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Supporting Families and Young Deaf Children With a Bimodal Bilingual Approach

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Introduction

This article reviews research and presents recommendations concerning bimodal bilingualism for families with young deaf and hard of hearing children. Bimodal bilingualism means deaf children and their families have access to a national sign language in addition to other spoken/written languages. National sign languages are one or more of the sign languages that make up the linguistic ecology of a country, including but not limited to British Sign Language (BSL) in the UK and American Sign Language (ASL) in Canada. National sign languages have their own vocabulary, grammar, and social rules of use, and many sign languages are used by deaf communities around the world. As deaf and hearing academics and researchers of sign language and literacy, our work seeks to benefit deaf children and their families by supporting their access to high-quality sign language learning and bilingualism. This work is important because often families with young deaf children face a lack of support, guidance, and resources for bimodal bilingualism (O'Neill & Wilks, 2021; Snoddon & Paul, 2020). However, bimodal bilingualism and enhanced family communication have long-lasting benefits for deaf children's development and wellbeing.

In this article, we briefly discuss the impact of infant hearing screening and early intervention to support deaf children's acquisition of language and literacy. We review research regarding language deprivation and communication neglect, early intervention policies, how to support early bimodal bilingual communication and literacy, and the role of practitioners in guiding families.

Keywords (4-5): Deaf children; bimodal bilingualism; sign language; parents; language deprivation

1. Importance of sign language to support deaf children's development

When deaf children do not have full access to a natural language between the ages of 0 and 3, the critical period for language acquisition, they are unable to achieve age-appropriate language milestones. In the case of sign language, a natural language means a national sign language such as BSL rather than sign-supported English, which may be suggested by some teachers of the deaf. SSE is an invented, sign-based code rather than a natural language like BSL that has evolved through centuries of use by deaf people. Impoverished access to a natural

language during the critical period for language acquisition and development is known as language deprivation (Murray et al., 2019). Language deprivation impacts many other areas of development such as cognition, literacy, socio-emotional wellbeing, and school readiness and achievement (Hall et al., 2017, 2018).

Deaf children can also face barriers to family communication and inclusion. This is also known as communication neglect, or ongoing exclusion from indirect communication in the deaf child's milieu and from the incidental learning that takes place through having access to these exchanges (Kushalnagar et al., 2020). Adverse childhood communication experiences have been shown to directly contribute to deaf children's gaps in world knowledge, social and academic skills, and health literacy as well as to psychological distress and to chronic health conditions (Hall et al., 2017; Kushalnagar et al., 2020). Deaf children are at higher risk of mental health disorders and face heightened vulnerability to abuse in childhood. The National Deaf Children's Society (NDCS, 2020a), a UK-based organisation that represents deaf children and their families, found that 40% of deaf children had issues with mental health, compared with 25% of hearing children. The NDCS (2020a) also reported that deaf children who struggled to communicate with their families were four times more likely to develop mental health issues. In contrast, several UK and US studies found a positive relationship between language fluency in deaf children and cognitive skills; deaf children with good language skills, whether spoken or signed, were also more likely to develop good cognitive and language skills (Botting et al., 2017; Caselli et al., 2021; Marshall et al., 2015; Woolfe et al., 2003).

Despite several studies highlighting the benefits of early acquisition of national sign languages and bimodal bilingualism, this information does not seem to be passed on to families or to practitioners who work with them, even though babies are being identified as deaf very soon after they are born. Newborn hearing screening has been implemented in several countries for decades. However, while the World Health Organization (2021) urges early identification and intervention for infants and young children with hearing loss, there has often been little improvement in terms of developmental outcomes in many deaf and hard of hearing children. For instance, in the UK, the National Deaf Children's Society (2021) reports persistent achievement gaps between deaf and hearing pupils and calls on governments to review how deaf children are supported following identification. This is a strong indicator that many families with deaf children are still receiving insufficient advice about the benefits of sign language and there is a significant lack of resources for supporting children and parents' sign language learning, including access to fluent sign language models. There is limited support for deaf children and their families to learn sign language, and most practitioners focus exclusively on speech development, leaving children at risk for inadequate linguistic input due to lack of exposure to an accessible language. Oftentimes, the decision not to introduce deaf children and their families to national sign languages stems from misconceptions surrounding sign languages and the false idea that learning sign language will have a negative impact on learning spoken languages. However, these conceptions are not empirically supported by research that shows deaf children's acquisition of sign language supports the development of spoken and written language (e.g.,

