Considering semiotic ideologies in the design of literacy learning software for multilingual youth and adults in rural South Africa

Andrew Babson , University of Michigan, School of Education, Prechter Laboratory for Interactive Technology
610 E. University Ave. Ann Arbor, MI 48109, Tel: +1-734-647-2119, Email: ababson@umich.edu

Abstract: Recently, interest has grown in understanding how sociocultural processes inform the design and use of learning technologies. In 2006, I managed the design and piloting of a multilingual literacy learning software for youth and adults in rural South Africa. Drawing from observations of and informal interviews with twenty-six learners who piloted the software, I propose that the software provided the learners with opportunities to reassess not only important self-understandings as learners of basic literacy skills, but also speakers of certain languages and in general, certain kinds of people. The findings, analyzed within the framework of semiotic ideology, support a broader proposition that literacy programs, and the technologies used in them, can serve as forcible mediators of people's understandings of what languages, signs and sociocultural identifications are.

Introduction

This paper presents a case study and theorization of the potential of a multilingual literacy learning software to mediate people's understandings of languages, signs, and social identifications.

First, I provide an overview of my research in Limpopo province, South Africa on the usage of the software mentioned above, developed as part of a project called the Bridges to the Future Initiative (BFI). The BFI software was designed for low-literate adult basic education and training (ABET) program learners in Limpopo. I then describe my approach to the study and my methods of analysis, followed by a brief historical overview of the South African language in education policy. I include this overview to contextualize attitudes about and practices of language and education among black South Africans (especially in rural areas). I will later argue that these culturally shared ideas about language and signs are highly relevant to designing and using literacy learning technologies (cf. Snyder and Prinsloo 2007, Young 2008).

Subsequently, I discuss the potential of literacy learning software to mediate people's understandings of languages, signs, and social identifications. Referring to the work of Irvine, Keane and Lemke, I argue that semiotic (including language) ideologies in turn mediate the usage of the software in important ways, and I support my claims with excerpts from field notes and informal interviews taken during the piloting.

Study Overview and Methodology

In this study, I provide a historical and ethnographic analysis of interview and observational data gathered from the usability testing of a prototype of the BFI software. The theoretical framework of my analysis is language and semiotic ideology, with a focus on the latter. The research took place in two villages in central Limpopo province in August of 2006. I informally interviewed twenty-six Sepedi-speaking users of the software, during and after the observation of the software usage itself. Two research assistants facilitated interactions with the users, only one of which spoke English. I also made notes during all of the usage sessions, and videotaped portions of the testing. As analysis of these project data is currently in progress, the data sources I have used for this paper are limited to my field notes and informal interviews. Dissertation field work, to be conducted in May of this year, will incorporate language attitude surveys and structured interview protocols to obtain further data on the phenomena in discussion.

South African language in education, past and present

A central premise of this paper is that research into the design and usage of learning technologies is incomplete without a substantial understanding of the historical and cultural processes that precede it. The following is a brief descriptive analysis of key themes and facts about language in education issues, particularly for rural blacks South Africans, including the policies that favored the development of the BFI software.

From the mid-seventeenth century until 1994, those of European descent have held power in the region referred to today as the Republic of South Africa. From Dutch colonization (1652-1795), to English dominance (1806-1948) and most recently, Afrikaner *apartheid* government (1948-1994), the black South African has lived, in the words of Sol Plaatje, “as a pariah in the land of his birth” (In Willan 1996 [1914]:186). Formal, secular, public education in South Africa was not offered until 1839 by the British colonial administration

(Malherbe 1900, Kallaway 1984). Even then, two basic systems for education had settled into place: one for the mostly white elite, and one for the mostly non-white underclass – as a form of "peaceful subjugation" according to Cape Colony governor Sir George Grey (Jansen 1990: 198). The situation, although improved, persists in South Africa to this day.

Language in education has been just one factor in this persistent and stark inequity, but I focus on it here in order to highlight a few points for my research in rural South Africa. First, the English language has maintained a preeminent place in the regional linguistic market and popular imagination since colonial times (Kamwangamalu 2007). Second, the history of education for black South Africans comprises two stories: one of learning and sociocultural change, and one of colonial conquest and missionary imposition. Even when education was available for blacks, it was mostly by Christian missionaries as evangelization, and of a standard far below what was available to children of European descent (Shanafelt 2003). As Prinsloo notes, "the political and economic circumstances under which groups of people first encounter literacy directly impact how they take hold of literacy… and have bearing on the facts of literacy today" (1999:418).

