

39. Deaf education and bilingualism

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Abstract

In this chapter, the major findings from research on deaf education and bilingualism are reviewed. Following a short introduction into (sign) bilingualism, the second section provides an overview of the history of deaf education from the earliest records until the late 19th century, highlighting the main changes in philosophy and methods at the levels of provision and orientation. In section 3, the major factors that have determined the path toward sign bilingualism in the deaf communities, in particular, at the levels of language policy and education, are discussed. Current developments and challenges in deaf education, as reflected in the recent diversification of education methods, are addressed in section 4, with a focus on bilingual education conceptions. The final section is centred on deaf bilinguals, their language development, and patterns of language use, including cross-modal contact phenomena in educational and other sociolinguistic contexts.

1. Introduction

Bilingualism is not the exception, but rather the norm for the greater part of the world population (Baker 2001; Grosjean 1982; Romaine 1996; Tracy/Gawlitzeck-Maiwald 2000). Maintenance and promotion of bilingualism at the societal level are related to the status of the languages involved (majority or prestige language vs. minority language). Indeed, while social and economic advantages are attributed to the ability to use various ‘prestige’ languages, minority bilingualism is generally associated with low academic achievements and social problems. This apparent paradox reflects the symbolic value of language and the continuing predominance of the nation-state ideology in the majority of Western countries, in which language is regarded as one of the most powerful guarantors for social cohesion in a state, language policies being commonly monolingual in orientation. The situation is markedly different in countries with a longstanding tradition of multilingualism, as is the case in India (Mohanty 2006).

The factors that determine the vitality of two or more languages in a given social context may change over time; so may the patterns of language use in a given speech community, indicating that bilingualism is a dynamic phenomenon. At the level of language users, the different types of bilingualism encountered are commonly de-

scribed in terms of a continuum ranging from balanced bilingualism to partial or semi-bilingualism (Romaine 1996). In view of the variety of acquisition types and competence levels attained, some authors have proposed to define bilingualism as the regular use of more than one language in everyday life (Grosjean 1982). Following this broad definition of bilingualism, most members of deaf communities are bilingual, as they regularly use the community's sign language and the spoken or written language of the larger hearing society (Ann 2001). Since this type of bilingualism involves two languages of different modalities of expression, it is commonly referred to as *bimodal bilingualism*, *sign bilingualism*, or *cross-modal bilingualism*. In addition, many deaf individuals know and use other sign languages – or spoken/written languages (for discussion of additional dimensions of bilingualism in deaf communities, see chapter 35, Language Contact and Borrowing). Linguistic competences in sign language and spoken language can vary substantially (Grosjean 2008; Lucas/Valli 1992; Padden 1998). Linguistic profiles range from native fluency in one or both languages to delayed, partial, or even only rudimentary skills. The reasons for this variation relate to such diverse factors as the age at which hearing loss occurred, the degree of deafness, the age of exposure to the respective languages, the hearing status of the parents and their family language policy, schooling, and social networks (Emmorey 2002; Fischer 1998; Grosjean 2008; van den Bogaerde/Baker 2002).

In recent years, sociolinguistic and psycholinguistic research has shown that sign bilingualism is as dynamic as other types of bilingualism, and that bilingual signers, like other bilinguals, skilfully exploit their linguistic resources. It is important to note in this context that deaf individuals have only recently been recognised as *bilingual* language users (Grosjean 2008; Plaza-Pust/Morales-López 2008; Padden 1998) following the gradual recognition of sign languages as bona fide languages from the 1960s onwards. Since then, deaf activism worldwide has led to a wider perception of deaf communities as linguistic minority communities, the official recognition of sign languages and their inclusion in the education of deaf children being among their central demands.

However, questions concerning the use of sign languages and spoken/written languages in the education of deaf individuals, and the impact of signing on the development of spoken language have preoccupied professionals and scholars for the last two centuries (Bagga-Gupta 2004; Tellings 1995). Beyond the controversy over the most appropriate educational methods, the establishment of deaf schools has been of critical importance in the development of deaf communities and their sign languages (Erting/Kuntze 2008; Ladd 2003; Monaghan 2003; Padden 1998), the emergence of Nicaraguan Sign Language being a recent example (Senghas 2003; see chapter 36 for discussion).

Education also plays a prominent role in relation to bilingualism in other minority groups. However, bilingual development of sign language and spoken/written language in deaf children is determined by two unusual factors, namely, (i) the unequal status of the languages at the level of parent-child transmission (more than 90 % of deaf children are born to hearing, non-signing parents) and (ii) the unequal accessibility of the languages (no or only limited access to auditory input). The response of the educational (and political) institutions to the linguistic needs of deaf students is a major theme in bimodal bilingualism research. The diversity of approaches to communication with deaf children can be described as a continuum that ranges from a strictly monolingual (oralist) to a (sign) bilingual model of deaf education, with variation in concepts

of bilingual education also reflecting different objectives in language planning in relation to sign languages. Another major topic in the field concerns the interaction of the two languages in their acquisition and use, with no consensus in the domain of deaf education on the role of sign language in the acquisition of literacy (Chamberlain/Mayberry 2000).

2. Early records of deaf education

Until fairly recently, little was known about sign languages, the language behaviour of their users, and the status of these languages in education and society at large. Studies on the early records of deaf individuals' use of signs to communicate and the first attempts to educate deaf children (Lang 2003) report that manual means of communication – where they were noted – were not referred to as 'language' on a par with spoken languages, and deaf individuals were not regarded as bilinguals. However, questions about the 'universal' nature of gesture/signing (Woll 2003), and the use of manual means of communication (in particular, manual alphabets) have been addressed since the beginnings of deaf education (for the development of deaf education, see also chapter 38, *History of Sign Languages and Sign Language Linguistics*).

The first records of deaf education date from the 16th century. Deaf children from aristocratic families were taught individually by private tutors (often members of religious congregations, such as monks). Spoken language was taught to these children with two main objectives: legal (i.e. to enable them to inherit) and religious. The earliest documents report on the teachers' successes rather than describe the methods used (Gascón-Ricao/Storch de Gracia y Asensio 2004; Monaghan 2003). As a result, little is known about the methods used around 1545 by Brother Ponce de León, a Spanish Benedictine monk, commonly regarded as the first teacher of the deaf. There are, however, some indications that he used a manual alphabet with his pupils, a practice that spread to several European countries following the publication of the first book about deaf education by Juan de Pablo Bonet in 1620. Juan de Pablo Bonet acknowledges signing as the natural means of communication among the deaf, but advises against its use in the education of deaf children, reflecting his main educational aim: the teaching of the spoken language. Publications on deaf education which mention the use of signs to support the teaching of the spoken/written language appeared soon after in Britain and France (Gascón-Ricao/Storch de Gracia y Asensio 2004; Woll 2003; Tellings 1995).

Classes for deaf children were established more than a century later, in the 1760s, at Thomas Braidwood's private academy in Edinburgh, and at the French National Institute for Deaf-Mutes in Paris, founded by the Abbé de l'Épée. The latter was the first public school for deaf children, including not only children of wealthy families but also charity pupils. Soon after, schools for deaf children were founded in other centres across Europe (for example, in Leipzig in 1778, in Vienna in 1779, and in Madrid in 1795) (Monaghan 2003). At that time, the state and religious groups (often the Catholic Church) were the major stakeholders in the education of deaf children. Priests, nuns, and monks founded schools in other countries throughout the world. In some cases, deaf and hearing teachers who had worked in schools for the deaf in Europe went on

to establish educational institutions abroad. For example, the first school for the deaf in Brazil was founded in Rio de Janeiro in 1857 by Huet, a deaf teacher from Paris (Berenz 2003).

By the end of the 19th century, education had reached many deaf children; however, education for deaf children did not become compulsory in most countries until much later, in many countries only in the second half of the 20th century (see various chapters in Monaghan et al. 2003).