Davidson et al., 2014; Hall et al., 2019; Hratinski & Wilbur, 2016). To this point, a growing number of deaf parents are opting for their deaf child to have cochlear implants and deaf children in those families are achieving similar spoken language milestones as their hearing peers. In addition, deaf children with cochlear implants in deaf families are outperforming deaf children from hearing families on linguistic milestones in both sign and spoken languages (Caselli et al., 2021; Davidson et al., 2014; Hassanzadeh, 2012). This indicates that raising deaf children bilingually, introducing them to spoken/written and sign language from an early age, is not harmful and in fact confers all of the benefits of bilingualism.

2. Supporting early bimodal bilingual communication

Families with deaf newborns, like other families, communicate naturally by responding to babies' cries, which often indicates that they are hungry, tired, or in need of a cuddle. In the first few weeks of life, babies also begin to smile, as they are imitating their caregivers. Babies are able to imitate a range of facial expressions and hand and body movements from a very young age, as they have a natural inclination to interact with those around them. Babies begin to babble at around six months of age, as they begin to make sense of the language that surrounds them. This includes manual babbling in infants exposed to sign language. Babies exposed to sign languages exhibit identical stages of language acquisition as babies exposed to spoken languages, including the syllabic babbling stage (7-11 months), the first-word stage (11-14 months), and the first two-word stage (16-22 months) (Petitto, 2000).

Consonant-vowel productions	**4-6 months**
Syllabic babbling (repeating the same syllable or handshape)	**7-10 months**
Variegated babbling (repeating varied syllables or handshapes)	**10-12 months**
Jargon babbling (continuous varied syllables or handshapes)	**12 months and beyond**
First word stage	**11-14 months**
Two-word stage	**16-22 months**
Grammatical and vocabulary development beyond the two-word stage	

Petitto (2000); Small & Cripps (2004)

All babies, deaf and hearing, use gesture and pointing to communicate. Gesture has a more restricted range of functions than signed or spoken languages; i.e., signed and spoken

words convey more complex references, syntax, and systematic linguistic structures (Abrahamsen, 2000). Gestures can consist of outstretched arms to indicate that infants want a cuddle, or opening and closing their hands with an outstretched arm to request something. Infants also point to objects and people in their environment to communicate: perhaps to request information from a caregiver, or to say they want to interact with a person or object. The quality and quantity of this parent-child interaction is one of the strongest predictors for later language development (Su & Roberts, 2019). This is true for both deaf and hearing children, regardless of the language used for communication. Professionals should advise families to incorporate as many of those elements mentioned above in their everyday interaction with their deaf children.

In addition to those strategies used in early communication, eye contact is vital for deaf children and those who interact with them. Regardless of how families communicate, deaf infants and children need to look at people's faces to obtain information. Families need to establish good eye contact with their deaf babies. This means using strategies to try and attract their babies' attention: exaggerated facial expressions, waving their hands, moving objects or people into babies' line of sight, etc. Eye contact takes time to develop, but the more families practise and ensure they do not communicate too often without first establishing eye contact, deaf babies will quickly learn that they need to look at people's faces for information.

There are several hearing technologies available for deaf children to enable them to access some spoken language, such as cochlear implants and hearing aids. Severely to profoundly deaf children usually receive cochlear implants at around 14 months of age. Prior to this, they are often fitted with hearing aids from when they are only a few weeks old. However, hearing aids and cochlear implants do not provide deaf children with full access to spoken language or to environmental sounds. Even if children are able to utilise hearing technologies well, it usually takes months or years to learn to make full use of these technologies. It is clear that early communication is vital for later language ability; thus, it is inadvisable to wait until after deaf children are able to make full use of their hearing technologies. During infancy and childhood, families need to be encouraged to use accessible communication tools with their deaf babies and children, including sign language.

3. Sign language and early literacy

We understand that it can seem challenging for families to learn sign language due to a perceived lack of resources; this lack is an outcome of early intervention policies that do not adequately support sign language learning. It can be challenging and expensive for a family with a new baby to attend a sign language class. Fortunately, there are online resources that help make a good start with BSL (NDCS, 2020b; RISE, 2021). Professionals supporting families with deaf children can signpost them to deaf organisations with family activities, online courses, and befriending schemes, or deaf mentor programs, which are often run by deaf organisations and which entail deaf professionals providing home visiting sign language services to families. In some countries, deaf schools may also provide outreach and home visiting services in addition to parent classes. High quality, specialized sign language courses for parents are an essential

resource, and such courses have been developed by researchers in the Netherlands and Canada using the Common European Framework of Reference for Languages as a basis (EDUSIGN, 2021; Oyserman & de Geus, 2021; Snoddon, 2015).

