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Strengthening bilingual and multilingual learning systems in francophone Africa

Final Report

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Contents

I.   Introduction

Evidence has widely demonstrated multiple benefits of mother tongue–based multilingual education in low- and middle-income countries.[1] These advantages include increased attendance in school,[2] long-term cost-effectiveness,[3] higher likelihood of girls and minority children staying in school,[4] better learning achievement outcomes in both children's familiar languages and targeted international languages,[5] and the development of cognitive skills that serve as a foundation for transfer from a strong language to a new language.[6]

However, language remains a significant obstacle to learning in many low- and middle-income countries.[7] Children are often required to begin school and literacy instruction in language(s) they do not speak at home or in their communities, or to transition out of their home language after only brief periods.[8] Few countries and contexts have been able to successfully systematize bilingual and plurilingual education, and major evidence gaps exist for how to design quality bilingual and multilingual transition models beyond the selection of the mother tongue.[9]

Some of the main reasons for these challenges are the following. First, there is significant demand for literacy acquisition in postcolonial languages because of the proven link between socioeconomic mobility and proficiency in postcolonial languages.[10] This leads to growing tension—and the need for empirical reconciliation—between teaching children in their mother tongues or familiar languages for as long as possible and the demand for introducing French (or other postcolonial languages) sooner. Second, there is a lack of teachers trained to teach local languages and to teach specifically to

[1] UNESCO. (1953). The use of the vernacular languages in education. *Monographs on Foundations of Education*. UNESCO; UNESCO. (2003). *Education in a multilingual world*. UNESCO Education Position Paper. Paris: UNESCO.

[2] Benson, C. (2005). *Girls, educational equity and mother tongue-based teaching*. UNESCO.

[3] Heugh, K. (2004). Is multilingual education really more expensive? In *making multilingual education a reality for all: Operationalizing good intentions*. 3rd International Conference of DALEST and 1st Malawian Language Symposium (pp. 212–233). Mangochi: Centre.

[4] Benson, C. (2005). *Girls, educational equity and mother tongue-based teaching*. UNESCO; Hovens, M. (2010). Bilingual education in West Africa: Does it work? *International Journal of Bilingual Education and Bilingualism*, 249–266.

[5] Evans, D. K., & Mendez Acosta, A. (2021). Education in Africa: What are we learning? *Journal of African Economies*, *30*(1), 13-54.

[6] Koda, K. (2008). Impacts of prior literacy experience on second language learning to read. *Learning to read across languages: Cross-linguistic relationships in first- and second-language literacy development*, 68–96; Nakamura, P. R., de Hoop, T., & Holla, U. C. (2018). Language and the Learning Crisis: Evidence of Transfer Threshold Mechanisms in Multilingual Reading in South India. *The Journal of Development Studies*, 2287–2305.

[7] Alidou, H., Boly, A., Utne-Brock, B., Satina, Y. D., Heugh, K., & Wolff, E. (2006). *Optimizing Learning and Education in Africa – the Language Factor: A Stock-taking Research on Mother Tongue and Bilingual Education in Sub-Saharan Africa*. Association for the Development of Education in Africa (ADEA) and UNESCO Institute for Education; Kim, Y.-S. G., Boyle, H. N., Zuilkowski, S. S., & Nakamura, P. (2016). *Landscape report on early grade literacy*. USAID; Nag, S., Chiat, S., Torgeson, C., & Snowling, M. (2014). *Literacy, foundation learning and assessment in developing countries: Final report*. Education Rigorous Literature Review. Department for International Development.

[8] Arnold, C., Bartlett, K., Gowani, S., & Shallwani, S. (2007). Transition to school: Reflections on readiness. *The Journal of Developmental Processes*, 26–38; Ouane, A., & Glanz, C. (2010). *Why and how Africa should invest in African languages and multilingual education: An evidence- and practice-based policy advocacy brief*. UNESCO Institute for lifelong learning.

[9] Nakamura, P., Molotsky, A., Zarzur, R. C., Ranjit, V., Haddad, Y., & De Hoop, T. (2023). Language of instruction in schools in low-and middle-income countries: A systematic review. *Campbell Systematic Reviews*, *19*(4), e1351.

[10] Azam, M., Chin, A., & Prakash, N. (2010). *The returns to English-language skills in India*. IZA Discussion Papers; Bakomba, E. (1991). French Colonial language policies in Africa and their legacies. In D. Marshall, *Focus on Language Planning. Essays in honor of Joshua A. Fishman*. Vol. 3 (pp. 175–214). John Benjamins Publishing Company.

plurilingual students.[11] Third, there is a lack of materials and curricula that go hand in hand with multilingual education policies.[12] Fourth, the existence of mixed-language classrooms, especially in urban areas, makes it difficult to select the language that teachers should use.[13] Finally, linked with all these reasons, there is a lack of political will to implement local language education programs, even when resources may be available.[14]

In the 1990s, francophone West Africa had the lowest literacy rates of any comparable region in Africa, the highest school dropout rates, and the least developed local languages.[15] Over the past few decades there has been a push for—and implementation of—more mother tongue–based education programs;[16] however, the same low literacy rates plague the region.[17]

Many francophone countries in Africa face all the issues described above as they work to construct language of instruction policies that lead to effective learning outcomes in both first and second (or more) languages. There are several pilot programmes and policies designed to improve multilingual education in the region, such as the *Stratégie Nationale d'Utilisation des Langues Nationales* (National Strategy on the Use of National Languages) in the Democratic Republic of the Congo (DRC); the *Ecole et Langues Nationales en Afrique* (Schooling and National Languages in Africa) in Benin, Burkina Faso, Cameroun, Côte d'Ivoire, Guinea, Madagascar, Mali, Niger, the DRC, Senegal, and Togo; and *Education Multi-Langue* (the French term for multilingual education). However, there is limited research on their effectiveness, especially at scale and on the way to structure a programme to be most effective in fostering plurilingual outcomes. Most critically, questions remain regarding the grade in which transition should occur, the skills that should be taught in each language, and the timing and the way to train teachers to teach for plurilingual outcomes.

In addition to the knowledge gap on when a child develops the necessary cognitive and linguistic skills to be introduced to a new language, there are critical gaps on the way to use existing and emerging evidence in and across education systems for policy and practice. Translational educational science— in which research on learning science is applied to educational problems—is far behind translational science in other fields, such as medicine or engineering.[18] This challenge is exacerbated in low- and middle-income countries that draw heavily on research from monolingual, western contexts of learning to address their bilingual and plurilingual teaching and learning issues. These gaps can be addressed through more effective bidirectional knowledge-sharing and co-interpretation platforms for evidence generators and users.

In sum, to strengthen teaching and learning quality in multilingual education contexts in West and Central Africa, evidence is urgently needed on when a child is cognitively and linguistically ready for

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[11] Lartec, J. K., Belisario, A., Bendanillo, J. P., Binas-o, H., Bucang, N. O., & Cammagay, J. L. (2014). Strategies and problems encountered by teachers in implementing mother tongue-based instruction in a multilingual classroom. *Journal of Language Learning, 1*(1); Malone, S., & Paraide, P. (2011). *Mother tongue-based bilingual education in Papua New Guinea*. International Review of Education; Hovens, M. (2010). Bilingual education in West Africa: Does it work? *International Journal of Bilingual Education and Bilingualism*, 249–266.

[12] Opuku-Amankwa, K., Edu-Buandoh, D. F., & Brew-Hammond, A. (2014). Publishing for mother tongue-based bilingual education in Ghana: politics and consequences. *Language and Education*, 1–14.

[13] Nakamura, P. R., Carson, K., Davis, D., & Rai, N. (2017). *Vamos Ler language mapping report*. Washington, DC: American Institutes for Research.

[14] Opuku-Amankwa, K., Edu-Buandoh, D. F., & Brew-Hammond, A. (2014). Publishing for mother tongue-based bilingual education in Ghana: politics and consequences. *Language and Education*, 1–14.

[15] Bakomba, E. (1991). French colonial language policies in Africa and their legacies. In D. Marshall (Ed.), *Focus on language planning: Essays in honor of Joshua A. Fishman*. Vol. 3 (pp. 175–214). John Benjamins Publishing Company.

[16] Alidou, H., Boly, A., Utne-Brock, B., Satina, Y. D., Heugh, K., & Wolff, E. (2006). *Optimizing learning and education in Africa – the language factor: A stock-taking research on mother tongue and bilingual education in sub-Saharan Africa*. Association for the Development of Education in Africa (ADEA); UNESCO Institute for Education.

[17] RTI International. (2015). *Status of early grade reading in sub-Saharan Africa*. Washington, DC: U.S. Agency for International Development.

[18] Roediger, H. (2013). Applying cognitive psychology to Education: Translational educational science. *PubMed*.

instruction in French. This evidence must then be translated into all aspects of the education system from language of instruction policies to teacher knowledge and practice, standards, and assessments. Finally, strong links between knowledge generation, utilization, and regeneration need to be built and fortified.

Note on terminology

The term "mother tongue" has been subject to much controversy and misunderstanding. (What about the language of the father? What about sign languages? Do we mean the language of the ethnic group, even if a person does not speak or understand that language?) When we use the term "mother tongue," we refer to the language (or languages) that children learn from a young age, and which they use and understand with a high level of familiarity and proficiency. These are often, but not always, a child's first language. They are likely the languages that the child uses at home—whether or not the mother is involved. These may include spoken or non-spoken (i.e., sign) languages.

Throughout this report, we use several terms to refer to these languages. These terms include "mother tongue," "first language (L1)," "native language," and "home language." We also use the term "local language" to refer specifically to the Congolese, Ivorian, and Senegalese languages that many of the participants in this study use and understand. These local languages are distinct from French, which is the official language and prominent post-colonial, *international* language used in the countries of study. We use the term "national language" specifically for the Democratic Republic of the Congo, where the government has designated the languages of Ciluba, Kikongo, Kiswahili (i.e. Swahili), and Lingala as "national languages."

Through the course of this report, we provide empirically defined ways of referring to these languages. Specifically, we identify the language(s) a child uses through objective measures (unlike self-reported or census data). Doing so enables us to categorize the languages children understand a) with high levels of familiarity and proficiency, b) with some degree of familiarity and proficiency (emergent level), or c) with low or no familiarity and proficiency, thus shedding considerable empirical light on the construct of most "familiar language(s)".

II.   Research Purpose and Objectives

This study aims to generate and mobilize evidence to strengthen bilingual and multilingual education systems in Côte d'Ivoire, the DRC, and Senegal (with applications to other multilingual settings of francophone Africa and beyond). In most francophone African countries, French is introduced as a medium of instruction at some point in primary school – if not as the initial language of instruction. Each of the three selected countries for this study represents a different stage in language of instruction policy development. In the DRC, schools use one of the four national languages (Kiswahili, Ciluba, Lingala, and Kikongo), depending on the region, for instruction in early grades and then transition to instruction in French beginning in grade 3. French becomes the sole medium of instruction in grade 5. In Senegal and Côte d'Ivoire, questions of how much and when to use local and regional languages as language of instruction have been part of the education policy for decades, but ministries of education have not yet implemented nationwide policies for local languages of instruction. Senegal has been undergoing several large-scale language of instruction experiments across specific regions in the country, while Côte d'Ivoire has experienced only limited experimentation, with most schools instructing only in French.

To build knowledge about innovative solutions to plurilingual education challenges, we conducted mixed-methods research on determining optimal timing to transition to French from mother-tongue instruction (or to add French to mother-tongue instruction) to ensure effective learning outcomes in both languages. According to research, first language (L1) reading ability is one of the most significant predictors of second language (L2) reading ability because L1 skills transfer from one language to facilitate learning another.[19] The relationship between L1 and L2 reading is typically measured linearly,[20] but we hypothesize that transfer can only occur when certain constrained cognitive and linguistic skills in an L1 such as decoding reach a level of *sufficiency*, and thus become readily available for transfer. Our team has previously confirmed that there is a point in L1 acquisition at which sufficient mastery occurs,[21] implying that there is an empirically determinable point when a child is ready to be successfully introduced to L2 literacy instruction. We apply this method to test and develop one of the first such empirical, skill-based transition models for bilingual reading in Côte d'Ivoire, the DRC, and Senegal.

To unpack *why* and *how* language transition readiness models and multilingual education programs may be utilized or implemented in classrooms and policies, we also conducted qualitative examination of the language practices associated with different transition models, perceived costs and benefits of multilingual education, and perceived successes and failures of existing multilingual education models.

Research Questions

Our study serves to answer the following research questions in the three target countries:

1. What language(s) do students use and understand?

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[19] Chung, S. C., Chen, X., Geva, E. (2018). Deconstructing and reconstructing cross-language transfer in bilingual reading development: An interactive framework. *Journal of Neurolinguistics*, *50*, 149–161; Koda, K., & Reddy, P. (2008). Cross-linguistic transfer in second language reading. *Language Teaching, 41*(4), 497-508; Koda, K., & Zehler, A. M. (Eds.). (2008). *Learning to read across languages: Cross-linguistic relationships in first-and second-language literacy development*. Routledge.

[20] August, D., & Shanahan, T. (Eds.). (2006). *Developing literacy in second-language learners: Report of the National Literacy Panel on language-minority children and youth*. Lawrence Erlbaum Associates Publishers.

[21] Nakamura, P. R., & Bonilla, J. (2019). Multilingual education in Ethiopia: Exploring mother tongue to English transfer thresholds. Presented at the Comparative and International Education Society, San Francisco, CA; Nakamura, P. R., de Hoop, T., & Holla, C. U. (2019). Language and the learning crisis: Evidence of transfer threshold mechanisms in multilingual reading in South India. *The Journal of Development Studies*, *55*(11), 2287-2305; Nakamura, P. R., de Hoop, T., & Holla, U. C. (2018). Language and the learning crisis: Evidence of transfer threshold mechanisms in multilingual reading in South India. *The Journal of Development Studies*, 2287–2305.

2. To what extent is there a match between language of instruction and student language skills?

3. Is there a threshold level of L1 literacy skills and L2 oral language skills required for L2 literacy? If so, what is the threshold?

4. What are teachers' proficiency levels, in terms of their own language proficiency in target language(s), their general pedagogy knowledge, and their knowledge of specific pedagogies for bilingual and multilingual learning?

5. What are teachers' practices and attitudes regarding bilingual/multilingual education, especially in terms of teaching local languages, teaching linguistically mixed classrooms, and the timing and skills requirements of transitioning to new languages?

6. What are parents' and community members' perceptions and preferences regarding bilingual/multilingual education?

7. What are the perceived costs and benefits to children and parents of a mother tongue–based multilingual education model?

III.   Research Design and Methods

In this section, we describe the methods used for both the quantitative and qualitative components of the study.

Theoretical Framework

Our research questions and hypotheses are grounded in two influential models of reading acquisition: the Cognitive Foundations of Reading Acquisition[22] and the Transfer Facilitation Model of biliteracy acquisition.[23]

The Cognitive Foundations of Reading Acquisition, based on the Simple View of Reading[24] and decades of research since its first conceptualization, draws on the notion that reading comprehension is a complex cognitive act that requires multiple subskills, all interacting seamlessly to make it appear simple and effortless. At the highest level, reading with comprehension depends on word decoding and language comprehension skills. Each of these skills is built on a series of prerequisite subskills, such as phonological awareness (i.e., understanding of sounds) and letter recognition, and a foundation of cognitive skills required for literacy. The automatic (quick and accurate) sounding out of words and passages (i.e., oral reading fluency) then bolsters (acts as a beam) to support the foundations and walls of the metaphorical house in Figure 1 on the following page, which then allows for the reading comprehension "roof" to successfully hold up.

The Transfer Facilitation Model focuses on the development of bilingual or multilingual literacy skills. Children who learn to read two or more languages develop a metaphorical "house" for each language. In these cases, the child's L1 impacts the development of reading in second or later-acquired languages in significant and predictable ways.[25] In essence, the Transfer Facilitation Model posits that there are shared and transferred resources between the learned languages (mostly metalinguistic skills such as phonological awareness and constrained skills such as decoding), as well as language-specific components to learning to read in each language (mostly language comprehension skills).

Our hypothesis on the cognitive components of this research is that there needs to be a level of sufficiency of decoding skills from the L1 (i.e., the metaphoric wall of the first house) for there to be a "tipping point" or "readiness" point for transfer from the L1 (i.e., the mother tongue) to the L2 (French, in this case). Metaphorically, as depicted in Figure 1, the wall representing decoding skills in the L1 is shared to support reading in the L2. Furthermore, while **both** L1 decoding and L2 oral language comprehension skills are needed for L2/French reading development, we hypothesize that only L1 decoding skills will be susceptible to so-called "threshold" effects because it is a constrained skill.[26] In other words, L1 decoding has a ceiling to when it can be sufficiently acquired because there are a limited number of letters and/or symbols the child needs to acquire to learn to decode efficiently. When this level of sufficiency has been reached, we hypothesize that there will be an exponentially higher level of growth of L2/French decoding skills because a transfer "tipping point" has been

[22] Hoover, W. A., & Tunmer, W. E. (2020). *The cognitive foundations of reading and its acquisition*. Springer International Publishing; Tunmer, W. E., & Hoover, W. A. (2019). The cognitive foundations of learning to read: A framework for preventing and remediating reading difficulties. *Australian Journal of Learning Difficulties, 24*(1), 75-93.

[23] Koda, K. (2008). Impacts of prior literacy experience on second language learning to read. Learning to read across languages: Cross-linguistic relationships in first- and second-language literacy development, In K. Koda, & A. M. Zehler (Eds.), *Learning to read across languages: Cross-linguistic relationships in first- and second-language literacy development* (pp. 68–96). Erlbaum.

[24] Hoover, W. A., & Gough, P. B. (1990). The simple view of reading. *Reading and Writing, 2*, 127-160.

[25] Chung, S. C., Chen, X., & Geva, E. (2019). Deconstructing and reconstructing cross-language transfer in bilingual reading development: An interactive framework. *Journal of Neurolinguistics, 50*, 149-161; Koda, K., & Zehler, A. M. (Eds.). (2008). *Learning to read across languages: Cross-linguistic relationships in first-and second-language literacy development*. Routledge.

[26] Snow, C. E., & Matthews, T. J. (2016). Reading and language in the early grades. *The Future of Children*, 57-74.

reached. This tipping point is an "aha moment" of how decoding works in one language that can be cognitively transferred to learning an L2 much more efficiently.

We also hypothesize that L2 oral language comprehension will also significantly predict L2 reading development, given the unconstrained nature of language skills. Unlike decoding skills, there is no real upper limit to vocabulary skills, syntactic skills, and pragmatic language use skills in a language. Therefore, we do not expect to see a tipping point per se. In sum, we expect the relationship between L1 and L2 decoding to be non-linear with a tipping point, and the relationship between L2 oral language comprehension and L2 reading to be linear.

### Figure 1. House Model for Bilingual Literacy Acquisition
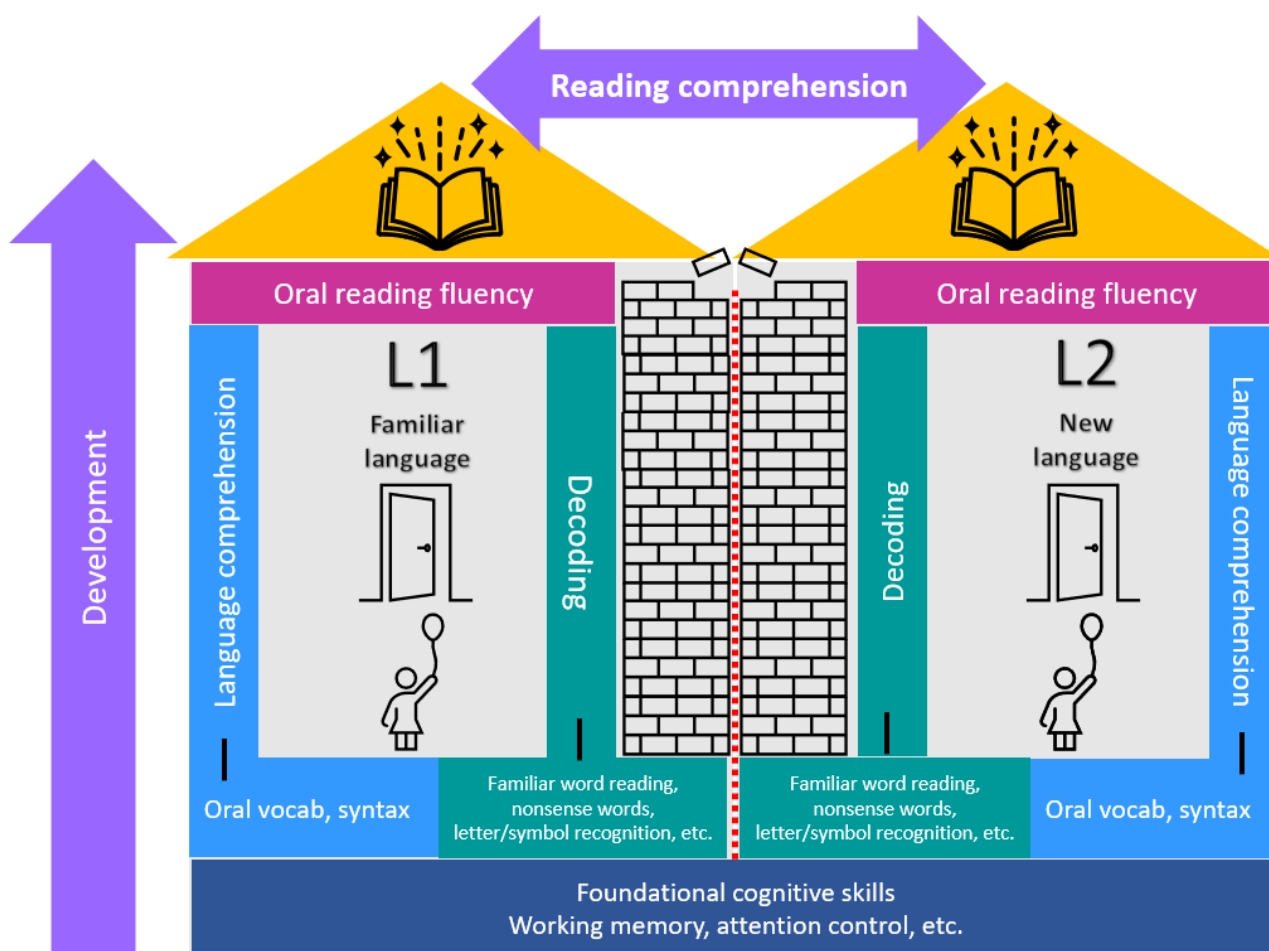
We further embed this cognitive model within the macro-sociolinguistic environment of reading development within schooling systems.[27] Environmental factors include classroom language-use patterns, language(s) used for instruction, political will, parental demands and language use, language status, and children's language skills and print exposure. The influence of these macro-sociolinguistic factors on cognitive processes is likely to be moderated by school and instructional factors, home and community print environment, and individual differences (e.g., age and gender). We examine the cognitive process of multilingual learning and link that to macro sociolinguistic factors and processes that make multilingual education systems successful (or not) in the context.

