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## Multilingual and multimodal methods to examining the situated communication among deaf children and their caregivers

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### ABSTRACT

This paper discusses methodologies for examining the multilingual language experiences of young deaf children that are sensitive to different cultural contexts of childhood, caregiving and language practices. We argue that in the context of early support, the combined use of situated multilingual and multimodal approaches to examine and assess individual language resources can provide rich and reliable information about individual communicative repertoires in their given context. This approach extends commonly used monolingual and unimodal research and assessment tools that lack the inclusivity of reach and granularity of analysis needed to inform contextually appropriate early intervention for multilingual and migrant deaf learners. We illustrate the potential of these methods using case study examples from multimodal video-based and ethnographic data gathering and analysis techniques deployed across three projects in different multilingual contexts, in Ghana and the UK. We use these case studies to examine the methodological choices, challenges and opportunities of researching different multilingual environments in culturally sensitive ways as a basis for supporting and assessing the language and communication development of young deaf children in multilingual and migrant contexts. We discuss how the resulting new knowledge base can extend Euro-Western epistemologies that are currently leading models of early intervention and support.

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Multilingual multimodal approach; deaf children; language and communication development; linguistic ethnography; multimodal analysis; context-sensitive methodology

## Introduction

This paper proposes ways of examining and describing the multilingual repertoires and language practices of deaf migrant and multilingual children and their families. We focus on early language and communication development and examine approaches that are sensitive to the diversity of multilingual contexts and different ways of communicating in those environments. This work builds on established research that has explored ways in which multilingual deaf children and adults harness their multilingual resources in meaning making activities (Mahon 2009), and use multimodal (Adami and Swanwick 2019), and translanguaging strategies (Kusters, De Meulder, and Napier 2021). As interest in deaf children's language experience has increased in international multilingual

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research (see for example Ortega 2020), so have the questions around what it means to grow up as a deaf child in different multilingual global contexts.

This paper examines ways in which we might extend the knowledge base surrounding multilingualism in the context of young deaf children and their caregivers to include underrepresented and marginalised sociocultural contexts and minorities (Crowe and Guiberson 2021; Szarkowski et al. 2024). We ask what kinds of methodologies have the potential to provide insights that will extend this knowledge base. We use a case study approach to respond to this question.

The goal of extending the knowledge base implies, first, broadening our understanding of the multilingual lives and language practices of deaf children in a way that fully accounts for the sociohistorical, cultural, and economic context of child and family. This entails collecting information about the diverse eco-cultural influences on language repertoire and communicative practices and the relations of power and agency embodied within these, as discussed in Moraru (2020) and Salö (2018). Knowing more about, and understanding, the social context of language use shines a light on the influence of contexts on the multilingual choices and behaviours of communities and individuals.

Second, we identify the need to know more about the different societal contexts where multiple spoken local languages identify and cohere communities. Families of deaf children have to navigate the flexible languaging that exists in these contexts, sometimes in ways that compromise the communication needs of their deaf child. Opoku et al. (2020) provide one of the few accounts of parental experience beyond the Western world that explains and contextualises these issues.

In contexts with a colonial history, it is important to understand how official (such as English, French or Portuguese in Africa) and local languages co-exist, especially in the educational context where some languages are valorised above others, potentially impacting on language choices and practices in the home (Ndiribe and Aboh 2022). For families of deaf children, who are for example enrolled in a school for the deaf, there may well be a dissonance between the language world of the home, where local languages are in use, and the language world of the school where an official language and a sign language (SL) are in use.

The varying extent to which SLs are accepted and promoted in different societies is a further consideration for understanding the multilingual contexts of deaf children's lives. The knowledge base needs to encompass more than one cultural view of deafness (Friedner 2018). Whilst being deaf and using SL is a celebrated aspect of inclusive societies (see, for example, constructs of Deaf gain in Bauman and Murray 2014), in certain contexts, the disclosure of childhood deafness is problematic for families and caregivers. Negative cultural beliefs around deafness and the use of SL can lead to discrimination and stigma, particularly (but not exclusively) in low-resourced contexts (Andrade and Ross 2005; Olusanya 2000; Stephens, Stephens, and Eisenhart-Rothe 2000; Swanepoel, Hugo, and Louw 2005). The use of SL in such contexts is not likely to be widely promoted and supported with families and communities. Constructs of bilingualism and bilingual education for deaf children are not therefore a societal expectation.

Inclusive multilingual research also needs to embrace the different languaging practices of families in different contexts that are embedded in cultural approaches to parenting. The different global contexts for early development comprise diverse cultural traditions and lifestyles, family structures, and caregiving practices. The economic, geopolitical, and social environment and resources shape the different ways in which children are cared for and educated in formal and informal settings. Equally, caregiving practices are embedded within cultural and societal values, beliefs, and traditions. In the context of deaf children language research and intervention, support often centres on nuclear family structures and patterns of caregiving that are informed by Western understandings of attachment (see, for example, Lucas 2019). These approaches may not align with family and community parenting practices in rural, subsistence communities where interaction may centre less on exclusive and affective caregiver-child communication and more on talk alongside daily activities and a collective input from all caregivers (Morelli, Rogoff, and Angelillo 2003).

