in other multiple birth sets. There are several different interpretations of how language development is affected by this sibling relationship. One view is that sharing moment-to-moment experience with another individual reduces the need for explicit communication [9], and the constant companionship of another individual at the same stage of development reduces the motivation to communicate with and learn the language of outsiders. Zazzo [9] and Howard [10] suggest that social language is delayed because jargon or cryptophasia replaces early speech development. In addition, it is argued that MBC may fail to develop individual identities. For example, it has been suggested that twins have difficulties learning their own names and distinguishing one another. However, there is no evidence for this in studies of twins’ language development where this issue has been specifically studied [11, 12]. This particular interpretation of the relationship between MBC is not persuasive because evidence suggests that when twins or MBC are observed in the company of adults they prefer to communicate with the adult rather than their siblings, often competing for adult attention and with one another for turns in conversation [8, 13]. Indeed, researchers have resorted to recording crib dialogues in order to record inter-twin dialogues [11]. There is evidence, however, that within the multiple birth group one sibling may dominate in communicative contexts with adults [8]. Haden and Penn [14] describe a pair of twins in which 1 child only had a speech and language delay. It is suggested that the dominance of the child with normal language contributed to the language difficulties of the co-twin. However, it is just as likely that the pattern of dominance was the result rather than the cause of these difficulties.

Another interpretation of the twin situation suggests that it results in the development of an autonomous language [15, 16]. This phenomenon has been discussed at length elsewhere [5, 13, 15–17]. There is evidence that autonomous languages do not develop only in multiple birth situations. In addition, Bakker [16] claims they occur only when MBC siblings are reared in relative isolation from peers and adults who could provide a language model; although in a case study of severe deprivation language failed to develop altogether [17–19]. The unintelligible word forms which characterise autonomous languages have been shown to be reduced, immature or distorted forms of the language of the
adult community. These forms may be consolidated in MBC because co-siblings use one another as language models. Despite the widespread awareness of autonomous languages, there are few adequately documented descriptions of these in the literature. Current opinion tends to favour a different interpretation of unintelligible speech in twins and MBC: that the children in the multiple birth set have a phonological disorder similar to those described in singleton children [5, 6, 8, 20]. Bakker [17] argues that in most cases MBC use their only language for communicating with every one: not only with their siblings. They have also been reported to show frustration and attempts to clarify when not understood [17]. In a study by Dodd and McEnvoy [6], although co-siblings seemed to understand each other better than unrelated peers did, MBC were more successful in understanding each other when a word closely resembled the adult form. In addition, the phonological systems employed by co-siblings, although very similar, were not identical.

The third argument is that the twin situation alters the quality of interaction with the adults who provide language models. Differences in the way MBC experience language and conversation in the primary language period have been found when the language learning group consists of an adult and more than 1 child of the same age and stage of language development. When a single adult interacts with 2 or more children, the quality of interaction changes subtly. Lytton et al. [21] found that parents were less responsive to individual children, which means that a significant element in language learning is reduced. The turn-taking structure of group conversation is more complex so that conversational turns may be briefer [8]. Tomasello et al. [22] concluded that ‘the quantitative and qualitative differences observed in the language learning environments of singletons and twins derive from the nature of the triadic situation and that these differences have important effects on the child’s early language development’.

**Differences in the Circumstances of MBC**

Although the division of resources and the distinctive sibling relationship is shared by all MBC, other developmental circumstances may vary. Firstly, there are two types of genetic relationship for MBC. Monozygotic siblings result from the splitting of a single zygote and these individuals share identical genetic endowment. Children who result from the simultaneous implantation of two or more fertilised ova share the same proportion of genes as any siblings with the same parents and are fraternal siblings. In the case of twins, they are termed dizygotic and triplets, trizygotic. Higher order multiple birth sets, i.e. triplets, quadruplets and more, can include individuals who are identical and others who are fraternal. These genetic differences have consequences for the environment in which the children are reared. The prenatal environment for monozygotic and fraternal individuals is different. There is more likelihood of competition for finite resources in the prenatal period in monozygotic cases. In addition, monozygotic children are bound to share the same sex, to closely resemble each other physically and to have the same predisposition to genetically determined diseases and impairments. Their abilities may also be very closely matched. The genetic characteristics of fraternal siblings means that although they may share the same sex they can also be of both sexes. This suggests differences in the way co-siblings are socialised as in most cultures child rearing practices vary with gender. Peer relationships are also strongly influenced by gen-
In addition, fraternal siblings have fewer points of physical similarity, which may influence the expectations of adults. Fraternal siblings may have distinctive abilities and a lesser likelihood of sharing genetic diseases and impairments.