To ensure that deaf children develop good literacy in a written language, they need to be introduced to sign language rhymes, storytelling and print as early as possible. Sign language rhymes, rhythms, and stories support infants and children's familiarity with narrative structure, visual attention and joint attention, and response (Snoddon, 2012). Sign language rhymes and rhythms also support the development of infants' sign language phonological and phonemic awareness, which is argued to support metalinguistic awareness, literacy and reading development (McQuarrie & Abbott, 2013; McQuarrie & Parrila, 2014). Sign language phonology includes handshapes, movement paths of signs, and location as units of signed languages (McQuarrie & Abbott, 2013). Deaf professionals can support families with learning sign language rhymes and stories, and with reading children's books through sign language. For example, parents can hold and rock their infant, pat their head, back, or chest, sign one handshape or BSL word with varying movements, play with signs.

In the first few months of life, families and deaf professionals can use a variety of books for storytelling and to introduce a wide range of concepts. Eye contact and joint attention at this stage is very important. Again, families need to make sure that their deaf babies are looking at them before sharing information, which may mean that the books need to be moved into the babies' line of sight or held up next to the storytellers' face and hands. Caregivers can also produce signs next to the book if babies aren't looking at the face and are more interested in the books. This enables them to begin to make connections between signs and concepts. As babies grow, they will learn joint attention, i.e., to look at the book with the storyteller and then make eye contact to gain information. Stories have specific structures - a beginning, middle and ending - as well as plots, characters and usually an underlying message. Becoming familiar with these structures early will help with school readiness. Children who are familiar with story structure will find it easier to write down stories as soon as they are able. Through stories, children will learn about a range of scenarios, real-life settings, and emotions., all of which will support their literacy as they get older.

Books are also a wonderful opportunity for children to become familiar with print. Babies and children who are familiar with a range of signed vocabulary can be introduced to printed words via picture-word books; e.g., a picture of a ball with the word "ball" underneath. Children and parents can also look together for print words that recur in a book. Linking children's knowledge of signed vocabulary with print words and familiarisation with a range of highly frequent words will greatly support children's literacy development. Print exposure is one of the strongest predictors of successful literacy; thus, families need to expose their babies to print as much as they possibly can, as early as possible.

Families should introduce their deaf babies to the alphabet both in print and fingerspelling. Children in signing families fingerspell before they learn to read and write, and very young children first recognise fingerspelled words as whole units (Padden, 2005). From

about 2 years of age, deaf babies can fingerspell their own names, recognise their own name in print and start to fingerspell other vocabulary items. Fingerspelling is a way to introduce deaf babies to printed words, and several studies show that fingerspelling supports spelling and literacy development in deaf children (Miller et al., 2021). Learning fingerspelling is simple for parents, and it is a crucial early skill which health and education professionals can encourage.

Sign language ebooks are also an excellent resource for families and professionals. For example, the RISE website offers bimodal bilingual stories and resources, including ebooks and videos, from around the world. Several BSL-English ebooks and videos are available through this site.

4. Role of professionals

Professionals working with deaf children and their families have a large role in preventing language deprivation and ensuring that deaf children go on to develop good language skills. Audiologists, Health Visitors, speech and language therapists, early years practitioners and teachers of deaf children should work closely together. In some areas, including in Canada, the USA, Ireland, and Australia, deaf teachers and professionals are involved in the early years support team providing regular sign language play and teaching for the family and child, as well as advice and support (Gale, 2020). Deaf teachers and service providers can help families link with deaf communities and other families with deaf children, and develop social networks that support children's identity development and well being. These provisions are supported by an international consensus statement regarding best practices in family-centered early intervention (Moeller et al., 2013; Joint Committee on Infant Hearing, 2019). Mitchiner and Batumala (2021) suggest a family language policy and planning framework to support families with a bimodal bilingual approach. This initiative builds on research with other bilingual families to support the maintenance and growth of home, school, and community languages. A family language plan can help with planning when and how families can use signed and spoken language, such as using sign language at mealtimes to ensure deaf children's inclusion in family communication. Health and education early years professionals should support families with deaf children to discuss a family language plan and gain more contact with deaf signers, parent signing courses and online signing resources.