Figure 2 below depicts the full conceptual framework for this study, with the biliteracy house models in the centre, the micro-cognitive/psycholinguistic components surrounded by the macro-sociolinguistic environment, the initial conditions for the theory of change to work, and the potential moderators.

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[27] Senechal, M., & Le Fevre, J. (2014). Continuity and change in the home literacy environment as predictors of growth in vocabulary and reading. *Child Development, 85*, 1552–1568.

Figure 2. Conceptual Framework
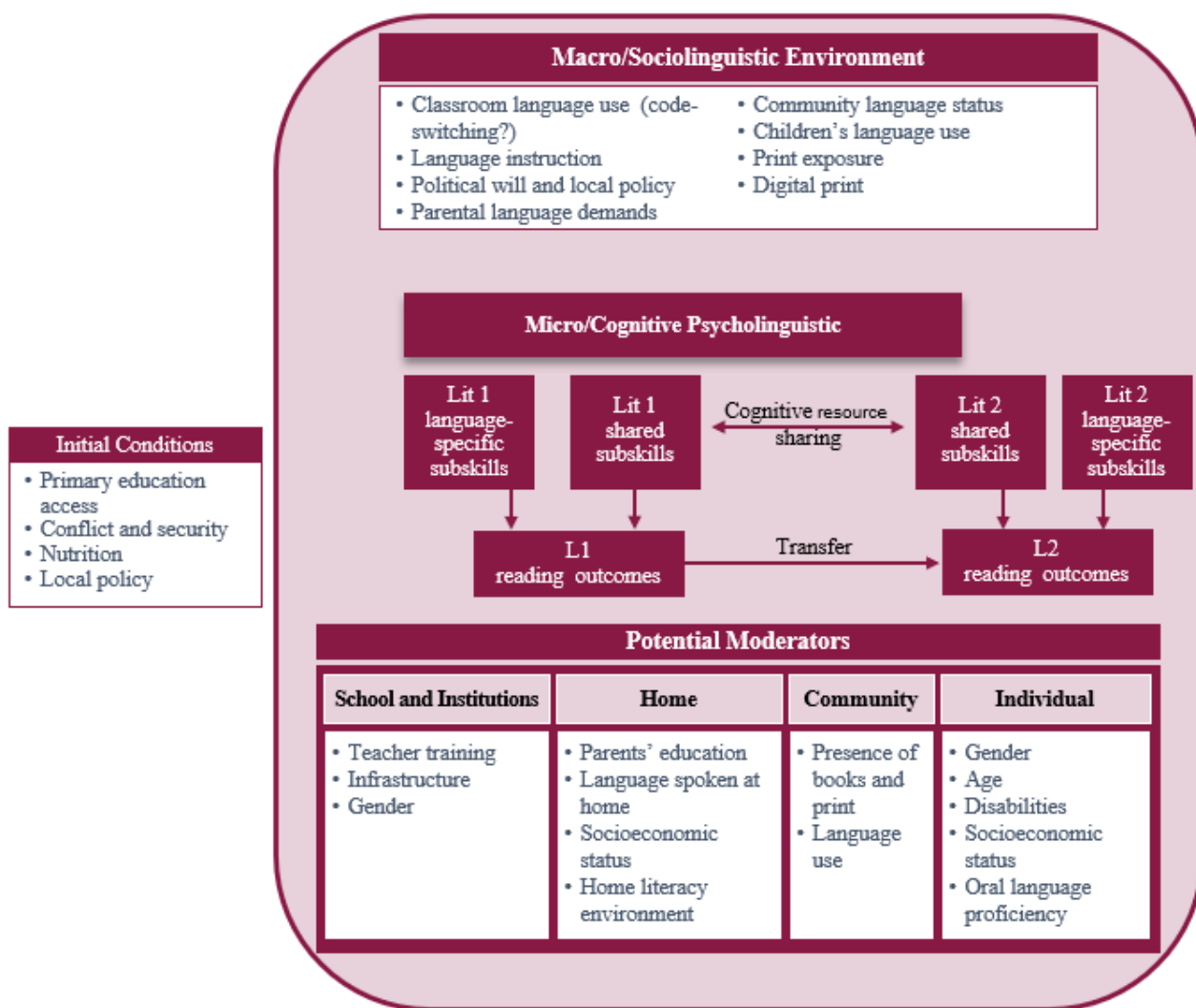
Note: "Lit 1" and "Lit 2" refer, respectively, to the first and second languages in which children learn to read

Research Design

Considering both the cognitive and sociolinguistic factors included in the conceptual framework, our study draws on both quantitative and qualitative methods. These include student language and literacy assessments and teacher surveys, as well as interviews and focus group discussions with parents, teachers, students, school directors, and national-level stakeholders, which we describe in the following sections.

Stakeholder Engagement

The first phase of our research included a stakeholder engagement phase, during which we connected with various national-level stakeholders in each of the three countries of our study—the DRC, Senegal, and Côte d'Ivoire. Before finalizing our research design, we spoke with organizational leaders working in basic education and languages of instruction, including representatives from:

- National ministries of education;
- The United Nations Educational, Scientific and Cultural Organization (UNESCO);
- The United States Agency for International Development (USAID);
- Non-governmental organizations active in elementary education, such as Associates for Research and Education for Development (ARED) in Senegal and the Association of Volunteers in International Service (AVSI) in Côte d'Ivoire;

- Local universities.

These stakeholders informed our team about the status of language of instruction policies and implementation in their countries, the context and associated challenges surrounding this work, and the research needs they experience. They also provided insight into the research design, particularly the sampling methods.

Quantitative Methods

Our team used quantitative methods to investigate students' language skills, allowing us to evaluate the match/mismatch between the languages students use and understand and the languages in which they learn. Quantitative methods also allowed us to assess students' literacy skills in both their mother tongue and French. These methods then enabled us to test for the existence of threshold levels of literacy skills, which we hypothesized can transfer to produce exponential increases in literacy skills in French, when developed to a point of sufficiency.

Tools. We used two main quantitative instruments to capture language and literacy skills of students. All assessments were administered electronically by local enumerators in the local languages and French. To assess literacy levels of students in sampled schools, our team administered a modified Early Grade Reading Assessment (EGRA) tool. The tool was administered in French and various local or regional languages, depending on the country. Table 1 shows the overall literacy skills and their sub-skills, alongside the sub-task which was used to measure each sub-skill.

The student literacy assessment measured students' listening comprehension, oral vocabulary knowledge, semantic fluency, phonological awareness, letter knowledge, decoding, oral reading fluency, and reading comprehension. We also administered surveys to teachers to evaluate their pedagogical knowledge; these assessments enabled us to correlate teachers' and students' skills.

Table 1. Summary of Literacy Skills Mapped to Sub-tasks

Literacy skill	Sub-skill	Sub-task
Language comprehension (LC1)	Expressive vocabulary	Recognizing images
Language comprehension (LC2)	Receptive vocabulary	Spatial words
Language comprehension (LC3)	Listening comprehension	Oral comprehension/Elision
Language comprehension (LC4)	Expressive oral language skills/semantic fluency	Semantic fluency
Decoding (D1)	Letter (symbol) name identification	Letter names
Decoding (D2)	Letter (symbol) sound identification	Letters/grapheme sounds
Decoding (D3)	Decoding familiar words	Familiar words
Decoding (D4)	Decoding invented words	Invented words
Oral reading fluency (ORF)	Oral reading fluency	Short story (fluency)
Reading comprehension (RC1)	Reading comprehension	Short story (comprehension)
Reading comprehension (RC2)	Silly sentences	Silly sentences/Picture matching

In line with current research on literacy skills, the research team computed three literacy constructs based on the Cognitive Foundations of Reading Acquisition: reading comprehension, language

comprehension, and decoding. [28] Table 2 lists the three literacy skills, their definitions, and the measure computation.

Table 2. Literacy Constructs

Literacy skill	Definition	Measures
Language comprehension	The multi-dimensional and complex process of extracting and constructing meaning (literal and inferred) from orally-presented (or signed) information (i.e., words, sentences, longer discourse, or sign-language). This construct consists of several sub-constructs.	Average of LC1, LC2, and LC3
Decoding	The ability to apply sound-symbol correspondences in order to sound out symbols (letters and letter clusters). This construct consists of several sub-constructs.	Average of D1, D2, D3, and D4
Reading comprehension	The ability to comprehend written texts, which requires language comprehension and automatic word recognition skills, as well as their corresponding sub-skills.[29] This construct consists of several sub-constructs.	Average of RC1 and RC2

One of our main goals was to conduct a **language mapping** by empirically determining how well students spoke any language. We utilized the semantic fluency assessment, which measured expressive oral language fluency and dominance for this purpose. We classified students as monolingual (i.e., the student knows only one language, even if the student claims to know more, or one language dominates and the student has far less proficiency in the other language[s]), bilingual/trilingual (i.e., the student knows two/three languages and neither language dominates), and emerging bilingual (i.e., the student knows more than one language with slight dominance of one language).

To determine the dominant language of each child, Dalberg conducted an AIR-designed semantic fluency assessment. In the semantic fluency assessment, enumerators asked school-aged children to list all the languages they use and understand at all (i.e., any languages they use at home, in school, with friends, in religious settings, etc.). Then enumerators showed students an image as a prompt and gave them 60 seconds to list words in each language that they use and understand. For example, if a student said they speak three languages, they were asked to complete the task three times separately for a total of 180 seconds. As the student listed the words, the enumerator tracked the number of words they said within the 60 seconds. Any word that came to the child's mind and was said aloud in the target language was counted. The enumerators were instructed that students must list individual words only. The enumerators were also instructed to audio-record the interaction on the survey platform.

Sampling. In each country we had initially intended to select two regions for inclusion in our study. However, after engaging with education stakeholders in each country, we jointly agreed upon slightly different sampling approaches, all with the aim of covering both rural and urban areas and diverse language zones. In the DRC, we selected four regions (Haut-Katanga, Kinshasa, Kongo Central, and

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[28] Hoover, W. A., & Tunmer, W. E. (2020). *The Cognitive Foundations of Reading and its Acquisition*. Springer International Publishing.

[29] Gough, P. B., & Tunmer, W. E. (1986). Decoding, reading, and reading disability. *Remedial and Special Education*, *7*(1). https://doi.org/10.1177/074193258600700104; Hoover, W. A., & Gough, P. B. (1990). The simple view of reading. *Reading and Writing*, *2*, 127-160; Kim, Y.-S. G. (2015). Developmental, component-based model of reading fluency: An investigation of predictors of word-reading fluency, text-reading fluency, and reading comprehension. *Reading Research Quarterly, 50*(4), 459-81. doi: 10.1002/rrq.107; Kim, Y.-S. G., & Wagner, R. K. (2015). Text (oral) reading fluency as a construct in reading development: An investigation of its mediating role for children from Grades 1 to 4. *Scientific Studies of Reading, 19*(3), 224–242. https://doi.org/10.1080/10888438.2015.1007375.

Lomami), one from each of the four main language zones. In Côte d'Ivoire, we selected three regions (Abidjan, Gbêkê, and Poro) to capture the diverse linguistic situations in the country. Lastly, in Senegal, we selected two regions (Dakar and Fatick) to ensure complementarity but not overlap with a USAID-funded study on Language of Instruction Transition in Education Systems. Further, these two regions capture linguistic diversity and bilingual education programs (i.e., ARED and USAID's *Renforcement de la Lecture Initiale pour Tous* [RELIT]) that were already in existence in these regions, thus supporting the use of the research results for policymaking.

Within each country, we sampled approximately 70 total schools, evenly split among the regions and across urban and rural districts. From each school, we sampled students from Grades 2 and 4, recognizing that the medium of instruction is meant to change to French in this range in each country, and that Grade 2 literacy is an internationally recognized metric. This approach enabled us to detect thresholds, as these are the earliest grades in which we are likely to see relatively normal distributions in reading scores in both L1 and L2. We randomly selected approximately 12 students per grade level from each school, for a total sample of approximately 1,680 students per country or 5,040 total students. In sampled schools with fewer than 12 students in Grade 2 or Grade 4 classes, we sampled all students in the class. Table 3 presents the actual school and student sample size for the quantitative analysis by country and region.

Table 3. Quantitative Sampling

Country	Region	Number of Schools	Number of Students
Côte d'Ivoire	Abidjan	22	530
	Gbêkê	24	577
	Poro	24	575
DRC	Haut-Katanga	18	430
	Kinshasa	18	432
	Kongo Central	17	406
	Lomami	17	409
Senegal	Dakar	35	841
	Fatick	35	850

The representativeness of the number of schools is determined by the total number of schools. As shown in the formula below, *m* denotes the number of students per school, *J*, the number of schools selected for a given region, and *D*, the number of regions in a country. We also set α = 0.05, which is related to the level of confidence that we use to calculate the margin of error (ME). The ME enables us to be 100(1 − α) per cent confident that an estimate from our analysis does not differ from the true value by more than the ME. The ME depends partly on the intraclass correlation (ICC), which measures the similarity in reading outcomes amongst students within (and between) schools. The relationship for estimating a proportion that is representative for a given language is given by the following formula:

$$ME = z_{\alpha\backslash 2} * \sqrt{\left(\frac{1 + (m-1) * ICC}{mJD}\right)}$$

Assuming an ICC of 0.15, which is consistent with EGRA data from other low and middle-income countries, we estimate that the ME for all countries is 0.10.[30] That is, based on our sample, we can be 95 per cent certain that our estimates for a given language within a given grade level will not differ from the true value by more than 10 per cent.

Analysis. The main goal of our analysis (beyond the descriptive analyses to assess children's language skills) was to test whether there is a threshold value of L1 decoding at which the child can transfer these skills to facilitate decoding acquisition in L2 (French). As detailed in the theoretical framework above, the underlying premise of our hypothesis is that there may be a point of L1 decoding skill mastery after which French decoding skills will improve substantially *more* with the same marginal improvements in the L1 decoding skills. On the basis of our conceptual model, the anticipated outcome is that, at a threshold point of L1 reading, the skills are mature enough and ready to be transferred to L2 reading development; thus, the association between L1 and L2 decoding skills increases at a far higher rate. We tested this hypothesis by using a two-stage process to determine the nonlinearities in the relationship between the skills for students in our sample.

First, we assessed the relationship between L1 decoding and L2 decoding by analyzing the two-dimensional scatter plots of the two variables. These two-dimensional scatter plots indicate whether a threshold value of decoding exists and, if so, how high that threshold value may be (see Appendix). The threshold value was approximated by visually determining the value of L1 decoding above which the correlation of the relationship between L1 decoding outcomes and L2 decoding outcomes increased substantively.

Next, we formally tested for the existence of a threshold value of L1 decoding by constructing a test statistic for a structural break without imposing a known threshold by combining the test statistics computed for each possible break score in L1 decoding in the sample. Then we used the maximum of the tests computed at each possible break, in what is known as a **supremum Wald test**, which uses the maximum of the sample tests. The intuition behind these tests is to compare the maximum sample test with what could be expected under the null hypothesis of no break.[31,32]

The thresholds to define the language categories (i.e., monolingual, bilingual, emerging bilingual, etc.), shown in Figure 3, were based on the theoretical basis for the semantic fluency analysis and AIR's previous language mapping research in Mozambique.[33] The thresholds tested in Mozambique were applied to the Côte d'Ivoire, DRC, and Senegal data and cross-checked in reference to the score distributions from the semantic fluency test. To ensure that the thresholds fit the scores well (i.e., that students in Mozambique were not able to speak far more or far less words in their self-reported languages than the students in our sample), the team conducted sensitivity analyses by adjusting the threshold of each language category to clearly understand how manipulation of the thresholds would affect the proportion of students across the different language categories. The purpose of this exercise was to ensure that we applied categories to students' expressive language levels that were data-driven and responsive to the context, rather than blindly applying thresholds used in another context that

[30] Menendez, A. & Ome, A. (n.d.) Intracluster Correlations for Early Reading Evaluations. *USAID*. https://pdf.usaid.gov/pdf_docs/PA00ZQNH.pdf
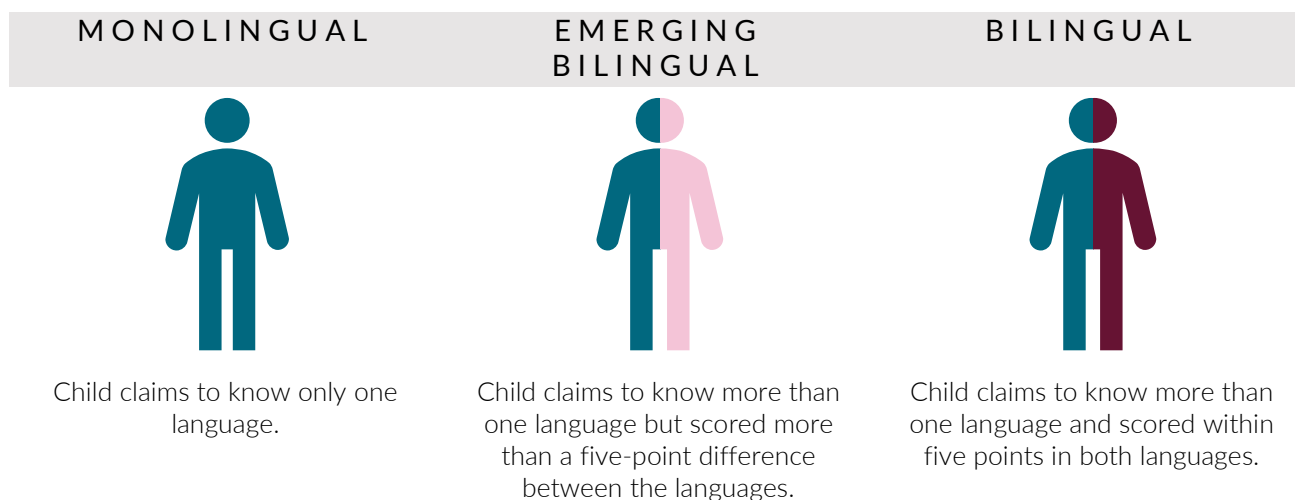
[31] Quandt, R. (1960). Test of the hypothesis that a linear regression obeys two separate regimes. *Journal of the American Statistical Association*, *55*, 324-330. https://doi.org/10.1080/01621459.1960.10482067

[32] Donald W., K. Andrews. (1993). Tests for parameter instability and structural change with unknown change point. *Econometrica*, *61*(4), 821–856. https://doi.org/10.2307/2951764

[33] Nakamura, P., Carson, K., Davis, D., Rai, N., & Todd, A. (2017). *Language Mapping Study in Mozambique*. USAID. https://pdf.usaid.gov/pdf_docs/pa00n7sd.pdf

tested different languages and do not provide the same standard of comparability between languages.[34]

Figure 3. Language Classifications

MONOLINGUAL	EMERGING BILINGUAL	BILINGUAL
Child claims to know only one language.	Child claims to know more than one language but scored more than a five-point difference between the languages.	Child claims to know more than one language and scored within five points in both languages.

We also used descriptive statistics to examine trends in teacher knowledge.

Qualitative Methods

Qualitative methods were used primarily to address research questions regarding attitudes, knowledge, and practices regarding bilingual education. These qualitative data provided understanding of the individual-, classroom-, and school-level dynamics that influenced student literacy outcomes.

Sampling. In each of the three countries, we purposively selected at least one urban and one rural school from each of the subregions of the quantitative sample to include in the qualitative data collection. Table 4 shows the school sample for qualitative data collection.

Table 4. Qualitative School Sampling

Country	Region	Number of urban schools	Number of rural schools	Total number of schools
Côte d'Ivoire	Abidjan	1	1	6
	Gbêkê	1	1	
	Poro	1	1	
DRC	Haut-Katanga	1	1	8
	Kinshasa	1	1	
	Kongo Central	1	1	
	Lomami	1	1	
Senegal	Dakar	2	1	6

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[34] Adjusting the thresholds for bilingual students (to mandate a difference of at least 7 or 10 in scores from the first dominant language) results inevitably in classifying more students as bilingual and fewer students as monolingual. The team also found that raising the threshold reduces the proportion of emerging bilingual students. Lowering the threshold between monolingualism and bilingualism reduces the proportion of bilingual/trilingual students and increases the proportion of monolingual students, while raising the threshold does the opposite. Reducing the threshold would also increase the proportion of emerging bilinguals, as well as widening the threshold to more than a three-word difference.