And today, almost all South African parents want their children to learn English in order to increase opportunities for social advancement (Heugh 2000). Yet, the most blacks still have little access to English education, and live in serious poverty (Nelson Mandela Foundation [NMF] 2005). Although Harvey Graff (1989) was right to point out that high literacy skill alone – in this case, English literacy -- does not alone redress social inequalities, it is hard to convince South African parents, especially in rural areas, otherwise (NMF 2005).

Many early leaders of the resistance to white hegemony in South Africa were educated at English-medium mission schools (most mission schools were local-medium), which received funding from the British administration (Prinsloo 1999, Jansen 1990). For example, ANC co-founders Plaatje and John Dube were educated at mission schools, as well as subsequent ANC leaders such as Albert Luthuli and Nelson Mandela (De Klerk 2002:44). In a nod to Graff, however, many of these leaders already came from relatively privileged backgrounds. Yet, English "has sometimes been seen in the popular imagination as evidence for the success of English-medium education" (ibid.). Attitudes toward African languages have tended to suffer by comparison.

The Bantu Education Act of 1953 mandated the end of missionary education. The legacy of missionary and *apartheid* policies of mother tongue education – to use the mother tongue as language of learning and teaching (LoLT) -- has left the impression among some black South Africans, especially in rural areas, that either learning the local language as a subject or using it as the LoLT is a waste of time, even a form of oppression (NMF 2005, Vesely 1998). Heugh (2000:19), however, cites research saying that most South African parents want their children to learn their mother tongues in school *along with* English (ibid.). Nonetheless, to the majority of black South Africans who have no access to high-quality English language education, the English language remains "unassailable but unattainable" (Alexander 2000, Brock-Utne and Holmarsdottir, 2004:67).

Addressing such language concerns, the South African Constitution of 1996 not only enshrines nine African languages as official (along with Afrikaans and English) -- it has also enshrined the individual's right to an education in an official language of choice, "where that education is reasonably practicable" (SA Constitution 1996: Section 29 Part 2). The strategy behind this legislation has been to raise the status of African languages while promoting multilingualism and empowering local decisions about language in education. The language in education policy (LiEP) of 1997 suggests additive multilingualism in schools, meaning that the mother tongue should be used as the (LoLT)as long as possible (Republic of South Africa, 1997). The LiEP also suggests that "the underlying principle is to maintain home language(s) while providing access to and the effective acquisition of additional language(s)" (ibid.; cf. Heugh 2000, 2008). The problem with the LiEP is that it *suggests* additive multilingualism, but does not *enforce* it (Brock-Utne and Holmarsdottir 2004: 72).

The South African Schools Act of 1996 mandated that parents, as the heads of school governing boards (SGBs) have final say over the school's LiEP (RSA, 1996). But parental choice has been very difficult to enforce at the local level in rural areas for numerous reasons, including: traditional rural governance, parental illiteracy, gender inequality, lack of English teachers, and constraints on the time and energy of poor people struggling to make a living (Biseth 2005, De Klerk 2002, NMF 2005, Ntsebeza 2006).

The current policies, in historical context, are revolutionary. Yet decentralization and the flexible LiEP, although meaning well, have conspired against the enforceability of additive multilingualism. On the ground, there are not only practical challenges to implementation but ideological ambivalence among locals and, importantly, lack of political will among the elite (Bambgose 2000). Additive multilingualism has been advocated forcefully by a plurality of the scholarly community (Alexander 2000, Heugh 2000, Skutnabb-Kangas 2004), although there are well-argued critiques of note (Gupta 1997, Makoni 2003, Pennycook 2002).

I believe that this complex situation must be understood in consideration of all scholarly debates, but should also be well grounded in historical understanding and ethnographic field research. In the next section, I provide an overview of the field testing process for the BFI software. This overview will set up my analysis of the ideological dimensions of using the software, informed by the above historical and policy context.

BFI Software Overview

In 2005 and 2006, I was the South Africa research manager for the Bridges to the Future Initiative (BFI), a project of the International Literacy Institute (ILI), based at the University of Pennsylvania. The premise of this field research was to understand the conditions under which youth and adult ABET learners might use the BFI software, and to note design and usability issues.