Developments in deaf education from the late 18th century to the end of the 19th century were also crucial in relation to policies about educational objectives and communication. While the goal of teaching deaf children the spoken/written language was shared, the means to achieve this goal became a matter of a heated debate that continues to divide the field today (Gascón-Ricao/Storch de Gracia y Asensio 2004; Lane/Hoffmeister/Bahan 1996; Tellings 1995).

De l'Épée, the founder of the Paris school, believed that sign language was the natural language of deaf individuals. In his school, deaf pupils were taught written language by means of a signed system ('methodical signs') which he had developed, comprised of the signs used by deaf people in Paris and additional signs invented to convey the grammatical features of French. The impact of his teaching went well beyond Paris, as several other schools that adopted this method were established in France and a teacher trained in this tradition, Laurent Clerc, established the American Asylum for the Deaf in Hartford (Connecticut) in 1817 together with Thomas Gallaudet. Teachers trained in this institution later established other schools for deaf children using the same approach throughout the US (Lane/Hoffmeister/Bahan 1996).

The spread of this philosophy, that promoted the use of signs, even though it included artificial signs, recognised the value of sign language for communication with deaf children, and the role of sign language in teaching written language, was challenged by the increasing influence of those who argued in favour of the oralist approach. Oralism regarded spoken language as essential for a child's cognitive development and for full integration into society, restricted communication to speech and lipreading, and regarded written language learning as secondary to the mastery of the spoken language. One of the most influential advocates of the oral method in deaf education and for its spread in Germany and among allied countries was Samuel Heinicke, a private tutor who founded the first school for the deaf in Germany in 1778.

The year 1880 is identified as a turning point in the history of deaf education. During the International Congress on the Education of the Deaf held in Milan in that year, a resolution was adopted in which the use of signs in the education of deaf children was rejected, and the superiority of the oral method affirmed (Gascón-Ricao/Storch de Gracia y Asensio 2004; Lane/Hoffmeister/Bahan 1996). The impact of this congress, attended by hearing professionals from only a few countries, must be understood in relation to more general social and political developments towards the end of the 19th century (Monaghan 2003; Ladd 2003). Over the following years, most schools switched to an oralist educational policy, so that by the early 20th century, oralism was dominant in deaf education.

While the Milan congress was a major setback for the role of sign language in deaf education, sign languages continued to be used in deaf communities. Indeed, although oralist in educational orientation, residential schools for the deaf continued to contribute to the development and maintenance of many sign languages throughout the fol-

lowing decades as sign languages were transmitted from one generation to another through communication among the children outside the classroom. These institutions can therefore be regarded as important sites of language contact (Lucas/Valli 1992), and by extension, of sign bilingualism, even though deaf people were not specifically aware of their bilinguality at the time.

It is important to emphasise that the Milan resolution did not have an immediate effect in all countries (Monaghan et al. 2003). In some, the shift towards oralism only occurred decades later, as was the case in Ireland, where signing continued to be used in schools until well into the 1940s (LeMaster 2003). In other countries, for example, the US, sign language retained a role in deaf education in some schools. In China, oralism was introduced only in the 1950s based on reports about the use of this method in Russia (Yang 2008).

3. Bimodal bilingualism at the societal level

In the course of the last three decades, administrations in several countries have been confronted with questions concerning language planning measures targeting sign languages, such as their legal recognition, their inclusion in deaf children's education, or the provision of interpretation. Grassroots pressure by deaf associations and related interest groups has been instrumental in getting these issues to appear on the agendas of governments throughout the world. Importantly, much of the impetus for local activities has been driven by international deaf activism, based on concepts such as *Deaf community* and *Deaf culture* that are linked to the notion of sign language as a symbol of identity (Ladd 2003). Indeed, hearing loss is not the sole determiner of Deaf community membership, as this is crucially determined by the choice of sign language as the preferred language (Woll/Ladd 2003) and solidarity, based on the concept of attitudinal deafness (Ladd 2003; Erting/Kuntze 2008).

3.1. The Deaf community as a linguistic minority group

The development of a socio-cultural (or socio-anthropological) view of deafness and related demands for the legal recognition of sign languages and their users as members of linguistic minorities throughout the world are examples of the internationalisation of political activism (recently referred to in terms of a 'globalization of Deafhood', Erting/Kuntze 2008), which is reflected in similar sociolinguistic changes that have affected deaf communities in several countries (Monaghan et al. 2003).

Historically, the gradual self-assertion of deaf individuals as members of a linguistic minority as of the late 20th century is tied to the insights obtained from linguistic research on sign languages, on the one hand, and socio-political developments toward the empowerment of linguistic minorities, on the other hand. Following the recognition of sign languages as full languages in the 1960s, deaf people themselves felt empowered to claim their rights as a linguistic minority group, on a par with other linguistic minority groups that were granted linguistic rights at the time (Morales-López 2008). The official recognition of sign languages as well as their inclusion in the education of

deaf children are central demands. In Sweden, where the provision of home-language teaching to minority and immigrant children was stipulated by the 1977 'home language reform' act (Bagga-Gupta/Domfors 2003), sign language was recognised in 1981 as the first and natural language of deaf individuals. The work of Swedish sign language researchers (inspired by Stokoe's research into ASL), Deaf community members, and NGOs brought about this change at the level of language policy that would soon be reflected in the compulsory use of sign language as the language of instruction at schools with deaf children. In the US, the *Deaf President Now* movement, organised by Gallaudet University students in March 1988, and leading to the appointment of the first deaf president of that university, did not only raise awareness of the Deaf community in the hearing society, it was also "above all a reaffirmation of Deaf culture, and it brought about the first worldwide celebration of that culture, a congress called *The Deaf Way*, held in Washington, DC, the following year", with thousands of deaf participants from all over the world (Lane/Hoffmeister/Bahan 1996, 130). These two events gave impetus to the *Deaf movement*, which has influenced political activism of deaf communities in many countries.

Sociolinguistic research into deaf communities around the globe has provided further insights into how developments at a broad international level can combine with local sociolinguistic phenomena in some countries, while they may have little impact on the situation of deaf people in others. Positive examples include Spain and South Africa. In Spain, political activism of deaf groups throughout the country began in the 1990s, influenced by the worldwide Deaf movement (Gras 2008) and by the socio-political changes in that country concerning the linguistic rights granted to regional language minorities after the restoration of democracy in the late 1970s (Morales-López 2008). A similar relationship between political reforms and the activities of local deaf communities is reported by Aarons and Reynolds (2003) for South Africa, where the recognition of South African Sign Language (SASL) was put on the political agenda after the end of the apartheid regime, with the effect that the 1996 constitution protects the rights of deaf people, including the use of SASL. In contrast, in many other African countries, socio-cultural and economic circumstances (widespread poverty, lack of universal primary education, negative attitudes towards deafness) work against the building of deaf communities (Kiyaga/Moores 2003).

In some cases, Deaf communities in developing countries have been influenced by Deaf communities from other countries. One example is discussed in Senghas (2003) regarding the assistance provided by the Swedish Deaf community to the Nicaraguan Deaf community in the process of its formation and organisation, through exchanges between members of the Nicaraguan and the Swedish Deaf communities; the Swedish Deaf community also funded the centre for Deaf activities in Managua.

Despite the differences in the timing of the 'awakening' of the deaf communities in different countries, the developments sketched here point to the significance of the "process by which Deaf individuals come to actualise their Deaf identity" (Ladd 2003, xviii) and the nature of Deaf people's relationships to each other – two dimensions that are captured by the concept of *Deafhood*, developed by Paddy Ladd in the 1990s (Ladd 2003). Padden and Humphries (2005, 157) highlight the sense of pride brought about by the recognition of sign languages as full languages: "To possess a language that is not quite like other languages, yet equal to them, is a powerful realization for a group of people who have long felt their language disrespected and besieged by others' attempts to eliminate it".