We seek to respond to some of these gaps in the research by testing methodological approaches to researching multilingualism that: acknowledge the particular context of early child development; are cognisant of caregiving practices, cultural understandings of deafness and SL communication;

are sufficiently sensitive to local languaging and communication practices; and that recognise the proximal and external resources around children, their caregivers and communities.

To extend the knowledge base around deaf children's multilingual lives in this way is, thus, a decolonising project that involves repositioning our perspectives (Meekosha 2011; Singal and Muthukrishna 2014). This requires a critical look at the questions that we ask, interrogates the underlying assumptions of these questions, scrutinises the methodologies that we deploy and the ethical dimension of these approaches (McMahon and Milligan 2021).

The ethical dimension entails a responsibility to inspect first assumptions to avoid the propagation of research and development work that is wasteful, potentially harmful to participants, and eventually ineffective. To support this endeavour, we propose a set of guiding questions to frame this critical review that we then use to 'walk through' the methodologies of three case studies of different multilingual environments.

### ***Researcher drivers and assumptions***

To develop a context-sensitive methodology it is important to acknowledge the provenance and assumptions of the science underpinning the research or intervention (Robinson-Pant and Singal 2013). In the case of multilingual research with deaf children and families we might ask to what extent the research concept and questions are pertinent to, and informed by, an understanding of different deaf childhoods and caregiver experiences of multilingualism in the given context. Involving stakeholders at these very early stages of a research project helps to ensure the appropriateness and relevance of the questions.

### ***Research context (multilingual and multicultural context)***

A detailed situational analysis is a crucial starting point for any research that centres on people and their behaviours and experiences. In the case of multilingualism and deafness research, an understanding of the wider societal language environment provides a framework for examining and understanding the ways in which children and adults are differently exposed to, and use language, in their daily lives. This important descriptive detail informs the essential social, geo-political, historical and resource context.

### ***Who is conducting the research? (team, roles, partnerships)***

It is important to know who the research team are and understand the agency of all the partners involved, including the participants. Researching across cultural contexts, for example, can create or exacerbate inequalities where the leadership and knowledge base is presumed to be non-contested and the knowledge flow assumed to be North → South. When researching in the multilingual space, we are especially mindful of criticisms of early colonial models of comparative and anthropological research that traditionally involved collecting and taking away data without the involvement of local experts 'at the expense of deep local knowledge' (Bloemraad 2013, 31).

A question that we might ask is if the team has the cultural competence to sufficiently understand and respect the beliefs, languages, and practices of the families and practitioners that they are working with. This assumes 'an examination of one's own cultural beliefs and values, an understanding of how to respond respectfully to cultural differences, and the ability to provide appropriate intervention and support for families from multicultural backgrounds' (Bowen 2016, 38).

### ***What is the methodology?***

The way in which we construct our methodology, and according to what principles, is crucial in the context of deaf multilingual research because this research sits at an intersection of language

development, multilingual/multicultural deaf studies and educational research – connected yet so specific that bespoke methodologies are needed. A rationale is needed for why, for example, an ethnographic, linguistic, multimodal, social constructivist approach has been taken and why this approach is appropriate for the particular context and the questions. The importance of relevance is germane to all the methodological decisions.

### ***Who is being researched?***

In bilingual research with deaf children and families it is important to be very specific about who the research participants are, why they have been selected, and how they have been involved as participants. Much of the language development research in our field centres on interaction between children and their parents with a particular focus on mother–child dyads in the home setting around play activities (Curtin et al. 2021). If we are going to be inclusive of a diverse range of multilingual contexts, especially those where parenting is construed as a more collective endeavour, or where deaf children spend their school lives away from home, we need to be mindful of who we are including in a sample of caregivers. Developing this rich research field is also contingent on researchers to involve participants with diverse experiences of multilingualism including marginalised groups (such as Roma, refugee, migrant communities), speakers of low status languages, and those who do not reside in economically rich and Westernised contexts (Cannon and Marx 2024; Collyer 2018), and who are less visible in the research literature.

### ***How is the data gathered?***

Research with multilingual deaf children and families has hitherto deployed mainly introspective, subjective methods such as questionnaires and interviews with caregivers, educators and support personnel, or relied on language assessment protocols. In the use of such instruments, it is important to query their relevance and validity and the extent to which the protocols are accessible to participants in linguistic terms (who may not speak, sign or read the language in which research is conducted), and culturally appropriate. Standardised assessments also need to be scrutinised for the linguistic issues of accessibility and potential cultural biases of their content (Pizzo and Chilvers 2019). Data collection and the use of assessment tools should ideally be carried out by researchers with expertise in the languages in play. Sometimes the use of interviews and questionnaires falls short of providing insights into how languages are used in different multilingual contexts and what kinds of communicative strategies multilingual interlocutors deploy. Different kinds of data gathering are needed to further these insights, including video-based data collection that can capture communicative behaviours such as multimodal strategies that support interaction in the context of communication asymmetries (Adami and Swanwick 2019). None of these data gathering decisions can be made without a good understanding of cultural and language biographies of the target group or individuals (Crowe and Guiberson 2022) and the sociocultural contexts for language use (Baker and Scott 2016).

