

Learning concepts, language, and literacy in hybrid linguistic codes: The multilingual maze of urban grade 1 classrooms in South Africa

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From the field of developmental psycholinguistics and from conceptual development theory there is evidence that excessive linguistic 'code-switching' in early school education may pose some hazards for the learning of young multilingual children. In this article the author addresses the issue, invoking post-Piagetian and neo-Vygotskian ideas on children's cognitive development and its interplay with language in an argument for a linguistically 'stable' pedagogy that prepares learners for the world of written language in which they have to express most of their learning in school. She argues that language development, literacy learning, and the development of concepts are intertwined phenomena in a child's development and that semantically and semiotically unambiguous and systematic classroom communication is therefore vital for learning success in the early grades when the foundations for cognitive academic language proficiency are laid. She calls for longitudinal research of young children's learning, investigating how language hybrids in classroom communication may impact it. Taking cognisance of linguistics theory that posits language as fluid, she hypothesizes that if language use, in mixed code, is excessive, it may lead to cognitive instability and insecure academic discourse.

Keywords: conceptual development, urban South African classrooms, 'code-switching', academic language insecurity

Introduction: a 'code-switching' conundrum in South African schools

When young, urban children go to school in South Africa the chances that they will enter a monolingual environment are almost none. The chances that they will enter a learning environment that is home to language hybrids such as *Isicamtho* and *Tsotsitaal*,¹ on the other hand, are plentiful. A rich linguistic mix can add to the educational tapestry of the children, bringing texture to what otherwise may have been a less dynamic cultural setting for learning. But too much language diversity in early education may come at a price. Its pragmatic demands may diminish its assumed advantages for learning and communication. The sociopragmatic skills (Myers-Scotton, 2002) that adults use when they mix language codes in single utterances are not yet well developed in young children (Cantone, 2007). Psychologically, they may be underprepared for the demands of language mixing in the learning challenges they face in the first grade. Yet, in local inquiries the psycholinguistics of learning in the early grades remains under-researched, while the social aspects are emphasised in research contexts as varied as San communities in the Northern Cape (Siegruhn, 2002) and in the Tsumkwe area of Namibia (Hays, 2002), and in rural Kwazulu-Natal (Mashiya, 2011).

Contemporary developmental psychologists agree that when young children start using language, their conceptual development is accelerated incrementally with their language development (Carey, 2009; Gopnik, 2003). The question is, however, whether the language hybrids that abound in urban areas can lead young learners to engage with the texts they have to master in the formal version of a language, both receptively and expressively. Most South African researchers of this topic would say that they do (Heugh, 2006; Mati, date unknown). I argue that we need to make sure of this by conducting longitudinal, school-based research in the foundation phase, something that has not yet been done. I argue, also, that we cannot rely on research findings from countries with different languages, different histories, and different sociocultural and political contexts.

To forward this argument, I will examine one of the potential problems of linguistic code-switching in early school education – the intersection of language and conceptual development. In this discussion I will use the term ‘code-switching’, because of its social currency in South African public life, although the operational meaning will include the notion of ‘code-mixing’, as used by Muysken (2000: 1). In this broader meaning of the term his distinction of components of code-mixing/switching will also be included, namely that code-switching can take the form of 1) alternation between a primary and a secondary language; 2) insertion of one language in another, and 3) “congruent lexicalization” of items from different language inventories. It is in the portfolio of the educationist to view language as social practice and as dynamic, but by the same token it is also our brief to investigate the psychology of language as it manifests in learning in the crucial years of early formal education. The article is thus composed from the perspective of developmental psychology, specifically, conceptual development, in which both the semiotics and the semantics of learning are emphasised.