Further diversity will come from the family structure into which MBC are born. Although monozygotic twin births seem to be a random event, fraternal multiple births are more common in older mothers who have already had children [23] so that these MBC are more likely to be born into established families with older siblings. In the United Kingdom it is estimated that about two thirds of higher order births result from treatment for infertility, i.e. IVF, GIFT and ovulation inducing drugs. Not infrequently these MBC are born to previously childless couples.

The social and material resources available for families to respond to this exceptional event and the challenge it presents will also vary. There is some evidence that the effects of disadvantages and advantages are magnified by the circumstances of twinship especially in regard to language development [13, 24]. Caring for 2 or more children at the same stage of development makes exceptional demands on a family. There is some evidence that child abuse is more frequent in MBC than in singletons [25]. Parenting MBC obviously presents with distinctive problems and child rearing handbooks and special support agencies specialise in advising parents on ways of rearing twins, for example, Bryan [26]. Most agencies emphasise the importance of developing separate identities for members of the set. However, recent research in France describes how parents differ in the way they implement this advice [27].

In conclusion, although some of the circumstances of multiple birth are shared in all cases, in other ways individual circumstances can vary considerably. In addition, MBC are also subject to most of the biological and social variations in circumstances found in singleton children. In other words, multiple birth does not give rise to a homogenous set of circumstances. Thus it is unlikely that one explanation will suffice to explain every case of speech and language impairment. Where multiple factors may be implicated the interaction of these factors needs to be considered.

Language Development in Twins and Multiple Births

Although this paper focuses on language impairments in MBC, it should be emphasised that language impairment is not inevitable [8, 13]. Some researchers have argued that in social aspects of language use twins can be more advanced than singletons [8]. However, the weight of evidence suggests that in the early stages a degree of delay in language acquisition is frequently evident when groups of twins are compared with singletons. Evidence for a relative delay in language development in twins began to accumulate from studies that compared singletons and twins from the 1930s onwards. The studies most frequently cited are Day [28], Davis [24] and Mittler [29]. The overall picture is of an early delay in primary language acquisition which diminishes gradually as the children approach middle childhood. Although detectable and systematic differences between twins and singletons have been found in adolescence, these differences are of less functional significance [30]. Additionally, there are a number of sources that indicate that language development in twins and multiple birth is vulnerable, and higher proportions of twins are referred for speech and language therapy than singletons [5–7].
Potential Explanations for Speech and Language Impairments in Twins

Potential causes for speech and language impairment have been investigated typically in group studies. The conclusions, while valid for groups, may not always be valid for individual cases within the sample. Three main explanations have been offered for the increased levels of speech and language delay found in twins and MBC. Firstly, the possibility that increased pre- and perinatal birth hazards lead to increased risk of damage to the neurological basis of language development was proposed. Note that children with hard neurological signs and speech and language impairment are excluded from samples of twins used for studying language acquisition and comparing with singletons. Some studies have examined the possibility that some language delay can be explained by the greater incidence of prematurity and low birth weight though no hard signs of neurological impairment are present [31]. There is little evidence to support this view. Lytton et al. [21] found no relationship between birth hazard and later language development and concluded that the majority of difference between twins and singletons in language acquisition, when individuals with frank disability had been excluded, could be attributed to postnatal factors.

A second explanation implicates a genetic predisposition to a specific language disorder. Language disorder is usually diagnosed when a specific language delay persists in linguistically favourable environments and different linguistic functions show uneven development. Some MBC who have early delay in language subsequently meet the diagnostic criteria for specific language impairment which was first described in singleton children [32]. However, the social conditions in which language is acquired in multiple births may play a part in the persistence and severity of the disorder. Studies by Lewis and Thompson [33] and Bishop et al. [34] used the twin method to study the relative concordance of specific language impairment in monozygotic and dizygotic twins. Though not without methodological problems, both studies conclude that there is strong support for a genetic basis to this disorder. LeCouteur et al. [35] found a genetic component for a broader phenotype in autism which included language delay. This may also account for some MBC who show early language delay.