Indeed, signers' reports on their own language socialisation and their lack of awareness that they were bilingual (Kuntze 1998) are an indication of the effect of oralism on the identities of deaf individuals. It should be noted in this context that *hearing* people with deaf parents shared the experiences of their families as "members of two cultures (Deaf and hearing), yet fully accepted by neither" (Ladd 2003, 157).

3.2. Language planning

Until the end of the 20th century, language planning and language policies negatively impacted on bilingualism in Deaf communities. The situation has changed as measures have been taken in some countries that specifically target sign languages and their users (see chapter 37, Language Planning, for further discussion). There has, however, been concern about whether the steps taken meet the linguistic and educational needs of deaf individuals (Cokely 2005; Gras 2008; Morales-López 2008; Reagan 2001). Abstracting away from local problems, studies conducted in various social contexts reveal similar shortcomings in three major areas: (i) sign language standardisation, (ii) sign language interpretation, and (iii) education.

Among the most controversial language planning measures are those that affect the development of languages. Sign languages have been typically used in informal contexts, with a high degree of regional variation. With the professionalization of interpreting, increased provision of interpreting in schools and other contexts, and the teaching of sign languages to deaf and hearing learners, these features have led to a demand for the development of new terminology and more formal registers. Standardisation deriving from expansion of language function is often contentious because it affects everyday communication in multiple ways. Communication problems may arise (e.g. between sign language interpreters and their consumers) and educational materials may either not be used (as is the case with many sign language dictionaries, see Johnston 2003; Yang 2008) or be used in unforeseen ways (Gras 2008).

Changes at the legal level concerning recognition of sign language do not always have the expected effects. In France, for example, the 1991 Act granted parents of deaf children free choice with respect to the language used in the education of their children, but did not stipulate that any concrete measures be taken, neither with respect to provisions to meet the needs of those choosing this option nor with respect to the organisation of bilingual teaching where it was being offered (Mugnier 2006). Aarons and Reynolds (2003) describe a similar situation for South Africa regarding the 1996 South African Schools Act, which stipulated that SASL be used as the language of instruction.

In general, scholars agree that many of the shortcomings encountered are related to the lack of a holistic approach in sign language planning that would be characterised by coordinated action and involvement (Gras 2008; Morales-López 2008). Indeed, in many social contexts, measures taken represent political 'concessions' to pressure groups (deaf associations, educational professionals, parents of deaf children), often made with little understanding of the requisites and effects of the steps taken. The question of whether and how diverse and often conflicting objectives in the area of deaf education are reconciled is addressed in the next section.

4. Deaf education in the 21st century

4.1. Diversification of educational methods

Moore and Martin (2006) identify three traditional concerns of deaf educators: (i) Where should deaf children be taught? (ii) How should they be taught? (iii) What should they be taught? From the establishment of the first schools for the deaf in the 18th century until today, the different answers to these questions are reflected in the diversity of educational methods, including the bilingual approach to deaf education. Developments leading to a diversification of educational options in many countries are similar, reflecting, on the one hand, the impact of the international Deaf movement and related demands for sign bilingual education, and, on the other hand, the more general trend toward inclusive education. However, variation in educational systems indicates socio-political and cultural characteristics unique to different countries.

It is important to note in this context that throughout the world, many deaf children continue to have no access to education (Kiyaga/Moore 2003). Indeed, it has been estimated that only 20 % of all deaf children worldwide have the opportunity to go to school (Ladd 2003). In many developing countries, universal primary education is not yet available; because resources are limited, efforts are concentrated on the provision of general education. Deaf education, where it is available, is often provided by non-governmental organisations (Kiyaga/Moore 2003).

Comparison of the different educational options available shows that provision of deaf education varies along the same dimensions as those identified for other types of bilingual education (Baker 2007): (a) status of the languages (minority vs. majority language), (b) language competence(s) envisaged (full bilingualism or proficiency in the majority language), (c) placement (segregation vs. mainstreaming), (d) language backgrounds of children enrolled, and (e) allocation of the languages in the curriculum.

From a linguistic perspective, the spectrum of communication approaches used with deaf children exists on a continuum that ranges from a strictly monolingual (oralist) to a spoken/written language and sign language bilingual model of deaf education, with intermediate options characterised either by the use of signs as a supportive means of communication or by teaching of sign language as a second language (Plaza-Pust 2004). Variation in the status assigned to sign language in deaf education bears many similarities to the situation of other minorities, but there are also marked differences relating to the difference in the accessibility of the minority vs. the majority language to deaf children and the types of intervention provided using each language. This is also reflected in the terminological confusion that continues to be widespread in the area of deaf education related to the use of the term 'signs' or 'signing' to refer to any type of manual communication, without a clear distinction between the use of individual signs, artificially created signed systems, or natural sign languages. Only the latter are fully developed, independent language systems, acquired naturally by deaf children of deaf parents.

The first alternative approaches to the strictly oralist method were adopted in the US in the 1970s as a response to the low linguistic and academic achievements of deaf children educated orally (Chamberlain/Mayberry 2000). Against the backdrop of strict oralism, the inclusion of signs to improve communication in the classroom marked an

important step. However, the objective of what is commonly referred to as the *Total Communication* or *Simultaneous Communication* approaches in deaf education was still mastery of the spoken language. For this purpose, artificial systems were developed, consisting of sign language elements and newly created signs (for example, *Seeing Essential English* (SEE-1; Anthony 1971) or *Signing Exact English* (SEE-2; Gustason/Zawolkow 1980) in the US). The use of these artificial systems to teach spoken language combined with the relative ease of hearing teachers in their 'mastery' (since only the lexicon had to be learned, rather than a different grammar) contributed to their rapid spread in many countries including the US, Australia, New Zealand, Switzerland, Germany, Thailand, and Taiwan (Monaghan 2003). It is important to note that the creation and use of these systems for didactic purposes represents a case of language planning with an assimilatory orientation (Reagan 2001). From a psycholinguistic perspective, these systems do not constitute a proper basis for the development of the deaf child's language faculty as they do not represent independent linguistic systems (Johnson/Liddell/Erting 1989; Lane/Hoffmeister/Bahan 1996; Fischer 1998; Bavelier/Newport/Supalla 2003). Moreover, adult models (hearing teachers and parents) commonly do not use them in a consistent manner, for example, frequently dropping functional elements (Kuntze 2008). It is clear, therefore, that what is often described in the educational area as the use of 'sign language' as a supportive means of communication needs to be distinguished from the use of sign language as a language of instruction in sign bilingual education programmes. Only in the latter case is the sign language of the surrounding Deaf community, a natural language, used as the language of instruction.

In the second half of the 1980s, there was increasing awareness that Total Communication programmes were not delivering the results expected, particularly in relation to literacy. Against the backdrop of the cultural movement of the Deaf community, the Total Communication philosophy also clashed with the view of a Deaf community as a linguistic minority group in that it was based on a medical view of deafness. That signed systems were artificial modes of communication and not natural languages was also reflected in studies documenting children's adaptations of their signing to better conform to the constraints of natural sign languages, for example, with respect to the use of spatial grammar (Kuntze 2008). In addition, there was consistent evidence of better academic results for deaf children of deaf parents (DCDP), which contributed to an understanding of the linguistic and educational needs of the children, in particular, the relevance of access to a natural language early in childhood (Tellings 1995; Hoffmeister 2000; Johnson/Liddell/Erting 1989).

4.2. Bilingual education

In recognising the relevance of sign language for the linguistic and cognitive development of deaf children, the bilingual/bicultural approach to deaf education marked a new phase in the history of deaf pedagogy (Johnson/Liddell/Erting 1989). Sweden pioneered this phase by recognising sign language as the first language of deaf people in 1981, and implementing in 1983 the Special School curriculum, with the aim of promoting bilingualism (Bagga-Gupta/Domfors 2003; Svartholm 2007). The policy has resulted in the implementation of a uniform bilingual education option (Bagga-Gupta/

Domfors 2003), which contrasts markedly with the range of options offered in other countries as of the 1990s.