The discussion begins with reference to current research in early childhood conceptual development and how language features in both scaffolding in and naming of children’s early concepts, invoking the work of theorists from the different domains of learning, language, and development (Levinson, 2001; Gopnik, 2003, 2001; Smith, 1993; Slobin, 1997; Carey, 2009; Tomasello, 2004). The argument, along with the hypothesis with which it will conclude, is thus positioned in developmental psycholinguistics and developmental psychology, from a post-Piagetian (Carey, 2009, 1994, 1985) and neo-Vygotskian perspective (Tomasello & Slobin, 2004; Rogoff, 1990). A brief discussion of intrasentential and intraclausal language mixing (Bullock & Toribio, 2007; Milroy & Muysken, 1995; Muysken, 2000), specifically in grade 1, follows. Here the complex new world of semiotic codes that grade 1 learners encounter when they enter school, learning alphabetical literacy codes (Snow, 2010; Snow, Griffin & Burns, 2005) and the codes of mathematics at the same time, is sketched. I thus use the term ‘code’ to include all of these semiotic tool systems.

In this vein I then propose that longitudinal research that captures early school learning in multilingual settings should be conducted in urban South Africa in order to yield reliable data on what happens in early learning when there is a great deal of linguistic, intrasentential mixing/switching. Currently, the literature in this country is divided on what the construct of ‘code-switching’ is, to begin with. From my reading of it, it would seem that most authors regard it as an asset that contributes to additive bilingualism (Heugh, 2006). Assumptions about how good or bad this practice is are, furthermore, confounded by socio-political, ideological positioning in the national drive for recognition of mother-tongue instruction as both cognitive and social asset. There are, however, no studies that have systematically examined foundation-phase education in this way. Authors such as Finlayson, Calteaux and Myers-Scotton (1998), Vorster (2008), and Setati (1998) investigated code-switching, but do not report on how it features during the early years of school. Vorster’s study, for example, is, in my view, about a specific bilingual teaching tool rather than about code-switching.

I argue that there is enough reason for concern about how we view the highly encoded new world of learning in the first grade, when it is coupled with more than one language, or language variant. I make the point that the rubric of codes can become too complex for many young children. In Figure 1 this multiple semiotic system is set out as it would be for children in an assumed ‘monolingual’ context, showing how their world very rapidly becomes a world of written signs and symbols, a veritable semiotic maze.

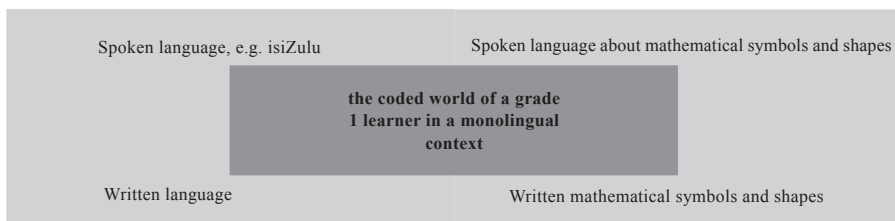


Figure 1: Learning codes in a ‘single’ language

Imagine how the pragmatic competence of a learner has to increase when the variety of languages or language hybrids increases in this maze. Moreover, the different variants signal different types of sentences and with that also differences in syntactic logic, which is a prominent role player in expressed cognition (Bowerman & Choi, 2001; Behrens, 2001). A great deal of research has been conducted on, for example, the way in which concepts of space and number are encoded in different languages (Brown & Levinson, 2009; Saxe, 1982).

Developing language and concepts

Since the 1980s there has been a renewed interest in the role of language in conceptual development and *vice versa* (Max Planck Institute, 1995; Bowerman & Levinson, 2001; Bowerman & Choi, 2001). However, there is a dearth of research on the interface of language and conceptual development in South Africa. Longitudinal research is generally scarce in this country's education scholarship and developmental psycholinguistic work in early formal education even more so. Policies make important statements about language and learning and so does the discourse research on classroom communication in which especially the issues of equity and code-switching are addressed in mostly descriptive studies (see, for example, the work of Setati on her personal website: <http://www.mamokgethi.com>). Yet, when we investigate the most successful school systems in the world, such as those in Finland and South Korea, we have to acknowledge that their early education is to a large extent 'monolingual' (Barber & Mourshed, 2007), even though English is studied as an additional language.