### ***How is data analysed?***

The openness needed in the design of data collection methods for deaf multilingualism needs to be reflected in the design of analysis strategies and techniques. The analysis of practitioners and self-reports and questionnaires can provide some insights into ways in which multiple languages are used for communication in daily life. However, to gain a deeper understanding of individual and intrafamilial multilingual and bimodal repertoires requires a deeper analysis of interaction that considers not only languages in use but also multimodal or embodied communication strategies (Kusters and De Meulder 2019). Combining video analysis with practitioner and self-reported evaluation can go some way to revealing the complexity of multilingual practices and the diverse

communicative repertoires of children and their families. Analysing family perspectives, including those of children and young people, is an important part of building this picture that will enable us to understand different patterns of language socialisation across different multilingual societies and the complexity of individual heteroglossic life worlds.

### ***Potential impact of the methodological choices***

In the context of this research, we are seeking to better understand the multilingual context of deaf children's lives in order to design appropriate early intervention and support for families. The impact of the work, thus, needs to be centred on the support that families will receive as a result of the new knowledge. It is important to ask what effective intervention should look like in any given context (Bizzego et al. 2020). For instance, a language intervention that is conceptualised according to understandings of multilingualism in well-resourced and industrialised settings where education and empowerment are features of the support context is unlikely to be a good fit for rural and subsistence-based environments where economic stability, mobility and access to information are precarious (Morelli et al. 2018).

### **Case studies**

Three case studies have been selected to extrapolate these guiding principles. In each of the studies the authors (Fobi and Asomaning, Casellato, and Czeke) illustrate different context-sensitive approaches to investigating communication and language in families with deaf children in different settings, i.e. Ghana and the United Kingdom. The studies have been selected because they bring contextual issues to the fore that are hitherto underrepresented in the literature.

The overarching aim of the studies is to respect the situated nature of communication by ensuring that the communicative context is captured alongside individual strategies and language trajectories. The study methodologies cohere around the analytical framework of linguistic ethnography as an approach characterised by an openness to understanding the social context of language experience and use and a desire to analyse the linguistics therein. Emerson, Fretz, and Shaw (2011) describe this as a simultaneous process of 'opening up' and 'tying down'.

Individually, each study showcases a different approach to collecting and analysing data on the communication and language experience of migrant and multilingual families and the different ways in which they deploy their semiotic resources. 'Opening up' perspectives on children's multilingual experience are demonstrated in the approaches described by Casellato, Fobi and Asomaning that involve interviews with caregivers and children and observational techniques. Of interest is the extent and dynamic nature of individual practices and the different ways in which communication practices are influenced by personal characteristics and abilities, motivations, and identities as well as social and cultural contexts. 'Tying down' involves a closer examination of what is happening in terms of communication and interaction among deaf and hearing interlocutors. Approaches to data collected from the observations of playful interactions, as described by Czeke, can provide this depth of analysis.

### **Case study 1: communication approaches for supporting young deaf and hard of hearing children and their caregivers in Ghana**

#### ***Research drivers and assumption***

The overarching aim of our study in Ghana was to build a deeper understanding of the social-cultural and resource dynamics surrounding the developmental precarities of childhood deafness to support early education programming. In Ghana, access to early care and intervention for deaf children cannot be assumed, as most of the children face significant barriers to receiving early care and support in their language and communication development (Swanwick et al. 2022). Our research highlighted the

critical drivers that centre on reducing developmental precarity and enhancing the available resources and support systems in developing the language and communication of deaf children, especially in contexts where there are communication asymmetries between them and their caregivers. By addressing these challenges, we aimed to create a more inclusive environment where deaf children can thrive. Ultimately, our goal is to ensure that deaf children in Ghana have the same opportunities for early education and developmental success in their language and communication as their hearing peers.

### **Research context**

This study takes place within the multilingual and multicultural context of Ghana where 73 indigenous and eight non-indigenous (including English, Hausa, and Arabic) languages are in use and where there are many different ethnic groups. Ghanaian Sign language (GhSL) is recognised as the main SL in Ghana among rural and urban deaf communities although it is not officially recognised as one of the languages of Ghana.

Within this context the study was conducted in three settings in Ghana, including two schools for the deaf and a family home. The first of these, is a school for deaf children and young people in Jamasi in the Ashanti Region. The school has a population of approximately 600 students and provides kindergarten through to vocational training (Awuku 2023). The primary medium of instruction is GhSL and the other language used is English. The second location is a school for the deaf in Mampong, Akuapem in the Eastern Region, that serves around 530 students (Oppong and Fobi 2019). The main medium of instruction is GhSL. English is also used in the school alongside the local language of Akuapem Twi. The third study site was a home in Bekwai in the Ashanti Region, consisting of a grandmother, three sisters, and a deaf boy. Communication within the household relied on Asante Twi and natural gestures.

We chose to conduct the study in these three settings to develop as rich a picture as possible of communication practices among deaf children and their caregivers and to facilitate an understanding of the ways in which different environments might impact on communication strategies used by caregivers. The schools for the deaf provide structured environments with formal communication strategies whereas the home setting represents a more informal, personalised communication context. We anticipated that communication in schools was more likely to include a combination of SL, visual aids, and the use of technology, in contrast to a home setting where caregivers rely more on personalised, intuitive methods tailored to the child's needs. Our aim was to identify a breadth of communication strategies that might be adapted or integrated across different environments to enhance communication with deaf children.

