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# Sign Bilingualism in Deaf Education

## From Deaf Schools to Regular School Settings

Gladys Tang

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### Abstract

In recent decades, empirical evidence from sign linguistics research has confirmed the natural language properties of sign languages used by Deaf members of the society. One consequence is to reintroduce sign language into the classroom for the deaf, to rectify the ban on sign language and Deaf teachers during the Milan Congress in 1880. Such a move led to the establishment of *sign bilingualism* in educating deaf and hard-of-hearing (DHH) students in deaf school settings. However, development of this approach constantly faces the challenge of oralism (i.e., the use of oral language with residual hearing only) supported by advanced

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G. Tang (✉)

Centre for Sign Linguistics and Deaf Studies, The Chinese University of Hong Kong, Shatin, NT, Hongkong, People's Republic of China

e-mail: [gtang@cuhk.edu.hk](mailto:gtang@cuhk.edu.hk)

assistive hearing devices until today, regardless of educational settings. This chapter addresses the combined effects of adopting *sign bilingualism* and *co-enrollment* in regular school settings where DHH and hearing students are supported by the collaborative teaching of a hearing teacher and a Deaf teacher in a bimodal bilingual fashion.

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**Keywords**

Coenrollment • Deaf Education • Deaf Teacher • Sign Bilingualism • Sign Language

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## Introduction

Language in raising and educating deaf and hard-of-hearing (DHH) children has consistently been under debate. Oralism supported by assistive hearing technology like hearing aids and cochlear implants basically predominates the field of practice; and due to misconceptions about sign language, manualism (i.e., use of sign language) is ascribed with secondary importance, if not regarded as “the untouchable.” Nowadays, children suffering from severe to profound hearing loss with or without additional disabilities or failing to demonstrate gains in auditory-oral development despite support of assistive hearing devices are channeled into deaf schools, for better individual attention and sometimes with sign language support. This controversy between a pathological or a linguistic view toward raising and educating DHH students persists until today (Marschark and Spencer 2010, 2011; Spencer and Marschark 2010).

In fact, back in the 1960s and 1970s when sign linguistics emerged as a subdiscipline of linguistic study (Klima and Bellugi 1979; Stokoe et al. 1965), deaf schools that endorsed sign language became the cradle for the initial development of *sign bilingualism* (i.e., acquisition of sign language and spoken language literacy), amid the general disappointment with the oralist approach toward educating DHH students during that time. However, when sign language was perceived as the language of the Deaf and used in deaf schools, sign bilingualism seldom surfaced in mainstream education.

Can sign bilingualism partner with advanced hearing technology to support DHH students' education? Newborn hearing screening with prescriptions for hearing aids or cochlear implants seems to suggest that in time individual DHH children will be able to pick up speech in order to venture into the classroom with confidence and success. The reality is that some of these DHH children still lose the windows of opportunities for language acquisition due to ineffective pathological intervention at the initial stage of language acquisition, and, at the same time, lack of access to language through sign language (Humphries et al. 2012).

In this paper, we propose that, given the current support of assistive hearing technology, the modality of communication as involved sign bilingualism as developed in deaf schools can be extended to cover not only sign language and spoken

language literacy but also oral language. Moreover, we argue that there is no physical boundary for practicing sign bilingualism. With modifications, this approach can be established in regular school settings within the general rubrics of inclusive education for the deaf (see Stinson and Antia (1999) for an earlier review of research findings on this approach). Linguistically, sign bilingual mainstream education for the deaf can assume the form of bimodal bilingualism, i.e., acquisition of both a sign language and a spoken language either simultaneously or sequentially, depending on the timing of linguistic exposure to the two languages. To achieve such a goal, sign bilingualism needs to partner with *co-enrollment* in mainstream education, meaning that a critical mass of DHH students be brought into the regular classroom to study with a group of hearing students, usually in the ratio of one DHH student to three or four hearing students (Tang et al. 2014). Over time, both groups of students become bimodal bilingual users of the school community and see each other as partners in the same educational process.

