

Holistic brains: neuroscience evidence for approaching to early literacy in multilingual settings

Carole Bloch 7 March 2019

Introduction

It's not surprising that young children have been described as 'linguistic geniuses' (Chukovsky 1963). Parents sense of wonder never ceases as they witness their baby's determined progress from generic sounds and babble to speech, often in more than one language. Such brilliant learning takes place in the informal teaching settings of home and community into which babies are welcomed. They find their voices as they integrate into family language uses and cultural practices. Yet once at school, many bright young children, struggle to learn what's expected of them in terms of new languages and learning to read and write.

“A growing number of children and youth live in multilingual environments and develop complex language repertoires – although often not exactly the ones that are expected by the respective education systems. In many of the systems, monolingual language development is considered as the ‘normal’ prerequisite for learning and can thus be the general basis for teaching. Research shows, however, that multilingualism is not only influential on language acquisition and development, but also on learning in general and should thus be taken into consideration in the organization, contents, and methods of teaching” (Gogolin 2018:3,4).

Thus language medium and learning are inseparable. In South Africa, huge numbers of young children are not taught to read adequately in either African languages or English (Bloch & Alexander 2003, Howie et al 2017). Lack of political will to implement the multilingual language policy (Alexander 2009), with cycles of low-level teaching and expectations of children, lead to poor results. Teaching reading here and globally is dominated by methods emphasizing a hierarchy of easy-to-test skills. Based in a ‘simple’ view of reading, which is supported by some neuroscience, children must become automatic and fluent in phonics (Shaywitz 2003, De Haene 2010) before comprehending. (Ababzi 2017). Ignoring the knowledge and experiences of children (González, N et al 2006), socio-cultural context is taken to be not relevant at this ‘learn to read’ stage. Once children can decode, they will comprehend and ‘read to learn’ (Spaull 2016). Many never do.

More holistic, socio-culturally embedded approaches are meaning-based from the start, supported by evidence from an interdisciplinary body of research (Hornberger 2003, Kenner 2004, Bloch 2006, Goodman et al 2016, Rogoff 1990, Street 1984). The concept of languaging captures a fluid process of use (García 2009) and children translanguage “to strengthen their multilingual identities through flexible pedagogical practices that champion the use of multiple languages to make sense of their experiences” (Creese & Blackledge, 2010). Mechanical aspects like letters, their sound combinations, and spellings, are taught as part of and in service of communication. Prior experience, knowledge of

grammar and of phonics, all help to make sense of text. Children "...are simultaneously developing oral and reading proficiency in both their languages" (Reyes 2012:312) and transfer concepts they know about print between languages Saiegh-Haddad, E. & Geva, E. 2010). A growing body of neuroscience evidence supports such a holistic view of learning, and it is to this I now turn my attention.

Brilliant baby brains

Research suggests that babies use the same learning mechanisms whether they learn one or more languages, without becoming confused (Werker, Byers-Heinlein & Fennell 2009). Monolingual and bilingual babies use auditory and visual cues to discriminate between their languages (Weikum, Vouloumanos, Navarra, Soto-Faraco, Sebastian-Galles et al 2007). If babies have been exposed to two language in the womb, they begin to discriminate between these two languages from birth (Byers-Heinlein, Burns & Werker, 2010). Also, we know that by the time they are a year old, babies are well into a process of being increasingly sensitive to their native speech sounds and less and less sensitive to the sounds of a foreign language (Kuhl, Stevens, Hayashi, Deguchi, Kiritani et al 2006).

Moreover, "...fluent bilinguals show some measure of activation of both languages and some interaction between them at all times, even in contexts that are entirely driven by only one of the languages." (Bialistok et al. 2012: 241).

What information is there about the way that brains function from birth which enables this to happen? Research reveals some evolutionary endowed functions which all human brains share. These operate at great speed without our conscious awareness. I summarize pertinent ones for learning below (for details, see Ellis & Solms 2018, Damasio 2006, Hawkins & Blakeslee 2007, Panksepp 1998).

Firstly, our brains are highly plastic and easily shaped by environmental factors and experience.

The neuronal links which form connections in our brains change all the time in response to the physical, ecological, and social environment, and this is what allows learning. Baby brains start off with vast numbers of connections. As they have experiences, some connections are repeatedly used. These thicken and strengthen and wire together. Other connections which are not needed get pruned, and gradually thin out. This process continues through life, but is most pronounced in the first ten years, as our brains shape during development. New learning is always possible, but in early childhood it happens easily, supporting the fact that enriched environments and opportunities are key for all children, irrespective of background.

Secondly, brains use experience to compare things and situations. Everything new is examined in the light of previous experience and rules of behaviour which have been learned already. These experiences create expectations which are then either met or not. Learning that builds on what

children know already is easier (Bruce 2012). Children who love stories but realise their language isn't in picture books can feel that their language is limited, and experience little desire to learn to read. Children who only experience reading as trying to sound out a text with an inauthentic story line will not expect reading to interest them, while children who have enjoyed treasuries of stories in languages they understand bring both this story language and the anticipation of pleasure to learning.