	Fatick	2	1	

In each school, Dalberg enumerators interviewed a school administrator, a Grade 2 teacher, and a Grade 4 teacher to better understand school- and classroom-level language practices. For example, interviewers questioned informants about student language proficiency, teacher code-switching practices, and challenges and successes related to French and local language instruction.

Enumerators also conducted focus group discussions with Grade 2 students, Grade 4 students, and parents at each school. These focus group discussions explored parental and student attitudes towards bilingual instruction, including the perceived value of the respective languages and the level of comfort using each language at school and at home. We also investigated student and parent language of instruction preferences as well as their perceived costs, benefits, challenges, and successes of instruction in each of the targeted languages.

In addition, our research team conducted interviews with three to five representatives from the national Ministry of Education, and five to seven representatives from partner organizations in each country. The data collectors questioned respondents about the development and implementation of language-learning policies, perceived successes and challenges with the policies, and stakeholder attitudes towards bilingual learning.

Analysis. AIR researchers analysed the qualitative data following a rigorous and iterative process of coding, analysis, and summation. For transcripts of the interviews and focus group discussions, we used NVivo software to deductively organize data into a thematic coding structure. After coding data, analysts inductively analysed the data within each theme to identify patterns, note any variance, and summarize findings, including noting any patterns or variations by region, respondent type, or urbanicity. Finally, researchers triangulated findings with the quantitative team members to validate and further explain survey and assessment results.

IV. Findings

In this section, we present our findings to each research question by country. We interpret all questions through the lens of our theoretical framework and design, which we developed based on inputs from stakeholders in each country.
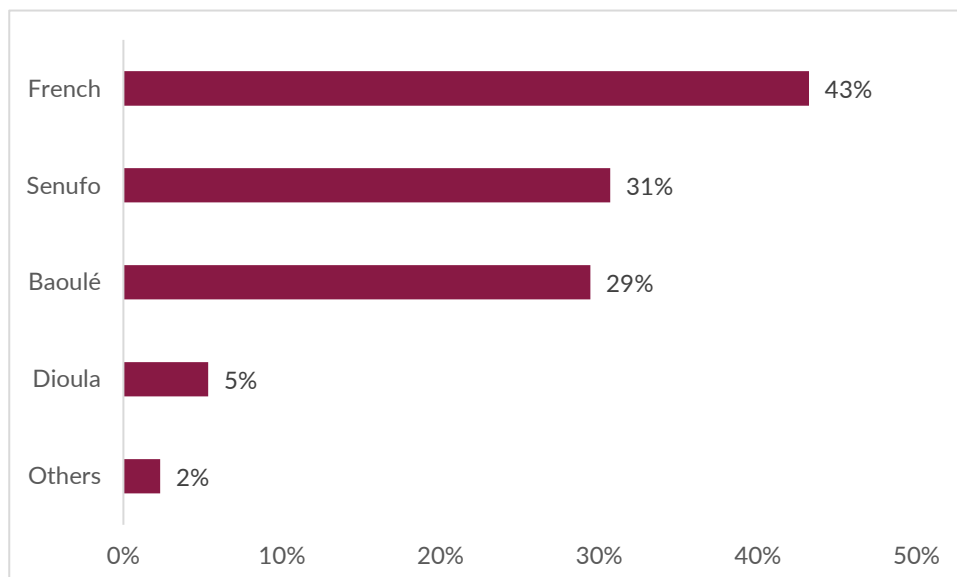
Côte d'Ivoire

Currently in Côte d'Ivoire, French is the only language officially prescribed for use in most schools. In recent years, Ivorian policymakers have indicated a desire to promote bilingual education in schools in view of the evidence demonstrating the positive outcomes of learning in local languages.[35] The government has led some experiments in bilingual learning across several schools[36] but has yet to implement any large-scale reform.

To study multilingual teaching and transition in this setting, we collected data in both urban settings (which are likely to have more languages spoken) and rural settings (which are likely to have more predominant local languages) across Abidjan, Gbêkê, and Poro.

What language(s) do students use and understand?

As shown in Figure 4, only 43 per cent of the sample can speak and understand French (whether they are monolingual in French or speak French in addition to another language). In other words, of all the children in our sample, about 57 per cent cannot speak or understand French as well as they can understand another language (or they cannot speak or understand French at all). Around 31 per cent of the students speak Senufo as a dominant language (i.e., a first or second language), and 29 per cent speak Baoulé. Dioula and other languages are spoken by a mere 5 per cent and 2 per cent of our sample, respectively, as their dominant language. (Please note that since a child can speak more than one language, the percentages do not add up to 100.)

**Figure 4. Languages Spoken by Students in the Sample**

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[35] Government of Côte d'Ivoire. (2022, April 22). Education nationale: le gouvernement reaffirme son engagement a poursuivre la politique de l'enseignement bilingue. *Official Portal of the Government of Côte d'Ivoire*. https://www.gouv.ci/_actualite-article.php?recordID=13436

[36] Ibid; Teaching at the Right Level Africa. (n.d.) Côte d'Ivoire. https://teachingattherightlevel.org/Côte-divoire/#:~:text=Although%20over%2070%20languages%20are,franca%20and%20the%20official%20language

According to semantic fluency assessments, we found that **88 per cent of the students are monolingual, while a small fraction (11 per cent) are bilingual** (see Figure 5). These figures are similar across Grades 2 and 4, with students in Grade 4 demonstrating some slight increases in bilingual abilities; ninety per cent of Grade 2 students and 86 per cent of Grade 4 students are monolingual, while eight per cent of Grade 2 and 13 per cent of Grade 4 children are bilingual.

Figure 5. Distribution of Language Skills Among Students
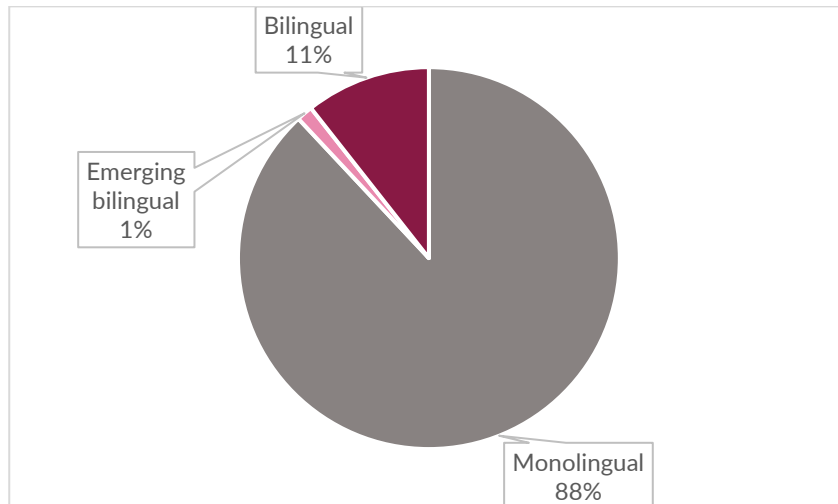
(N =1682)

When we look at student language abilities across languages, we see **large differences between the languages spoken by children and the likelihood that they are monolingual or bilingual** (see Figure 6). French, Senufo, and Baoulé are the languages most spoken by children in our sample. French-speaking students are more likely to be bilingual (23 per cent), followed by Senufo (18 per cent). Among the main languages of Côte d'Ivoire, students who have Baoulé as a dominant language are most likely to be monolingual. Ninety-two per cent of Baoulé-speaking students are monolingual, as are 80 per cent of Senufo-speaking students and 75 per cent of French-speaking students. While larger proportions of Dioula and other language speakers are bilingual, the actual number of students in our sample who fit into these groups is small (<100 students).

Figure 6. Multilingual Distribution of Languages
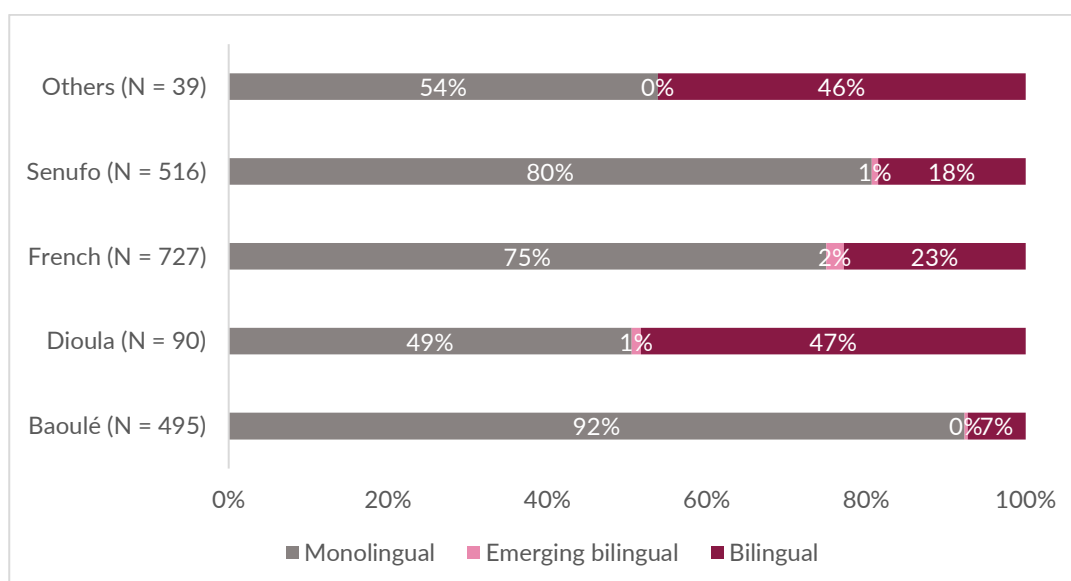
As expected, qualitative respondents reported that **students speak French outside of school much more often in Abidjan than in other regions**. This is borne out by quantitative data as well; 65 per cent of students who have French as a dominant language are from Abidjan. Moreover, 75 per cent of

students who are monolingual and have French as a dominant language are from Abidjan. Respondents in Abidjan reported that students speak a greater variety of other languages outside the classroom. Respondents also reported Gbêkê and Poro as more bilingual (Baoulé and Senufo, respectively, with French) rather than multilingual. Across all regions, teachers and students made some reports of significant numbers of children unable to speak the mother tongue of the majority. We see that approximately 15 per cent of the students in each of the regions do not speak the regional language (e.g. Senufo in Poro).

To what extent is there a match between language of instruction and student language skills?

In accordance with the language of instruction policy of Côte d'Ivoire, qualitative informants reported that French is the only reported language of instruction across the country. (Although some students outside of the city of Abidjan reported that their teachers briefly use local languages to speak with their students. See page 22 for more information.)

Using our student assessment data, we determined whether students' familiar language—coded as either the one language known to monolingual children or any of the languages known to multilingual children—matched with the language of instruction. Resulting data showed that **students in Abidjan are likelier to be French speakers, and thus, more likely to be in classrooms in which they understand the language of instruction.** In each of the sampled schools in Abidjan, at least 60 per cent of students are in a classroom where they can understand the language of instruction.

Yet, **there are schools in both Poro and Gbêkê in which none of the children know French.** In both these regions, children are more likely to be at a disadvantage, since they do not speak the language of instruction. Only 20 per cent of children in Poro and 33 per cent of children in Gbêkê classify as being able to speak the language of instruction. The level of mismatch between the languages students know and the language of instruction level ranges from 48 per cent to 100 per cent in Gbêkê and from 31 to 100 per cent in Poro. In other words, there are some schools in each region where none of the children know French but are being taught in French.

> ONLY 20 PER CENT OF CHILDREN IN PORO AND 33 PER CENT OF CHILDREN IN GBÊKÊ ARE TAUGHT IN LANGUAGES THEY SPEAK AND UNDERSTAND.

There is a huge disparity in mismatch between Abidjan and the other two regions. While in Abidjan only 15 per cent and 6 per cent of students in Grades 2 and 4, respectively, are in classrooms where they do not know the language of instruction (French), this figure is upwards of 85 per cent for all grades in Gbêkê and Poro.

Figures 7-9 map the percentage of mismatch between the languages of students and the languages of instruction in our research sample, with the darker colored dots representing the schools with the higher percentages of mismatch.
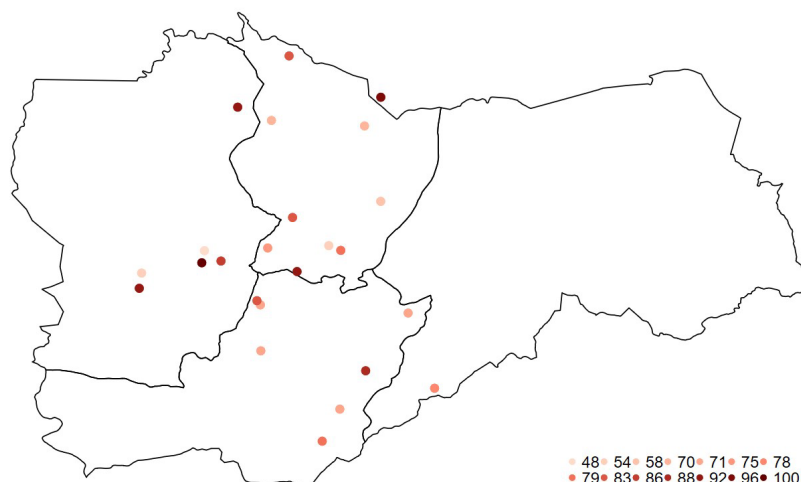
Figure 7. Mismatch Percentage in Abidjan Schools

0 · 4 · 8 · 17
· 21 · 25 · 29
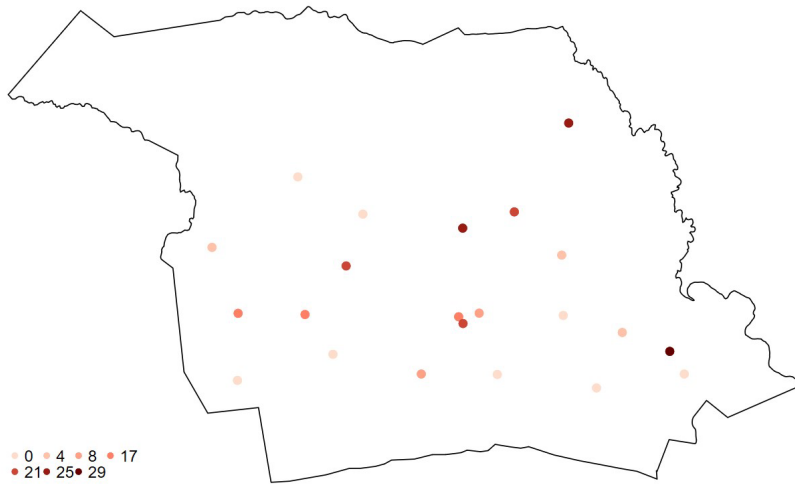
(N =530)

Figure 8. Mismatch Percentage in Poro Schools

· 31 · 38 · 48 · 65 · 67 · 71 · 76 · 78
· 79 · 80 · 85 · 86 · 88 · 92 · 96 · 100
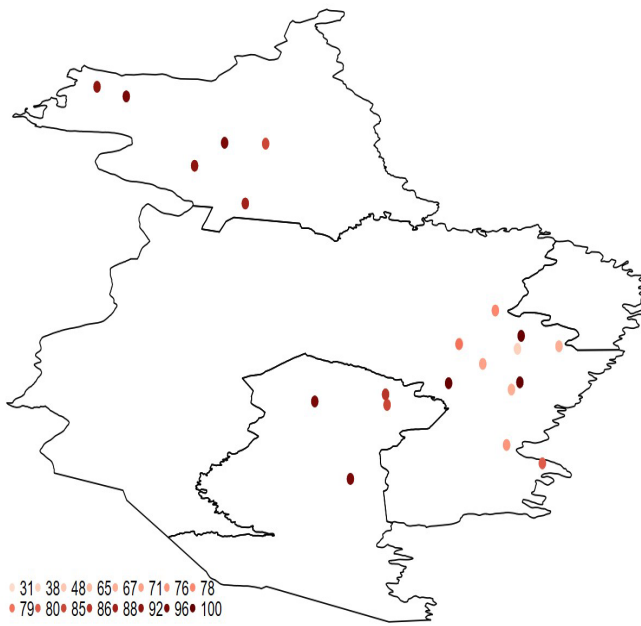
(N =575)

Figure 9. Mismatch Percentage in Gbêkê Schools

48 · 54 · 58 · 70 · 71 · 75 · 78
79 · 83 · 86 · 88 · 92 · 96 · 100

(N =577)

In addition to differences by region, we also see that the level of mismatch drops slightly between Grades 2 and 4. While 77 per cent of the children in Grade 2 are in a classroom that doesn't use a language of instruction that they know, this numbers falls to 72 per cent in Grade 4. This implies that **children are learning French language skills in school, but a large fraction of children still are not learning these skills by Grade 4.**

In addition, our data found that students who know French have better achievement in French decoding and reading comprehension when compared to those who do not know French (see Table 5). Furthermore, students who are bilingual and know the language of instruction (French) have better decoding and reading comprehension scores than non-French speakers.

Table 5. Differences in Sub-skills by Mismatch in the Language of Instruction

Sub-task	Monolingual students who know the language of instruction (French)	Bilingual students who know the language of instruction (French)	All students who know a language other than French (including bilingual French speakers)	Difference in means between students who know the language of instruction and students who do not
French Decoding Score (%)	31%	37%	21%	12.19***
French Reading Comprehension Score (%)	29%	30%	16.1%	16.20***

*Note: Differences in means is the difference in scores between all students who know the language of instruction and all students who do not know the language of instruction. *** denotes p-value < 0.01.*

Is there a threshold level of L1 literacy skills and L2 oral language skills required for L2 literacy? If so, what is the threshold?

Theory suggests that two skills—language comprehension of an L2 (French in this case) and decoding skills of the L1—are positively correlated with reading skills in an L2.[37] In general, we expect to see an increase in a student's decoding and reading comprehension abilities in French as their French language comprehension (LC) skills improved. We found that this correlation held true for students in both Grade 2 (Decoding-LC ρ = 0.33; Reading Comprehension-LC ρ = 0.54) and Grade 4 (Decoding-LC ρ = 0.25; Reading Comprehension-LC ρ = 0.71).

We then explored whether there is a threshold above which there is a stronger relationship between decoding in the L1 and decoding in French. In other words, do children acquire French skills at a higher rate once they have reached a certain level of decoding skills in their native languages?

As shown in Figure 10, **there does not appear to be a threshold point** for decoding skills in Côte d'Ivoire. While this result was not entirely as expected, it is not surprising in the country context. As discussed, students enter Grade 1 in Côte d'Ivoire and immediately begin learning in French. Therefore, they do not officially learn to read and write in their mother tongue, and thus they are likely not developing the literacy subskills, such as decoding, in that language. **In other words, students are likely to possess little to no decoding skills in their mother tongue even if they are able to decode in French**. This helps explain why we do not observe a threshold in this case.

> IN CÔTE D'IVOIRE, WE DO NOT OBSERVE A THRESHOLD FOR DECODING SKILLS, LIKELY BECAUSE CHILDREN ARE NOT LEARNING TO READ IN THEIR FAMILIAR LANGUAGES.

Figure 10. Threshold Analysis for L2 Decoding-L1 Decoding

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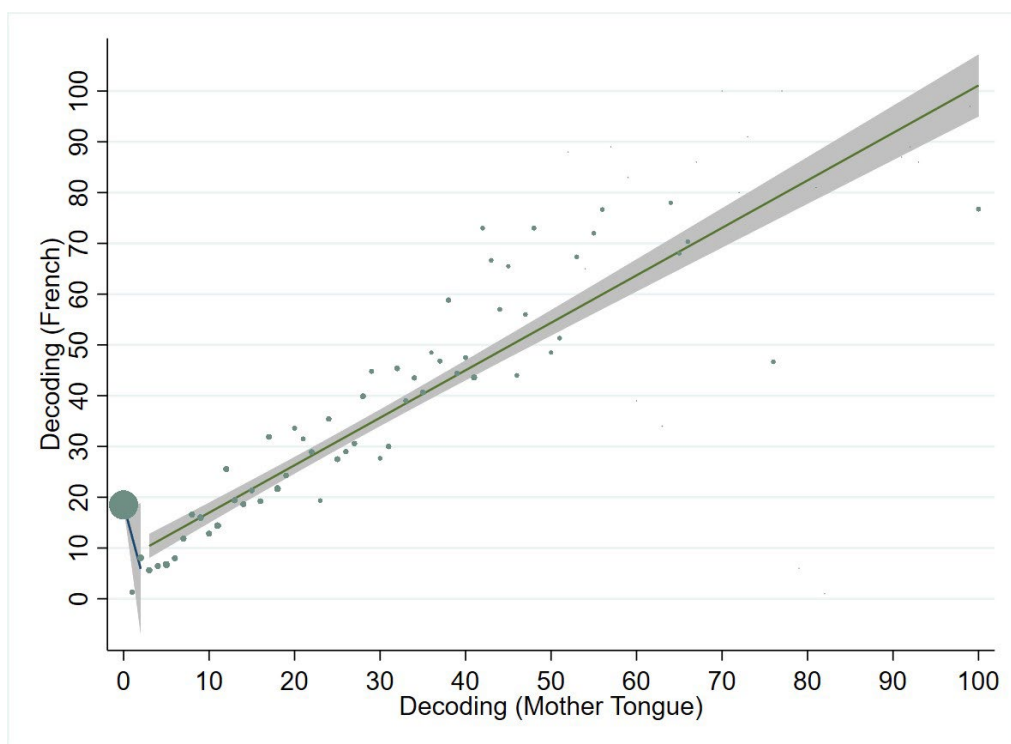
[37] Chung, S. C., Chen, X., & Geva, E. (2019). Deconstructing and reconstructing cross-language transfer in bilingual reading development: An interactive framework. *Journal of Neurolinguistics, 50*, 149–161; Koda, K. (2008). Impacts of prior literacy experience on learning to read in a second language. In K. Koda & A. M. Zehler (Eds.), *Learning to read across languages: Cross-linguistic relationships in first- and second-language literacy development* (pp. 68–96). Routledge.