There is no comprehensive systematic comparison of bilingual education programmes internationally. However, some scholars have addressed the issue of variation in the bilingual conceptions applied.

4.2.1. Sign language promotion

There are two main tenets of bilingual deaf education: (i) sign language is the primary language of deaf children in terms of accessibility and development; (ii) sign language is to be promoted as a 'first' language. How these tenets are operationalised varies in relation to the choice of the languages of instruction, the educational setting, and the provision of early intervention measures focussing on the development of a firm competence in sign language as a prerequisite for subsequent education. The majority of deaf children are born to non-signing hearing parents, so support for early intervention is particularly important given the relevance of natural language input during the sensitive period for language acquisition (Bavelier/Newport/Supalla 2003; Fischer 1998; Grosjean 2008; Leuninger 2000; Mahshie 1997). However, this requirement is often not met and the children enter bilingual education programmes with little or no language competence.

Specific difficulties arise in interpreted education, where children attend regular classes in a mainstream school, supported by sign language interpreting. In this type of education, it is common to take the children's sign language competence for granted, with little effort put into the teaching of this language. In practice, many children are required to learn the language whilst using the language to learn, receiving language input from adult models who are mostly not native users of the language (Cokely 2005). In addition, these children often lack the opportunity to develop one important component of bilingualism, namely the awareness of their own bilinguality and knowledge about contrasts between their two languages (i.e. metalinguistic awareness), as sign language is hardly ever included as a subject in its own right in the curriculum (Morales-López 2008).

4.2.2. Spoken language promotion

In sign bilingual education programmes, the spoken/written language is commonly conceived of as a *second language* (L2) (Bagga-Gupta 2004; Günther et al. 1999, 2004; Knight/Swanwick 2002; Vercaingne-Ménard/Parison/Dubuisson 2005; Yang 2008; Plaza-Pust/Morales-Lopez 2008). In these programmes, the teaching of L2 literacy is approached via L1 sign language. In general, the written language is given prominence over the spoken language; however, socio-political pressure to promote the spoken language skills of deaf children varies from one country to another, affecting the status assigned to this modality in bilingual teaching (Plaza-Pust 2004). Hence, many educational professionals in bilingual education programmes are confronted with the ethical dilemma of how to deal with the political pressure to deliver good results in the spoken language, on the one hand, and their knowledge about the impact of hearing impair-

ment on the effort required to learn the spoken language, on the other hand (Tellings 1995, 121).

Another development affecting the status of the spoken language pertains to the increasing sophistication of technology – in particular, in the form of cochlear implants (CIs) (Knoors 2006). As more and more cochlear-implanted children attend bilingual programmes – a trend that reflects the overall increase in provision of these devices – the aims of bilingual education in relation to use of the spoken language need to be redefined to match the linguistic capabilities and needs of these children.

4.2.3. Languages of instruction

One crucial variable in bilingual education pertains to the choice of the main language(s) of instruction (Baker 2001). In some bilingual education programmes for deaf children, all curriculum subjects are taught in sign language. In this case, the spoken/written language is clearly defined as a subject in itself and taught as a second or foreign language. Other programmes, for example, those in Hamburg and Berlin (Günther et al. 1999), opt for a so-called ‘continuous bilinguality’ in the classroom, put into practice through team-teaching, with classes taught jointly by deaf and hearing teachers.

In addition to spoken/written language and sign language, other codes and supportive systems of communication may be used, such as fingerspelling or Cued Speech (LaSasso/Lamar Crain/Leybaert 2010). The continuing use of spoken language-based signed systems, not only for teaching properties of the L2 but also for content matter, in those programmes where instruction through sign language is provided for part of the curriculum only, is subject of an ongoing heated debate. Opinions diverge on whether these systems are more useful than sign language in the promotion of spoken language acquisition in deaf children, given the ‘visualisation’ of certain grammatical properties of that language, as is argued by their advocates (Mayer/Akamatsu 2003). Critics maintain that the children are confronted with an artificial mixed system that presupposes knowledge of the language which is actually to be learned (Kuntze 1998; Wilbur 2000). Between these two positions, the benefit from utilising signed systems in the teaching of the spoken language is conceded by some, although with a clear disapproval of their use in place of sign language for the teaching of content matter.

4.2.4. Learners’ profiles

Teachers are confronted with a heterogeneous population of learners, with marked individual differences not only in terms of degree of hearing loss, but also with respect to prior educational experiences, linguistic profiles, and additional learning needs. In some types of bilingual education (co-enrolment, interpreted education), deaf and hearing children are taught in the same classroom. Indeed, particularly in the US, a widespread alternative to bilingual education in special schools or self-contained classrooms in mainstream schools is the provision of sign language interpreters in mainstream classrooms. Interpreted education is also provided in Spain, particularly in secondary education. In Spain and other countries, the transition from primary to second-

ary education involves a change of institution, and often also a change of bilingual methods used, as team-teaching found throughout primary education in some bilingual programmes is not available in secondary education (Morales-López 2008). Variation in learners' profiles is often overlooked in these educational settings, even though adaptations to meet the linguistic abilities and learning needs of deaf children are necessary (Marschark et al. 2005).

Co-enrolment of deaf and hearing children has been offered in Australia, the US, and in several countries in Europe (Ardito et al. 2008; de Courcy 2005; Krausneker 2008). While studies on this type of bilingual education coincide in the positive results obtained, which mirrors the findings reported for Dual Language programmes with minority and majority language children in the US (Baker 2007), these programmes are often offered for a limited time only. A bilingual programme in Vienna, for example, was discontinued after four years.

For multiple reasons, including the temporary character of some bilingual programmes, or changes in orientation from primary to secondary education, many deaf children are exposed to diverse methods in the course of their development, often without preparation for changes affecting communication and teaching in their new classrooms (Gras 2008; Plaza-Pust 2004).

Demographic changes relating to migration are also reflected in the changing deaf population (Andrews/Covell 2006). There is general awareness of the challenges this imposes on teaching and learning, in particular among professionals working in special education. However, both in terms of research and teaching, the lack of alignment of the spoken languages (and, at times, also sign languages) used at home and in school remains largely unaccounted for. It is clear that the concept of bilingual education, if taken literally (that is, involving two languages only) does not recognise the diversity that characterises deaf populations in many countries. Moreover, because of differences in educational systems, some deaf children from migrant families enrol in deaf schools without prior knowledge of any language because deaf education was not available in their country of origin.

The increasing number of deaf children with cochlear implants (CI) – more than half of the population in the UK, for example (Swanwick/Gregory 2007) – adds a new dimension to the heterogeneity of linguistic profiles in deaf individuals. While most children are educated in mainstream settings, there are many CI children attending bilingual programmes, either because of low academic achievements in the mainstream or because of late provision of a CI. The generalised rejection of sign language in the education of these children in many countries contrasts with the continuing bilingual orientation of education policy in Sweden, where the views of professionals and parents of deaf children with CIs in favour of a bilingual approach follows a pragmatic reasoning that acknowledges not only the benefits of bilingual education but also that the CI is not a remedy for deafness and its long-term use remains uncertain (Svartholm 2007). In a similar vein, though based on the observation of remaining uncertainties concerning children's eventual success in using CIs, Bavelier, Newport, and Supalla (2003) argue in favour of the use of sign language as a 'safety net'.