One way of investigating the reciprocal interplay of language and learning, and specifically conceptual development and change, is to do so within a conceptual framework in which the interrelationship of these two developmental spheres is clarified in longitudinal research that can deliver evidence beyond single-case classroom descriptions. This article is a call for action for such research. The results of the recent Annual National Assessments (ANAs) that measure performance in literacy and mathematics paint a bleak picture of learning in the foundation phase (Department of Basic Education, 2011). Arguably, there may be many reasons for this poor performance, but the nature of classroom communication may be one source for concern, especially in the foundation phase, when the building blocks of the language of learning are formed.

I forward an emergent conceptual framework for such research, beginning with views of conceptual development as partly innatist, meaning that young children learn concepts at first by simply being in the world and developing physiologically-neurologically. I believe that this view has some merit (Spelke & Kinzler, 2007), but that it cannot explain the different routes taken by children to reach a certain level of cognitive and linguistic competence in different domains. I would thus argue that there is likely to be some innate domain specificity of early concepts and that young children learn through "bootstrapping" (Carey, 1985, 2009; 519-523) to develop these (embryonic) domains. To this I would add the notion of 'linguistic bootstrapping', meaning that language, once children start their verbal journey, serves not only as representation of the world, but also as a conjoining agent that brings different (specific) conceptual domains together (Gopnik, 2001; Gopnik, 2003; Gopnik & Nazzi, 2003; Gopnik & Meltzoff, 1997). Given health and a secure environment, children stand an equal chance to learn and to use language in this way.

On this view, one can accept that young children thus learn their world from a base that may be partly innate, with both core knowledge structures (Carey, 2009) and domain-specific knowledge learning devices, one of which is language, and partly sociocultural. And they then build their knowledge and their language in reciprocal growth spurts (Gopnik, 2001). By the time they reach school age they know a great deal about their world and they use language to navigate it and to map more semantic categories onto their experience with the help of language as conjoining agent. Most developmental psychologists accept that there are broad 'constructivist' phases of development, but that they cannot be narrowed down to specified stages as proposed by Piaget (1954). As children develop, their *interaction* with their world becomes increasingly important as they learn to represent reality in the signs of language. The more they are able to represent their world through language, the more they are able to navigate and to map, and, therefore, to learn. In grade 1 they learn many such linguistic mapping skills.

Interactionist theorists such as Vygotsky (1992), Bruner (1983), Rogoff (1990) and Tomasello (2004) emphasise this part of language development as partner to conceptual development. Figure 2 of the framework that I suggest to examine children's language, in tandem with conceptual development, shows that there is a continuous balancing interaction between the development of concepts (knowledge of the world) and language (representing the world and 'speech acting' in and upon the world). There is consensus about the peak period in a child's early years when language starts to play a more important role and when it serves as one of the stepping stones with which to "bootstrap" conceptual development. At this time, around three years, children are mostly able to represent their world to some extent in the linguistic code(s) they have learned thus far and in which they are *pragmatically competent*. They can award a sign to time concepts (in early tense structure, as described by Behrens, 2001), to absent objects, to stories, and they also engage in fantasy play, talking to imaginary friends. They 'act' as fairies or horses or little mice, or fly as aeroplanes. And in much of this they can explore their world with the help of linguistic representation. They have learned to theorise their world, and their specific linguistic code(s) help them to do so. In school they learn new forms of representation at a rapid rate.