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## Sign Bilingualism and Co-enrollment

### Sign Bilingualism in Deaf Education: In Search for a Linguistic Orientation

As said, *sign bilingualism* was originally associated with educating DHH students in deaf school settings via the use of a sign language to promote spoken language literacy (Hoffmeister 2000; Padden and Ramsey 2000; Wilbur 2000). Traditionally, it stemmed from the concern for developing a linguistic and cultural model of deafness, using the premise that sign language is the first language of the minority Deaf community;<sup>1</sup> hence, an appropriate system had to be devised to legitimize the use of sign language in educating DHH students. Back in the 1980s, sign bilingualism was introduced to the schools for the deaf in the Scandinavian countries, the United States, the United Kingdom, as well as Australia, and has since spread to many countries in Asia (Swanwick et al. 2014; Wu 2008; Woodward and Hoa 2012). Cummins' Linguistic Interdependence Hypothesis (LIH) developed in the 1980s to account for bilingual education in spoken languages also held a great appeal to educators for the deaf who promoted sign bilingualism in deaf education (Cummins 2006). When applied to the deaf learning condition, the LIH stipulates that, given a common underlying proficiency among languages, development of a strong conceptual and linguistic foundation in sign language at an early age facilitates transfer of such knowledge to spoken language, thereby supporting literacy and academic skills development in the long run. In recent years, LIH has been challenged by

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<sup>1</sup>In research on sign language, Deaf with a capital letter D refers to those individuals that use and accept sign language as part of their identity and culture, while deaf with a small letter often refers to those oral deaf people who are brought up in the auditory-oral mode and who may not avail themselves of sign language or interact with members of the Deaf community.

researchers of deaf education particularly on grounds of inadequate sign language input as a first language at home, as 90 % to 95 % of parents are hearing and do not have this linguistic resource as first language to support their DHH child. Clearly, the signing of hearing teachers being second language learners themselves is also a concern (Knors and Marschark 2012). Some also argued that the lack of a written mode for sign language weakens the argument of using this language to support DHH students' literacy development (Mayer and Leigh 2010).

Research on childhood bilingual acquisition in recent years has documented the importance of naturalistic input of a second language through early bilingual education (Paradis et al. 2011). In many countries, implementing bilingual and multilingual programs is the norm rather than the exception. Under those circumstances, children as young as age 2 or 3 begin to acquire an additional language through exposure to it at day care centers and kindergartens, sometimes alongside their first language. Rinaldi et al. (2014) argue that such learning conditions in Italy nurture bimodal bilingualism for young DHH children when parents request sign language for their child in public day care centers and regular elementary schools.

The emergence of bilingual acquisition as an autonomous research paradigm has also created an impact on sign language acquisition research. In recent years, focus has been shifting from a monolingual to a bilingual perspective, to capture the processes that occur in DHH children's bimodal bilingual acquisition (Baker and Van den Bogaerde 2008; Fung and Tang 2016; Lillo-Martin et al. 2012).

While one must caution that there is no straightforward transfer of bilingual theories and practice in the hearing context to the deaf context, insights from such research instill new interpretations on sign bilingualism in deaf education, in particular, how best to gauge the complex acquisition phenomena in the transition from home to school among the many DHH students born to either Deaf or hearing parents. Bimodal bilingualism for DHH or hearing children capitalizes on exposure to early, dual language input to trigger bilingual acquisition. A recent study by Lillo-Martin et al. (2012) demonstrated that the linguistic outputs of hearing bimodal bilinguals (i.e., hearing children born of Deaf parents) were qualitatively different from their monolingual counterparts, although they achieved the desirable acquisition outcomes in the respective target languages. Based on longitudinal and experimental data, they observed bidirectional, crosslinguistic transfer between a sign language and a spoken language (i.e., American Sign Language vs. English and Brazilian Sign Language vs. Brazilian Portuguese). Focusing on crosslinguistic transfer, they assumed that bilinguals have at their disposal two independent but interactive linguistic systems; therefore, bidirectionality of transfer of linguistic elements is a natural acquisition outcome which was mistakenly taken to be linguistic confusion previously. Lillo-Martin et al. (2012) further argue that such processes of language synthesis will persist into adulthood, a characteristic of bimodal bilinguals. To sum up, recent research on bimodal bilingual acquisition further justifies the linguistic benefits of adopting sign bilingualism in deaf education especially at an early age, regardless of hearing status, hearing loss levels, parental backgrounds (i.e., whether Deaf or hearing), or even types of assistive hearing devices.