The BFI began as an effort to address literacy acquisition in multilingual, rural environments, the spirit of additive multilingualism. The rationale was to exploit the potential of interactive software to provide flexible, user-directed and engaging literacy learning opportunities. A further intent was to create locally developed, relevant and useful educational content, thereby going beyond issues of *access* to information and communication technologies (ICTs) in developing countries to issues of *content.*

The first version of the BFI software was created in 2001 for mother tongue literacy learning in rural India. BFI South Africa, launched in early 2005, intended to build on best practices from BFI India, as has been co-sponsored by the South African Department of Education for the ABET program to facilitate its incorporation of additive multilingualism into the curriculum. The BFI-SA prototyping process began in 2005, but it was not until spring of 2006 that a workable, testable Flash™-based prototype was designed. This design process and subsequent testing involved myself as client-side project manager as well as designers and consultants in Johannesburg and Pretoria.

The software was designed with a familiar but aspirational aesthetic in mind. Thus, language (including features thereof, such as style, accent, etc.), clothing, as well as the personal and social qualities of the characters such as age, gender, role, etc. all contributed to the process of the learner making meaning of the software usage experience as a whole. Each character is meant to represent a part of the demographic spectrum; the clothing and appearance is meant to be congruent with local appearance, yet slightly better to add an aspirational value to the software experience. The program features exercises guided by an avatar through a narrative sequence (see Figure 1 below). The principal investigator of the project suggested including the avatar guide because, as in India, virtually no learners had ever used a computer. I suggested a mobile phone, because it is one of the few ICTs that has penetrated even the poorest and most remote rural areas of South Africa. I considered it a semiotic link to the software, a way for users to make sense of a new technology in relation to a relatively similar local one. The latest prototype revolves around a scenario of seven characters traveling in a *combi* minibus from the village to town (see Figure 2 below). The narrative sequence requires the learner to complete exercises on basic literacy subskills (e.g., letter recognition, grapheme-phoneme correspondence) in order to advance through the narrative. Users are encouraged by the avatar to click on the characters and follow prompts to drag and drop blocks of sound units in the correct order, forming words. There is also a numeracy section involving counting change for the *combi* fare. The avatar prompts the users to make navigation choices when they get stuck or during delays, and point to a help section if needed. The software requires no basic literacy skills and is guided entirely by auditory and visual cues (see Figure 1 above) for the user to follow. Each waypoint in the software's interactive sequence constitutes some corresponding benchmark of the South African National Qualification (NQF) standard for literacy in the language concerned. The software was also expected to interest youth and adult learners and to save the latter potential embarrassment- even foster pride- by learning independently on the computer (Wagner 1993:7; Eisenlohr 2004).

Figure 1. BFI screen shot, "Palesa". In Sepedi, the bubble text reads, "Click here to learn in Sepedi".

Findings from usability testing and observation

In August 2006, I talked with ABET learners about the BFI software, and observed their usage of it. Three important facts about the users are that they 1) can read neither Sepedi nor English, but speak up to five languages 2) are only using a mouse for navigation and 3) have barely if ever used a computer. Of the twenty-six piloters, twenty four were women, with an average age of forty-three. All were at ABET Level 1 or 2, meaning that they were still learning basic literacy skills in Sepedi and English.

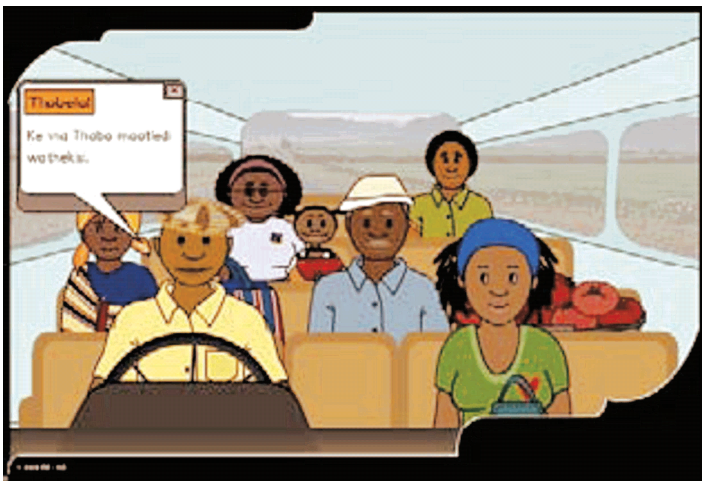

Figure 2. BFI screen shot, "combi". In Sepedi, the bubble text reads, "Hi, my name is Thabo and I will be your taxi driver"

For testing, each user was asked to open the program and follow the guidance of the avatar. From my observations, the usability issues here became obvious. User difficulties exacerbated the well-known sensitivity of some adult learners to being perceived as unintelligent (Wagner 1993). There was also considerable performance anxiety and a lack of feeling in control of the software's process. After initial testing, I advised the design team on creating a more robust and captivating "help" function in order to promote independent usage. Multiple iterations of the help function improved the learning experience for users -- though at the end of development, it was clear that more basic computer usage tutoring (e.g. mouse) was necessary. Both the scenario and the characters were meant to feel familiar yet aspirational. I suggested this scenario based on my field experience in one of the two testing locations, Ga-Mothiba. Such local knowledge informed the entire the two month long design process.