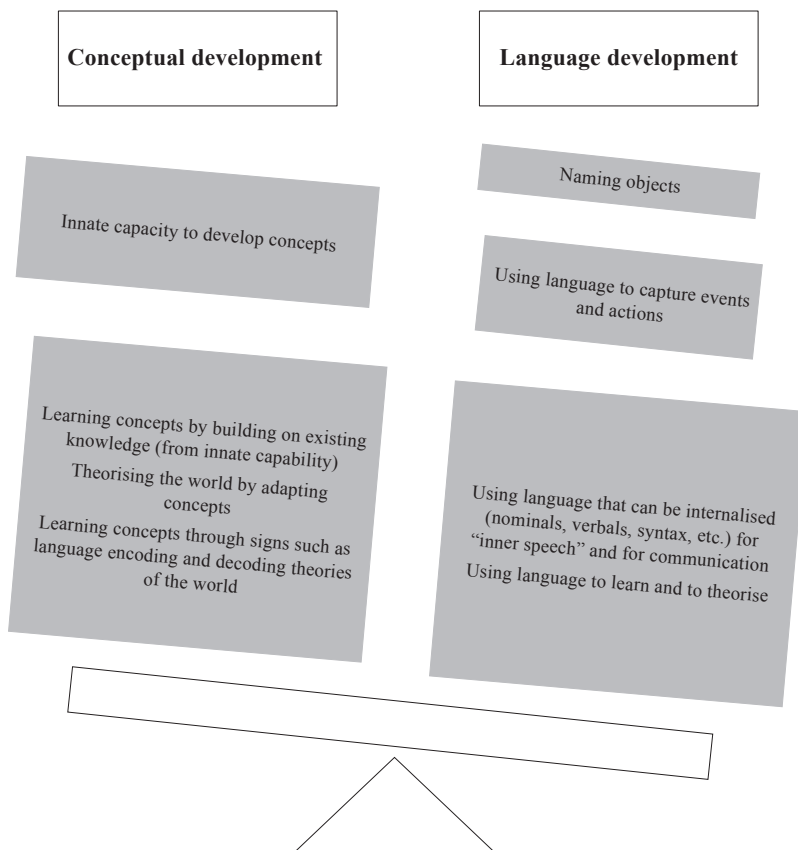


Figure 2: Learning to theorise the world by way of concepts and language: A balancing act

By starting to represent the world linguistically, young children make sense/meaning of the world by developing their own theories and by verbalising them, not unlike scientists theorise the world and share/verbalise their theories (Carey, 1987; Gopnik, 2001, 1988; Gopnik & Choi, 1990). They change their first naïve, folk theories and their methodologies as they learn more, which is why it is enticing to think of

cognitive development as happening in stages, as Piaget did. If a child's one theory is no longer functional, it shifts to another that functions well, or the theory is amended. Upon school entry more language and more theorising are required and the two become increasingly interdependent.

In the literature this view of child theory-building has become somewhat endearingly known as the “theory theory” of child cognitive and language development. Bowerman and Levinson (2001:6) capture a constructivist-innatist-interactionist integration, or the “theory theory” view of conceptual development, to which Gopnik (2009) and other authors also subscribe and in which language manifests as agent:

Indeed, conceptual development is thought of as a series of theory replacements or reconstructions as over-simple theories are replaced with ones more adequate to the data of experience (just as scientific theories are overthrown or revised). Such theory changes appear to be especially dramatic at just the time when language production begins to flourish, and these events may be closely linked, reciprocally feeding each other.

Apart from changing their ideas about their environment as they interact with it and as they use language to do so increasingly, children also change their language, especially as they enter school. In this new environment with its many new cues, children will sometimes ‘change’, or adopt words before they are fully meaningful to them. In a radical Vygotskian view, it is not unlikely that they (and adults) change their knowledge because they have learned a new word (Gopnik, 2001:57). Learning happens either in tandem with word use, or prior to it, or results from it. Socioculturalists/interactionists will argue that the word is the vehicle, or the semiotic mediator of its message (its semantics). Thus, when a new term comes into a young child's discourse, it is adopted and its meaning becomes clear with use in social action. And in school there is much new social action, most of it captured in new language and abstractions. The process of understanding this new world may be rapid, or slow. A grade 1 learner may not fully grasp the meaning of the object word ‘mammal’, but with some, often indiscriminate, use and many examples and scaffolding in the social context, the meaning settles and the category of ‘animals that are mammals’ that behave in a certain way, is established. The process of refining understanding can be messy, and this is one of the problem spaces of mixed languages in childhood education. If children learn by way of different language hybrids, there is no way of knowing which linguistic pegs or “formats” (Bruner, 1983: 132 -134) will be utilised for their theorising. And, what will they do when they are expected to express knowledge in the ‘standard’ forms, such as in the ANA test items and in all formal assessment in school, if they communicate and try to learn, in an extreme case, through *Isicamtho* or *Tsotsitaal*?