### **Who is conducting the research?**

The research team comprised local and external deaf education professionals with diverse linguistic and cultural backgrounds. The lead British researcher was responsible for the overall management and academic direction of the project work. The lead Ghanaian researcher, who is deaf and multilingual himself, conceptualised and designed the case study analysis work in context as part of his thesis. Local field researchers, including deaf and hearing deaf education practitioners conducted on-site observations and interviews and videotaped communication episodes among caregivers and the deaf children. The local teams also facilitated community liaison, and collaboration with the school administrations and the family, thereby ensuring smooth interactions and the effective sharing of information between all parties involved.

### **What is the methodology?**

A phenomenological research approach was taken to gain a deep understanding of the lived experiences of hearing caregivers and deaf children and their communication practices. This approach

was chosen to enable the local research team, who are primarily deaf educators working in universities and schools for the deaf, to set aside their own biases and preconceptions. The lead Ghanaian researcher, who is deaf and communicates using speech, GhSL, and gestures, sought to enter the participants' lifeworld to gain a deeper understanding of their experiences and perspectives on the one hand and to avoid their own life experiences as a deaf person colouring the interpretation of the data on the other hand.

### ***Who is being researched?***

The study focused on a total of 12 participants, comprising three distinct groups: housemothers (3), deaf children (6), and family members (3). The term 'housemother' describes female individuals employed as caregivers in schools for the deaf. Housemothers were involved in the study in their role as designated caregivers in the school for the deaf. The group of deaf children aged between 4 and 12 years consisted of six learners with varying degrees of hearing loss. The family group comprised three immediate family members who interacted closely with the deaf children.

### ***How is the data gathered?***

Data for the study were gathered in two phases. In the first phase, researcher-induced video data was collected by videotaping communicative interactions between housemothers and deaf learners in the schools for the deaf. These videos were created in natural settings, meaning the situations and contexts were created by the participants themselves.

To ensure natural communicative interactions, two teachers in the schools were employed as field researchers under the supervision and support of the lead researcher. They recorded the videos using their smart mobile phones. These videos captured gestures, facial expressions, and communication strategies. For the deaf boy and his family in Bekwai, videos were recorded as they engaged in their routine household chores (cooking, washing, cleaning). In addition, demographic information about the housemothers and deaf children was elicited via semi-structured interviews. This demographic data was crucial for establishing the context for each video.

### ***How is data analysed?***

Sections of the video interactions that involved reciprocal and shared-focus communication among the children were identified for fine-grained analysis. These included moments of joint attention, for example, around searching for shoes and clothes, washing clothes, washing dishes, and supper preparation.

A multimodal analysis of each interactional video was carried out using Knoblauch and Tuma's (2011) process, which involved four main stages: selection of relevant fields or situations, coding, internal sampling of data, and fine-grained analysis. This entailed a detailed analysis of turns of action, gestures, body positions, movements, facial expressions, and emotions, resulting in detailed transcripts and emergent themes and sub-themes.

A three-phase visual transcription method was employed, including a video still of interaction instances, a sketch with symbols to illustrate gestures and actions, and a narrative description. This method allowed for the identification of non-verbal elements of the interaction, such as body positioning, gestures, and facial expressions, while also editing out distractions to focus on the interaction's relevant features (Ramey et al. 2016). This recursive visual transcription supported a comprehensive understanding of the interactions and facilitated the analysis process.

### ***Potential impact of these methodological choices***

The locational aspect of the methodology promoted collaborative efforts between schools and families and provided opportunities to share communication strategies and practices across these



contexts. This collaboration has the potential to facilitate consistent and supportive communication for deaf children, across school and home settings, ultimately enhancing their overall development and well-being.

The multimodal analysis of video data, including fine-grained analysis of gestures, facial expressions, and body language, provides a holistic view of the communication process. This detailed examination helps to uncover subtle aspects of non-verbal communication that are critical in interactions with deaf children. It also ensures that the study captures the complexity of communication beyond spoken or signed language, which is essential for developing effective communication strategies.

That said, the time-intensive nature of multimodal video analysis can be a hindrance to dynamic feedback and the quick dissemination of findings and thus reduce the responsiveness of research to emerging issues or changes in the research context.

## **Case study 2: language and communication acquisition in deaf children with CI from multilingual and multicultural families**

### ***Researcher drivers and assumptions***

Case study 2 was designed to investigate the context for multiple language acquisition in deaf children with cochlear implants (CIs) who grow up in multilingual and multicultural families in the Bradford area in the UK. The researcher aimed to explore how these children and their families navigate the experience of growing up – or caring for – a deaf child in such contexts, and to identify factors influencing the child's language development. Additionally, the study aimed to verify whether the collected data could corroborate the results of language assessments carried out in the clinic before the observation.