Thirdly, our brains seek and recognise patterns and make predictions. Our brains continuously filter information, selecting what they need and throwing away masses of data that is irrelevant in the moment. We fill in the information with only partial knowledge because so much happens all the time that it's not possible to use all of the information. Thus brains have evolved to efficiently predict what is likely to happen, searching for, recognising, and classifying patterns. Patterns bring smaller parts together to make meaningful wholes. A word like 'multilingualism' is easier to recognise and remember than a string of letters, such as 'msiltpbordiluft'. A song or rhyme is easy to memorise, and so is a story. We use the pattern of story to organise and make meaning of our lives. All perception proceeds in the same contextual 'holistic' way (seeing, hearing, reading), being based in the same cognitive mechanism, applied in different domains.

When we read in any language our brains use prediction:

“Regardless of the orthography, readers, like listeners, are preoccupied with comprehension. They predict meaning, syntactic structures, and the written language forms which expresses the language. These aspects of reading are universal and create the parameters in which the features of each writing system and language are used.” (Goodman et al 1984: 24).

Fourthly, we are born with a set of primary emotional systems developed over time through evolutionary processes (Panksepp 1998, Ellis & Solms 2018) which strongly influence how we behave. They change activity in our brains, are remembered in our bodies, and guide neurological development. Thinking cannot happen without this emotional guidance; an emotional tag attaches to every memory, influencing and shaping our reactions (Damasio 2006). We have an “emotional predisposition that motivates us to learn a language in order to communicate our needs and desires...” (Ellis & Solms 2018:156).

Three of these emotional systems appear to be fundamental for learning:

The need to belong – Babies bond with their mothers or primary caregivers, and then with others, seeking security and social connection; confidence arises from and connects into this. This bonding initiates communication and language learning with emotional intent and personal use at the centre (Greenspan & Shanker 2009). By implication, rejection or a sense of alienation hinders or damages confidence and the will to learn.

The need to seek and make meaning - From birth, babies are motivated to find out about their world. The reward is intrinsically rooted in the 'doing'. Learning continues in this way if the activities children are involved in are authentic, and not exercises stripped of context.

The need to play – Babies play with sounds, imitating significant adults, soothing and comforting themselves. They move on to pretend-play as story in action (Gussin Paley 1991), with real and imagined scenarios, rehearsing and consolidating experiences, and solving problems. Symbolic play is a precursor to theory of mind and to written language (Vygotsky 1978); pretending to be the doctor or patient, nudges young minds towards others. Pretending that a box represents a car is only a few steps from appreciating how the letters 'Carole' represent me.

Conclusion

How do we put the power of the universal brain functions outlined above to use as we support young children's language and literacy learning in multilingual settings? How our brains function, points to the relevance of using holistic approaches. There are plenty of ways in which to teach skills as part of, rather than separate from authentic learning opportunities. For me, this begins with placing value on both the language and cultural practices inherent in any particular group. Thus, in my work we aim to create settings in which the various languages and their uses are alive. This indicates respect for every child and adult and what they bring into a shared space, including family and community histories, relationships and home narratives. It also creates a purpose for family members who are willing and able to link home and school, becoming reading and writing role models for the children in various languages.

We support all adults who are involved with young children's learning to become curators and tellers of the kind of stories which stimulate curiosity and wonder. We ensure the sharing of plenty of stories and books, wherever possible in the languages represented by the group. The children follow this lead, engaging their own impetus to tell stories and finding their composing voices in the languages they choose to use. As part of an approach we call Storyplay (Bloch 2018), we use storytelling and story acting (Gussin Paley 1991, Cremin et al 2017), whereby adults write down the children's stories, role-modelling how and why we write. Later the children play out one another's stories. This practice generates print, raising the status of the languages in question. It encourages imagination and narrative thinking, placing value on children's self-expression. Adults get to know children's interests and concerns and children appreciate that adults care about them and want to know about them. The regular reading and writing ethos, motivates the children to try and read and write for themselves. We legitimize and respect that as they are involved in learning something new, like the meaning or spelling of words, children will bring 'with them' what they know of the sounds, the look, the structure and the rules from their listening, talking, reading and writing in their languages. We invite

children to use what they already know to communicate, supporting their emergent writing and reading, as we support the oral language mastery of babies and toddlers.

What I have outlined above is not new. But pervasive politically motivated language policy implementation and overuse of ‘tick-box’ skills, hinders and harms children’s motivation and ability to understand and learn effectively. Insisting on reinstating and reinforcing a sense of authenticity and humaneness into early language and literacy education is increasingly urgent today. More of us need to know about and build upon the neuroscientific evidence which supports this sense of urgency.

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