4.2.5. Biculturalism

An aspect that continues to be controversial, and is also of relevance in discussions about appropriate educational placements, concerns the notion of biculturalism in the

education of deaf children (Massone 2008; Mugnier 2006). Whilst sign bilingual education is also bicultural for some educational professionals, the idea of deaf culture and related bicultural components of deaf education are rejected by others. There are diverging views about whether sign bilingualism is the intended outcome (following the model of maintenance bilingual education) or is intended to be a transitional phenomenon as an 'educational tool', as in other types of linguistic minority education (Baker 2001). The latter view, widespread among teaching professionals (see Mugnier (2006) for a discussion of the situation in France; Massone (2008) for Argentina), commonly attributes the status of a teaching tool to sign language, with no acknowledgment of culture.

Apart from questions about the inclusion of deaf culture as an independent subject, the discussion also affects the role assigned to deaf teachers as adult role models, linguistically and culturally. As Humphries and MacDougall state (2000, 94): "The cultural in a 'bilingual, bicultural' approach to educating deaf children rests in the details of language interaction of teacher and student, not just in the enrichment of curriculum with deaf history, deaf literature, and ASL storytelling."

4.2.6. Educational conceptions and policy

Because sign bilingual education is not institutionalised in the majority of countries, its provision often depends on the interest and support of parents, on the one hand, and the expertise of specialists offering such programmes, on the other hand. Not only do these programmes often struggle for survival, but professionals working in these settings also face the task of developing their own curricula, teaching materials, and assessment tools (Komesaroff 2001; Morales-López 2008; Plaza-Pust 2004). In many cases, teachers in bilingual education programmes have little or no training in bilingualism in general, or sign bilingualism in particular. In sign bilingual education, written language is taught as an L2, but teachers are rarely taught the theoretical underpinnings of this type of language acquisition (Bagga-Gupta/Domfors 2003; Morales-López 2008). Contrastive teaching is assigned an important role, but there is a general lack of knowledge about research in sign language linguistics and the impact of critical language awareness on the developmental process, an issue that is the focus of education of other linguistic minorities (Siebert-Ott 2001). Whatever the role assigned to the different professionals involved in the teaching of deaf students, a (near-)native level of proficiency in sign language should be a requirement. However, for multiple reasons, this requirement is often not met, and in-service training is often insufficient to fill the skill and knowledge gaps (Bagga-Gupta/Domfors 2003). In general, there is agreement that many of the shortcomings must be addressed in the context of a coherent *holistic* planning of bilingual education involving all stakeholders (administration, teachers, parents, deaf association) with the aim of aligning the different measures that need to be taken, such as the provision of appropriate teacher training, the development of teaching materials specifically devised for sign bilingualism, and focus on the aspects that distinguish sign bilingualism from other forms of bilingualism (use of two different modalities, lack of access to the spoken modality, etc.) (Morales-López 2008). Clearly, the absence of co-ordinated action results in ineffective use of the human and financial resources available.

It is also apparent that the aim of guaranteeing *equity of access* to all children often takes precedence over educational excellence. The objectives of the general trend toward educating deaf children in mainstream schools – namely, choice of the least restrictive environment, integration, and inclusion (Moores/Martin 2006) – have, since the 1970s, been increasingly regarded as preferable to segregation (Lane/Hoffmeister/Bahan 1996), not only in many Western countries (Monaghan 2003) but also in countries such as Japan (Nakamura 2003, 211), with the effect that many special schools have been closed in recent years.

In the US, the trend initiated through Public Law 94–142 (1975), which requires that education should take place in the *least restrictive environment* for all handicapped children, has resulted in more than 75 % of deaf children being educated in the mainstream (Marschark et al. 2005, 57), compared with 80 % of deaf children educated in residential schools before the 1960s in that country (Monaghan 2003). The pattern is similar in many other countries, for instance, in the UK, where only 8 % of deaf children are currently educated in special schools (Swanwick/Gregory 2007). Moores and Martin (2006) note, though, that this has been a long-term trend in the US, where education in mainstream settings began to be increasingly offered after the end of World War II, due to the increasing child population, including deaf children, and the favouring of classes for deaf children in mainstream schools rather than the building of additional residential schools.

These observations point to the additional issue of the economics of education, which is often overlooked. To date, few cost-effectiveness studies have been undertaken (but see Odom et al. 2001). While limited attention is paid to the economics of bilingual education (Baker 2007), the limited discussion on the cost benefits of sign bilingual education can also be considered as an indication of the ideological bias of deaf educational discourse. A few scholars have speculated about whether the move toward mainstreaming was motivated by efforts to improve the quality of deaf education and promote deaf children's integration, or was related to cost saving (Ladd 2003; Marschark et al. 2005).

The provision of educational interpreting in mainstream or special educational settings is based on the assumption that through interpreting, deaf children are provided with the same learning opportunities as hearing children (Marschark et al. 2005). However, there is limited evidence concerning the effectiveness of educational interpreting and little is known about the impact of the setting, the children's language skills, the interpreters' language skills, and the pedagogical approach on information transmission.

In their study of interactions between deaf and hearing peers outside the mainstream classroom, Keating and Mirus (2003) observed that deaf children were more skilful in accommodating to their hearing peers than vice versa and concluded that mainstreaming relies on an unexamined model of cross-modal communication.

A major challenge to traditional concepts of bilingual education and the development of appropriate language planning measures concerns the increasing number of deaf children with CI. While this general trend and the revival of radical oralist views of deaf education are acknowledged, the long-term impact of CIs on educational programmes for deaf students is not yet clear. Although there is little research to provide empirical support for the appropriateness of this generalised choice, mainstreaming is the usual type of educational setting provided for children with a CI. Studies indicate

substantial variation in the developmental progress of cochlear-implanted orally educated children. The individual differences observed suggest that some of them would certainly profit from the use of sign language in their education (Szagun 2001).

As for children themselves, remarkably little is known about their educational preferences. Interview data are available from adult deaf people revealing their views of oralist education and special schools, but at the time of their education, bilingual approaches were not an option (Krausneker 2008; Lane/Pillard/French 2000; Panayiotis/Aravi 2006). Mainstreamed children in Spain, when asked whether they would prefer interpreters or support from tutors (most of whom were competent in sign language) expressed their preference for the latter option (Morales-López 2008), highlighting the importance of face-to-face communication in the teaching and learning of content matter. As for the increasing number of deaf children with CIs, little is known about their views concerning the impact of a CI on their quality of life (Preisler 2007).

Finally, it should be noted that most research has been orientated towards demonstrating the effectiveness of one educational option over another, reflecting the interdependence of research, policy, and practice (Bagga-Gupta 2004; Plaza-Pust/Morales-López 2008). Demonstrating the success of a bilingual approach may be of critical importance in ensuring its maintenance, even when it has not been appropriately implemented. A few scholars (Bagga-Gupta 2004; Moores 2007) have drawn attention to the dangers of ideological biases in research that should critically analyse and reflect.

5. Bilinguals

Because of the diversity of factors determining the acquisition and use of sign language and spoken language in deaf individuals, bimodal bilingualism offers a rich field of research into the complex inter-relation of external sociolinguistic and internal psycholinguistic factors that shape the outcomes of language contact. Indeed, recent years have witnessed an increased interest in the study of this type of bilingualism. The next sections summarise the major findings obtained in the psycholinguistic and sociolinguistic studies conducted, in particular, concerning (i) developmental issues in the acquisition of the two languages, (ii) sociolinguistic aspects determining patterns of language use in the deaf communities, and (iii) (psycho-)linguistic characteristics of cross-modal language contact phenomena.

5.1. Bilingual learners: acquisition of sign language as an L1 and spoken/written language as an L2

Studies of hearing children's bilingual development commonly concern bilingual families (Lanza 1997). The situation is markedly different regarding research into sign bilingualism, in which longitudinal studies of family bilingualism are rare, although there are exceptions, such as the studies conducted by Petitto and colleagues (2001) and Baker and van den Bogaerde (2008). Over the past decade, such factors as scarcity of bilingual educational settings and lack of appropriate measures of sign language knowl-

edge (Chamberlain/Mayberry 2000; Singleton/Supalla 2003) have changed and an increasing number of studies have been conducted.