### ***Research context***

The city of Bradford presents a unique public health case due to its high incidence of congenital diseases, particularly deafness. A 2010 study (Ardle and Bitner-Glindzicz 2010) reported that childhood deafness in Bradford is about 1 in 1000 live births, doubling by age 9, with some areas experiencing even higher rates. Around 40% of deaf children have additional health or developmental problems. This trend is linked to the high presence of Southeast Asian residents, particularly the British Pakistani community, where consanguinity and genetic factors significantly contribute to congenital diseases (Born in Bradford 2022; Corry 2002). Bradford's socio-economic challenges exacerbate the issue. High deprivation levels, limited healthcare access, and low awareness of prenatal care and genetic counselling worsen the situation. In 2020/2021, 33.2% of children under 16 in Bradford lived in absolute low-income families, more than twice the national average (City of Bradford Metropolitan District Council 2023a). Both this study and study 3 were situated in and shaped by this context.

### ***Who is conducting the research?***

The study was based at the University of Leeds and conducted in collaboration with the Yorkshire Auditory Implant Service (YAIS) located within the Bradford Royal Infirmary. The principal investigator is an early-stage researcher affiliated both with the University of Leeds and the Comm4CHILD network, sponsored by the Marie Skłodowska Curie ITN. Comm4CHILD is a consortium implementing an innovative approach for optimising the communicative skills and social inclusion of children with hearing impairment. The researcher is a hearing multilingual female with a background in Neuroscience. The study presented in this paper is her PhD project, conducted under the supervision of two British supervisors. All participants were recruited from the

YAIS caseload, and the collaboration involved professionals from YAIS, such as audiologists, speech and language therapists and teachers of the deaf (ToD) who were familiar with the participants. The team collaborated closely with families to ensure accurate data collection and interpretation.

### ***What is the methodology?***

This study aimed to investigate multiple language acquisition in deaf children with CIs in multilingual and multicultural families in Bradford. The objectives were to explore how these children and their families navigate multilingual contexts and to identify factors influencing language development. A further goal was to verify whether the data collected during the study could corroborate the results of the language assessments carried out in the clinic before our observation.

To avoid an English-only bias, the Student Oral Language Observation Matrix (SOLOM) was used to evaluate proficiency in all languages the children use. SOLOM allows for informal evaluation of language proficiency and has been used to assess multiple languages (McConkey Robbins, Green, and Waltzman 2004). Parents scored home language proficiency, while a familiar ToD scored English proficiency. The Language Background and Use Questionnaire (LBUQ) was created to investigate each family's language practices, considering parental backgrounds, child preferences, social context, and interaction frequencies. This tool was inspired by existing questionnaires but tailored to the study research objectives. CI Logging Data were collected to determine habitual CI use and triangulate it with questionnaire data. We also gathered previous YAIS language assessments (only conducted in English) to observe against our new data.

### ***Who is being researched?***

Four families and six children (two pairs of siblings), aged 4–13, implanted with CIs at least four years prior to the observation, participated in the study. All were part of the YAIS caseload and known to YAIS professionals. Parents, all hearing, were interviewed at YAIS with assistance from their ToD. Parental consent was obtained for the children's participation. The children were informed about the study and involved in responding to questionnaire items related to their language habits and preferences to acknowledge their perspectives.

### ***How is the data gathered?***

Data were gathered through interviews with families, the SOLOM assessments, the LBUQ, and CI Logging Data. All the procedures, except from the collection of CI Loggings, were held at YAIS, after one of the participants' routine visits. Parents were asked to complete the LBUQ together with the researcher, and to score the SOLOM for the home language(s), while the family's ToD of reference scored the SOLOM for English. The family's ToD was also present during the entire procedure. CI Data Loggings and assessment history were collected, after obtaining the parents' consent, with the help of YAIS professionals.

### ***How is data analysed?***

The data analysis, pending completion, will use descriptive statistics and qualitative methods. Quantitative data from SOLOM and CI Logging will be analysed to assess language proficiency and CI use patterns. Descriptive statistics will summarise scores and CI usage to identify potential significant differences. Qualitative data from the LBUQ and family interviews will be thematically analysed to explore language practices, family dynamics, socio-economic factors, and challenges. Triangulating SOLOM scores, CI Logging, and thematic analysis will ultimately provide a comprehensive understanding of the contexts affecting the children's language development. The

qualitative analysis will review LBUQ responses and family comments, coding text with descriptive labels based on the research questions. Identified themes will be refined into a narrative answering the research questions while using quotes and examples to illustrate each theme. It is anticipated that this approach will provide a context-sensitive understanding of language development in deaf children with CIs in multilingual and multicultural families.

### ***Potential impact of these methodological choices***

This study used qualitative methods to provide account of the importance of contextual factors in the language development of deaf children with CI exposed to multiple languages. The chosen methods for this study were designed to provide a nuanced understanding of language development in deaf children with CIs within multilingual and multicultural contexts. By employing a bioecological framework and a qualitative approach, the study mitigated the biases associated with assessing communication abilities solely in English and acknowledged the diverse linguistic environments of the participants, and their influence on language development. SOLOM assessed language proficiency in multiple languages, while CI Data Logging provided insights into CI usage patterns. This combination captured the context of the child's language development. Thematic analysis of responses from the LBUQ and family interviews added contextual insights into participants' experiences. By identifying and exploring emerging themes, the study highlighted the linguistic, familial, and contextual factors shaping language acquisition. These methods address the challenges and opportunities experienced by deaf children with CIs in multilingual families, providing a comprehensive understanding of their language development.