Next, we assessed whether there is a break in French language comprehension skills, the other skill for which there was a positive correlation with reading in French, as related to French decoding. As shown in Figure 11, **we also did not find a threshold for language comprehension in French.** While the graph may appear to show a break, the results are not significant and the slopes of the lines on either side of the break are not substantially different from each other. This result aligns with our conceptual framework and initial hypothesis that there is no definitive level of language comprehension in the L2 above which the relationship between language comprehension and decoding in L2 is greater. This finding is in line with the conceptual model that oral language skills are unconstrained, and therefore may not appear to present a point at which a person reaches sufficient "mastery." Rather, language comprehension is a significant predictor – and thus important to teach and learn – throughout the development of L2 reading comprehension.

Figure 11. Threshold Analysis for L2 Decoding-L2 Language Comprehension
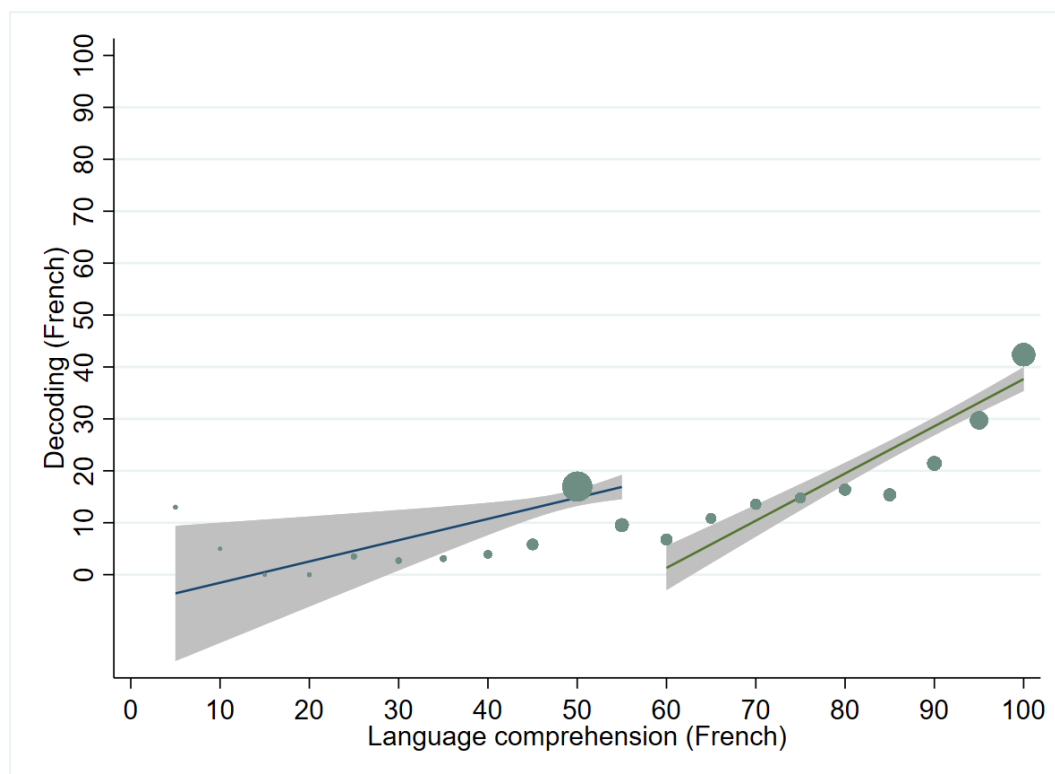
What are teachers' proficiency levels, in terms of their own language proficiency in target language(s), their general pedagogy knowledge, and their knowledge of specific pedagogies for bilingual and multilingual learning?

TEACHER LANGUAGE PROFICIENCY

In interviews, many teachers reported not knowing the mother tongues of their students or knowing their students' familiar languages only a little. These teachers often originated from other regions of the country where other local languages are more prominent. One Grade 2 teacher in Gbêkê explained, *"The majority of the students speak Baoulé, but I don't understand anything about the language. Let's say there are a few words that I know and that I'm familiar with, but I can't hold a fluid conversation with someone in this language. It's really complicated for me."* Teachers across the country reported being much more competent in French than in students' mother tongues.

GENERAL PEDAGOGY KNOWLEDGE

Teacher assessments showed that teachers in our sample have insufficient knowledge of general pedagogical practices. Assessments administered to test the teachers' knowledge of pedagogical practices included multiple choice questions on topics such as the purposes of continuous assessment

in the classroom, the benefits of groupwork, and activities that may help students with specific challenges. We found that teachers were able to answer only 58 per cent of the questions accurately. For instance, only 19 per cent of the teachers were able to answer a question related to student feedback correctly. Teachers scored relatively poorly in questions specific to subject matter pedagogy as well. For example, only 16 per cent of the teachers answered correctly a question about a student skill-building activity.

A number of teachers and school directors were **unfamiliar with the concept of bilingual/multilingual learning** and thought that our researchers were asking about ways to help students *learn* a local language. As a result, some respondents seemed to be giving their opinion on the possibility of adding local language courses to the regular school curriculum. This is demonstrated by a school director in Abidjan who said, *"If mother tongues are taught at school, on the whole, this will help to promote and perpetuate our local languages."* This conception appeared to be more prevalent in urban areas, where most students reportedly spoke French as their first language.

Overall, survey responses from **teachers indicated that they do not feel well equipped to teach in students' native languages**. As shown in Table 6, less than one-third of teachers said that they have been well trained to teach reading in students' native languages or to teach in a multilingual environment. In addition, only 21 per cent of teachers said that they have the materials they need to teach effectively in students' L1. One Grade 2 teacher explained the crucial need for training by stating:

> *"Without training, it's guaranteed that the mission won't be successful. It's like entrusting a public transport vehicle with passengers to someone who hasn't been to driving school, who doesn't have a driver's license, and who has no notion of driving."*

TEACHERS AND SCHOOL DIRECTORS NEED FURTHER TRAINING AND RESOURCES TO TEACH IN LOCAL LANGUAGES AND KNOW WHEN STUDENTS SHOULD TRANSITION TO FRENCH.

Despite the lack of training and resources, about two-thirds of teachers said they feel confident that they can teach students to read in their L1.

When questioned about when students should transition from learning in local languages to learning in French, **most teachers and school directors did not appear to understand the concept of "transitioning" into French**, so they did not articulate the possible skill requirements for students to make the transition. A few teachers did, however, offer their opinions on this topic, each suggesting that students should transition to French instruction in Grade 1, Grade 2, or even in preschool. A teacher in rural Gbêkê stated, *"I think it might be a good idea to switch from mother tongue to French. Because it's a linked chain . . . but I think it has to start from preschool because, if that threshold is exceeded, the mother tongue will take over."* Such qualitative data suggest that teachers and school directors will need further training and resources to identify if and when the correct level at which students transition into another language of instruction.

What are teachers practices and attitudes regarding bilingual/multilingual education, especially in terms of teaching local languages, teaching linguistically mixed classrooms, and the timing and skills requirements of transitioning to new languages?

In terms of current practices, teachers reported using **French as the only language of instruction**. Students are learning to read and say the alphabet only in French; the few students in our qualitative sample who reported knowing the alphabet in the local language claimed that they learned it at home.

Some teachers reported **using students' home languages on occasion**, to amuse students or to help them understand concepts. They may translate a few words or phrases from French or explain difficult parts of a lesson in students' familiar languages. As a teacher in Abidjan explained, *"I understand a bit of Malinké, a bit of Guéré—it's not too much—and a bit of Baoulé too. So, I try to say it in the children's mother tongue so that they can understand, and if the majority understand the word in that language, I pass it on."* However, this teacher clarified that she does not do this often, since not all her students spoke the same language. Other teachers explained that if or when they use Ivorian languages, it is only for a small percentage of the class.

Educators noted that, in addition to not understanding local languages, they lack teaching materials in local languages, such as teaching guides, books, and other resources, which prevent them from using those languages in the classroom. Overall, teachers feel ill equipped to teach in students' local languages. As a Grade 2 teacher in Gbêkê illustrated, *"I don't understand Baoulé myself. So, I do my best to make myself understood by the children. I regularly use down-to-earth language so that they can better understand what I'm saying. Otherwise, frankly, teaching in mother tongues isn't in my line of work because I don't master those languages myself."*

Teachers navigate teaching French in their classrooms in several ways. Most teachers agreed that they begin French instruction orally, by using poetry, asking students to repeat letter sounds, or using other listening comprehension strategies. They reported using simple language or gesturing to students. One teacher illustrated by saying, *"For example, if I want to explain a bucket, I say 'a bucket,' the word 'bucket.' I take the object and show them. 'What is it? It's a bucket.'"* Several teachers also indicated that asking students who understood French well to translate for other students or back to the teacher was a relatively common practice.

ATTITUDES

Teachers and school directors noted some **potential benefits of teaching in Ivorian languages; namely, increasing the engagement of students and parents and improving student comprehension**. According to survey results, as shown in Table 6, around 80 per cent of teachers agreed that it is important for students to learn to read in their native languages. Several teachers and school directors highlighted in interviews the ways in which teaching in Ivorian languages might help students be more attentive and engaged in the classroom. Especially when students are comfortable speaking in a local language, teachers expected that they would be "proud," "happy," and "motivated" to do lessons in that language. One person noted that teaching in local languages might also enable parents to support students' learning. In addition, teachers perceived that learning to read in local languages would lead to better learning outcomes for students. Around 70 per cent of surveyed teachers agreed that, if students learned to read in their L1, it would help them read better in French, and around 80 per cent of teachers agreed that teaching students to read the L1 and French at the same time would help them read well in both languages. (It is interesting to note, however, that a large proportion of teachers had conflicting responses; nearly 40 per cent of teachers also said that students *could not* learn to read in two languages at the same time because it would be too confusing.) Several of the interviewed teachers agreed with the academic advantages of learning to read in students' familiar languages, some noting that instruction in students' familiar languages can help children comprehend the lessons across all subjects.

On the other hand, **many interviewed teachers and school directors criticized the idea of teaching in Ivorian languages.** They broadly stated that doing so would negatively affect French language learning, overburden teachers, and offer little value to students. Teachers and school directors worried that the introduction of local languages would lead students to "lose interest" of "give up on" French-language learning. Most believed that school should be a place where speaking French was enforced, and they invoked the importance of learning French—the "main language" of Côte d'Ivoire—in so doing. A few respondents also noted that teaching local languages would burden teachers with additional material

to cover during the school year. Accordingly, 55 per cent of surveyed teachers agreed that teaching students to read in local languages would take too much time away from teaching them to read in French. A teacher in urban Poro stated, *"If I have to give a 25-minute [French] lesson, it's not certain that all the students in the class will understand it. Imagine if these insufficient hours were also used to teach the mother tongue."* This concern stemmed from a misconception that local language learning would require additional courses.

Teachers also believed that Ivorian languages are not worthwhile to teach because they afford few educational or professional opportunities to students. A teacher in rural Poro felt that learning Ivorian languages is a cultural experience rather than something that could benefit students in the long run. Several teachers and school directors further suggested they were critical of multilingual education because the curricula and resources did not exist at that time. A school director in urban Poro stated,

> *"Once the programme has been established and validated [...], we shouldn't be short of materials. Because to teach well, you need the right materials, [...] the right training, a full range of appropriate documents, and of course, support measures to ensure that teachers feel comfortable and motivated in their mission."*

Teachers and school directors likely found it important to mention the need for materials because, as several respondents mentioned, schools lacked resources and investment.

The respondents broadly highlighted the linguistic diversity in Côte d'Ivoire, and they pointed to the **challenges of teaching in linguistically mixed classrooms**. Several suggested that this placed additional burden on teachers to learn new languages, which would impede the quality of multilingual instruction. Several others suggested using a regional language approach, teaching only that language which is dominant in a particular area. Overall, the variety of reactions on the topic of linguistically mixed classes suggests that teachers and school directors do not feel well informed or well prepared to teach in such a way.

Table 6. Teacher Views on Multilingual Instruction in Côte d'Ivoire

Statement	Strongly Agree or Agree
I am confident that I can teach students to read in French.	97%
I am confident about instructing in French.	96%
It is valuable for students' future economic opportunity to be bilingual.	96%
I prioritize teaching in French because pupils are tested in French.	95%
I have the materials I need to be able to teach effectively in French.	84%
Teaching pupils to read in their mother tongue and French at the same time will help them read well in both languages.	82%
It is important for pupils to learn to read in their mother tongue.	81%
It is valuable for students to learn to read in their mother tongue, because it will help them read well in French.	79%
Teaching pupils to read in their mother tongue will help them read better in French.	73%
I would teach more in their mother tongue if I had teaching and learning materials in their mother tongue.	68%

Statement	Strongly Agree or Agree
I am confident that I can teach students to read in their mother tongue.	67%
I am confident about instructing in their mother tongue.	64%
Teaching students to read in their mother tongue takes too much time away from teaching them to read in French.	55%
Parents only/mostly prefer to have their children learn in French.	52%
My school's head teacher encourages teaching in their mother tongue in early grades.	41%
Pupils cannot learn to read two languages at the same time because it is always confusing.	38%
I do not have time to prepare teaching and learning materials in their mother tongue.	38%
I feel that I have been well trained to teach reading in their mother tongue.	29%
I feel that I have been well trained to teach in a multilingual environment.	27%
I have the materials I need to be able to teach effectively in their mother tongue.	21%

What are parents' and community members' perceptions and preferences regarding bilingual/multilingual education?

STUDENT VIEWS

Most students prefer to learn French, but they would be happy to learn their mother tongue as an auxiliary to French. Students highlighted the importance of learning French to be able to speak to people throughout Côte d'Ivoire, to continue their studies, and to find a good job. Across all sampled regions, students described French as "easy," "chic," and "interesting." Several mentioned examples of their family members who speak French well, making comments like one Grade 4 student who said, *"I want to learn French so I can speak like (my uncle)."*

Students seem **accustomed to French-language instruction**, so they were skeptical of multilingual education. A few reminded interviewers that they were not allowed to speak their home language in school or that they come to school to learn French, not their mother tongue. A few also said that their teachers or their classmates do not speak their mother tongue, and they expressed confusion about how multilingual education would be possible.

Despite this, many students who preferred French would be happy to also learn the local language because of a desire to speak their parents' mother tongues. This was true across all sampled regions, regardless of urbanicity, as students expressed **pride in their mother tongue** if they spoke it or a desire to learn the local language if they did not.

Further, a few students—none of whom lived in Abidjan—highlighted the idea that instruction in local languages would **improve their comprehension and learning** at school. They said that mixing their home language with French would help them "understand what the teacher says in French," "understand the lessons well," and "understand what the teacher is teaching."

PARENT VIEWS

Parents unanimously expressed the **importance of French fluency** because of its function as the lingua franca in Côte d'Ivoire. A parent in Abidjan, for instance, said, *"French is the language that allows everyone to communicate. If it was just the mother tongues, I think people would find it difficult to*

communicate." Another parent in rural Gbêkê expressed the hope that his children would leave to settle elsewhere, saying that French literacy would be vital to their ability to do so.

Moreover, parents commonly **equated education with the French language**, saying things like *"I don't really see the point of coming to school to speak [a local language]. . . There's no real change or contribution for the children"* (parent, urban Poro). For this reason, most parents in both urban and rural areas believed that local languages should be taught within the family, while all levels of schooling should be conducted in French so as to best support French language acquisition. As a parent in rural Poro stated, *"The earlier you start, the better!"* Another parent in Abidjan meanwhile noticed that many students struggled to learn French but concluded, *"It's inappropriate to add yet another language that has to be relearned."*

When probed about the possibility of using local languages in schools, parents were more **divided on the way bilingual instruction might work** in practice. Numerous parents across Côte d'Ivoire highlighted their belief that children raised in urban areas generally spoke French as their first language. As a result, many parents in urban areas said they would like to see multilingual education implemented to *teach* their children a local language and to thereby help to preserve Ivoirian languages. It is important to note that at least one parent suggested that multilingual education was *more* relevant to urban contexts for this reason. This suggests that (a) the functional purpose of multilingual education may be misunderstood by parents, and (b) the relevance of multilingual education to support French-language learning may depend on the urbanicity of the school catchment area.

A few parents did see **value in including local language instruction** within classroom curricula, believing such instruction might help students comprehend lessons and learn French. A parent in urban Gbêkê noted, *"Children come to school with their mother tongue, but there's a break when they get to school . . . . There are objects that the child can't know, but when you tell them these things in Baoulé and in French, the child can easily find their way around."* This suggests that there are some existing proponents of multilingual education throughout Côte d'Ivoire, although there is much room for further parental engagement and sensitization.

What are the perceived costs and benefits to children and parents of a mother tongue–based multilingual education model?

PERCEIVED COSTS

Ministry of Education officials and partners indicated that developing a strategy and detailing a clear language of instruction policy would need to be an important first step for using local languages in schools. However, interview respondents believed that **choosing a local language for instruction** would be a notable challenge if Côte d'Ivoire were to implement a national language of instruction policy. While several people recommended that the schools use the primary language of the community as the language of instruction, many others expressed concern that using Ivoirian languages in schools would be difficult for classrooms in which students did not all speak the same mother tongue. Furthermore, policy decisions could cause controversy or resentment among ethnic groups whose languages were not selected for classroom instruction. As one teacher in Abidjan stated,

> *"Won't [choosing a particular language for instruction] frustrate everyone else? Imposing a language that isn't [people's] mother tongue, what good will that do? [...] Here in Côte d'Ivoire, there are more than 60 ethnic groups. [...] Some people will feel frustrated: 'Why is this language being imposed on us?'"*

In addition to the challenge of policy development, qualitative informants indicated that in order to teach in local languages, **teachers would need high-quality training and classroom materials**, which

would require substantial resources. One ministry of education official weighed the overwhelming costs of implementing a multilingual education policy in schools:

> *"It would be a new model that needs a lot of resources. A lot of resources. For example, we're going to Yamoussoukro for 10 days of training, and estimating the cost of 100 teachers coming for 10 days, taking care of them, the training, the trainers, and all that—all this has a cost, and we really need support."*

In addition to training teachers, **teachers' language abilities and teacher mobility** also pose challenges to implementing such policies. A representative from the AVSI Foundation stated that Côte d'Ivoire currently does not have a **conducive literacy environment** for local languages because no writers have produced books in those languages.

PERCEIVED BENEFITS

As previously described, teachers, parents, and students noted several perceived benefits of mother tongue-based learning. These benefits include potential improvements in student comprehension, increases in student and parental engagement, and preservation of Ivorian languages. Yet, because the people in our sample did not have much familiarity with bilingual education, they had mixed responses about the overall value. If Côte d'Ivoire were to invest in mother tongue-based education, community engagement and sensitization about the benefits of such models would be necessary.

> BECAUSE PARENTS AND COMMUNITY MEMBERS IN CÔTE D'IVOIRE ARE LARGELY UNFAMILIAR WITH MOTHER TONGUE-BASED EDUCATION, THEY NEED SENSITIZATION ABOUT THE POTENTIAL BENEFITS.

Conclusions

- 62 per cent of students in our sample, including 100 per cent of students in some schools, do not understand French as the language of instruction.

- Given the lack of teaching in Ivorian languages, it was difficult to identify a threshold point of mother tongue proficiency after which students in Côte d'Ivoire are better able to learn French.

- Mother tongue decoding skills and French oral language proficiency are important for children to learn to read in French.

- Although there is a clear need for teaching in students' familiar languages, there are widely held beliefs that Ivorian language teaching is not useful and could hinder students from learning French.

- Teachers lack proficiency in students' familiar languages, as well as teaching and learning materials designed for transition and fostering biliteracy/bilingualism in Côte d'Ivoire. There is a critical need for teacher professional development, curricula, teaching and learning materials, and policies to be reviewed and updated in line with the evidence on successful bilingual models for the Ivorian context.

Democratic Republic of Congo

In 2009, policymakers in the DRC introduced the national strategy for the use of national languages (*Stratégie nationale d'utilisation des langues nationales*). According to the policy, teachers should use one of the four Congolese national languages (Ciluba, Kikongo, Kiswahili, and Lingala) as the primary language of instruction in Grades 1 through 4. The national language used depends on the linguistic zone (see Figure 12). During the early years, schools should teach both French and the national

language as subjects. In Grades 3 and 4, students should transition to using French as a language of instruction, and then in Grade 5, French should be the primary language of instruction.

In this context, our study included data from each of the four linguistic zones: Haut-Katanga (Kiswahili zone), Lomami (Ciluba zone), Kinshasa (Lingala zone), and Kongo Central (Kikongo zone).