The specific circumstances that determine exposure to and access to spoken/written language and sign languages in deaf children raise a number of issues concerning the status attributed to the two languages as L1 (sign language) and L2 (spoken/written language). The notions of *mother tongue* or *first language(s)* are commonly bound to criteria of age (first language(s) acquired) and environment (language(s) used at home), while full access to the language(s) learned is assumed. In the case of deaf children, however, *accessibility* should be considered the defining criterion of which language is their primary language, given that they can only fully access and naturally acquire sign languages (Berent 2004; Grosjean 2008; Leuninger 2000; Mahshie 1997). Age of exposure to sign language is a critical issue for the large majority of deaf children born to non-signing hearing or deaf parents. Whether they acquire sign language successfully through contact with signing peers or adult signers depends on such factors as parents' choices about language, medical advice, and early intervention, in a context where the medical view of deafness prevails (Morales-López 2008; Yang 2008; Plaza-Pust 2004). Even in countries where bilingual education is available, many parents only learn about it later as an option for their deaf child, so that many children only enter such programmes when they are older.

There are many reasons why deaf children are not exposed to sign language during the sensitive period for language acquisition. It has been argued that the full accessibility of the language may compensate for delay in exposure; however, there is evidence that late learners (5–10 years old) of a sign language as L1 may not become fully fluent (Mayberry 2007). Another issue concerns the potential impact of the early use of an artificial signed system at home and/or in pre-school on the later development of sign language. Despite these caveats, sign language is generally referred to as the L1 of bilingually educated deaf children.

With respect to the status of the spoken/written language, there is some consensus that written language can be directly acquired by bilingually educated deaf children as an L2 (Leuninger 2000; Plaza-Pust 2008; Vercaingne-Ménard/Parison/Dubuisson 2005). However, there is little agreement on whether deaf children can compensate for the lack of access to spoken language by taking other pathways in the learning of written language to successfully acquire L2 grammar. Many researchers discuss deaf children's written language development in the context of the impact of hearing loss, specifically in relation to the role of phonological awareness in the development of literacy (Muselman 2000; Mayer 2007). A different view is adopted by others who emphasise the need to look at written language in its own right. Günther (2003), for example, maintains that although written language is related to spoken language, it is an autonomous semiotic system. Learners must 'crack the code' along the lines proposed for other acquisition situations, that is, they have to identify the relevant units of each linguistic level, the rules that govern their combination, as well as the inter-relation of the different linguistic levels of analysis. Both innate knowledge and linguistic environment are assumed to contribute to this process (Plaza-Pust 2008).

While numerous studies provide detailed accounts of error types in deaf children's written productions, few scholars discuss their findings about deaf children's acquisition of the written language in relation to linguistic theory. Wilbur (2000) distinguishes internal and external sources of errors in the writing. As the errors found resemble

the rule-based errors found in learner grammars of hearing L2 learners (i.e. omissions or overgeneralisations), it is assumed that they reflect developmental stages. However, the characteristic long-term persistence of these errors is reminiscent of plateau or fossilisation effects in second language learner grammars and suggests that the development of the written language by deaf children might be delayed or truncated as a result of restricted *quantity* of the input and a deficit in the *quality* of input. Following this line of reasoning, it has been argued that the traditional teaching of written language structures in isolation with a focus on formal correctness is at the expense of creative uses of written language which would allow deaf children to acquire subtle grammatical and pragmatic properties (Günther et al. 2004; Wilbur 2000).

Studies that specifically address similarities and differences between deaf learners and other learners continue to be rare. In longitudinal studies, both Krausneker (2008) and Plaza-Pust (2008) compare deaf learners' L2 written language development with that of other L2 learners of the same language in order to ascertain whether the underlying language mechanisms are the same. Krausneker (2008) directly compared hearing and deaf children's development of L2 German. She explains differences between the learner groups in developmental progress as resulting from differences in the amount of input available: while hearing children are continuously exposed to the L2, deaf children's input and output in this language are much more restricted. Plaza-Pust (2008) found that the bilingually educated deaf children in her study acquired the target German sentence structure like other learners, but with marked differences in individual progress. She argues that variation in the learners' productions is an indicator of the dynamic learning processes that shape the organisation of language, as has been shown to be the case in other contexts of language acquisition.

Additionally, where written language serves as the L2, the question of the potential role of sign language (L1) in its development is fundamental to an appropriate understanding of how deaf children may profit from their linguistic resources in the course of bilingual development.

5.2. Bilingual development: pooling of linguistic resources

Over recent years, several hypotheses have been put forward with respect to positive and negative effects of cross-modal language interaction in sign bilingual development (Plaza-Pust 2008). In research on bilingualism in two spoken languages, this is usually expressed as a facilitating or accelerating vs. a delaying effect in the learning of target language properties (Odlin 2003). A variety of terminology is found in the literature, including that concerned with sign bilingualism, to refer to different types of interaction between two or more languages in the course of bilingual development, such as 'language transfer', 'linguistic interference', 'cross-linguistic influence', 'code-mixing', and 'linguistic interdependence'. Many of these terms have negative connotations which indicate attitudes toward bilingualism and bilinguals' language use and reflect a common view that the 'ideal' bilingual is two monolinguals in one person who should keep his two languages separate at all times.

Studies on language contact phenomena in interactions among adult bilinguals, including bilingual signers, and in the productions of bilingual learners have shown that language mixing is closely tied to the organisation of language on the one hand, and

to the functional and sociolinguistic dimensions of language use on the other hand (Grosjean 1982, 2008; Tracy/Gawlitzek-Maiwald 2000), with a general consensus that bilingual users, including bilingual learners, exploit their linguistic resources in both languages.

5.2.1. Cross-modal language borrowing

Following a long debate about separation or fusion of languages in early bilingual acquisition (Tracy/Gawlitzek-Maiwald 2000; Meisel 2004), there is a consensus that both languages develop separately from early on. This is supported by longitudinal studies on the acquisition of diverse language pairs, including the acquisition of sign language and spoken language in hearing children (Petitto et al. 2001). More recently, some researchers have studied language mixing in young bilinguals and concluded that their languages may temporarily interact in the course of bilingual development (Genesee 2002). Particularly in cases where there is asymmetry in the development of the two languages, learners may use a 'relief strategy' of temporarily borrowing lexical items or structural properties from the more advanced language. It has also been argued that the sophisticated combination of two distinct grammars in learners' mixed utterances not only reveals the structures available in each language, but also that learners know, by virtue of their innate language endowment (i.e. *Universal Grammar*), that grammars are alike in fundamental ways.

In relation to bilingual acquisition of sign language and spoken/written language by deaf children, some scholars acknowledge in general terms that L1 sign language knowledge, drawing on Universal Grammar, might reduce the complexity of acquiring a written language as an L2 (Wilbur 2000), but do not consider cross-linguistic influence or borrowing as outlined above.

Günther and colleagues (1999) maintain that sign language serves a critical role in the bilingual development of deaf children. Based on a study of the writing of deaf children attending the Hamburg bilingual programme, they claim that these children profit from their knowledge of German Sign Language (DGS) in two respects. Firstly, they benefit from general knowledge attained through this language (general *world knowledge* and also knowledge about *story grammar*) in their production of written narratives (Günther et al. 2004). Secondly, they compensate for gaps in their written language grammar by borrowing sign language structures. Crucially, the authors show that DGS influence was a temporary phenomenon; as the learners' knowledge of written German increased, the use of DGS borrowings decreased.