Thirdly, it has been suggested that the exceptional social situation in which twins and MBC experience language and communication is responsible for early language delay. However, opinions have differed about how this social situation brings about the delay. Earlier views that stressed lack of motivation for explicit communication, lack of personal identity and the development of autonomous language have been down-graded as the primary explanation for most children who show a language difficulty. Mounting evidence suggests that it is the presence of 2 or more children in the language learning environment with the primary caretaker that subtly alters the language learning experience and reduces its effectiveness. However, the argument that MBC use each others’ immature forms as models cannot be ruled out. The possibility that language delay can sometimes be attributed to the earlier explanations cannot be entirely dismissed, particularly when there has been a failure to develop individual identity or provide adequate opportunities for language acquisition. Published single case studies of language and communication difficulties in twins [8, 14, 15, 36–38] amply illustrate the complexity and variety of circumstances in which MBC acquire language. Where disadvantages exist in conjunction with multiple birth it could be argued that the risk of lan-
language delay and the severity and persistence of a disorder will be increased [13].

The Implications for Management of MBC with Language Impairments

Given the variation and complexity of circumstances in which MBC are reared, the most important implication is that all the relevant information should be systematically collected and reviewed to identify which factors are most likely to be involved in an individual case. Unless this is done, it will be difficult to determine the most effective means of managing the language difficulty and finding the most effective method of resolving difficulties.

A considerable part of the necessary information can be assembled through a thorough interview with parents or caretakers. This will take longer than with singletons because information needs to be obtained for each child in the set. A guided interview which collects the information listed below has been developed for this purpose [39].

Family structure: number, age and spacing of children in the family; zygosity of the MBC; adults living in household and support of extended family.

Family history of speech and communication: brief history of singleton siblings, communication development and school progress; language development of natural parents, their siblings and children.

Caretaking and interaction: current provision; history of caretaking by parents and others, including nursery and school attendance.

Birth and perinatal history: pregnancy and birth; details of delivery and neonatal status for each child.

Medical history: details for each child including ENT and hearing assessments.

Developmental history: details for each child including current development and history of communication development.

Play and picture book reading: for each child: details of play preferences, attention, social play and interaction with peers; experience of books in adult-child situations.

Current speech and language: relative development of each child; dominance within the MBC group, individual functional abilities in different situations, communication preferences, intelligibility and comprehension of language.

Approach to rearing MBC: effect of MBC on family life, support and information available, strategies to develop individuality of MBC; amount of activity and individual attention for MBC on a 1:1 basis.

Standard assessment procedures can be used to describe each child’s language function but there are practical difficulties for a single clinician working with 2 or more young children who are reluctant to be separated from one another and their caretaker. Even if children can be successfully separated from one another they may not adequately demonstrate their communication skills. Where the children are reluctant to be separated from their main caretaker individual assessments are difficult, since when both or all children are present with the clinician, one child will often respond for another. If audio recordings are made when all children are present it can be difficult to distinguish individual speakers. Videotape recordings can help but there can also be difficulties with visual identification. Finding an appropriate way of conducting an assessment will require discussion with parents and using the practical help and support of the family or colleagues. In older children, assessment may be carried out at school or in a nursery where each child can be withdrawn separately from class. It may be more effective to use natural language samples in social situ-
It is strongly recommended that traditional assessment methods are supplemented by systematic observation of the multiple birth group in a variety of social situations. The purpose is to find out about the use and form of language in different social settings. This is essential for the clinician to assess the communicative relationship between the MBC group and their willingness to communicate effectively with others. Observation of the interaction between co-siblings and between the principal caretaker and MBC are a priority. If the children attend a nursery or school, they can also be observed during an unstructured activity to see how they interact with other children and their co-siblings. Their interaction with teachers can also be observed in a variety of classroom situations.

At the conclusion of the assessment the clinician can assess the contribution of relevant factors for each individual child and design intervention which is appropriate to these judgements bearing in mind all the possible explanations for the children’s difficulties outlined above. A discussion of intervention is beyond the scope of this paper but will follow from the judgements made on reviewing the information available.

**Conclusion**

The sharing of language learning resources in multiple births typically produces a pattern and rate of language development that differs from singletons. Group comparisons of language development in multiple birth and singleton children highlight the advantage of one-on-one adult-child interaction in infancy when conversational exchange relies partly on the scaffolding provided by the more skilful adult. However, it suggests that other language learning experiences become more influential coinciding with more mature attention and social abilities in early childhood. This demonstrates the plasticity of language acquisition. Single-case studies illustrate the range of social and biological factors that may interact with the social circumstances of language acquisition in multiple birth to exacerbate and maintain language delay and disorder. MBC seem prone to phonological delay and disorder, which may explain the strong popular belief in the existence of autonomous languages. Clinicians need to systematically examine all the possible reasons suggested for speech and language impairments in MBC when investigating individual cases to arrive at explanations for problems that will generate appropriate case-based solutions.

**References**