### **Case study 3: multimodal communication in early parent–child interactions to support access to and opportunities for communication in moments of joint attention**

#### ***Researcher drivers and assumptions***

The United Kingdom falls under the category of Western, educated, industrialised, rich and democratic countries that have implemented guidelines for universal newborn hearing screening, which has been shown to significantly decrease the age of diagnosis and intervention for children who are deaf or hard of hearing (Neumann et al. 2022). Prompt detection and appropriate follow-up thereby dramatically enhance children's language development (Yoshinaga-Itano et al. 2018) as they ensure timely and consistent access to communication. This can be achieved through different early intervention approaches that include the use of hearing technology, such as hearing aids and cochlear implants and/or SL – both usually combined with forms of rehabilitative therapy (World Health Organization 2021). Either approach, or a combination of approaches, mitigates the risk of language deprivation during the critical period for language development for deaf children who grow up in predominantly hearing, non-signing family contexts. The needs and preferences of every child and family, however, are diverse and individual trajectories and outcomes of early intervention differ with individual circumstances and, crucially, with early access to and opportunities for communication in joint attention. The latter looks different for deaf and hearing children (Chen et al. 2020) and is initially rooted in the individual's immediate family context, or microsystem (Bronfenbrenner 2005). Early intervention, thus, starts there and is dependent on parent's and care-taker's agency and support.

#### ***Research context (multilingual and multicultural context)***

This case study, like study 2, was conducted at YAIS at Bradford Teaching Hospitals NHS Foundation Trust, UK. YAIS receives families and children with hearing loss from across Yorkshire

and surrounding regions in the Northeast of England. Their multidisciplinary team of surgeons, audiologists, speech and language therapists, advisory teachers of the deaf, clinical scientists, rehabilitation and technical support workers offers early assessments, cochlear implantation, and long-term post-implant rehabilitation for severe to profoundly deaf children and adults. Located in Bradford, YAIS is placed in a multilingual and multicultural context as the city, compared to the rest of England, is home to a uniquely large proportion of people from Pakistani (25%) or, more broadly speaking, 'Asian' or 'Asian/British' (32%) backgrounds in relation to people who identify themselves as 'White (British)' (61%) (City of Bradford Metropolitan District Council 2023b). Different cultural and linguistic backgrounds shape the lived experience of every one child and influence what daily interactions and communication look like in the family home. It is, in fact, the latter that contextualises and affects individual support and early intervention, especially in the form of access to and opportunities for communication in the early months and years of life.

### ***Who is conducting the research?***

The study was led by an early-stage researcher who is affiliated with the University of Leeds and part of the Marie Skłodowska Curie Innovative Training Network Comm4CHILD, which, as described above, is an international and interdisciplinary consortium that is concerned with supporting the communication and social inclusion of children who are deaf and hard of hearing. The researcher is a white hearing female with a background in Linguistics and moved to the UK from Germany for her PhD. Her doctoral research creates the framework for the presented study. Up to the start of the research project, the researcher had been primarily involved in first language acquisition research with young children and families but had no experience in working with children who are deaf or hard of hearing. The study, and specifically the data collection, was conducted in collaboration with the team at YAIS, and first and foremost with the help of the local ToDs. The researcher was in regular contact with the professionals and got to know the work with families both, in person, during several visits at YAIS and through the ongoing collaborative work within the Comm4CHILD network. She applied herself to learning British Sign Language (BSL) during the course of the study and was able to communicate in sign when needed.

### ***What is the methodology?***

The aim of the current study was to support deaf children's access to and opportunities for communication during early parent-child interactions. In a social-constructivist approach, moments of joint attention were examined to identify how individuals with different experiences and resources of communication use a multimodal communicative repertoire in order to accommodate sensory and communicative needs. On the one hand, the social-constructivist approach foregrounds the reciprocal and interactive nature of communication that is observed between parents and children and accounts for the fact that meaning is made in joint engagement. The multimodal perspective, on the other hand, highlights the multimodal nature of communication and captures different communicative resources as they are used and combined depending on the individual context and affordances in order to make meaning (Motamedi et al. 2024). Multimodal communication strategies and communicative behaviour were observed and analysed in video-recorded early parent-child interactions.

### ***Who is being researched?***

A total of eight parent-child dyads (3 female-female, 1 female-male, 2 male-male, 2 male-female) from seven different families<sup>1</sup> participated in a video-recorded play session and a semi-structured interview. All seven families attended the visit and play session at YAIS with two caretakers, mother and father in six cases and mother and grandmother in one case. It was up to the caretakers to

decide who wanted to play with the child. The free choice naturally resulted in equally as many fathers as mothers participating in the play session. Participating children were between 10 and 20 months of age and had been diagnosed at or referred to Y AIS with severe to profound hearing loss. At the time of the play session, children were at different stages in the paediatric assessment pathway, but none of them had received or fully switched on their cochlear implants (yet). The presence or absence of sensory and communication asymmetries was mediated by the parents' hearing and communication modes. Two parents were profoundly deaf and primarily used BSL for communication with their child, while the other six parents were hearing and used English or English and Arabic, both occasionally supported by single signs in BSL.

