

Understanding Deafness, Language and Cognitive Development. Essays in honour of Bencie Woll (2020). Ed. Gary Morgan. *Trends in Language Acquisition Research 25*: John Benjamins Publishing.

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Our understanding of 'typical' language and cognitive development has largely been informed by investigating spoken languages used by hearing people, while deaf people's signing practices and contributions to cultural and linguistic diversity have often been marginalised and treated as 'atypical'. Yet signed languages and deaf people provide a unique lens into the study of human communication and cognitive development. The evolution of signed languages diverges from the usual pathways of language acquisition and transmission because most deaf children are born to hearing parents with no experience of deafness or sign. Furthermore, signed languages are not shaped by geographical proximities in the same way as spoken languages. This represents an unusual pattern of language acquisition globally, but very common in sign language contexts, with significant implications for deaf children and signed language transmission across generations.

This volume marks the career and contributions of Professor Bencie Woll, a pioneering scholar in the field of deafness. As Jim Kyle explains in the foreword, Woll's work has resulted in many fruitful collaborations, putting signed languages on the map for studying human cognition and language. Her efforts led to a significant shift in attitudes and an increase in publications on signed languages and deaf people, exemplified by the many scholars whose work, either carried out in collaboration with Woll or inspired by her, is reflected in these ten chapters.

In Chapter 1, Gary Morgan describes perspectives for understanding deaf children's development, with particular attention to their social and educational environment. The comparison between native signers (i.e. those who have experienced early and consistent sign language input) and non-native signers (those who have not) is of interest to researchers because it raises important questions about the impact of delayed language development on cognitive skills. Morgan discusses several factors that in the last few decades have impacted on deaf children's language-learning experience, such as earlier identification through neonatal screening, the availability of digital hearing aids and cochlear implants, and the changing landscape of deaf education. He then raises the question of what education is optimal for deaf children. For example, what education models can balance high-quality education and equitable social inclusion? At what point can parents who are sign novices achieve a sufficient level of early communication and language skills? If children's language development is delayed, brain plasticity, as well as their ability to develop age-appropriate cognitive skills, is severely affected, a topic taken up in subsequent chapters.

Chapter 2, by Margaret Harris and John Clibbens, focuses on early communication in deaf and hearing children, reporting on the similarities and differences between visual and auditory communication. They discuss different strategies employed for effective communication in the visual modality, such as adaptations to dyadic social routines and joint attention. For example, deaf mothers modify the form and proximity of signs and use tactile and/or visual cues to gain attention more than hearing mothers do, illustrating the importance of looking to deaf adults for insight into how best to support deaf children's early development and quality of interaction. A better understanding of visual communication and how strategies employed maximise visual attention and language exposure can help us to

create a rich language-learning environment and to be attuned to a child's specific needs. The chapter ends with a review of possible early interventions, including working with deaf adults, thus reinforcing the significance of deaf lived experiences to the support of deaf children.

In Chapter 3, Anne Baker and Beppie Van den Bogaerde discuss turn-taking in signed mother-child dyadic and triadic interactions, and what happens when signers overlap. Little is known about this phenomenon, such as whether sign turn-taking practices follow a universal system or whether they are influenced by cultural and/or modality variables. Pragmatic rules for interaction must be learned and are achieved through multiple visual strategies. Data come from one deaf signing mother and her two deaf twins, recorded in triadic (i.e. mother-child-child) and dyadic (i.e. mother-child) interactions; the authors describe the different interactional strategies from both types of conversations. Explicit strategies such as hand waving and hand tapping occur more within the triadic interactions, while remaining more implicit (e.g. seeking eye contact or initiating signing prior to checking) in the dyadic interactions.