Language, learning, and literacy in the early grades of school

With many sentences and words of their linguistic code(s) at their command and with the ability to change meaning by morphemic inflections denoting time, number, and so forth, children go to school at around the age of six. They now enter the world where signs and codes rule, where more and more is learned through these signs and their coding systems, including the orthographical and numeric ones such as written language and written mathematics. If they are adept at converting code-switched language use to the requirements of school life, they could succeed in the semiotic mediation that happens there all the time. Much of Lev Vygotsky's oeuvre was about the “semiotic mediation” that takes place in school, where signs are learned to grasp the ‘school knowledge’ that is needed to advance in school (Vygotsky, 1992; Kozulin, 1990 151-194). In this context, children thus do not only have to be able to use language for oral interaction, where code-switching usually occurs, but they have to use its representational version in written code, by either reading or writing, and increasingly so as they progress in the system. Eventually their learning will be assessed mainly via written language, and this assessment does not provide for mixed language.

Bearing in mind what they now encounter in school, the world of the grade 1 child is arguably a maze of codes and systems of knowledge for the newcomer (see Figure 1). In a few months s/he learns the Arabic code for number, coupled with signs that indicate equation, subtraction, addition, and so forth.² Children also have to learn that the utterances they make can be parsed and ‘squeezed’ into letters and then related to sounds and *vice versa*, becoming what Snow (2010) refers to as “alphabetically” literate. So, while

becoming veritable detectives, searching for clues for what constitutes the number signs in numeracy, they must also detect phonemes and find the paths of these sound bytes to graphemes, the orthographic equivalents. And then they have to get those blended into morphemes and words and ultimately lined up in sentences and make meaning within a discourse! All of this happens very suddenly and at the same time in the first grade. Add oral code-switching to the mix and one realises that we urgently need local research on the issue. In her ethnographic work on grade R classes in a Sowetan school, Sekhukhune (2010) identifies this as the main concern.

We need to ask questions about what constitutes learning in a code-switching grade 1 class where, typically, five or more new topics or ideas or concepts are introduced per day, some of which will be in the numeracy code and some in the language code, and some in the alphabetical code of literacy. Unless the child's 'code-switching' system is *pragmatically synchronised* with that of the teacher, they do not, in actual fact, use the same language and this may lead to the type of misunderstandings that happen so easily in teaching. In a classroom where the foundations for, and bridges to, logic between numeracy, biology, physics, chemistry and language itself are laid, this mix may be a hazardous one, because the building blocks for cognitive academic language proficiency (Cummins, 1979) are very specific. Considering what leading developmental psycholinguists and other linguists are saying about the relation between language (and its structures, specifically also its morphemic structures, as described by Cantone, 2007; Wei, 2000; Myers-Scotton, 1993), the use of mixed language communication in early school education needs to be investigated before it is taken at face value to be an asset and judged by the same norms as adult social code-switching:

Instead of language merely reflecting the cognitive development which permits and constrains its acquisition, language is being thought of as potentially catalytic and transformative of cognition... The conclusion could then be that the kinds of transformation of thinking by language may be subject to language-specific biases (Bowerman & Levinson, 2001:13).

Considering "language-specific biases" and the possible flood of crossed lines of meaning and form, I cannot but agree with Macara (2005:63) who, while writing about code-switching in L2 classrooms, mentions, "(i)n classroom discourse, code-switching is considered by many neither an asset nor a valuable addition". In an article on the delayed cultural-linguistic competence in primary school Henning & Dampier (2012) argue that lack of shared cognitive academic language (CAL) may create an extended linguistic liminality and thus delay learning.