### ***How is the data gathered?***

For the video-recorded play session, parents were asked to play and interact with their child as they usually would at home. Keeping in mind that play is culturally sensitive and, depending on the home, more or less common, parents could choose a set of toys from a wider age-appropriate selection that fit their personal and cultural approach – playful, instructional or based on a common routine. The following semi-structured interview asked about parents' impression of the play session and, more broadly, inquired about their language background, daily routines, communicative behaviour and typical interactions in the home to contextualise the recorded play session. Information from the child's health record regarding their (and the family's) hearing history provided further context for the observed interaction.

### ***How is data analysed?***

The recorded play session was analysed with ELAN, an annotation tool for audio and video recordings (ELAN 2024) that allowed for systematic multimodal analysis of the parent–child interaction. A coding template with separate, self-defined tiers was used to dissect the observed interaction and highlight the individual communicative repertoire of parents and children. In a first step, the researcher marked and measured the frequency and duration of moments of joint attention between parent and child and subsequently identified multimodal resources of communication – auditory, visual and/or tactile – used in joint engagement. Taking a multimodal rather than a language-driven approach when looking at the interaction, the analysis not only captured the diverse and subtle ways of communication between the individuals but also revealed the synchrony, reciprocity and contingency therein. It drew attention to the individual's communication preferences and needs and illustrated how meaning was co-created in interaction. Changing dynamics in turn-taking further highlighted the agency of both parents and children during the play session.

### ***Potential impact of these methodological choices***

The current systematic multimodal approach to investigating early parent–child interactions in the absence and/or presence of sensory and communication asymmetries highlights individual (multimodal) resources rather than deficits. It enables a rich description of both individual affordances and the communicative repertoire, which is essential to assessing and supporting early language and communication development. This unbiased form of enquiry has the potential to provide the observations needed to inform contextually and individually appropriate early support. More specifically, video-based intervention can be used to 'tie down' the individual's communicative behaviour and needs and, consequently, raise increased awareness of how communicative resources can be used to support access to and opportunities for communication. Rich description replaces prescription that often fails to account for different lived experiences, needs, language and communication practices as well as preferences that are situated in the context of the individual. A comprehensive and evidence-based understanding of how communication for and with every child

looks like with regard to their individual context and affordances, helps to understand and support the individual child's early (language) development.

## Discussion

### *Researcher drivers and assumptions*

The three case studies demonstrate different starting points and assumptions underpinning the research that consider the proximal and distal influences on language and communication choices and practices. In both UK studies (2 and 3) the families' access to early screening and information about their child's deafness can be assumed and so the drivers centre on maximising that support. Access to early support and intervention cannot be assumed in the Ghana study (1), where drivers centre on reducing developmental precarity and enhancing the resources and support in place. A shared language between the caregivers and their child can be assumed in study 3 but needs to be further investigated in study 2 and cannot be assumed in study 1. Querying the research drivers and assumptions is an important first step that can avoid the imposition of an ill-fitting methodology and/or the use of data collection and analysis tools that are not fit for purpose (Szarkowski et al. 2024).

Developing stakeholder groups from the outset of project work is a useful way to ensure that the research questions and assumptions are pertinent to the context. Involving parents, young people, indigenous deaf communities in the early stages of project design goes some way to addressing issues of power, culture, and language as discussed by Valente (2017), and ensures that the 'insider' knowledge influences the project structure and approaches taken (Graham and Horejes 2017).

### *Research context*

A good understanding of the research context is a prerequisite for adopting a critical approach to methodological development. The analysis of the context that introduces each of the case studies demonstrates the complex language and communication realities that the methodological design needs to navigate. The context of study 1 is Ghana, a low-income West African country. In this context, more than 70 spoken languages are used, there is a high prevalence of deafness often associated with poverty and poor health conditions, and negative attitudes towards deafness and SL prevail (Opoku et al. 2020). Reaching families of young deaf children is problematic which is why the decision was to focus primarily on school for the deaf settings.

The research design must also account for the multilingual language practices of the families and the dissonance between the language worlds of home and school. Whilst study 2 and 3 took place in a clinical setting, the cultural and linguistic location of the clinic is very particular in terms of the multilingual and multicultural history of the city. Getting to know the different research environments and learning about the lives of families within these environments is an important part of the process of contextualising the research questions and shaping the methodological choice in each case (Crisfield 2022).

### *Research team*

The makeup of the research team is also a key factor for developing culturally sensitive methods. This can be challenging where, for example, the availability and structure of research funding privileges Euro-Western project leadership (such as for the Ghana project). In such cases, the established equitable research partnerships across cultures and contexts are essential (Bradley 2017). For the Ghana study (1) it is clearly advantageous to have established a local multilingual research team who understand the cultural context and have local language and SL fluency. The studies undertaken in the UK (2 and 3) were part of a large European consortium, Comm4CHILD, and the

onus was therefore on the researchers to work with interpreters, community partners and other experts within the clinical team who had close links and an understanding of the day to day lives and communication practices of the families. The construct of cultural competence has been widely discussed in the context of health professional practice and intervention and is an increasingly important consideration in deaf education research (Hulme et al. 2024; Jacob et al. 2022). The aspect of the research team needs to be a part of the methodological scrutiny, especially where project work involves a range of cultural and linguistic groups in countries where there are minority language users and where SL is differently socialised.