Figure 12. Map of Congolese Language Zones
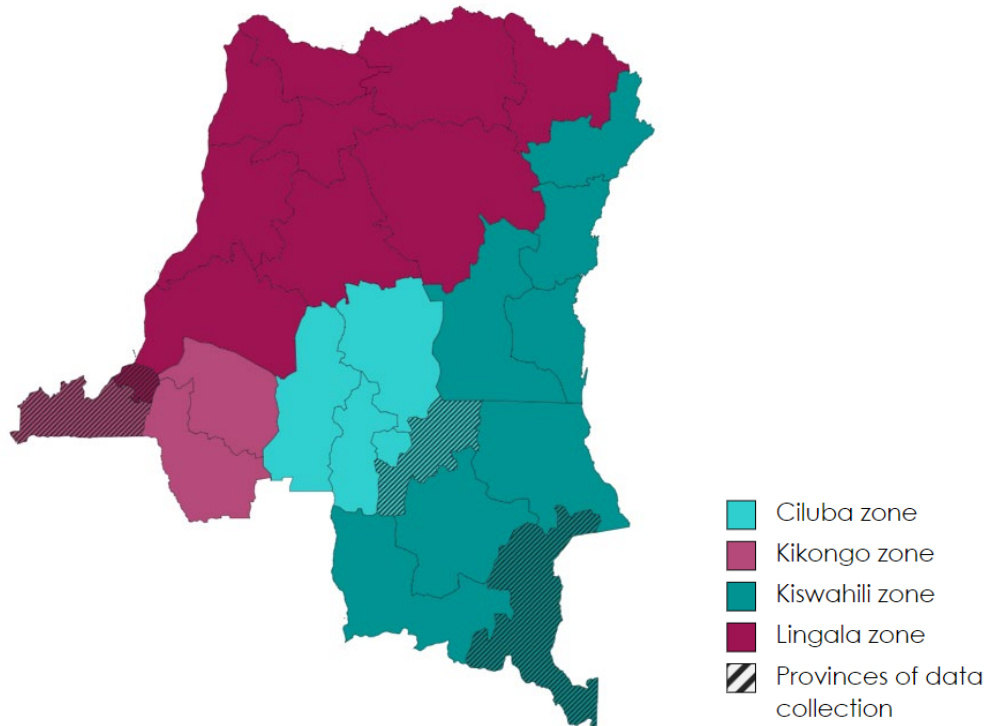
Note. Adapted from Nassenstein, N. (2019). Map of Congolese national language regions. In L. Semley, T. Barnes, B. Holsey, & E. Uchendu (Eds.), *History in Africa*. (2023; pp. 1–33). https://doi.org/10.1017/hia.2022.13

What language(s) do students use and understand?

French is a dominant language for the greatest number of children in our sample (37 per cent), followed by Lingala (29 per cent). Kiswahili and Kisonge are spoken by the same proportion of students (22 per cent).[38]

As shown in Figure 13, only 37 per cent of the sample can speak and understand French (whether they are monolingual in French or speak French in addition to another language). In other words, of all the children in our sample, about 63 per cent cannot speak or understand French as well as they can understand another language. Around 29 per cent of the students speak Lingala as a dominant language, 22 per cent speak Kisonge, 22 per cent, Kiswahili, and 14 per cent, Kikongo. A mere 2 per cent of our sample speaks Ciluba as their dominant language.

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[38] Note that since a child can speak more than one language, the percentages do not add up to 100.

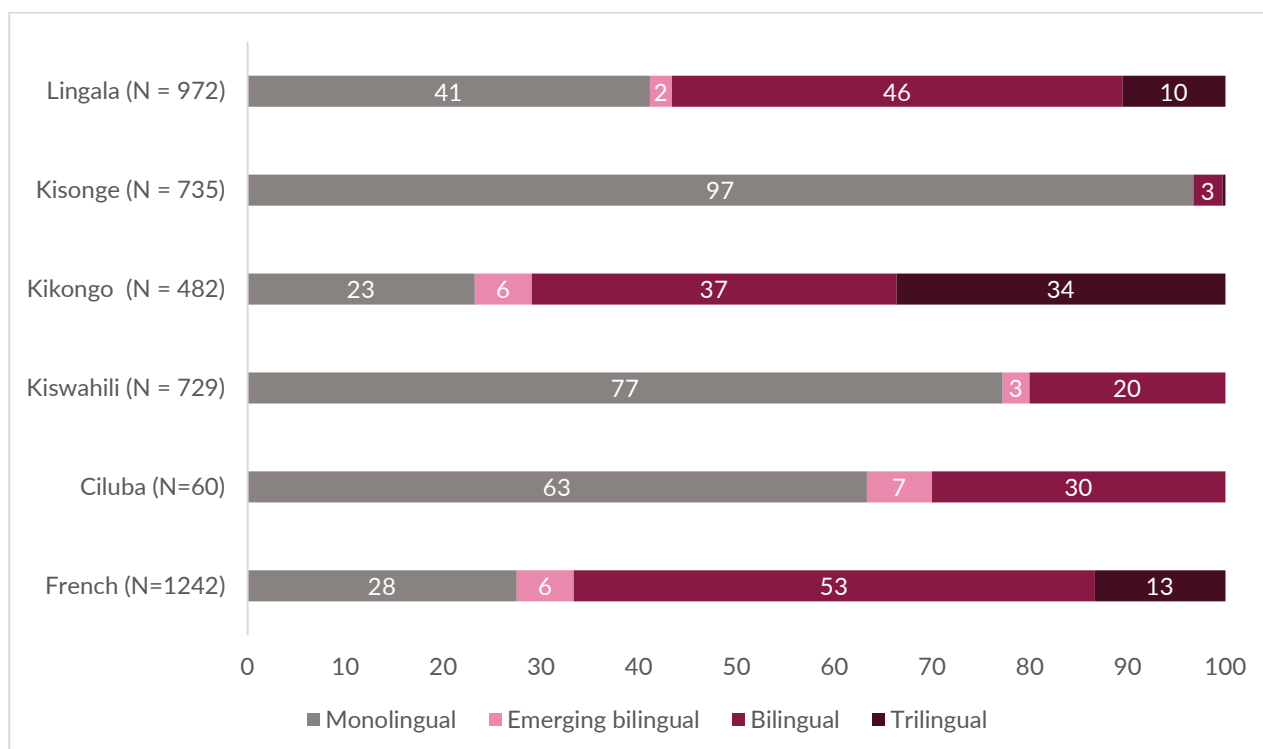**Figure 13. Distribution of Language Skills Among Students**
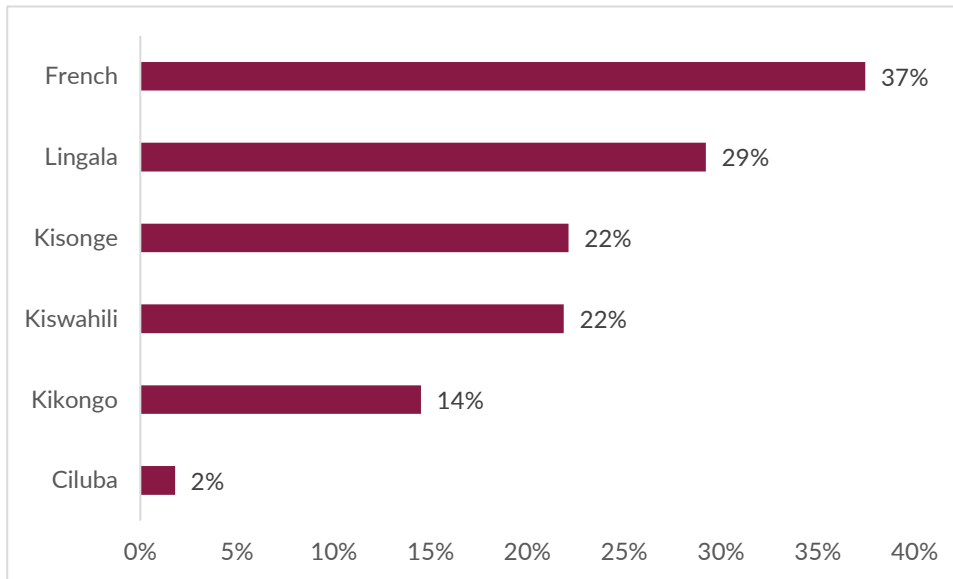
As depicted in Figure 14, we found that two of three children are monolingual, while nearly a quarter of children are bilingual. These figures were similar in Grade 2 and Grade 4. Sixty per cent of Grade 2 children and 65 per cent of Grade 4 children are monolingual. Twenty-three per cent of children in Grade 2 and 24 per cent of children in Grade 4 are bilingual. Regional differences exist, with nearly all the children in Lomami being monolingual (96 per cent), whereas 56 per cent of the children in Kongo-Central are multilingual.

Figure 14. Distribution of Language Skills Among Students
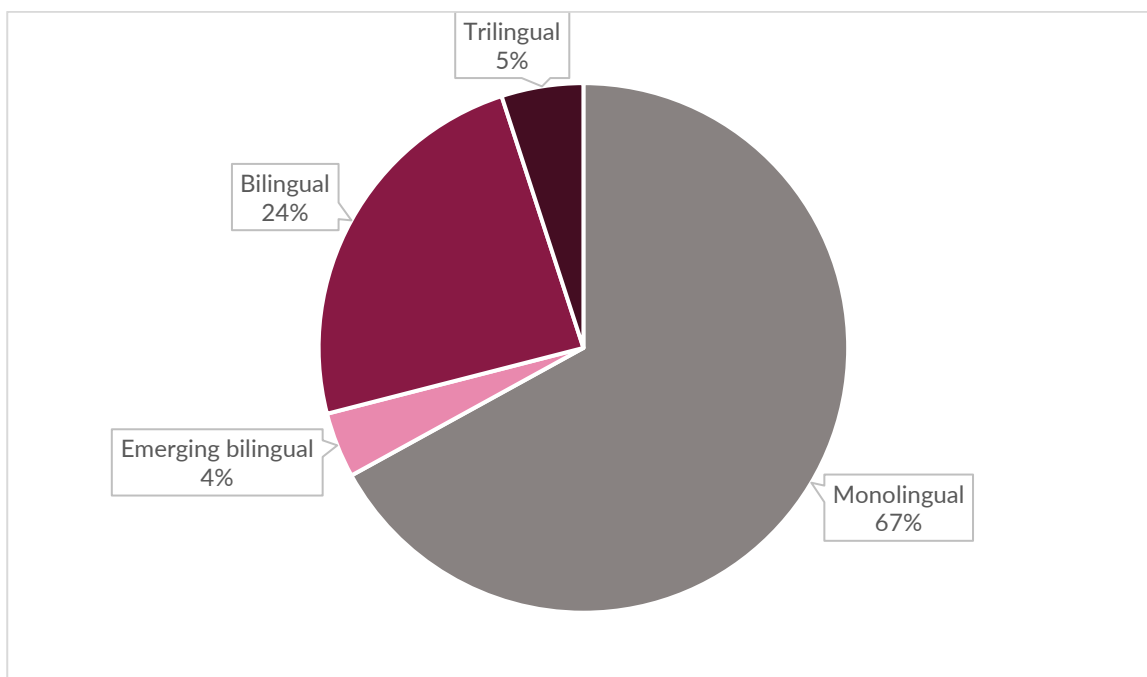
(N =1667)

Figure 15. Multilingual Distribution of Languages (in Percentages)

Figure 15. Multilingual Distribution of Languages (in Percentages)

Language	Monolingual	Emerging bilingual	Bilingual	Trilingual
Lingala (N = 972)	41	2	46	10
Kisonge (N = 735)	97			3
Kikongo (N = 482)	23	6	37	34
Kiswahili (N = 729)	77	3	20	
Ciluba (N=60)	63	7	30	
French (N=1242)	28	6	53	13

When we look at this information across languages, as shown in Figure 15, we also see large differences in the likelihood that children are monolingual or multilingual. Close to two-thirds (63 per cent) of the children who speak French are multilingual, likely because French is the official language and, thus, they are more likely to be exposed to its usage. More than half the students who speak French are bilingual. For 28 per cent of the children in our sample, French is the first and only language. This is a smaller percentage than all the other languages, indicating that French speakers were likely to have learned it as a second or later learned language. Nearly half (46 per cent) of the students who speak Lingala are bilingual, whereas a little more than a third (37 per cent) of Kikongo speakers are bilingual. In contrast, only three per cent of the students who speak Kisonge are bilingual.

According to qualitative data, when data collectors asked participants which languages children speak at home and which languages most community members speak and understand, they responded with a wide variety of languages, as shown in Table 7.

Table 7. Languages That Qualitative Respondents Claimed Were Spoken in Their Communities

Region	Haut-Katanga	Kinshasa	Kongo Central	Lomami
Language zone	Kiswahili	Lingala	Kikongo	Ciluba
Languages spoken by students and in community	Kiswahili French Ciluba Kibembe	Lingala French Kikongo, Kiteke, Kimbala Kiyaka Kisakata	Kikongo Kiyombe Kivungu French Lingala	Ciluba French Kisonge Kiswahili Lingala Tshilandé

To what extent is there a match between language of instruction and student language skills?

Considering the numerous languages spoken across the DRC, interview and focus group participants discussed several challenges related to the prescribed national languages that schools should use in the early years. First, many children—but not all—from the qualitative sample claimed to speak and/or learn French outside of school, including some who reported speaking French in preprimary settings.

In addition, many children reportedly do not speak the national language, which is the language of instruction, but speak another local language instead. For example, a school might be in the Ciluba language zone, but the children who attend the school speak Kisonge or Tshilandé, rather than Ciluba. In such cases, teachers often use Kisonge or Tshilandé as the language of instruction to teach children to read in Ciluba before switching to French.

> THE NATIONAL LANGUAGE USED FOR INSTRUCTION IS NOT APPROPRIATE FOR A LARGE PERCENTAGE OF STUDENTS.
>
> FURTHERMORE, CONGOLESE STUDENTS ARE TRANSITIONING TO INSTRUCTION IN FRENCH BEFORE THEY UNDERSTAND THE LANGUAGE.

Quantitative data bear this out; we found that **many (52 per cent) Congolese children are taught in a language they do not understand**. 62 per cent of Grade 4 children and 43 per cent of Grade 2 children are taught in a language they do not understand. As shown in Figure 15, **the main driver of the mismatch between the language of instruction and the languages students understand is from students in Grade 4.** According to the national language policy, the primary language of instruction should transition from a Congolese national language to French in Grades 3 and 4. **Yet, our data show that even though students learn French as a subject in the early grades, many children do not sufficiently understand French by the time French becomes the main language of instruction.** Naturally, monolingual students in Grade 4 are most likely to be taught in a language (French) that they do not understand; eighty-four per cent of monolingual students are taught in a language they do not know. As indicated earlier, non-French speakers are likelier to be monolingual, putting them at a disadvantage when it comes to learning in the classroom.

The mismatch is less pronounced for Grade 2 students because teachers use one of the four national languages for instruction at that point. However, there is still a large percentage of Grade 2 students who are taught in a language they do not understand (43 per cent). In Grade 2, **53 per cent of monolingual students, 64 per cent of emerging bilingual students, and even 7 per cent of trilingual students are not taught in a language they know**. **These results indicate that the national language taught at school is not appropriate for a large percentage of Grade 2 students.**

As illustrated in Figure 16, **the mismatch between children's familiar languages and the language of instruction varies significantly depending on the language**. According to our data, children who speak Kisonge (represented by the green line) experience a mismatch with the language of instruction throughout primary school. None of the national languages used in the earlier grades correspond to a language they understand. (As shown previously in Figure 15, 97 per cent of Kisonge speakers are monolingual.) These children are also less likely to know French and are again at a disadvantage in Grade 4, when French is the primary language of instruction. Children who speak Ciluba (the grey line) and Kiswahili (the purple line) are also likely to be monolingual and therefore do not know the language of instruction (French) in Grade 4. The transition to teaching French in Grade 4 is less problematic for bilingual or multilingual speakers of Kikongo (in black) and Lingala (in brown) in Grade 4. One hypothesis to explain this disparity is that the sample of children from the Kikongo and Lingala zones are close to the capital city of Kinshasa, where more resources are available, than the sampled children in the Ciluba and Kiswahili zones.

Figure 16. Percentage of Children Who Learn in Languages They Speak and Understand, By Language
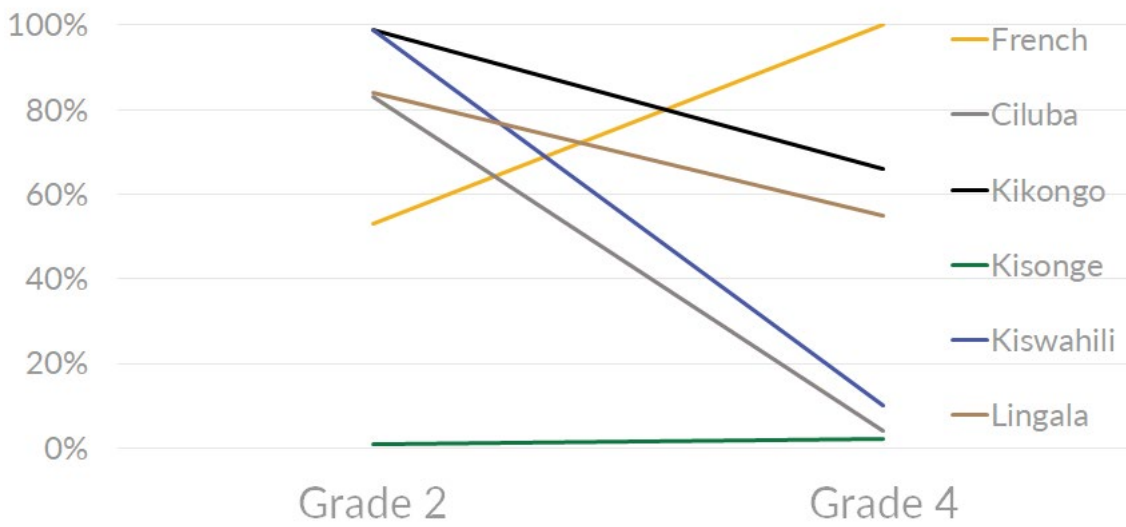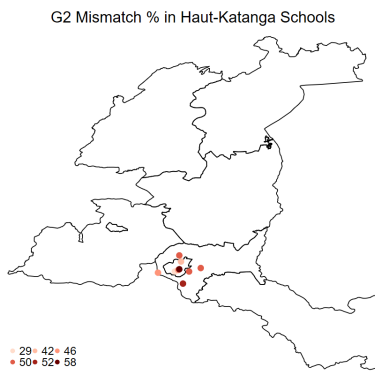

(N =1667)

In Figure 17, we present this same information by school for Grade 2 students. The schools in our sample are indicated by dots on the map. The darker the color, the less likely children were to understand the language of instruction. For instance, we see that, in Kongo Central, the mismatch between the language the children know and the language of instruction ranges from eight to 50 per cent.

Figure 17. Level of Mismatch for Grade 2 Students in the DRC Between the Languages they Understand and the Language of Instruction
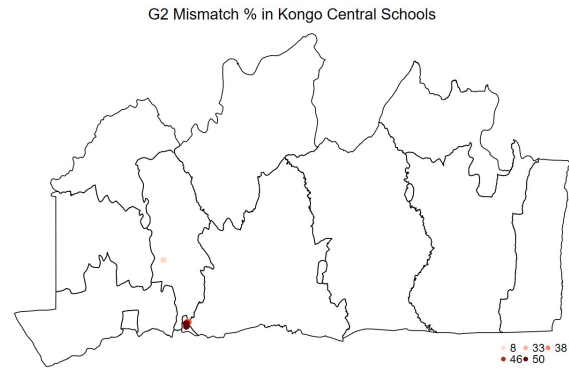

G2 Mismatch % in Lomami Schools

G2 Mismatch % in Kinshasa Schools

(N =409)   *(N =432)*

G2 Mismatch % in Haut-Katanga Schools

29 42 46
50 52 58

(N =430)

G2 Mismatch % in Kongo Central Schools

8 33 38
46 50

(N =406)

The mismatch between students' familiar languages and the language of instruction has important implications on children's academic outcomes. As shown in Table 8, our data show that students who know the language of instruction have better achievement scores on decoding and reading comprehension literacy sub-tasks, when compared to those who do not know the language of instruction. Furthermore, **students who are bilingual and know the language of instruction perform slightly better when compared to those who know the language of instruction and are monolingual.**

Table 8. Differences in Sub-skills by Mismatch in Language of Instruction

| Sub-task	Monolingual students who know the language of instruction	Bilingual students who know the language of instruction (as one of their languages)	All other students who know a language other than the language of instruction (including bilingual speakers)	Difference in means between students who know the language of instruction and students who do not
French Decoding Score (%)	15%	18%	14%	**4.04**
French Reading Comprehension Score (%)	16%	16%	15%	**7.05**

Note: The differences in means column is the difference in scores between all students who know the language of instruction and all students who do not know the language of instruction.

Is there a threshold level of L1 literacy skills and L2 oral language skills required for L2 literacy? If so, what is the threshold?

For the DRC, we find a strong correlation between French language comprehension, French decoding and reading comprehension for both Grade 2 (Decoding-LC ρ = 0.20) and Grade 4 (Decoding-LC ρ = 0.30) students in our sample.

We then tested for the existence of threshold points in the relationship between mother tongue decoding and French decoding skills. As shown in Figure 19, we find evidence of a break point in French decoding skills for children who have around 12 per cent proficiency in decoding in their mother tongue.[39] **This suggests that once children can achieve the threshold score on decoding tasks in their mother tongue, the transferability of those skills into learning to decode in French increases at a much higher rate.** Previous studies have shown that alphabetic-alphabetic language thresholds are in the range of 10 to 30 per cent, while alpha syllabic-alphabetic thresholds tend to range from 40 to 60 per cent,[40] which is in line with the orthographic properties and transfer facilitation model discussed above. While the actual threshold point is not transferrable to other types of assessments which may include simpler or more complex decoding tasks, the existence of a break point in decoding skills indicates that the acquisition of basic decoding skills in a familiar language leads to improved decoding skills in French.