Understanding, stability and aligned codes in early education

I have argued thus far that schools are places where learning depends to a large extent on a learner being able to encounter the objects of learning through language. But, soon after grade 1, schools require *advanced* alphabetical literacy and mathematical literacy and other signing systems, discourses, and genres, covering the spectrum of the humanities and physical and life sciences, each with their own discourses and genres – their own CAL. Moreover, when the teacher then has to teach literacy, which, notably, is always scripted in one language only in any one text, both teacher and young learner have to work in the code of that text. It makes sense to me that the language that is encoded in the initial reading material should be the same as the language used to teach literacy. Why would one wish to make the road to literacy more difficult than it already is?

If the developmental psycholinguistic view that I have presented briefly is anything to go by, and if one accepts that CAL is constructed in discipline-specific discourses, the cross-over of languages within sentences poses problems because CAL does not transfer easily (Lems, Miller & Soro 2009:41). In his more recent work, Cummins (in Lems *et al.*, 2009:41) emphasises the register specificity and the "nitty-gritty" of the building of CAL proficiency. Syntax rules and morphemic structures also do not transfer easily and morphemic cross-overs can pose semantic problems, irrespective of what the primary or host language is and which language(s) are the secondary codes. Scotton-Myers (2002:54) argues that "(m)orphemes denoting grammatical relations cannot be borrowed" and that a "split arises between lexicon and morphosyntax" in mixed code with either the host or the secondary language taking preference.

On this view, the teaching of, for example, mathematical concepts by using cross-over linguistic structures may be obstructive to learning. Hamsa Venkatakrishnat (personal communication, October 2011), a mathematics education specialist, states that it does not matter what language is used, as long as the communication is clear in learning mathematics in the early grades. I am not sure how clear communication can be with the type of switching/mixing I have witnessed in classrooms. We will not know empirically until this has been investigated longitudinally, or in large cross-sectional studies of learning and language.³

Conclusion: A call for action

In this article I have tried to set out an argument for research that will address the interplay between children's cognitive development and their language development in the first years of schooling and how excessive mixing of language may be a barrier to learning. I conclude by now invoking the view of psycholinguists who advocate a view of non-universalism of language, emphasising the principle that languages, including the mixed varieties of languages in urban South Africa, capture reality in unique ways. Gopnik (2001) talks about a fresh take on the Whorf hypothesis and Slobin (1996, in Brown & Levinson, 2009:451) argues that languages, including dialects and creoles, are not universal and that there is some relativity in what and how different codes capture the world: "In the evanescent time frame of constructing utterances in discourse one fits one's thoughts into available linguistic frames". "Available linguistic frames", if they are not pragmatically aligned with the frame of the specific life world and linguistic world of grade 1 children, who are laying the foundations of CAL for their school career, may bring about cognitive instability that could be related to language hybridisation.

For some educationists and applied linguists, code-switching as discourse practice in schools is regarded as a discursive form that enhances learning and that leads to CAL. I hypothesise that there is also a possibility that it does not enhance learning. While this type of language behaviour may be socially suitable and even desirable in informal adult settings, where its sociopragmatic flavour is accepted, I propose that it becomes problematic when young children are navigating their way into the abstract world of school learning, using language to map their cognitive, academic platforms for learning.

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Endnotes

1. These evolving Nguni and Sotho dialect forms are prevalent in the broadcast media and in urban areas.
2. The 2012 ANA exemplar mathematics tests require of grade 2 learners to know terminology such as "number symbol" and "digit symbol" in the various languages (Department of Basic Education, 2012)
3. Henning, Dampier and Welch (2011) report on the first results of a pilot study in a longitudinal panel inquiry in which, in the intervention, random code-switching is replaced with systematic translation to and from English, Isizulu and Sesotho in the forms in which these languages are used in the books the children read.

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