Informal interviews I conducted with each user increased my impressions that not only were many of them enthusiastic about the opportunity to use a computer, but also to learn English and Sepedi literacy. Further, they were generally receptive to the design, the characters and the scenario. Learners were content to learn literacy skills in their home language. As one learner said, "the part I liked most about the software was the beginning, when Palesa started speaking to me in my mother tongue". When learning in this environment, learners identified with the characters (one learner was teased for looking like the character Sarah, another said Pula looked like her husband) -- especially when testing in the village area of Nobody and Ga-Mothiba, the setting of the software scenario. A strong finding was that almost all learners were happy to hear Sepedi in the software, to hear music from the area in the software -- in general, to experience the culturally familiar in the software: "The computer can teach us all languages, even Pedi" "white people usually use computers, I did not expect to learn Pedi or Tsonga or African languages on a computer". This fairly new association of local culture with computer usage resulted in a strong, fairly unified response from all of the learners: namely, that they began to see Sepedi (and themselves, Sepedi speakers) as less bound to the ideology of "tribal" and "purely rural" of the *apartheid* era.

In the next section, I describe my theoretical framework for explaining this process of ideological shift.

Language as semiotic, and ideologies thereof

Ideologies deserve attention in this discussion of education and specifically literacy programs because, I argue, they mediate how people think about languages, signs and sociocultural identifications. In this section, I start with a brief explanation of how I use ideology in this paper, and then discuss language and more broadly semiotic ideologies in the context of my field research.

I use Terry Eagleton's definition of ideology, which is, "a body of meanings and values encoding certain interests" (2007: 45). To be clear, my use of ideology here is not in the spirit of Engels' "false

consciousness", (cf. Woolard 1998:16) but more akin to the fairly neutral concept of "shared set of ideas". Why *ideology*? After all, similar concepts exist to describe organized and shared sociocultural knowledge. Examples include the schemata of Anderson (1977) and predecessors, the cultural models of Holland and Quinn (1987), or in a Chomskian and evolutionary vein, the mental modules of Dan Sperber (1986), to name a few. Using ideology has to do with disciplinary background and perspective, but I also find ideology's wide applicability across many domains very useful. The term links ideas to cultural and semiotic processes, political economy and power relations in a way the aforementioned cognitivist construals tend not to.

Further, how do we determine the existence of an ideology? Eagleton notes, "nobody has ever clapped eyes on an ideological formation" (2007: 195). Ideologies emerge in group research, and through cross-cutting historical and comparative analysis, as "attitudes" or "beliefs". Scholars must reflect on their own ideologies as they locate and construct the objects of their research in the field (Philips 2000, Wee 2006). When we claim to have grasped an ideology in the field, it is in some ways a reflection of our own. Yet, as Eagleton notes, ideologies don't emerge from the ether, nor purely in the analyst's mind: "deeply persistent beliefs have to be supported to some extent, however meagerly, by the world our practical activity discloses to us" (2007: 12).

Culturally shared ideas and their associated practices also have a durability and resistance independent of the interloping analyst – which makes them available as objects of research (cf. Keane 2003). A further question for another paper, in the words of Thompson, is "*why* do ideologies 'stick', and what makes them susceptible to change?" (Thompson 1984:132, quoted in Eagleton 2007:195).

Based on my data on the usage of the BFI software, I argue that language policies and the programs they engender serve as forcible mediators of how people think about languages, signs and themselves as speakers of certain languages (Irvine 2007; 1989: 256). In other words, literacy programs mediate ideologies of language -- *themselves mediators* of self-understandings about languages and their speakers. An ideology of language – or "cultural system of ideas about social and linguistic relationships, together with their loading of moral and political interests" (Irvine 1989:255) -- informs people how to construe linguistic phenomena (languages per se, utterances, speakers, etc.) in their sociocultural context.