Plaza-Pust and Weinmeister (2008) specifically address the issue of cross-modal borrowing in relation to learners' grammatical development in both languages. Their analysis of signed and written narratives (collected in the context of a longitudinal investigation into bilingual acquisition of DGS and written German by deaf children attending the bilingual programme in Berlin) shows that lexical and structural borrowings occur at specific developmental phases in both languages, with structural borrowings decreasing as learners progress. Once the target structural properties are established, language mixing serves other, pragmatic functions (code-switching). The use of language mixing both in signed and written productions was relatively infrequent. For one participant, no language mixing was observed in either DGS or German. Individ-

ual variation shows patterns similar to those described in research on the bilingual acquisition of two spoken languages (Genesee 2002). Finally, the data reveal a gradual development of the grammars of both languages, with differences among learners in the extent of development in the time covered by the study.

5.2.2. Inter-dependence of sign language and literacy skills

Academic disadvantages resulting from a mismatch between L1 and L2 skills are most pronounced in linguistic minority members, in particular, in the case of socially stigmatised minorities (Saiegh-Haddad 2005). Cummins' Interdependence Hypothesis (1991), which sees a strong foundation in the L1 as a prerequisite for bilingual children's academic success, targets functional distinctions in language use and their impact on academic achievements in acquisition situations in which the home language (L1) differs from the language (L2) used in school.

Because the theoretical justification for a bilingual approach to the education of linguistic minority and deaf children bears important similarities (Strong/Prinz 2000, 131; Kuntze 1998), the Interdependence Hypothesis has been widely used in the field of deaf education. As the role of spoken language in the linguistic and academic development of deaf children is limited, including reading development, the promotion of sign language as a base or primary language, although not the language used at home in the majority of cases, is fundamental to deaf children's cognitive and communicative development (Hoffmeister 2000; Niederberger 2008).

As for Cummins' Common Underlying Proficiency Hypothesis, which assumes cognitive academic proficiency to be interdependent across languages, it is important to note that it is not a monolithic ability but rather involves a number of components, making it necessary to carefully examine the skills that might be involved in the 'transfer process'. In research on sign bilingual development, the identification of the skills that might belong to common underlying proficiency is further complicated by the fact that sign language, the L1 or base language, has no written form that might be used in literacy related activities. Thus the notion of transfer or interaction of academic language skills needs to be conceived of independently of print. This in turn has led to a continuing debate about whether or not sign language can facilitate the acquisition of L2 literacy (Chamberlain/Mayberry 2000; Mayer/Akamatsu 2003; Niederberger 2008).

The positive correlations between written language and sign language found in studies of ASL and English (Hoffmeister 2000; Strong/Prinz 2000) and other language pairs (Dubuisson/Parisot/Vercaingne-Ménard (2008) for Quebec Sign Language (LSQ) and French; Niederberger (2008) for French Sign Language (LSF) and French) have provided support for the assumption that good performances in both languages are indeed linked. As for the specific sign language skills associated with specific literacy skills, several proposals have been put forward. Given the differences between the languages at the level of the modality of expression and organisation, some authors assume that interaction or transfer mainly operate at the level of story grammar and other narrative skills (Wilbur 2000). Other researchers believe that the interaction relates to more specifically linguistic skills manifested in the comprehension and production of sign language and written language (Chamberlain/Mayberry 2000; Hoffmeister 2000; Strong/Prinz 2000). Higher correlations were obtained between narrative comprehen-

sion and production levels in ASL and English reading and writing levels than between ASL morphosyntactic measures and English reading and writing. Niederberger (2008) reported a significant correlation of global scores in LSF and French and observed that correlations between narrative skills in both languages were higher than those relating to morphosyntactic skills. Additionally, sign language comprehension skills were more highly correlated with French reading and writing skills than with sign language production skills. Given that LSF narrative skills also correlated with French morphosyntactic skills, the interaction of both languages was assumed to involve more than global narrative skills.

The study by Dubuisson, Parisot, and Vercaingne-Ménard (2008) on the use of spatial markers in LSQ (taken as an indicator of global proficiency in LSQ) and higher level skills in reading comprehension showed a relationship between improvement in children's use of spatial markers in LSQ and their ability to infer information when reading French. With respect to global ability in the use of space in LSQ and global reading comprehension, the authors reported a highly significant correlation in the first year of the study. More specifically, a correlation was found between the ability to assign loci in LSQ and the ability to infer information in reading. In a two-year follow-up, they observed a correlation between locus assignment in LSQ and locating information in reading, and between global LSQ scores and locating information in reading.

In summary, the results obtained from these studies show a relation between sign language development and literacy skills. However, they do not provide any direct information about the direction of the relationship, and some of the relations in the data remain unaccounted for at a theoretical level, in particular where the links concern grammatical properties and higher level processes.

5.2.3. Language contacts in the classroom and the promotion of metalinguistic skills

In the course of bilingual development, children learn the functional and pragmatic dimensions of language use and develop the capacity to reflect upon and think about language, commonly referred to as metalinguistic awareness. From a developmental perspective, the ability to monitor speech (language choice, style), which appears quite early in development, can be distinguished from the capacity to express and reflect on that knowledge (Lanza 1997, 65). It is important to note that metalinguistic awareness is not attained spontaneously but is acquired through reflection on structural and communicative characteristics of the target language(s) in academic settings (Ravid/Tolchinsky 2002). Thus with respect to the education of deaf children, the question arises as to whether and how these skills are promoted in the classroom.

One salient characteristic of communication in the sign bilingual classroom is that it involves several languages and codes (see section 4.2). This diversity raises two fundamental issues about communication practices in the classroom and the children's language development. On the one hand, because modality differences alone cannot serve as a clear indicator of language, scholars have remarked on the importance of structural and pragmatic cues in providing information about differences between the languages. In particular, distinctive didactic roles for the different languages and codes used in the classroom seem to be fundamental for successful bilingual development.

On the other hand, Padden and Ramsey (1998) state that associations between sign language and written language must be cultivated. Whether these associations pertain to the link between fingerspelling and the alphabetic writing system, or to special registers and story grammar in both languages, an enhanced awareness of the commonalities and differences will help learners to skilfully exploit their linguistic resources in the mastery of academic content.

While language use in classrooms for deaf children is complex (Ramsey/Padden 1998), studies of communication practices in the classroom show that language contact is used as a pedagogical tool: teachers (deaf and hearing) and learners creatively use their linguistic resources in dynamic communication situations, and children learn to reflect about language, its structure and use.

Typically, activities aimed at enhancing the associations between the languages involve their use in combination with elements of other codes, as in the use of teaching techniques commonly referred to as *chaining* (Padden/Ramsey 1998; Humphries/MacDougall 2000; Bagga-Gupta 2004) or *sandwiching*, where written, fingerspelled, and spoken/mouthed items with the same referent follow each other. An illustration of this technique is provided in (1) (adapted from Humphries/MacDougall 2000, 89).

- (1) VOLCANO – v-o-l-c-a-n-o – ‘volcano’ point – v-o-l-c-a-n-o
 initialized + fingerspelling + point to printed + fingerspelling
 sign word

Particularly in the early stages of written language acquisition, knowledge of and attention to the relationships between the different languages and codes become apparent in the communication between the teachers and the children: children use sign language in their enquiries about translation equivalents; once the equivalence in meaning is agreed upon, fingerspelling is used to confirm the correct spelling of the word. At times, children and teachers may also use spoken words or mouthings in their enquiries. The following example describes code-switching occurring upon the request of a ‘new-comer’ deaf student:

Roy [...] wanted to spell ‘rubber’. He invoked the conventional requesting procedure, waving at Connie [the deaf teacher] and repeatedly signing ‘rubber’. [...] As soon as she turned her gaze to him, Roy began to sign again. She asked for clarification, mouthing ‘rubber? rubber?’, then spelled it for him. He spelled it back, leaving off the final ‘r’. She assented to the spelling, and he began to write. John, also at the table and also experienced with signed classroom discourse, had been watching the sequence as well, and saw that Roy had missed the last ‘r’ just before Connie realized it. John signalled Connie and informed Roy of the correction. (Ramsey/Padden 1998, 18)

During text comprehension and production activities, teachers and children move between the languages. For example, teachers provide scaffolding through sign language during reading activities, including explanations about points of contrast between spoken language and sign language. Bagga-Gupta (2004) describes chaining of the two languages in a simultaneous or synchronised way, for example, by periodically switching between the two languages or ‘visually reading’ (signing) a text.