## Migration of Sign Bilingualism from Deaf School to Regular School Settings

As said, traditional sign bilingualism implemented in deaf school settings emphasized early sign language input as first language to bolster literacy development in spoken language at subsequent stages. Given this theoretical backdrop, it is understandable why oral language training with assistive hearing devices was originally not perceived as equally important to DHH students as sign language. According to Spencer and Marschark (2010), views on the effectiveness of sign bilingualism in promoting literacy development continue to be polarized. In recent years, the pendulum seems to have swung to the oralist end again because advancement in cochlear implantation has demonstrated improvement in speech perception, although outcomes are still diverse. Yet, medical advancement together with the shift to inclusive education has resulted in more and more DHH students receiving education in regular school settings, leading to a reduction of deaf schools and the scale of sign bilingualism being practiced there.

In some countries, sign language manages to enter regular schools as part of the “support services” for isolated DHH students. This service is usually rendered by an external aide, usually an itinerant teacher, a teaching aide, a deaf paraprofessional, or simply an educational interpreter, who visits the classroom at regular intervals. The quality of such service, in particular, the signing skills of the service provider, has been consistently called into question (McKee 2008; Russell 2010; Schick et al. 2006). In other words, sign language in those contexts is only seen as a pedagogical tool for conveying curriculum contents through a third party, rather than a language of social interactions among the core participants – teachers and students. Hence, speech by the regular teacher and hearing students predominates, and sign language is relegated to the interactions between the DHH student and the external aide only. Understandably, such interactions contribute little to the general classroom discourse except for some occasional “mediated” exchanges between the peers or the regular teacher and the DHH student, through the signing external aide. As such, individual DHH students enrolled in a regular setting requesting sign language support are being epitomized as “marginal bilinguals.” Conflicts thus arise sometimes between practicing sign bilingualism to satisfy the linguistic and social needs of DHH students, as against adopting sign language as an ancillary communication mode to support the DHH students’ education in the classroom. With very little chance for participating in classroom discussions and social interactions, the DHH students are rather isolated in the mainstream learning context (Schick et al. 2006).

How feasible is it to incorporate sign bilingualism into the mainstream setting? One crucial ingredient would be the nurturing of a bimodal bilingual environment to encourage direct and spontaneous interactions between the DHH and hearing participants within the school context. This creates opportunities for ample, dual naturalistic input to trigger early bilingual acquisition of not only the DHH but also the hearing students, as well as the hearing regular teachers in the classroom. Under those circumstances, one has to subscribe to the tenets that (a) both the sign and spoken languages in the classroom are equal in linguistic status, (b) DHH

students are equal partners with hearing students in the educational process (i.e., class membership), and (c) the use of assistive hearing technology and speech/language training are given more prominence than what traditional sign bilingualism offered in the past.

Creating a sign bilingual community for both DHH and hearing students to participate fully is easier said than done. The small DHH population (i.e., statistically 1 in 1000 live births is diagnosed as having potential hearing loss) makes it difficult to cluster them in regular settings especially in their neighborhood in order to create an educational context with members that who are bimodal bilinguals (Hermans et al. 2014).

## Co-enrollment

Knoors and Marschark (2012) argue that, for sign bilingual education to be appropriately implemented to benefit DHH students, increasing the size of deaf enrollments in the educational context is one possible solution to resolve the problem of having lonesome “deaf singletons” struggling on their own in the classroom. They further suggest that co-enrollment is a potential direction for future deaf education.