Relevant to the ABET learners with whom I interacted, Irvine has notably described how ideology "links the nature of linguistic differentiation" in a multilingual environment "to social differentiation", such that *a shift in either system would affect the other* (ibid.). In a multilingual environment such as rural Limpopo, a change outside of the language situation itself could effect a change in how people thought of the language, and thereby how people would actually use the language. Irvine's example of Senegalese multilingualism is particularly appropriate here:

> The political and economic connection with (former colonist) France eventually affected villagers' ideas about French, now the official language of the Senegalese state. (M)any people who used to consider French unlearnable and unspeakable had changed their minds (Irvine 1989:255).

This example highlights how an outside intervention can change how people think about language. I propose that the BFI software, by offering software-based instruction in both English and Sepedi literacy, subverts the value relation between English and African languages, opening the way for the kind of shift Irvine describes.

Semiotic Ideology and the Use of the BFI Software

Keane (2007) widens the discussion from languages however to all types of semiotic -- arguing that "the very distinction between what counts as language and what does not is itself constructed ideologically, and it differs across social and historical contexts" (2007:18). Lemke (1998) has argued that language is just one "semiotic resource system" of many –that "we never make meaning with language alone" (Lemke 1998). Further, Lemke asserts that "semiotic approaches can say back that the role of language in constituting meaningful cultural phenomena is problematic because such phenomena are always multimodal and trans-linguistic and meanings are never constituted by linguistic signs alone" (2008). This leads to the suggestion that communities share general, customary meta-views of about language, but also how language and other semiotics relate (Lemke 1995, 1998). In this spirit, Keane has called for a broadening of language ideology to a *semiotic* ideology, or set of "basic assumptions about what signs are and how they function in the world" (2003: 419). Keane and Lemke point to the value of considering all semiotic resources, not just language, to understand the shift Irvine describes above. This move opens up further analytical possibilities for researching multimodal resources like interactive learning software such as the BFI. Just as a language ideology is a resource for users to make sense of the language-related issues in the software, semiotic ideology is a resource for people to make sense of "different modes of signification at play" (e.g. text, music, etc.) and the "dynamic interconnections between them (e.g. lyrics of the music in Sepedi) … within a particular historical and social formation (usage of

the software as part of BFI pilot testing)" (Keane 2007: 18). Keane calls a set of such of dynamic interconnections a *representational economy* (ibid.; Keane 2003:410; cf. network in Latour 2005).

Applying these concepts to the BFI situation, the software usage experience happens within a representational economy that is fairly new for the ABET learners: that arising in the usage of interactive, multilingual learning software. I suggest that their experiences and reactions to the software are organized by two competing semiotic ideologies that shape the representational economies of a) using and manipulating printed texts and text objects, and b) using the BFI software.

Another concept from Keane's work, *bundling* (which I find to be relevant to schemata and cultural models) is useful for describing how representational economies cohere through the mediation of semiotic ideologies (Keane 2003: 414). Basically, certain characteristics can apply to multiple entities – e.g. "newness" can apply to a new car, a new attitude, etc. Such a characteristic "cannot be manifest without some embodiment that inescapably binds it to some other qualities (in that embodiment) as well". Thus "newness" in all situations involves connections to other qualities, which may include freshness, youth, shock, etc. Again, these connections happen as a result of a necessary embodiment, and in a contextually contingent way. A new car is different than a new ailment – "newness" thus shifts with the context. Within representational economies, certain signs cohere based on such contingent qualities, and the coherence is mediated by the semiotic ideology. Referring to Irvine's example, "unlearnability" was once a quality of the French language in rural Senegal – until a shift in the political economy of the region shifted the relationship between French language and "learnability". Irvine describes this shift as mediated by language ideology. I will discuss further below how qualities such as "Pedi-ness" or "whiteness" or "modernity" – all at play in the representational economy of the ABET learners using the BFI software – are, basically, redefined for users through a shift in semiotic ideology.

Since missionary education, unschooled people in many parts of rural South Africa have been referred to as "red" people -- versus those who took up literacy education readily (Harries 2001, NMF, 2005: 37; Ntsebeza 2006; Prinsloo 1999: 420). Redness necessarily exists with other qualities, though these co-presences vary across representational economies. For rural South Africans, redness is co-present with tradition, and with lack of education. Education in general allows rural people to move, to work outside of the village, to interact with speakers of other languages. Thus, literacy is associated with social mobility, modernity and migration from the village to the city. In one informal interview, a woman who spoke some English told me that she only spoke English with "educated white people" in town. This is connected to the legacy of *apartheid*, whereby black people were literally trapped in local economies of joblessness and under-education (Kallaway 1994). Further, due to the lack of development of African language printed material, and social and economic priorities, most rural areas in South Africa lack a culture of literacy – of integrating reading and writing practices into their daily lives (cf. Maake 2000:137). Today, people in rural areas have limited use for literacy -- local businesses are scarce and jobs are few. Thus education is seen as a way out, but also as a threat to rural cultural continuity