Figure 19. French Decoding Skills in Relation to Mother Tongue Decoding Skills for Congolese Students
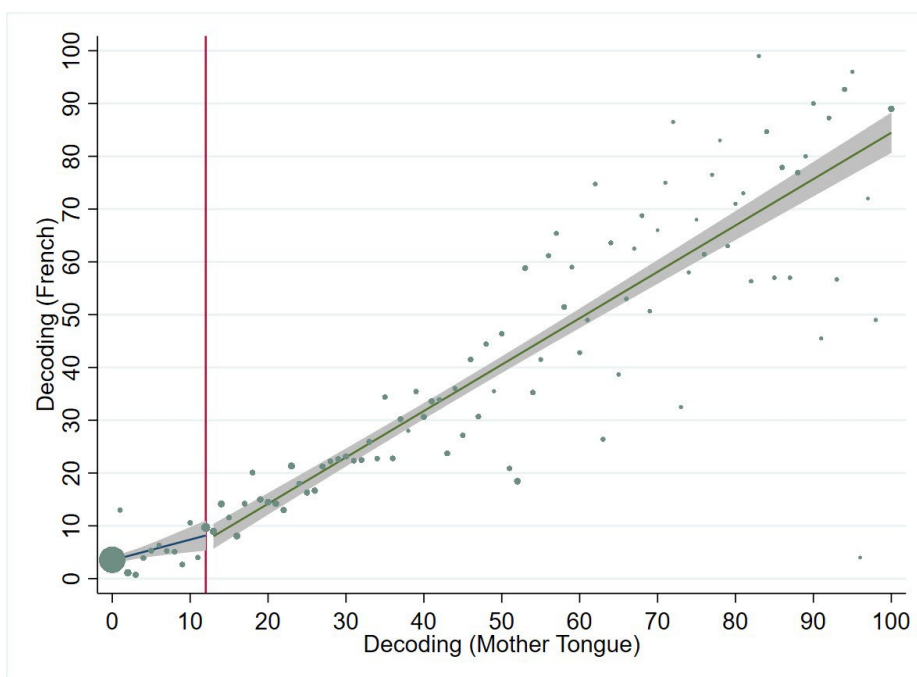
Next, we explored whether there is a threshold of French language comprehension above which there is a stronger relationship with decoding in French. In other words, do children acquire French decoding skills at a higher rate once they reach a certain level of language comprehension in French? As shown in Figure 20, the data suggest that there is no such threshold for the students who were part of our sample. While the graph may appear to show a break, the results are not significant and the slopes of the lines on either side of the break are not substantially different from each other. This result aligns with our conceptual framework and initial hypothesis that there is no definitive level of language comprehension in the L2 above which the relationship between language

THERE IS A THRESHOLD POINT OF DECODING SKILLS FOR CHILDREN IN THE DRC AFTER WHICH THEY ARE ABLE TO DECODE IN FRENCH AT A FASTER RATE.

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[39] The threshold score is not independent of the test administered, ie there isn't a test-invariant threshold level that we will observe across all levels of test difficulty.

[40] Nakamura, P. R., Bonilla, J., Mekonnen, B., Tefera, D., Gebrekidan, Z., & Turner, K. (2019). *READ M&E: Language Transition Study Report*. American Institutes for Research. https://www. air. org/sites/default/files/READ-ME-Lang-Transition-Rpt-508.pdf; Nakamura, P. R., de Hoop, T., & Holla, C. U. (2018). Language and the learning crisis: Evidence of transfer threshold mechanisms in multilingual reading in South India. *Journal of Development Studies*, *55*(11), 2287–2305.

comprehension and decoding in L2 is greater. As understood through our conceptual model, oral language skills are unconstrained, and therefore may not appear to present a point at which a person reaches sufficient "mastery." Rather, language comprehension is a significant predictor – and thus important to teach and learn – throughout the development of L2 reading comprehension.

Figure 20. French Decoding Skills in Relation to French Language Comprehension Skills for Congolese Students
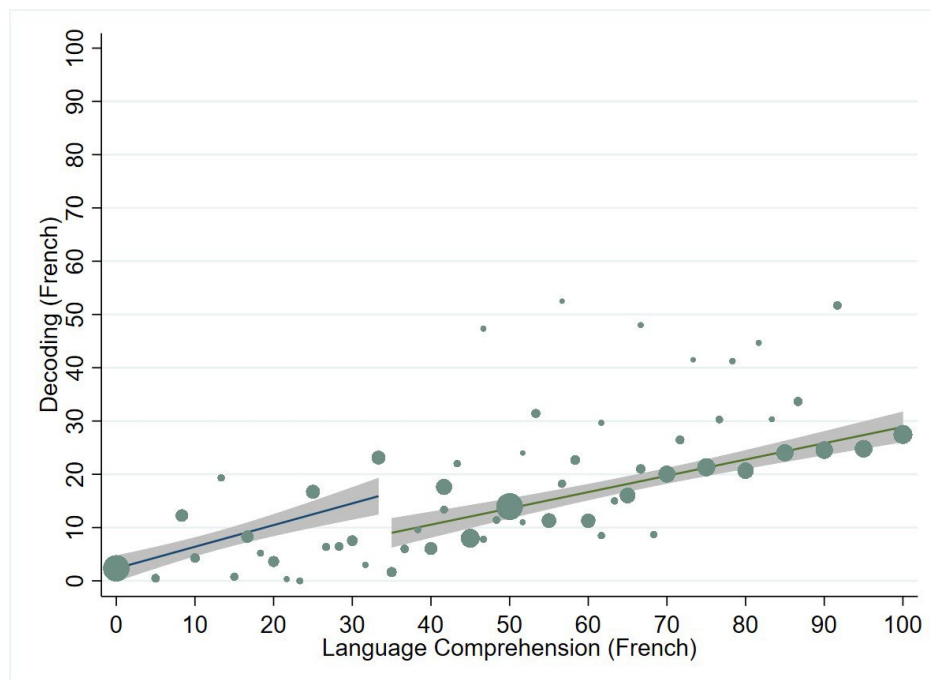
What are teachers' proficiency levels, in terms of their own language proficiency in target language(s), their general pedagogy knowledge, and their knowledge of specific pedagogies for bilingual and multilingual learning?

LANGUAGE PROFICIENCY

Most of the teachers in our qualitative sample indicated that they are comfortable speaking both French and their students' mother tongues. No teachers admitted to having challenges in French, and even teachers who claimed to have a different mother tongue than their students professed that they can speak and understand the language of their students well. Only a few teachers claimed to face language barriers with their students, namely when they taught in multilingual classrooms. One teacher in Kinshasa (in the Lingala zone), explained, *"[I feel] comfortable, especially during Congolese language lessons because [for these lessons,] we are required to teach children according to our national languages. Despite, I don't know Swahili, I don't know Ciluba either. I really don't know even Kikongo well, but what I know is what I also give to the children."* He explained that to teach children in his classroom that originate from other regions, he will ask students who speak multiple languages to translate for students he cannot communicate with directly. Overall, teachers did not indicate any significant challenges with their own language skills.

GENERAL PEDAGOGY KNOWLEDGE

Findings from our teacher assessments showed that teachers in the DRC have a relatively weak knowledge of general pedagogical practices. Assessments administered to test the teachers' knowledge of pedagogical practices included multiple choice questions on topics such as the purposes of continuous assessment in the classroom, the benefits of groupwork, and activities Note help students with specific challenges. We found that teachers were able to answer only 50 per cent of the

questions accurately. For instance, only 19 per cent of the teachers were able to answer a question related to student feedback correctly. Teachers scored relatively poorly in questions specific to subject matter pedagogy as well. For example, only 17 per cent of the teachers identified the correct response to a question related to a skill-building activity for students. However, 92 per cent of the teachers accurately answered a question on teaching visual learners, indicating that the gaps in teacher knowledge are widely shared and can be addressed without personalized attention.

KNOWLEDGE OF BILINGUAL AND MULTILINGUAL PEDAGOGIES

As aligned with the national policies, teachers reported using Congolese languages during the first few years of primary school. Several teachers and school administrators in Haut Katanga and Lomami described receiving training to teach in Congolese national languages through USAID's ACCELERE! or PAQUE[41] programs but did not describe these trainings in detail. Teachers did not name specific pedagogies for bilingual and multilingual learning, yet they described the methods they use for teaching, which we detail as follows.

What are teachers' practices and attitudes regarding bilingual/multilingual education, especially in terms of teaching local languages, teaching linguistically mixed classrooms, and the timing and skills requirements of transitioning to new languages?

PRACTICES

Most school-based participants agreed that teaching practices at their schools align with national policies. They reported that students in the early grades learn primarily in the national languages while learning French as a subject. Most people stated that the transition to French occurs in Grade 3, up to Grade 6, but some claimed that teaching in French occurs as early as Grade 1. As one parent mentioned, "*It depends on the schools; there are schools that reject Lingala; [...] they consider only French.*"

Teachers reported using several different approaches to teaching languages in their classrooms. Some teachers mentioned using engaging methods such as stories, songs, or pictures to teach children to read. Yet, many teachers and students noted that French reading instruction begins with letters, sounds, and verb conjugations. Teachers often described teaching French and national languages in tandem; for instance, several teachers described comparing sounds or words between languages or giving children translation assignments. As one Grade 2 teacher in Kinshasa explained, "*In French conjugation, if I give the conjugation, for example of the verb 'to be' in the present tense in French, the next day I give the verb 'to be' in Lingala.*" To reinforce reading skills in both targeted languages, teachers often indicating using rote teaching practices such as recitation or memorization.

Teachers reported that in classrooms where students speak multiple languages, learning can be difficult for students who do not speak the language of the majority. A few teachers claimed that these students learn the local language quickly as they interact with other students. Nonetheless, teachers described several different methods to facilitate learning for these children. These methods include alternating between French and the prescribed national language, relying on French as a lingua franca, asking multilingual students to translate, and using pictures or gestures to indicate meaning. A few school administrators also indicated that they place students in classrooms with specific teachers who share a common language.

Although they often find ways to teach their students in the national languages, **teachers noted a significant need for materials in Congolese languages**. According to survey data, one in three teachers indicated that students in their classroom do not have textbooks in the national language. While schools face additional insufficiencies for French materials, the dearth of resources is more pronounced for materials in national languages. When classrooms do have materials, they are often

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[41] an acronym which, in French, stands for "Project to Improve the Quality of Education"

insufficient. Teachers indicated that the materials are often outdated, irrelevant, overly complicated, and are written in dialects or languages that people in their communities do not speak. One school inspector explained as follows:

> *"With the documents that are there, they are not in the right language. They are in the Kikongo of Bandundu, but for us here in Kongo-Central, our Kikongo is different. This is why sometimes the documents or the books are there, but the language does not correspond, which complicates it a little."*

Other educators noted that the existing Congolese language materials do not cover all needed subjects, such as mathematics. Furthermore, nearly 70 per cent of surveyed teachers indicated that their students do not have their own textbooks. Overall, teachers expressed a need for textbooks, alphabet cards, teacher manuals, and other reading materials in Congolese languages in order to teach well.

ATTITUDES

Teachers in the DRC largely expressed positive views towards the use of Congolese languages in schools. Most claimed that using local languages as the languages of instruction helps children to better understand their classroom teaching, facilitates learning of French, leads to improved student outcomes, and, as one teacher also noted, is easier for the teachers as well. Although some teachers do believe that the use of local languages in schools may hinder children's achievement in French, many teachers have seen the positive effects of the mother tongue-based teaching models; students are better able to read and write, and both parents and teachers are happy with students' progress. One teacher in Kinshasa exclaimed:

> *"God bless the person who brought the multilingual teachings. [...] Truly, God bless whoever had the vision of mother-tongue education."*

Nonetheless, while teachers overall support the country's current language learning policies, it seemed that they might hesitate if policies were to encourage a later transition towards French in the future, considering the crucial importance of French for children's long-term success.

What are parents' and community members' perceptions and preferences regarding bilingual/multilingual education?

Previous research has shown that parents and community members often oppose mother-tongue education policies because they prefer that their children learn in an international language such as French, which is important for future employment. Stakeholders from the Ministry of Education and UNESCO, as well as educational non-governmental organizations that we engaged in the initial phase of our research supported this perception. For example, one respondent from ELAN, a prominent organisation promoting bilingual education, said, "*Some parents, especially in urban areas, don't want their children to learn in national languages. Whether it is out of prestige or pride, they say that their children cannot study in the national language, and they are opposed to this.*"

NATIONAL-LEVEL STAKEHOLDERS BELIEVED THAT PARENTAL RESISTANCE TO LOCAL LANGUAGE POLICIES WAS A GREATER ISSUE THAN PARENTS INDICATED.

It is interesting to note that our qualitative data revealed that most respondents—including parents—claim to support the teaching of local languages in schools and agree with current language learning policies. Many parents stated that learning local and regional languages

helps to improve student comprehension of lessons, eases the transition to French, and leads to general positive learning outcomes. Many parents also indicated the cultural value of learning local Congolese languages. To illustrate, one parent said:

> *"Let them use Swahili first, which the child knows how to write because it is the language that children have grown up with and speak at home. Let them know their language. . . . If the child doesn't understand Swahili, they won't even be able to learn or communicate in French."*

In general, national-level stakeholders, such as Ministry of Education officials or non-governmental organization partners, believed that parental resistance to local languages policies is a greater issue than parents indicated.

What are the perceived costs and benefits to children and parents of a mother tongue–based multilingual education model?

PERCEIVED BENEFITS

As previously described, teachers, parents, national-level stakeholders, and even students themselves indicated support for the use of Congolese languages in schools, namely, for students' ease of understanding, improved literacy and general student achievement, and the cultural value of the national languages. Some additional benefits that interview and focus group participants mentioned include the ability to better engage parents in their children's education and the overall cost effectiveness of the education system.

PERCEIVED COSTS

At the same time, interview and focus group participants described several hesitations regarding multilingual education.

First, most parents and education officials **maintained the importance of children's learning French.** They attested that local languages fail to have the widespread utility of international languages like French; local languages lose their value if someone moves to another region. These languages also do not provide the same opportunities for future employment. Thus, parents, teachers, and school administrators expressed more concern over students' French literacy skills than over their mother-tongue abilities.[42] Some respondents believed that using local languages in schools could hinder children from learning French. However, respondents mentioned this potential drawback less often than they discussed the benefits of local languages for French acquisition.

> THE PRIMARY QUESTION IS NOT WHETHER OR NOT TO PURSUE MULTILINGUAL EDUCATION, BUT RATHER *HOW* TO IMPLEMENT IT.

Other stated drawbacks of multilingual education include the associated **practical challenges of supporting multiple languages within the education system**. As qualitative informants noted, the Congolese education system must also juggle other competing priorities, such as increasing enrollment, supporting teachers, and maintaining school infrastructure. Incorporating local languages into the education system entails many challenges, including navigating the large number of languages and dialects, and accounting for the effort and associated costs required to develop the materials and train teachers across the country in new pedagogies. In general, the primary

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[42] Interestingly, qualitative research participants in rural areas indicated being more pleased with students' overall academic achievement than participants in urban areas, even though children in urban areas were more likely to speak French than children in rural areas.

question among respondents is not whether to use local languages in schools but, rather, how to do so.

Conclusions

- Two-thirds of Congolese children in our sample are monolingual, while nearly a quarter of children are bilingual. These figures are similar in Grade 2 and Grade 4.

- There are large differences in children's language abilities based on which languages they speak; speakers of some languages, such as Kisonge, are less likely to be bilingual.

- The national language used for instruction is not appropriate for a large percentage of students. For example, a school might be in the Ciluba language zone, but the children who attend the school may speak Kisonge or Tshilandé, rather than Ciluba. Furthermore, Congolese students are transitioning to instruction in French before they understand the language.

- Student assessments show that there is a threshold point in mother tongue decoding skills, after which children's French decoding skills are higher. This means that students who are able to reach a particular level (12 per cent on a specially designed decoding test) are more likely to succeed in learning to decode French.

- Teachers and parents hold largely positive views about mother tongue-based education. National-level stakeholders believed that parental resistance to local language policies was a greater issue than parents indicated.

- Students and teachers face a great need for learning materials in the local languages of instruction.

Senegal

Formally, French is the official language and primary language of instruction in Senegal. However, Senegal's Ministry of Education has demonstrated considerable interest in promoting the use of local languages in schools and has experimented with bilingual learning over the past several decades. One notable initiative in school language use is that of the Associates in Research and Education for Development (ARED), a prominent grassroots organization that is showing promising trends in developing and testing models for teaching Senegalese languages in schools. In recent years, the Ministry of Education is working to harmonize the various bilingual models and experiments throughout the country and, in partnership with ARED and USAID, have introduced large-scale language programming in select regions. This programming includes Lecture Pour Tous (LPT; French for "Reading for All"), which developed materials and trained teachers in bilingual education in six regions of the country, along with RELIT,[43] its current follow-on program, which is scaling up LPT programming in additional regions and schools.

In consultation with national stakeholders in Senegal, our research collected data in Dakar and Fatick, where some schools have received bilingual programming through ARED and/or LPT. Our sample includes a mixture of schools that have begun bilingual teaching in local languages—Wolof in Dakar and Serer in Fatick—as well as schools that have not received programming and are teaching primarily in French.

What language(s) do students currently use and understand?

According to the findings from our student language assessments, Wolof is a dominant language for the greatest number of children in our sample (61 per cent), followed by Serer (40 per cent). French is

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[43] An acronym for *Renforcement de la Lecture Initiale pour Tous,* which is French for "Strengthening of Early Reading for All"

spoken by 29 per cent of the students in our sample. Other languages are spoken by a small fraction of our sample (7 per cent).[44] As shown in Figure 21, only 29 per cent of the sample can speak and understand French (whether they are monolingual in French or speak French in addition to another language). In other words, of all the children in our sample, about 71 per cent cannot speak or understand French as well as they can understand another language.

Figure 21. Distribution of Language Skills Among Students
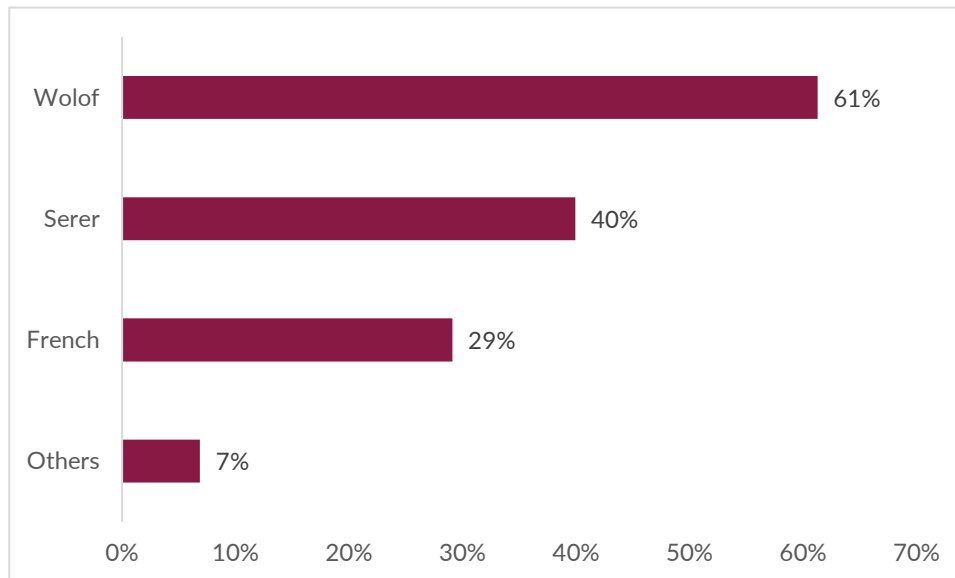
According to student assessment data, we found that two of three children from our sample are monolingual, while more than a quarter of children (30 per cent) are bilingual, as depicted in Figure 22. Students in Grade 4 are slightly more likely to be bilingual (57 per cent monolingual, 35 per cent bilingual), compared with Grade 2 students (68 per cent monolingual, 25 per cent bilingual).

Figure 22. Percentage of Monolingual, Bilingual, and Trilingual Students in Senegal
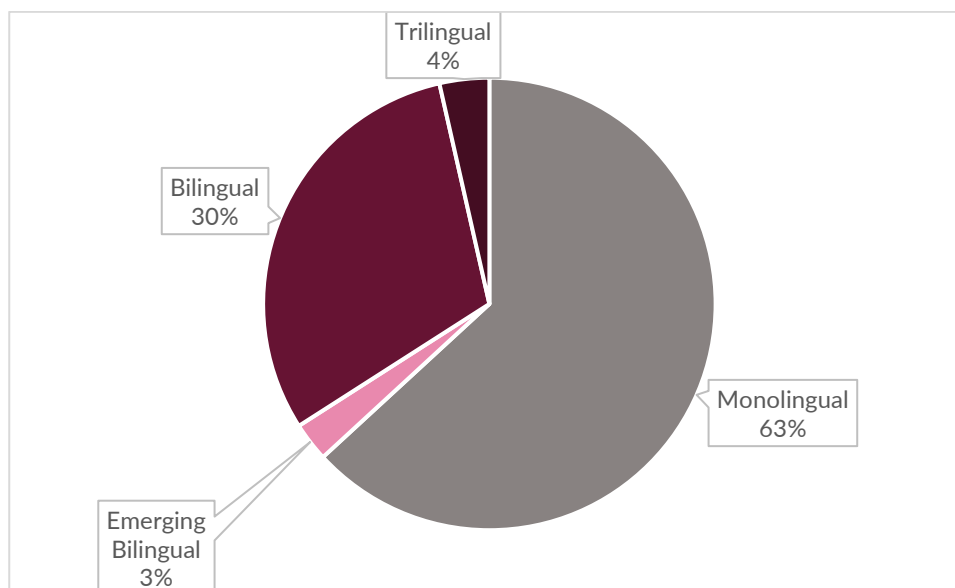

(N =1691)

When we look at this information across languages, **we see large differences between the languages spoken by children and the likelihood that they are monolingual or multilingual**, as displayed in Figure

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[44] Note that since a child can speak more than one language, the percentages do not add up to 100.