In Chapter 4, Ros Herman, Nicola Grove, Tobias Haug, Wolfgang Mann and Philip Prinz discuss signed language assessments. Modelling sign language assessments on spoken language assessments has not been possible because of modality and delivery differences. The first standardised assessment was only developed in 1999 (Herman, Holmes & Woll, 1999), which has made it very difficult to measure deaf children's sign language development rigorously. The authors describe a number of methodological challenges to developing sign language assessments, including many failed approaches. Drawing on expertise from the UK, USA and Germany, the authors focus on how static and dynamic assessments can be used for measuring development amongst a diverse group of signers, including deaf and hearing signers, those with intellectual disabilities and adult learners of a signed language.

In Chapter 5, Chloë Marshall, Katherine Rowley, Joanna Atkinson, Tanya Denmark, Joanna Hoskins and Jechil Sieratzki discuss signers with atypical sign language development and what these individuals can teach us about language and cognition more generally. The chapter includes a useful review of developmental research of individual case studies of deaf people with various syndromes, disorders and specific language impairments. Attending to exogenous and endogenous factors that influence sign language development, the authors explore consequences of specific visuospatial developmental learning difficulties on the linguistic system when language is visual and spatial, as well as the way in which sign language impairments are similar to spoken language impairments despite the difference in modality. They also propose that use of a sign language may bring cognitive and social benefits unavailable in spoken languages. The chapter concludes by emphasizing the need to enhance training and supervision of Deaf practitioners so that they can promote a shared understanding of children's language difficulties and provide intervention strategies.

In Chapter 6, Diane Lillo-Martin, Neil Smith and Ianthi Tsimpli discuss how late first-language acquisition of a signed language due to lack of accessible linguistic input from birth should be taken into consideration when discussing age-of-acquisition effects and the critical period for language acquisition. As the authors note, we must bear in mind the changing linguistic environment for deaf children and the rise of technological devices for better sound amplification. Studies in this area can also shed light on how adults learn signed languages and possible linguistic influence from their first language. For example, what can studies of deaf children learning signed language after a certain age tell us about adult signed language learners? Is there a critical period for learning a signed language as a second language? The chapter concludes with a discussion of the unique case of Christopher, a hearing polyglot

savant who has learned many languages in adulthood, including BSL. Christopher's difficulties with visual processing impacted his ability to master spatial constructions in BSL, which demonstrates the important role of visual-spatial abilities for sign language learning.

Chapter 7 discusses Theory of Mind and Executive Functions in deaf children's cognitive and language development. Gary Morgan, Anna Jones and Nicola Botting prioritise language scaffolding rather than auditory scaffolding as key to deaf children's development of socio-emotional functions and structural aspects of language. Poor exposure to language, including being denied access to incidental language learning, can trigger poor development of language-dependent cognitive abilities. The authors propose how access to early interaction and rich linguistic environments can be made more feasible to inexperienced, non-signing hearing parents. They stress that visual and spoken aspects of language need not compete with one another, but if either is neglected, this has huge repercussions for cognitive development.

Chapter 8 extends the discussion on the perception and production of signed languages. Authors Matthew Dye and Robin Thompson discuss the psychological processes and language exposure available to children using a visual-manual modality and the impact this has on child sign language acquisition. As addressed in earlier chapters, there are several modality-specific strategies for learning and using a signed language. These include use of peripheral visual attention, visual and tactile joint attention, eye-gaze tracking and early visual processing. In addition, the child must learn how to look at a signed language, discern what is meaningful and sustain this attention. These issues inspire further questions about how we process, comprehend and study languages. For example, how is visual feedback discerned by signers?

In Chapter 9, Velia Cardin, Ruth Campbell, Mairéad MacSweeney, Emil Holmer, Jerker Rönnerberg and Mary Rudner raise the importance of studying deafness and sign language to understand the unique capacities and adaptability of brain development. The brain is shaped by type and quality of early environmental experience. What does the brain do or look like when language is produced in the visual modality? The authors report on modality-independent mechanisms linked to sign language and working memory, leaving us with a bigger question: what is the functional and behavioral relevance of the neural reorganization observed in deaf people's brains? These observations cannot be explained purely by the absence of auditory input, but also by the acquisition of a visual language.