First, co-enrollment changes the ecosystem and mode of communication of a regular classroom through having a critical mass of DHH students who study and mingle with a larger group of hearing students. Second, it promotes partnership between sign language and spoken language in the creation of a bimodal bilingual learning environment, to support DHH students’ inclusive education (Kirchner 1994). It was originated from The TRIPOD Program in California in 1982 and aimed to remove the pitfalls as a result of inclusive education for the deaf. According to Kirchner, co-enrollment embraces a set of pedagogical procedures to safeguard (a) direct communication between the DHH and hearing members in the classroom (i.e., the “no interpreters” approach), (b) equal access to a regular curriculum through team teaching between a regular teacher and a teacher of the deaf in both a sign language and a spoken language, (c) DHH students’ socio-emotional development by creating a peer group of both DHH and hearing students that shares common linguistic resources and flexibility of code choice, and, above all, (d) the opportunities for engaging DHH students in academically challenging tasks. In the Tripod Program, both DHH and hearing students have demonstrated positive gains in social behaviors and academic skills, at least considerably above what is normally expected of DHH students at similar age levels elsewhere, including deaf school settings. The program has also been well received by parents. For the teachers, team teaching enhances professional experiences in supporting students with special needs as well as the learning of an additional language. Clearly, professional training for the regular hearing teachers is required in areas like strategies to tend to DHH students’ needs as well as strategies for teaching collaboratively with a signing Deaf teacher.

More and more co-enrollment programs have been documented worldwide at the turn of the century – a program in Tucson, Arizona (Antia and Metz 2014); the Twin-School Program in the Netherlands (Hermans et al. 2014); a few programs in Italy

(Rinaldi et al. 2014); two in Taiwan (Hsing 2014); one in Japan (Torigoe 2014); four in Madrid, Spain (Pérez Martin et al. 2014); and three in Hong Kong (Tang et al. 2014; Yiu and Tang 2014). All co-enrollment programs nowadays endorse the use of natural sign language as the language of instruction, although use of manually coded spoken language is also reported in some programs. Manually coded spoken language refers to a mode of signing that is based on the grammar of spoken language. It is regarded as artificial signing and not a language in its own right (e.g., Signed English vs. American Sign Language, Signed Chinese vs. Chinese Sign Language, Signed Dutch vs. Sign Language of the Netherlands). In a co-enrollment classroom, dual language input is provided by the regular hearing teacher who teaches in an oral language and a teacher for the deaf who signs. Note that in a co-enrollment classroom, both teachers, Deaf and hearing, are tending to the educational needs of both DHH and hearing students, whichever medium of instruction they adopt. Incorporating a sign language into a regular school setting thus supports both DHH and hearing students to access the same and regular curriculum. For hearing students who start to be immersed in a sign bilingual environment at a young age also means they will become linguistically competent in a sign language, using it to facilitate comprehension of curriculum contents in class, in case obtaining them through the hearing teacher's speech fails (Tang et al. 2015).

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## Empirical Evidence

### Language Performance and Academic Attainment

Since sign bilingualism and co-enrollment in deaf education is a relatively new approach toward educating DHH students, published empirical evidence to evaluate its effectiveness has just begun to emerge, and the results have been quite encouraging, especially in areas like language skills and socio-emotional development (Marschark et al. 2014). Preliminarily, a number of studies have reported positive gains in literacy development in spoken language. Kreimeyer et al. (2000) found that DHH students who had 2–3 years of co-enrollment experiences fared better than those from deaf schools in a reading comprehension test based on the Stanford 9 Achievement Subtest. However, these co-enrolled DHH students still lagged behind their hearing age peers. Similar results were reported by McCain and Antia (2005) in the reading comprehension of five DHH students after 4 years of co-enrollment. Similarly, Hermans et al. (2014) observed a significant growth rate in receptive vocabulary in Dutch with their twelve DHH students in the Twin-School Program, although a gap still existed when compared with the hearing age norms. Initial positive gains in vocabulary knowledge were also found with a group of co-enrolled DHH students studying in four sign bilingual, regular schools in Madrid (Pérez Martin et al. 2014). Eight out of 12 young DHH students tested on the spoken Spanish Child Development Inventory (López-Ornat et al. 2005) had scores above age norms. Also, all older children (i.e., 11 subjects) revealed age-appropriate development based on their vocabulary scores of PPVT-III Peabody (Dunn et al. 2006)