23. A very high percentage (70 per cent) of children who know French are bilingual, indicating that these children typically learned French after having learned a local language. By comparison, only 19 per cent of Serer speakers and 46 per cent of Wolof speakers are bilingual. Most Serer-speaking children in our sample (74 per cent) are monolingual, while about half of Wolof-speaking children (47 per cent) are monolingual.

Figure 23. Multilingual Distribution of Children in Senegal, by Language
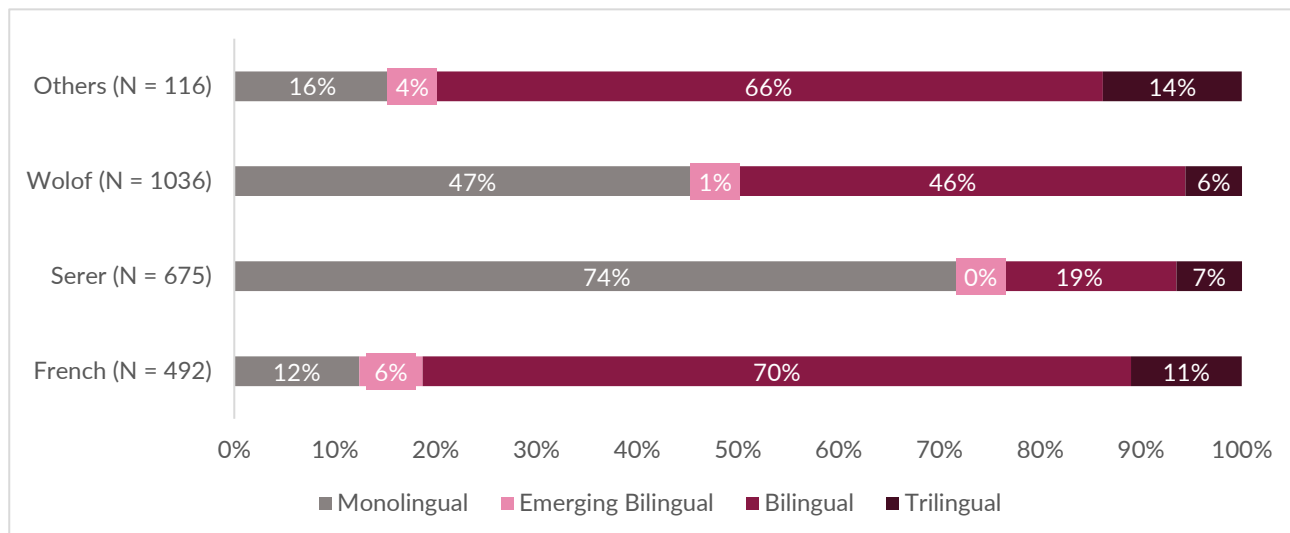
The greater prevalence of bilingual Wolof speakers is likely due to the language's status as a lingua franca throughout the country. As shown in Table 9, interview and focus group respondents in both Dakar and Fatick claimed that students speak Wolof outside of school. In fact, in urban areas of Fatick, children reportedly speak Wolof outside of school more often than Serer, which is the only language that rural children in Fatick reportedly speak outside of school. However, overall, in Fatick, only 36 per cent of students have Wolof as a dominant language. By contrast, 76 per cent of the students in Fatick have Serer as a dominant language.

Table 9. Languages That Qualitative Respondents Claimed Students Speak Outside of school, by Region

	Dakar	Fatick	
		Urban	Rural
Languages that respondents claimed students spoke outside of school In order from most to least prevalent	• Wolof • French • Peulh • Pulaar • Other	• Wolof • Serer and French • Other	• Serer

As one might expect, respondents in Dakar reported that children speak a greater variety of home languages. As Senegal's capital and largest urban center, Dakar draws in residents from across the country. Accordingly, respondents in Dakar reported that children in their communities spoke a variety of languages such as Peulh, Pulaar, Bambara, and Diola.

Across regions and both urban and rural areas, many respondents claimed that most or all students speak the majority language of the region. However, a significant number of people reported that some students, especially in urban areas, which have greater language diversity, do not speak the majority language.

To what extent is there a match between language of instruction and student language skills?

While respondents from most schools in our qualitative sample reported primarily using French in the classroom, some schools reported using Wolof or Serer, along with French. Of the schools that reported using Senegalese languages, all the schools in the Dakar region and the urban schools in Fatick reported using Wolof, while the rural schools in Fatick reported using Serer, which corresponds with the languages that children reportedly speak outside of school, as shown in Table 9.

Although many schools are using Wolof or Fatick for instruction in the early grades due to LPT or other bilingual programming, we calculate the level of mismatch between the languages students speak and French, which, according to policy, is the official language of instruction. Because children in Dakar reportedly used French more often, those children are more advantaged in terms of knowing the official language of instruction (French) than were children in the Fatick region. **In the Dakar region, 55 per cent of the children classified as being in classrooms where they do not speak or understand the official language of instruction, compared to 87 per cent of children in Fatick.** As depicted in Figure 24, all schools in our sample from the Fatick region had a mismatch percentage greater than 50 per cent, which included one school in which none of the children knew French, the official language of instruction. In Dakar, the level of mismatch ranges from 17 per cent to 79 per cent.

We also see that the level of mismatch drops slightly between Grades 2 and 4. While 61 per cent of the children in Grade 2 do not know French, this numbers falls to 53 per cent in Grade 4. This implies that children are learning French language skills, but a large fraction of children are still not acquiring these skills by Grade 4.

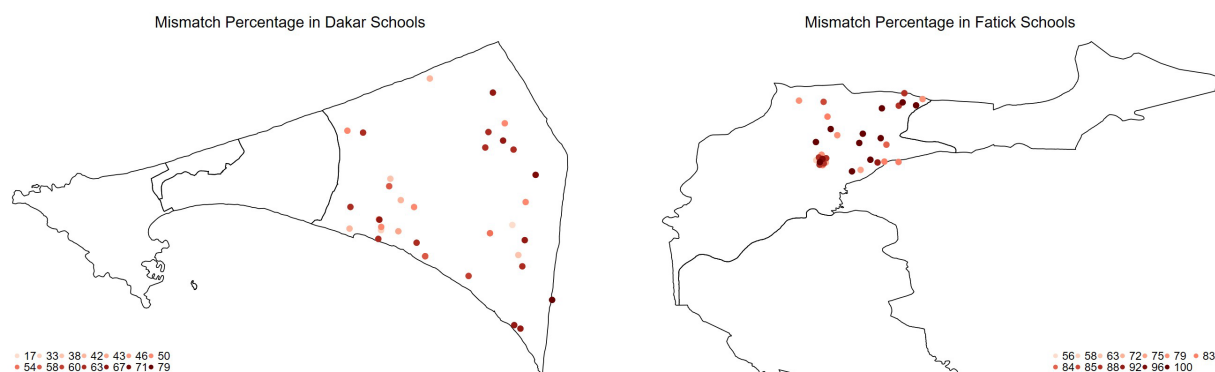**Figure 24. Mismatch between children's familiar languages and the official language of instruction**

Table 10. Differences in Sub-skills by French Abilities

| Sub-task	Monolingual students who know French	Bilingual students who know French (as one of their languages)	All other students who know a language other than French (including bilingual French speakers)	Difference in means between students who know French and students who do not
French Decoding Score (%)	15%	18%	14%	**16.64*****
French Reading Comprehension Score (%)	16%	16%	15%	**11.89*****

Our student assessment data showed that **students who know French have better achievement scores on decoding and reading comprehension literacy sub-tasks, when compared to those who do not know French** (Table 10). This difference in achievement is even more pronounced for those students who are bilingual and know French to those who do not know French.

Is there a threshold level of L1 literacy skills and L2 oral language skills required for L2 literacy? If so, what is the threshold?

Our team explored whether a threshold point exists in Senegal, above which there is a stronger relationship between decoding skills in the mother tongue and decoding skills in French. Our data suggested that such a threshold occurs when children are able to decode their mother tongue with 15 to 20 per cent proficiency on our specifically designed assessment (Figure 25). In other words, **once children achieve foundational decoding skills in their mother tongue, they are able to transfer those skills at a higher rate to French.** While the actual threshold point is not transferrable to other types of assessments which may include simpler or more complex decoding tasks, the existence of a break point in decoding skills indicates that the acquisition of basic decoding skills in a familiar language leads to improved decoding skills in French.

> ONCE CHILDREN IN SENEGAL ACHIEVE A FOUNDATIONAL LEVEL OF DECODING SKILLS IN THEIR MOTHER TONGUE, FRENCH DECODING ABILITIES ACCELERATE AT A FASTER RATE.

Figure 25. French Decoding Skills in Relation to Mother Tongue Decoding Skills for Senegalese Students
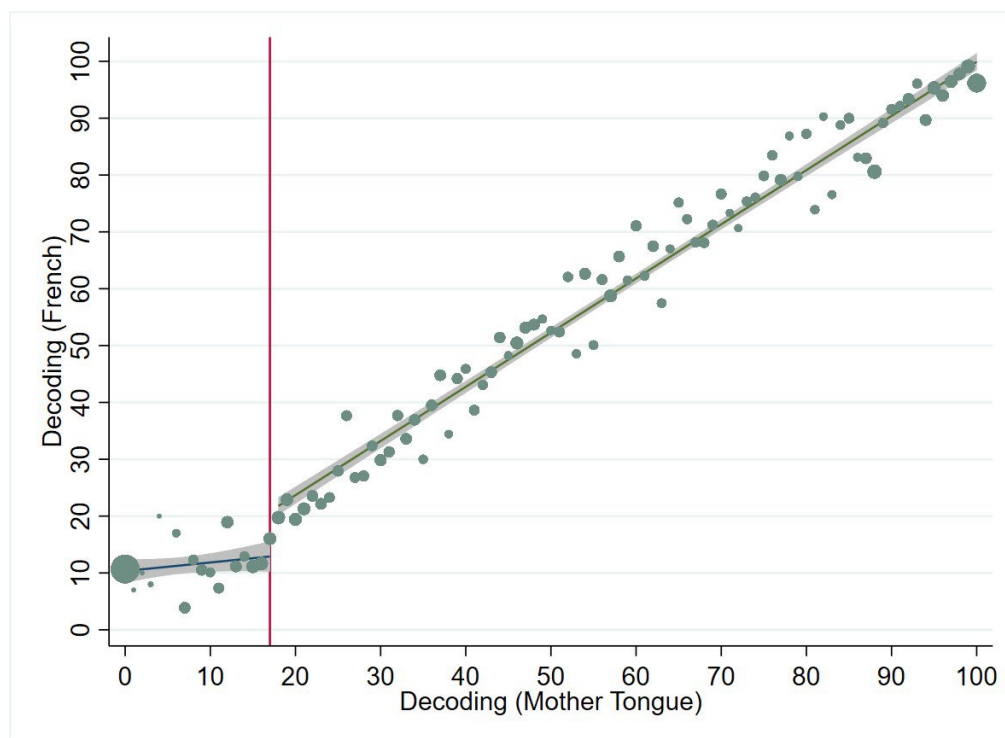
Conversely, yet as expected, we did not find a threshold for French language comprehension above which there was a steep rise in French decoding skills, as shown in Figure 26. The slope of the lines do not significantly differ from one another before or after the artificial breakpoint, suggesting there is no point in French comprehension skills after which French decoding skills grow at a faster rate. This finding aligns with our theory that the strength of the relationship between one's level of language comprehension, while correlated with decoding skills, does not change significantly at any minimum

proficiency level. Because language comprehension is a continually developing skill—in contrast to decoding, in which one reaches a point where one has learned all the sounds of letters in a language— there is no definitive level of language comprehension above which decoding is greater.

Figure 26. French Decoding Skills in Relation to French Language Comprehension Skills for Senegalese Students
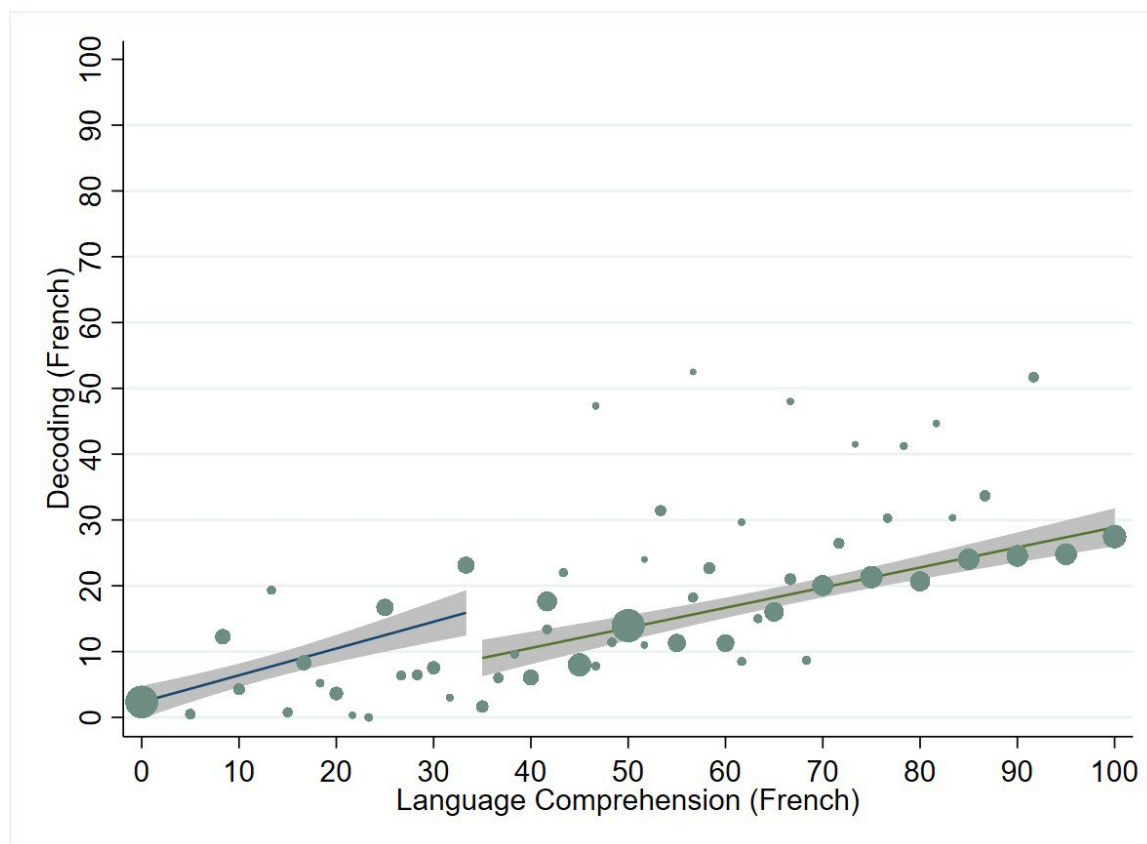
What are teachers' proficiency levels, in terms of their own language proficiency in target language(s), their general pedagogy knowledge, and their knowledge of specific pedagogies for bilingual and multilingual learning?

LANGUAGE PROFICIENCY

Most Senegalese teachers in our qualitative sample claimed to speak their students' home languages sufficiently, although some reported not being comfortable speaking those languages. For instance, one teacher from a school in rural Fatick explained that she had been trained by LPT to use Serer in the classroom. However, she did not feel completely confident speaking Serer. She explained, *"As we are in the Serer zone, we teach Serer because I had followed training in LPT. I manage as best I can because it's not my mother tongue! I'm Wolof, but I manage--I manage as best I can to get my message across."* In cases like this, teachers often reported relying on students who understand either the teacher's mother tongue or French to translate into the other students' language. For example, the teacher in Fatick explained, *"Sometimes I ask for students' assistance by asking them the meaning of this or that word in Serer. Especially with students who understand Wolof, I ask them how to say that word in Serer, and then I use that to try to make the lesson understood."* A few other interview participants indicated that, although teachers might speak the language of the students, they might not know how to read and write in those languages.

In order to ameliorate this challenge, **several people recommended that teachers specialize in specific languages.** They often gave the example of Arabic instruction in Senegalese schools, which occurs through a dedicated teacher who teaches separate lessons in Arabic. Like community members in Côte

d'Ivoire, many of these people indicated that they believed local languages would be taught during specific lessons, rather than used as a medium for all instruction for all subjects. However, the same approach could be used to place teachers in classrooms on the basis of their language skills—for example, by placing teachers who speak the local languages in the early grades, when that language is the primary language of instruction, and placing other teachers in the upper grades, when schools transition to French as the primary language of instruction.

GENERAL PEDAGOGY KNOWLEDGE

Overall, teachers demonstrated inadequate knowledge of pedagogical practices. Assessments administered to test the teachers' knowledge of pedagogical practices included multiple choice questions on topics such as the purposes of continuous assessment in the classroom, the benefits of groupwork, and activities to may help students with specific challenges. We found that teachers were able to answer an average of only 63 per cent of the questions accurately. Some questions posed particular challenges for teachers. For instance, only 20 per cent of the teachers were able to answer a question related to student feedback correctly.

KNOWLEDGE OF BILINGUAL AND MULTILINGUAL PEDAGOGY

At the time of data collection, only teachers who had been part of Senegal's experimentation through ARED, LPT, or RELIT had been trained in bilingual or multilingual pedagogies.

The teachers who were involved in those trainings explained a couple of methodologies for bilingual teaching and teaching in multilingual classrooms. For instance, a school director in Dakar explained the **"I do, we do, you do" gradual release approach** learned through LPT, in which a teacher would explain and model a new concept before giving students opportunities to practice with the teacher and then independently.[45] Another interview respondent explained a different approach learned through LPT in which teachers would **relate sounds in French to sounds in the child's familiar language**. He said, *"For example, with the sound 'b,' if the child had difficulty in mastering this sound, already in Serer we have 'baba,' which means 'dad.' The teacher called on this word known by the child to decant (clarify) and it produced results."*

One teacher explained that, in classrooms in which students spoke multiple languages, she uses a strategy of **"horizontal pedagogy"** for student-to-student learning. Although other teachers who had not been formally trained in bilingual teaching methods reported occasionally asking students who understand both the students' and teachers' languages to translate, the horizontal pedagogy method builds on students' mutual languages more systematically. She stated, *"If a language problem does not resolve, we make [students] work in groups. There, they will help each other and work in teams—in groups of the same language. These are what we call 'need groups.'"* The benefits of this method, she stated, are that it *"socializes the student; it encourages mutual assistance, and the message will get across much more quickly."*

> TEACHERS GREATLY APPRECIATED THE BILINGUAL AND MULTILINGUAL TEACHING METHODS THEY HAVE LEARNED, NOTING POSITIVE IMPACTS ON STUDENT ENGAGEMENT AND COMPREHENSION.

Altogether, these educators **positively appraised bilingual and multilingual teaching methods**, saying that those methods had garnered more interest and engagement from students and promoted better student comprehension, as well as making the lessons easier for teachers, as well.

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[45] USAID. (2021). *Lecture Pour Tous/All Children Reading Senegal Early Grade Reading Assessment / Snapshot of school management effectiveness 2021 report.* https://pdf.usaid.gov/pdf_docs/PA00Z6BF.pdf

What are teachers' attitudes and practices regarding bilingual/multilingual education, especially in terms of teaching local languages, teaching linguistically mixed classrooms, and the timing and skills requirements of transitioning to new languages?

PRACTICES

Across both Dakar and Fatick, **schools introduce French early**. Most students reported being taught in French in Grade 1, and sometimes even in preprimary settings. For the most part, students reported that their teachers **first taught them the alphabet in French** before teaching basic greetings and simple words in French. Teachers then progressed to French reading skills, by teaching pronunciation of short words through syllable-by-syllable oral recitation. Most reading instruction occurs solely in French; although some students did report learning the alphabet of their home language in preschool or Grade 1, many students were only able to recite the alphabet in French.

Even in schools in which teachers had not received formal training on bilingual or multilingual pedagogies, **most teachers and students noted the use of local languages to explain concepts**, especially in early grades. However, they explained that French is still the primary language of most lessons, with local languages used mostly for translating or reiterating what teachers had previously explained in French. In linguistically mixed classrooms, in which students do not all speak the same local language, teachers sometimes ask other students to act as translators or persist with the language of the majority until students adapt to Wolof or French.

ATTITUDES

Most teachers and school directors in our sample expressed **favorable attitudes toward teaching in students' native languages**, based on (a) their experiences implementing a bilingual education model as part of USAID's RELIT program, (b) anecdotal and news reports about bilingual education, or (c) their challenges with monolingual education. Teachers who had implemented bilingual education perceived a positive impact of local language instruction on student literacy and engagement, which led them to speak highly of the bilingual model. These respondents suggested expanding RELIT to additional classes and schools. Most teachers and school administrators who were not involved in RELIT also reported seeing the value of bilingual education. In teacher surveys, 98 per cent of teachers indicated that they believed it is important for children to learn to read in their home language. In interviews, these respondents noted that young children struggle to participate when in classes that are conducted only in French. They speculated that using Senegalese languages would improve student understanding, comfort, and enjoyment. A teacher in urban Fatick explained:

> *"With the national language . . . we see that the children are so comfortable. . . . There was a sort of barrier with children, but this barrier completely disappears with the mother tongue."*

Some teachers, however, expressed **skepticism about teaching in local languages**, citing the importance of learning French and expressing the idea that teaching Senegalese languages might slow or inhibit students' development of French skills. According to survey findings, as shown in Table 11, almost one in three teachers believe that students cannot learn to read two languages at the same time because it would confuse them. (Note however, that 88 per cent of teachers indicated that teaching students to read in both their L1 and French would help improve their reading abilities.) Half the teachers also believe that teaching students to read in L1 would take too much time away from teaching reading in French.