Mugnier (2006) analyses the dynamics of bilingual communication in LSF and French during text comprehension activities in classes taught by a hearing or a deaf

teacher. LSF and French were used by the children in both situations. However, while the deaf teacher validated the children's responses in either language, the hearing teacher only confirmed the correctness of spoken responses. Teacher-student exchanges including metalinguistic reflection about the differences between the languages only occurred in interaction with the deaf teacher. It was occasionally observed that in communication with the hearing teacher, the children engaged with each other in a parallel conversation, with no participation by the teacher. Millet and Mugnier (2004) conclude that children do not profit from their incipient bilingualism by the simple juxtaposed presence of the languages in the classroom, but benefit where language alternation is a component of the didactic approach.

The dynamics of bilingual communication in the classroom also has a cultural component. As pointed out by Ramsey and Padden (1998, 7) "a great deal of information about the cultural task of knowing both ASL and English and using each language in juxtaposition to the other is embedded in classroom discourse, in routine 'teacher talk' and in discussions".

5.3. Sociolinguistic aspects of cross-modal language contact

Language choice in bilingual interactions is a complex phenomenon. For bilinguals, variation in situation induces different language modes. Whether bilinguals choose one language or another as a base language is related to a number of factors such as their fluency in the two languages, the conversational partners, the situation, the topic, and the function of the interaction (Fontana 1999; Grosjean 1982, 2008; Romaine 1996). For deaf bilinguals, limitations on perception and production of the spoken language condition its choice as a base language. Thus, in interactions with other sign bilinguals, code-switching for stylistic purposes or communicative efficiency can involve mouthing or fingerspelling. Code-switching provides an additional communication resource when clarification is required (Grosjean 1982). For this purpose, bilingual signers may combine elements of different codes, that is, sign language, mouthing, and fingerspelling (see chapter 35, Language Contact and Borrowing, for further discussion).

An interesting example, indicating that cross-cultural differences are reflected in preferences for specific combinations over others, is described by Yang (2008) with respect to contact between Chinese Sign Language (CSL) and Chinese. Like other sign bilinguals, Chinese/CSL bilinguals combine CSL elements and mouthings. However, they also code-switch to written Chinese by tracing the strokes of Chinese characters in the air or on the palm of the hand, a strategy that is also common among hearing Chinese to disambiguate homophonic words.

Studies of the use of mixed varieties, initially referred to as 'pidgin sign language' and later as 'contact signing' (also see chapter 35) have shown that the hearing status of the conversational partner is not the sole criterion determining language choice in situations of sign language and spoken/written language contact (Fontana 1999). Lucas and Valli (1989) report on the use of ASL by some deaf participants in their communication with a hearing interviewer, and on the use of contact signing with a deaf interviewer even where both the interviewers and the participants were fluent in ASL and the participants were addressed by the deaf interviewer in ASL. According to Lucas and Valli, language choice in any of these cases is determined by sociolinguistic factors,

such as the formality of an interview situation or the use of a particular language as a marker of identity. Similar patterns of language use have been reported with respect to other linguistic minorities (see Grosjean (1982) for a discussion of the factors that determine language choice in bilingual settings).

There has been limited research outside the US into the sociolinguistic factors determining language choice. However, studies of loan vocabulary indicate the influence of different teaching practices in deaf education. For example, the widespread use of fingerspelling as a teaching tool in the US is reflected in the frequency of specific types of cross-modal language contact phenomena, such as initialisation (Lucas/Valli 1992), which contrasts with the widespread use of mouthing in the sign languages of German-speaking countries, reflecting the spoken language orientation in deaf education in these countries.

LeMaster's (2003) study of differences between men and women's signing indicates the impact of educational philosophy and segregation by gender. In Dublin, girls and boys attended different schools, which is reflected in lexical differences (see chapter 33, *Sociolinguistic Aspects of Variation and Change*, for details).

From a sociolinguistic perspective, where two linguistic communities do not live in regionally separate areas, language contact phenomena can be considered to be a natural outcome. This holds equally of the intricate relationship between the hearing and Deaf communities. However, where languages in a given social space do not have the same status, language mixing may not only be associated with a lack of competence at the individual level, but it may also be perceived as a cause of language loss (Baker 2001; Grosjean 1982; Romaine 1996).

The situation is markedly different in communities where bimodal bilingualism develops primarily as a result of a high incidence of deafness (Branson/Miller/Marsaja 1999; Woodward 2003; see chapter 24, *Shared Sign Languages*, for further discussion). Kisch (2008) describes the complexity of language profiles she encountered in her anthropological study of the Al-Sayyid community (Israel). Her observations of the interactions between hearing and deaf, competent and less competent signers point to a situation of intensive language contact, with dynamic movement between the languages. With respect to linguistic profiles, Kisch observes an asymmetry between deaf individuals, who are usually monolingual in sign language, and hearing individuals, who are bilingual in spoken language and sign language. This type of language contact situation results in a 'reverse' pattern to that found in the language profiles of linguistic minority members in other social contexts where the minority language community members are bilingual, while the majority members are usually monolingual. This demonstrates how sociolinguistic and educational factors affect the patterns of language use in a given social space. Indeed, cases of such 'village sign languages' offer the opportunity to study the outcomes of language contact in situations without language planning targeting sign language. Also, in such communities, language behaviour is neither determined by the stigmatisation of deafness nor by the concept of a Deaf community and related notions of attitudinal deafness. As more and more deaf children in such communities are exposed to deaf education, it will be interesting to see how this affects their language development and use, and, eventually, also the communication patterns in the social context of the village in light of the discussion of how the establishment of the American School for the Deaf was an important factor in the disappearance of the Martha's Vineyard deaf community (Lane/Pillard/French 2000).

6. Conclusion

Human beings, deaf or hearing, have an innate predisposition to acquire one or more languages. Variation in linguistic profiles of deaf individuals, ranging from competence in two or more languages to rudimentary skills in only one language, indicates how innate and environmental factors conspire in the development and maintenance of a specific type of bilingualism that is characterised by the fragile pattern of transmission of sign languages and the unequal status of sign language and spoken/written language in terms of their accessibility.

Today, the diversity of approaches to communication in the education of deaf students ranges from a strictly monolingual (oralist) to a (sign) bilingual model of deaf education. Variation in the choice of the languages of instruction and educational placement reveals that diverse, and often conflicting, objectives need to be reconciled with the aim of guaranteeing equity of access and educational excellence to a heterogeneous group of learners, with marked differences in terms of their degree of hearing loss, prior educational experiences, linguistic profiles, and additional learning needs. Demographic changes relating to migration and the increasing number of children with cochlear implants add two new dimensions to the heterogeneity of the student population that need to be addressed in the educational domain.

While bilingualism continues to be regarded as a problem by advocates of a monolingual (oral only) education of deaf students, studies into the bimodal bilingual development of deaf learners have shown that sign language does not negatively affect spoken/written language development. Statistical studies documenting links between skills in the two languages and psycholinguistic studies showing that learners temporarily fill gaps in their weaker language by borrowing from their more advanced language further indicate that deaf learners, like their hearing bilingual peers, creatively pool their linguistic resources. Later in their lives, bilingual deaf individuals have been found to benefit from their bilingualism as they constantly move between the deaf and the hearing worlds, code-switching between the languages for stylistic purposes or communicative efficiency.

7. Literature

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