Finally, in Chapter 10, Gladys Tang, Robert Adam and Karen Simpson review what we currently know about sign language and deafness and how this knowledge can support education of deaf children. The authors provide an overview of sign bilingualism and practices in Europe, Australia and Asia and propose a redefinition of sign bilingualism. Sign bilingualism has been tied with various policies and ideologies about deaf children and signed languages, affecting those who are involved in deaf children's education directly and the quality of sign language input in the classroom. They note the importance of recognizing features of language and cultures of deaf people, their diverse contribution and how the changing linguistic repertoires of deaf children should be explored in relation to their multilingual backgrounds. Their ultimate aim is for this knowledge to be passed on to school communities to improve teaching practices. The authors go on to discuss translanguaging as a pedagogical tool in which diverse linguistic repertoires are applied, and how it can help us to better understand and improve bilingual deaf education. Their proposals for revising sign bilingualism will hopefully support bilingual programmes and practices globally.

The Afterword by Ruth Campbell discusses how this small field on deafness has expanded since Woll's first studies in the 1970s. She concludes that we now know much more about deafness and signed languages, yet we have much more to learn. There is no doubt that involving deaf people directly in research is hugely beneficial. The hope is that disciplines become more accepting and properly value deaf insights into language and communication. For example, spoken language researchers should incorporate insights from research on signed languages, just as the latter already do from the former. Educational and clinical practices can then use this research in applied contexts.

As always, the landscape is changing for deaf people and signed languages. Longstanding ideologies of signed languages and deaf people influence discourse and reinforce prejudices amongst practitioners working in a range of professions (De Meulder, 2018; Humphries et al., 2017). These include theories on how deaf people think, behave, communicate and contribute to society, all of which have shaped policies and research agendas. Only now is the value of deaf epistemologies in understanding childhood deafness starting to be grasped, and how clinical and educational settings can draw from this body of knowledge.

While the volume acknowledges the importance of deaf epistemologies, the overall emphasis is on academic knowledge, rather than on interrogating both scientific and local epistemologies and integrating academic research and community-based practice. This is a shame because Woll herself has a long track-record of doing exactly this. We can all go much further with efforts to understand different deaf intersectionalities, especially relating to ethnicity, sexuality and other aspects of human experience. Individuals follow different trajectories in accordance with their identity, and so different aspects of identities are consistently negotiated in life. The relevance is that language and culture contribute to the shaping of one's identity. If deaf children experience linguistic deprivation and a limited exposure to shared ethnocultural identities, this could affect their intersectional experiences and understanding of identities, which, in turn, impacts further on their language development. However, if we strive for a broader understanding of the complexities of an individual, our understanding of deaf language and cognition can extend beyond the historically myopic representation.

For example, we must attend to the demographics of deaf communities when describing and documenting deaf people and signed languages: who is researched most, and who is not (Costello et. al, 2008) acknowledging that the concept 'native signers' in deaf populations is problematic because signed languages are often learnt later in life. Rather, the concept should be revisited, taking on board other factors, such as when one gains proficiency, when one opts for sign as one's preferred language and even how sign is tied to the development of deaf identity. As deaf people navigate a world that privileges spoken languages, they are increasingly building on diverse linguistic and semiotic repertoires (Kusters et al., 2017). Deaf signers from migrant families often experience bilingual and bicultural dilemmas that are not experienced by those from non-migrant backgrounds and may have their own language barriers in terms of accessing sign language resources. This can influence their language choices and language maintenance for their child, which can impact the development of a positive identity and relationships (Willoughby, 2012).

The contributions in this book collectively make a compelling argument for the importance of early accessible language and the value of signed languages to deaf people as linguistic minorities with unique sensory perspectives. It is written in an accessible way, appealing to academics, students, professionals working with deaf people, and parents of

deaf children. Bringing together language theory, empirical findings and knowledge, it is a fitting testament to the legacy of Professor Bencie Woll.

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