Many of the older ABET students I spoke with (all of whom were educated under *apartheid*)considered knowledge technologies such as education, English literacy and computers to be basically "white" – "white people use computers, at the bank", "computers are made by white people", etc. Many of them are pensioners, and go to town only for their checks, or health reasons, and equate computers with banking machines. I saw however a parallel between the semiotic ideology of computer technology and that of English literacy technology: fourteen of the twenty six ABET learners I spoke with were interested in learning to speak English in order to communicate with white people. This connects with other work (e.g. McKinney 2007; Banda 2000; Snyder and Prinsloo 2007) that discusses how, to many black South Africans, participation in the "white" world is a precondition for material success.

This brings me to reassert that the BFI software usage de-bundled key qualities ("Pedi-ness" or "whiteness" or "modernity") which allowed for new semiotic relations in the local representational economy of using the software. This shake-up of the representational economy subsequently led to a shift in semiotic ideology about those relations: in short, problematizing the associations between whiteness and modernity, .being educated, digitized, etc. One example: the set of ideas about signs indicating whiteness (e.g., modernity, urbanization English literacy) shifted as a result of a new object in the system of words and things hanging together as a representational economy of software usage. Another set of ideas about literacy also shifted: literacy is no longer limited to books, and the modal affordances of them (text for reading, a physical embodiment of paper material for tactile manipulation, etc.). Computer software that is interactive and multimodal (music, voice, vocal-text symmetry, drag and drop capability, etc.) changes this ideology of book use for literacy learning – in effect changing the semiotic ideology of literacy learning and practice. Referring to Lemke (2008), the multimodal potentials of the software enlarge the potentials of the representational economy, and in effect, to change the semiotic ideology. For example, in addition to the ability to create interactivity with these characters, the designers could include music: in this case, from a CD I bought outside in Cape Town featuring two producers from the Ga-Mothiba village, the setting of the software scenario and one of the pilot testing locations.

Rephrasing the key point of this section: I suggest that associations ranging far beyond the linguistic were rearranged in the ABET learners' usage of the BFI software. This is especially relevant given the history of language issues in rural South Africa, especially in Limpopo province, and the current promotion of multilingualism in both the Constitution and the LiEP.

Conclusion

Additive multilingualism, through a re-valorization of African languages and multilingualism, is a policy which is meant to encourage a shift in these ideologies of language (Irvine), but as Keane and Lemke have pointed out, also of other semiotics. The BFI incorporates this policy into the software experience; in fact, the minister of education, Naledi Pandor, endorsed the BFI software as an innovation that may facilitate additive multilingualism. Within the theoretical framework I propose in this paper, I suggest that using the software introduced a novel representational economy for the ABET learners, which was mediated by their semiotic ideologies about literacy. But further, the new connections between language, signs and social identification made possible within this representational economy resulted in a subsequent shift of their semiotic ideology of literacy, and thus meanings of who is literate, in what languages and how those meanings are construed.

A key motif of education is social and economic transformation. In South Africa, English language skill is perceived by most key to this transformation. But if we are to recall Prinsloo's words (1999), the original conditions of the introduction of literacy practices shaped the development of those practices through history. Missionaries treated indigenous Africans as heathens in need of enlightenment; the apartheid government developed policy based on the idea of black Africans as inherently and immutably inferior. If Prinsloo is right, then ideas about who is literate, in what language, and what this means for self-understanding, have a long history which I argue must stay in the purview of any contemporary analysis (cf. Bartlett 2005 on development discourses; Cook 2006 on multilingualism in South Africa; Snyder and Prinsloo 2005 on ICTs in South African education). In light of this, a Latourian approach (2005) may be appropriate to further analyze the concept of representational economies as networks comprising ideologies, technologies and signs. This approach would re-address issues of sociocultural continuity and change, the role of ideology in those processes, and the materiality of signs and their political economy.

Finally, as this research progresses to the dissertation stage, I will be building on this more theoretically-oriented work to focus on more systematically analyzing intergenerational differences in semiotic ideology, with particular attention to broadened media ecologies and thus resources for self-identification among youth in Limpopo, considering major policy changes post-1994.

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