and the Spanish version of K-Bit (Cordero and Calonge 2000). The only difficulty these older children seemed to be facing was their grammatical knowledge of Spanish. In the Asian context, Tang et al. (2014) tested the effect of 5 years of sign bilingualism and coenrollment education on the language development of a group of 20 DHH students, and found a positive correlation in terms of their grammatical development between oral Cantonese, written Chinese which is based on Mandarin grammar, and Hong Kong Sign Language. This result dispels the long-standing misconception that acquiring sign language impedes the development of spoken language of DHH children.

There has been little research on the oral language development of co-enrolled DHH students. In the Madrid program, except for one deaf child, ten DHH students with 0–24 months hearing age at the time of assessment (i.e., after 1 year of co-enrollment) showed auditory development above their hearing age norms. However, the assessment was only based on a parental questionnaire, and objective measurements are necessary in future research.

Turning to sign language skills, the DHH students of the Twin-School Program in the Netherlands were reported to be able to maintain a higher than average level in their development of phonology, vocabulary, and grammar in the Sign Language of the Netherlands, despite the fact that they had switched from a special school (i.e., with more opportunities for sign language exposure) to a co-enrollment setting presumably with less exposure to sign language (Hermans et al. 2014). In the Madrid programs, the researchers measured the sign vocabulary of eight co-enrolled DHH students who were aged between 23 and 42 months and had 15–24 months of exposure to LSE (i.e., Spanish Sign Language). Using an adapted vocabulary test (i.e., CDI for American Sign Language), they found a significant increase in these children's vocabulary size over a span of 12 months. As for grammatical assessment in LSE, these researchers used an adapted test from the British Sign Language Receptive Skills Test and found a significant increase in their receptive signing skills (Woolfe et al. 2010). They ascribed the results to the ample opportunity for sign language input in the sign bilingual and co-enrollment environment, which they failed to obtain at home as most hearing parents were hearing and had very little experience in sign language before.

Not much has been documented regarding the DHH students' academic attainment in a co-enrollment context. The study by Kreimeyer et al. (2000) found no significant differences in the scores of mathematics skills (i.e., problem solving and procedures) between the co-enrolled DHH students and DHH norms (i.e., DHH students of deaf schools). However, in one analysis, although the co-enrolled DHH students performed significantly worse than their hearing age norms after 2 years of co-enrollment, their performance was comparable by the end of the third year. Therefore, it seems that the longer the DHH students undergo co-enrollment education, the better they are able to catch up with their hearing age norms in mathematical skills. Hermans et al. (2014) also reported results of standard assessments in reading comprehension, mathematics, as well as spelling, and found that, on average, the co-enrolled DHH students'



performance was below their hearing classmates. Only a few of them performed better than their hearing peers. They argued that the positive or negative effects of co-enrollment were sometimes difficult to determine due to the small sample size and mobility of the DHH students who switched between the special school for the deaf and the regular school.