### ***Methodological decisions***

The methodological approaches adopted by each of the case studies can be broadly grouped under the heading of linguistic ethnography (Kusters and Hou 2020), although each study involved the development of bespoke methods to capture the rich communicative landscapes of multilingual families, and the communication strategies between children and adults.

Methodological choices have ethical implications and working across cultures and contexts is challenging in terms of negotiating a universally acceptable research code of ethics, which is enacted in culturally sensitive ways (McMahon and Milligan 2021). It is the responsibility of the project team to establish an appropriate ethical agreement that is cognisant of a context-sensitive design of data collection as well as analysis methods and tools.

The choices made about research participants in each case were informed by the cultural and situational contexts. The participants in studies 2 and 3 were the parents who were bringing their child into the clinic for (post-) cochlear implantation and who were highly motivated to improve their communication and connection with their young deaf children. Working with these dyads who presented at the clinic provided an opportunity to observe communication practices and develop methodological tools that would lead to outcomes ultimately helpful to the parents themselves. Identifying the research participants for case study 1 was more complex, not least because of the issues around reaching young deaf children in a context where early identification is not in place, but also because of more communal attitudes to caregiving that were inclusive of the pastoral care team in the schools for the deaf.

To move towards more global understandings of the multilingual contexts of deaf children's lives requires us to ensure that our participant choice reflects more diverse understandings of child development and parenting and the different ways in which community and family shape childhood experience (LeVine 2004; Super and Harkness 2008).

### ***Data gathering and analysis***

Case study 2 deploys the use of established (SOLOM) and specifically developed parental questionnaires to ascertain a deep understanding of multilingual languages practices in the home and to gather information about the children's experience of language exposure and use. This study underlines the issues surrounding the use of established language assessment protocols that lack the sensitivity needed to capture the different ways in which heritage languages alongside English were being spoken in the home setting, and the ways in which these languages co-exist.

Case studies 1 and 3 adopt a multimodal rather than a language-based approach in order to examine the different ways in which caregivers deploy and coordinate different embodied multimodal resources (including touch, gesture, pointing, movement and eye-gaze) in their interactions with young deaf children. Detailed multimodal analysis of caregiver-child interactions can show how the use of these resources facilitates mutual understanding in the presence of sensory asymmetries (Adami and Swanwick 2019). This knowledge provides an important basis for supporting the development of caregivers' multimodal communication in culturally sensitive ways that build on their established repertoire of strategies.

Both methodological strategies go some way to build a picture of the language resources around the individual young children and the communication strategies in play. These are small scale studies but for a larger investigation, combining these approaches would embrace the communicative and sociolinguistic context and provide more holistic information.

### **Research impact**

In different ways, the methodological approach and choices made in each of the case studies present an opportunity to extend and challenge the existing knowledge base. Each study provides insights into the diverse multilingual realities of the context and the actual language and communication resources of the families. With the goal of early intervention, these insights can usefully inform the design of meaningful intervention and assessment that is contextually appropriate and relevant.

In all three cases, the potential for developing support for professional practices and enhancing caregiver-child communication are evident. The exploitation of the video material collected in studies 1 and 3 has potential for family-centred support (Kelly et al. 2022) and the narratives collected in study 2 provide a depth of insight into families' lived experience that most practitioners do not have the resources or time to gather.

### **Conclusion – a call to action**

In this paper, we have explored the processes involved in developing methodologies for examining the complex language and communication development of young deaf children within multilingual and multicultural contexts. By intertwining multilingual and multimodal approaches, the methodologies discussed provide opportunities to extend traditional monolingual and unimodal paradigms but also enrich our understanding of communicative repertoires in diverse cultural settings.

As a concluding comment, we propose a call to action for researchers in deaf education and studies to continue to develop, disseminate and share the processes involved in developing context-sensitive methodologies that account for the unique sociocultural and linguistic environments of migrant and multilingual families. The richness of knowledge gained by critiquing and extending our processes can then be harnessed to underpin the development of more meaningful assessments and intervention programmes that currently tend to be rooted in Euro-Western epistemologies and fall short of capturing the multifaceted nature of language development in different contexts.

This call to action essentially advocates for a paradigm shift towards decolonising knowledge and assumptions, supporting a more inclusive, comprehensive and evidence-based approach to understanding and supporting the language development of deaf children across different cultures and languages. This shift involves moving from a paradigm of 'learning about' to an orientation to 'learning from' different contexts, acknowledging the uniqueness of each individual's communicative repertoire. It entails the development of equitable research partnerships across cultures and contexts, the development of research capacity beyond well-resourced environments and strategies for sustaining research and development initiatives. Central to this endeavour is an awareness of the ethical considerations involved, including the development of approaches that are respectful, beneficial, and culturally relevant.

As a group of researchers cohering around this special issue of the Journal of Multilingual and Multicultural Development, we are well placed to consider ways of extending our research ambitions and capacity building activities to promote emerging initiatives and scholars in Southern contexts.

We conform to the use of Global North and Global South to denote developed vs. developing countries (<https://worldpopulationreview.com/country-rankings/global-north-countries>). They indicate economic and migratory differences in the wider context of globalisation.



## Note

1. One family switched caretakers halfway through the session; i.e. 8 parents and 7 children participated in the study and formed the 8 parent-child dyads.

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