Professionals should monitor early language development in deaf children to make sure that they are achieving age-appropriate language developmental milestones. Professionals need to be aware that language milestones are similar for signed and spoken language acquisition. Children should be producing their first word/sign at 9-12 months, be able to produce 70-80 words at around 18 months and around 500 words/signs by age three (Rowley, 2020; Small, 2004). To track early vocabulary development, families and professionals can use the Communicative Development Inventory (CDI), which is a list of 550 items along with two tick-box columns. The CDI should be filled in by the person who knows the child best and/or communicates with the child best. In one column, caregivers can enter a tick if the child understands a given vocabulary item and in the other, caregivers enter a tick if the child can

produce a given vocabulary item (Woolfe et al., 2010). There are CDI norms for BSL and ASL in addition to other languages. There are also several language development monitoring tools available in English, BSL and ASL that can be used to track deaf children's language development. For example, Success from the Start is used by parents to profile spoken English, BSL, play, and other skills (NDCS, 2020c). If deaf children are not developing age-appropriate language, this often means that the child is not accessing enough language in their environment in order to be able to achieve these age-appropriate language milestones. Many families and professionals make the mistake of thinking that children will catch up, but they rarely do. There is a brief time window for all children to acquire language, and this critical period also applies to sign languages. Delayed access to language has serious and long-term consequences.

The recent National Health Service Lothian paediatric audiology report found poor assessment practices and faulty diagnoses affecting at least 155 families with deaf children in the Edinburgh region (British Academy of Audiology, 2021). No alternative input of early BSL teaching for families existed in these local authorities, leaving many deaf children with serious language deprivation and delay. Reliance on good systems in audiology, such as the 1-2-3 month guidelines for newborn screening, diagnosis and support for families, is important, but not sufficient (Joint Committee on Infant Hearing, 2019). To minimize the risk of language deprivation, support for families should include tuition in BSL and support from professionals fluent in sign language.

Summary

Although there have been significant advances in hearing technology and the provision of early intervention, little progress has been made in terms of more deaf children reaching developmental and language milestones (Clark et al., 2020). We argue this lack of progress is due largely to insufficient advice and resources for supporting children's and families' bimodal bilingualism. Gaps in practitioner knowledge and in sign language resources for families are not natural but created by the predominance of speech-only interventions and the failure of policymakers to translate research showing the benefits of bimodal bilingualism into practice. As researchers and educators, we urge greater awareness of the importance of sign language to supporting deaf children's development and the incorporation of early sign language and literacy practices in early intervention and family communication. Professionals can play an instrumental role in ensuring deaf children have access to signed in addition to spoken language from infancy. This will help us to collectively imagine a good future for deaf children.

Practice Pointers:

1. If you are a health visitor, midwife, speech and language therapist or early years practitioner, investigate the resources available in your area for parents wanting to learn BSL. Talk to families about the advantages of bimodal bilingualism.

2. Joint work in early years teams is crucial for successful language outcomes for deaf children. Advocate that deaf professionals and fluent sign language users should be part of this team so as to reduce the risks of language deprivation in deaf children.

3. Talk to families about the importance of early gesture, establishing joint reference, learning basic BSL early, fingerspelling, interpreters on children's programmes and subtitles always being on TV, and the risks of language deprivation. Support the family to make a family language plan and signpost resources about bimodal bilingualism.

4. Learn a sign language yourself. We recommend online or local courses and building friendships with deaf signers to understand more about the unique cultural perspective offered by deaf communities.

5. Ensure that parents and caregivers have met with deaf adults and linked with deaf communities in their area. Parents and caregivers may be able to hire a deaf babysitter to provide child care and language access.

6. Ensure that parents and caregivers have access to BSL classes.

7. Help parents and caregivers to locate online BSL resources such as ebooks and videos found on the RISE website (https://riseebooks.wixsite.com/access).

8. Support parents and caregivers with attending deaf community events, such as those offered through the National Deaf Children's Society (https://www.ndcs.org.uk/our-services/our-events/events-for-children-and-young-people/).

9. Ensure families are aware of captions and subtitles for television, flashing lights for doorbells, and visual fire alarms.

10. Help children meet with other deaf children.

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