## **Social Integration**

Evidence on social integration between DHH and hearing students in co-enrollment programs is generally quite positive. Kluwin (1999), examining the long-term effects of co-enrollment on self-concept, found no differences between DHH and hearing students on aspects such as school status, popularity, satisfaction, happiness, as well as degree of loneliness. The researcher concluded that the socio-emotional advantages brought about by co-enrollment were definitive. Antia and Metz (2014) further confirmed the positive outcomes in terms of peer acceptance and an increase in opportunities for social interactions between the DHH and hearing students. The 17 cochlear implanted children from the Madrid program also showed good socio-emotional development in terms of social competence and general adaptation. According to the researchers, the opportunity to use both sign and spoken languages at an early age increases the frequencies of interactions between the DHH and hearing students over time, thus collectively building a bimodal bilingual community and nurturing class membership. Yiu and Tang (2014) also observed highly positive peer acceptance between the DHH and hearing students, as well as positive self-image among the DHH students in their co-enrollment program in Hong Kong. They attributed it to the inclusion of a Deaf teacher in the classroom daily, serving as a sign language model and a social role model of a facilitator in the educational process not only of the DHH but also hearing students. For the coenrollment program in the Netherlands, Hermans et al. (2014) showed less positive results. They surveyed 16 co-enrolled DHH students and 96 hearing classmates using procedures like peer rating and peer nomination. While DHH students appreciated the company of DHH peers in the classroom, affirming the critical mass proposal of co-enrollment, the ratings between the DHH and the hearing classmates toward each other were significantly less positive. They attributed these results to the tendency of DHH students to cluster as a subgroup, which in turn generated some negative perception by the hearing peers. In their program, the Deaf teacher only visited the co-enrollment school a couple of times a week to teach sign language, while a hearing teacher of the deaf participate in regular classroom teaching during some periods of the timetable. They agreed that it might be more beneficial if Deaf teachers are given a more prominent role in future, to strengthen the DHH students' social position in a co-enrollment classroom. Certainly, giving Deaf teachers a more prominent role than just teaching sign language in school would enhance their status of a collaborative teacher in the co-enrollment classroom.

## Discussion and Conclusion

The empirical evidence for effectiveness of sign bilingualism and co-enrollment in deaf education has been accumulating, largely showing positive gains in vocabulary, grammar, reading comprehension skills, mathematical skills, as well as socio-emotional development. Yet, the perennial concern from educators of the deaf remains that DHH students' performance lags behind their hearing age norms in language, literacy, as well as academic attainment. Clearly, whether or not one should define success in intervention in deaf education only in terms of DHH students reaching hearing age norms in all respects remains a moot point. At least, linguistically, these children are undergoing bilingual rather than monolingual acquisition hence, possibly, the quality of the state of knowledge of their ultimate attainment might be quite different (Baker 2014; Montrul 2008). As far as the current approach is concerned, the crucial ingredients for success seem to depend on whether the DHH and hearing participants, teachers and students alike, become bimodal bilinguals eventually. The constant presence of a Deaf teacher as a member rather than an outsider of a sign bilingual classroom also helps to sustain bimodal bilingual acquisition, as well as to raise Deaf awareness among the participants in the co-enrollment classroom. Yiu and Tang (2014) suggested that the co-teaching practices between the hearing and Deaf teachers in such classrooms eventually entice DHH and hearing students to set up their own expectations about Deaf-hearing collaborative learning. The current approach has revealed that, if given the right ingredients, sign language is no longer confined to the language of the Deaf only, but becomes part of the common linguistic resources for classroom learning and social interactions between the Deaf and the hearing participants. Also, for DHH students, the facility of using speech to communicate in a regular school context also creates a new capacity for them to code switch or code blend when interacting with either hearing or Deaf people in society.

While preliminary results of co-enrollment are quite encouraging, one has to admit that the deaf education context is very complex and the backgrounds of the DHH students are hugely diverse. In many countries additional resources have been channeled into the classroom to support the learning of children with special education needs. In fact, in the co-enrollment context, the resources can be used to hire Deaf teachers, or under specific conditions, hearing teachers who are fluent signers and who appreciate the nature of being Deaf. In this way, the sign bilingualism and coenrollment approach will stand a better chance of success in providing support, not only for DHH but also hearing students. Certainly, more professional training for teachers especially in sign language, deafness, and collaborative teaching is necessary. In terms of research, findings about the effects of sign bilingualism and co-enrollment on educating DHH and hearing students, however encouraging initially, need to be further verified in future.

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## Cross-References

- ▶ [Language Rights and Bilingual Education](#)
- ▶ [Teaching for Transfer in Multilingual School Contexts](#)
- ▶ [Translanguaging in Bilingual Education](#)

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C. Erting, M. Kuntze: [Language Socialization in Deaf Communities](#). In Volume: Language Socialization

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