On the topic of teaching Senegalese languages, however, several teachers and school administrators in our qualitative sample emphasized the idea that **the government must provide adequate support** to

schools to implement bilingual programming. These respondents expressed that curriculum and policy changes happened often and that policymakers sometimes failed to consult teachers or provide adequate resources to schools. While supportive of teaching local languages, respondents urged the government to provide training and manuals in support of such an initiative. According to surveys, teachers do not feel that they are fully equipped to teach in students' mother tongues. Only 31 per cent of the teachers indicated that they have the materials they need to be able to teach effectively in children's L1, and only 43 per cent of the teachers feel that they have been well trained to teach reading in L1, compared with 99 per cent of teachers who reported feeling confident about teaching students to read in French.

When asked how local language instruction should work in linguistically diverse areas, **teachers and school directors foremost suggested that they should only be expected to teach one Senegalese language**. As a teacher in urban Fatick exclaimed, *"Two languages! That's enough."* Like respondents in Côte d'Ivoire, education stakeholders in Senegal expressed some concerns about choosing languages for use in schools without neglecting minority ethnic and language groups. Some teachers believe that Wolof should be universally implemented as the national language of instruction because of its function as the *lingua franca* in Senegal. But many more agreed with a regional language model, where schools would teach in the language dominant in the region.

Teachers had **varied opinions on the timing for students to transition from instruction in their mother tongues to instruction in French**. They suggested that mother-tongue instruction should start in Grade 1 and should last between one to five years. Several noted that students' skill levels in identifying and pronouncing letters and syllables would indicate their readiness to transition to French, and that this transition should be "gradual." However, none of the teachers explained concrete criteria for advancing to French language instruction. Relatedly, a number of teachers and school directors did not appear to understand that students would transition from Senegalese languages to French. Rather, they believed that the bilingual education model would involve teaching Senegalese languages through the university level.

Table 11. Teacher Views on Multilingual Instruction in Senegal

Statement	Strongly Agree or Agree
I am confident that I can teach students to read in French.	99%
It is important for pupils to learn to read in their mother tongue.	98%
I am confident about instructing in French.	97%
It is valuable for students' future economic opportunity to be bilingual.	96%
It is valuable for students to learn to read in their mother tongue because it will help them read well in French.	95%
Teaching pupils to read in their mother tongue and French at the same time will help them read well in both languages.	88%
I prioritize teaching in French because pupils are tested in French.	88%
Teaching pupils to read in their mother tongue will help them read better in French.	85%
I would teach more in their mother tongue if I had teaching and learning materials in their mother tongue.	84%
My school's head teacher encourages teaching in their mother tongue in early grades.	82%
I am confident about instructing in their mother tongue.	80%

I am confident that I can teach students to read in their mother tongue.	78%
I have the materials I need to be able to teach effectively in French.	76%
Parents prefer to have their children learn only/mostly in French.	62%
I feel that I have been well-trained to teach in a multilingual environment.	56%
Teaching students to read in their mother tongue takes too much time away from teaching them to read in French.	50%
I feel that I have been well-trained to teach reading in their mother tongue.	43%
Pupils cannot learn to read two languages at the same time because it is always confusing.	32%
I have the materials I need to be able to teach effectively in their mother tongue.	31%
I do not have time to prepare teaching and learning materials in their mother tongue.	28%

What are parents' and community members' perceptions and preferences regarding bilingual/multilingual education?

STUDENT VIEWS

When given the choice between monolingual (French only) and bilingual (their mother tongue and French) education, Senegalese students appear equally divided in their preferences. They generally **described their mother tongue as "easy," "nice," and "pleasant,"** and most stated that they speak their mother tongue well. Most students also stated that, when they do not understand the lesson in French, they would like their teachers to use the local languages to explain things. On the other hand, students were more likely to describe French as "difficult," but most nonetheless said they **liked learning French**. A few students also noted that speaking French would allow them to travel to the West, get jobs, and operate businesses.

PARENT VIEWS

Parents unanimously agreed that **everything should be done to increase students' level in French**. They noted that, because French is spoken internationally, it provides opportunities that local languages do not offer. Further, students could have a "brighter future" and a "good job and help their parents" if they master the French language. Thus, several parents expressed concern that bilingual education would inhibit students' French language acquisition. Many suggested that their children would rely too much on their home languages if not forced to speak French in school. For instance, a parent in Dakar stated, *"If they are in the playground they can speak in Wolof, but in class we must force them to speak in French."* Some parents also suggested that learning a Senegalese language is useless because students are assessed in French and because there is no infrastructure for local language learning beyond primary school.

What are the perceived costs and benefits to children and parents of a mother tongue–based multilingual education model?

PERCEIVED COSTS

As stated above, **many parents fear that promoting the use of Senegalese languages in schools might limit students' literacy in French.** With French learning being so crucial to students' academic success and prospects, some argued that teachers should introduce French at an early age because, as one

parent in Dakar claimed, "*the child manages to capture [the language] better when he is a child than when he grows up.*"

National-level education stakeholders, however, noted several concerns about the literal costs associated with developing and providing resources for bilingual learning. The teacher training and materials of the ongoing bilingual programming have incurred considerable costs, which foreign partners have largely financed. For this reason, some interview participants questioned the sustainability of these initiatives.

Other participants noted that **policy decisions regarding languages of instruction and the provision of resources in select languages may favour some ethnic and linguistic groups over others**. As one school inspector explained:

> *"It's a question of language, it's a question of culture, it's a question of community, it's a question of region... There are issues. You know, there are localities where the dominant traditional language is this or that. If you go there, there are always languages that are widely spoken, but it's not always easy to choose. That's perhaps where there can be fears because there are always claims, regionalisms, defensive tendencies on the part of certain cultures/communities. You know, language is one of the building blocks of identity."*

As so, decisions regarding multilingual learning much be weighed carefully to avoid marginalization of minority language groups and to promote linguistic preservation in an equitable manner.

PERCEIVED BENEFITS

As for the benefits of bilingual education, some parents and educators did note that **instruction in children's familiar languages may support students' literacy in French and the mother tongue, as well as comprehension in other subjects.** They additionally noted the futility of teaching in French before children understand the language. One parent, for instance, explained, *"Everyone has said [that students'] current level is not good. Today, if we taught them through their mother tongue, which they master better, their comprehension would be faster than what we teach them in French."* Teachers who have received training and materials to teach children in local languages spoke positively about the improvements they have seen in their students. Many of these teachers claimed that teaching in local languages has improved student interest, motivation, and engagement in the classroom, as well as allowed many parents to better interact with their children's education. One teacher in Dakar stated, "*Given my experience, I think that using the mother tongue in teaching is better than using the French language. With the mother tongue, the student understands more quickly and has enthusiasm.*" Other benefits that teachers mentioned include reduced dropout rates and more inclusive education.

MOTHER-TONGUE TEACHING CAN HELP TO PRESERVE LOCAL LANGUAGES AND THEIR CULTURAL IDENTITIES. DECISIONS TO CHOOSE ONE LANGUAGE OVER ANOTHER MUST BE CAREFULLY CONSIDERED.

In addition, some qualitative informants highlighted the idea that **bilingual instruction could help preserve local languages,** which are a "national pride" and source of identity for Senegal. Both parents and students expressed a desire to speak and learn in their languages and viewed mother-tongue education as a means to preserve those languages. A parent in one focus group explained, "*We are happy that our children are learning Serer because it avoids uprooting. Sometimes we move to big cities and our children will be born there and will not understand Serer.*"

Conclusions

- Two of three children from our sample are monolingual, while more than a quarter of children (30 per cent) are bilingual. The likelihood that a child is monolingual or bilingual varies greatly by region and languages spoken.

- In the Dakar region, 55 per cent of children do not understand French, the official language of instruction. By contrast, 87 per cent of the children in Fatick do not understand French.

- Student assessments show that there is a threshold point in mother tongue decoding skills, after which children's French decoding skills are higher. This means that students who are able to reach a particular level (15 to 20 per cent on a specially designed decoding test) are more likely to succeed in learning to decode French.

- Educators positively appraised bilingual and multilingual teaching methods, saying that those methods have garnered more interest and engagement from students and promoted better student comprehension. Yet, educators noted that the government should provide adequate support to schools to in order to implement mother tongue-based learning.

- Many participants described how mother-tongue teaching can help to preserve local languages and their cultural identities but noted that decisions to choose one language over another must be carefully considered.

V. Recommendations

In this section we make both country-specific and cross-country recommendations for general policy design, curriculum review, professional development, and stakeholder involvement and engagement.

In terms of policy recommendations, each country of our study is in a different phase of bilingual education that can be built upon for improved learning outcomes. **Across countries, we recommend that education leaders provide nuanced language of instruction decisions**—not a one-size-fits-all language of instruction for the entire country. We recommend that policymakers use language mapping data to determine language needs at the school and community level. **In Côte d'Ivoire, there is a need to focus on new policy development and expansion of small-scale bilingual education pilots**. Expanding the existing pilots would include selecting mother tongues and national languages for a small-scale roll out, and then introducing French literacy acquisition at the point of acquiring threshold level literacy in the local languages. **In Senegal, there is a need for experimental programs to become large-scale reforms.** Our research indicates the promise of mother tongue-based education programming for improved student learning outcomes, as long as sufficient teacher training and resources can be provided. **In the DRC, the most pressing needs for multilingual programming are for refinement of the education policy to account for students' familiar languages at the school level and for further provision of relevant local language materials**. While many Congolese children learn in their familiar languages in the early grades, children in some communities do not speak one of the four national languages prescribed for early grade instruction, thus creating additional challenges for teachers and students. In all three countries, the policies can draw on language mapping data to select initial language(s) of instruction, and then utilize the thresholds to determine timing for introducing literacy instruction.

When making curricular revisions, teacher professional development must occur in tandem. The results of this study shed light on some of the cognitive and linguistic learning mechanisms that underpin multilingual literacy acquisition in the Francophone countries in West Africa. These findings can provide an empirical lens through which curricula can be reviewed and revised if necessary. In the cases of biliteracy acquisition in the DRC and Senegal, where some children are already learning to read in their mother tongues, our data show that acquiring a foundational level of decoding skills in a familiar language provides a sufficient basis for introducing literacy instruction in French. Our study also makes the case for continuous emphasis on French oral language instruction beginning in the early grades, considering the strong correlation between French comprehension skills and French decoding skills. Teacher professional development curricula should be similarly revised to stress the importance of utilizing mother tongue skills in developing *both* mother tongue reading abilities, but also for French reading development. In addition, teacher placement practices should consider teachers' language skills so that teachers' linguistic background corresponds with that of their students and, relatedly, the language of instruction.

In cases of linguistically mixed classrooms and classrooms with a large range of student language levels, **there is a need for teachers to make assessment-informed decisions to determine which language(s) are spoken by a majority of their students**. Importantly, teachers should be given several easy-to-use tools and methods to help support students who may then be in classrooms where they do not speak the language of instruction (i.e., emerging bilinguals whose weaker language is not the language of instruction, or monolinguals in classrooms where their familiar language does not match the language of instruction). These teacher-student scaffolds are critical for supporting all children in the classroom. Participants in our study also recommended formally assessing students on mother tongue literacy to encourage student and parental investment in developing those skills.

Lastly, **we recommend advocacy among parents, teachers, and other community members regarding the use of local languages in education**. Participants in our study widely perceived benefits to the use of local languages in the classroom–even if only as a steppingstone for French. Many teachers already use local languages to support learning in the classroom across all three countries. Education officials should harness these existing attitudes and practices through advocacy efforts, as well as promote community engagement about the benefits of mother tongue-based education for developing successful bilingual and multilingual learners.

VI. Conclusions

The results from this multi-country research examining plurilingual education in francophone West and Central Africa has significant implications for language of instruction policy and practice across the region. Critically, the study mapped student language proficiencies in relation to language of instruction policies. This data has helped shift the needle on policy decisions in Côte d'Ivoire, which is now better poised to implement large-scale bilingual education programming. The study also empirically determined the "readiness" for transferring reading skills from one language to another, which can thus inform policy, curricula development, pre- and in-service teacher training modules, and standards and assessments for quality multilingual education. In this section, we conclude with some key take-aways across all three countries.

First, most students from our large-scale data collection across Côte d'Ivoire, the DRC, and Senegal are monolingual. Most children who are bilingual are bilingual in French and another local language. Vast differences in the rate of multilingualism exist by language and region, with monolingualism being far more prevalent in rural areas, and French being far more common in urban areas as a second dominant language or as an emerging language.

It is important to note that the semantic fluency data from the student assessments in this study indicates a child's "dominance" in their language skills. While we refer to children being able to "speak" languages throughout the report, it is important to make a distinction between level of proficiency and level of dominance. Semantic fluency only shows which language(s) are more dominant in each child, and not necessarily whether they are stronger than other students in each language. Therefore, this information is valuable in identifying what language skills students have in the classroom (assuming normal speech development) instead of focusing on what they do not have. This language assessment data produces information on each child's strongest languages (be it one or more languages per child), which provides policymakers and education stakeholders with a tool for decisions on which language of instruction is likely to reach the greatest number of students in a classroom.

Second, in line with previous research, this study has confirmed the existence of decoding thresholds between first and second language literacy acquisition. In other words, there is a "tipping point" or an "aha moment" in learning to read a known language (often the mother tongue) that allows children to learn the new language (often French) exponentially better. If teachers introduce French reading skills prior to this point, the likelihood of success in learning to read French is much lower. A tool like this can be tailored and designed for policymakers or classroom teachers to help them decide when a child is ready to be introduced to French literacy instruction, providing the first empirical tool of its kind.

A vital point to underscore with relation to thresholds is that **the exact level of the threshold is not as important as the fact that there is a threshold**. The level of the threshold is highly dependent on the test, which may vary in difficulty level from another test of the same concepts. The range of 10 to 30 per cent across studies of alphabetic-alphabetic biliteracy[46] is more important than the precise number. The fact that there is no threshold for decoding skills in Côte d'Ivoire does not indicate that thresholds do not exist in Ivoirian languages. It only indicates that Ivoirian students in our sample did not have enough mother tongue reading skills to transfer to French, since they were never taught to read in their mother tongue.

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[46] Nakamura, P. R., Bonilla, J., Mekonnen, B., Tefera, D., Gebrekidan, Z., & Turner, K. (2019). *READ M&E: Language Transition Study Report*. American Institutes for Research. https://www. air. org/sites/default/files/READ-ME-Lang-Transition-Rpt-508.pdf; Nakamura, P. R., de Hoop, T., & Holla, C. U. (2018). Language and the learning crisis: Evidence of transfer threshold mechanisms in multilingual reading in South India. *Journal of Development Studies*, 55(11), 2287–2305.

While this study sheds light on when teachers should introduce literacy skills such as alphabet knowledge, decoding, simple sound-symbol correspondence acquisition, etc. in French, it does not indicate that a child is ready to transition to French as a *medium of instruction*. In essence, stakeholders may think of transition at three levels: 1) transition to learning the new language as an oral/spoken/signed language, 2) transition to decoding in the new language (based on the threshold results from this study), and 3) transition to using the new language as a medium of instruction, which should occur last. Each of these areas needs further research and continuous adaption to determine effective timing for transition.

Third, French language comprehension skills also have significant importance for learning to read in French. As part of this study, we tested for thresholds between French language comprehension and French decoding skills and did not find a break point as we did for French and mother tongue decoding skills. This lack of a threshold indicates that no precise tipping point exists for readiness in terms of *how much* French vocabulary and language skills are needed before teachers introduce French literacy. Instead, it reveals that *the more French language skills a child has, the better they can learn to read in French.* As discussed in the conceptual framework, language-specific listening comprehension is critical for reading skills – not just "non-linearly" at a tipping point or threshold level.

Fourth, students who are learning in languages they speak and understand are significantly more likely to attain better foundational literacy outcomes. As measured through the semantic fluency task, both monolingual and bilingual students in our sample who were learning in either their only dominant language or one of their dominant languages demonstrated better decoding and reading comprehension outcomes.

Furthermore, the findings from the qualitative component of this study indicate that parents, teachers, and other community members across all three countries generally see the value of using children's familiar languages for instruction, but that French language skills should remain as the key outcome of interest. Parents and educators often agree that using languages that students speak and understand in the early grades can help improve student comprehension. Many people also described the cultural value of local languages and the desire to sustain those languages. Yet, because of the importance of French language skills for children's academic and socioeconomic futures, most people deem that any policy or programmatic changes should be done to improve French language and literacy outcomes. Thus, decisions to increase the use of local languages in the classroom should be paired with community sensitization focused on the intended benefits for children's French abilities.

Overall, this study provides empirical data to support language of instruction policy and programme decisions, with direct application to the francophone countries of this study and additional relevance to other multilingual contexts across LMICs. The language mapping data can help to inform choices for initial languages of instruction, while the decoding thresholds can help to inform curricula and teaching practices regarding optimal timing for transition. As Côte d'Ivoire, the DRC, and Senegal each work to scale-up or improve their existing language policies, we hope that this study can guide stakeholders to make language-informed decisions to ultimately improve student learning outcomes.

Appendix

Côte d'Ivoire

Table A1: Performance on modified EGRA constructs

Sub-task	French	Mother Tongue
Language Comprehension Score (%)	68%	68%
Decoding Score (%)	8%	20%
Reading Comprehension Score (%)	20%	24%

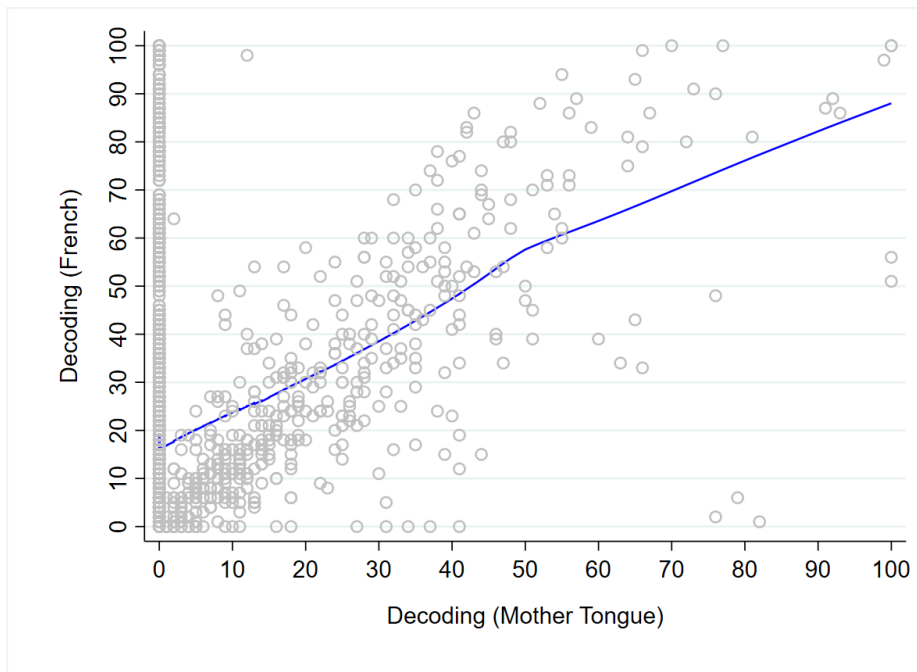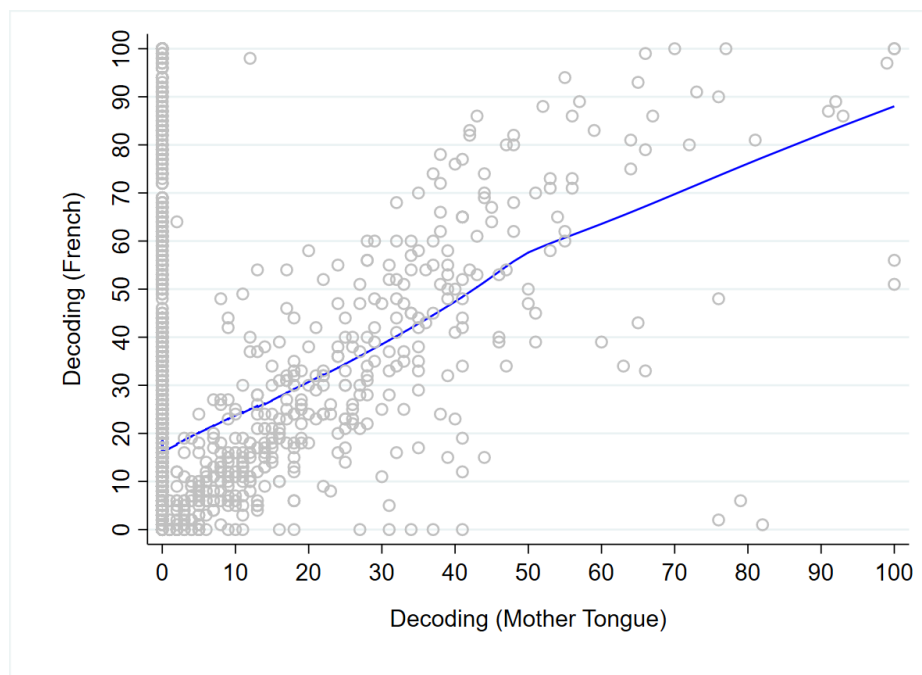**Figure A1. Scatterplot of L2 Decoding- L1 Decoding**

Figure A2. Scatterplot of L2 Decoding- L2 Language Comprehension

Democratic Republic of Congo

Table A2: Performance on modified EGRA constructs

Sub-task	French	Mother Tongue
Language Comprehension Score (%)	36%	52%
Decoding Score (%)	16%	17%
Reading Comprehension Score (%)	11%	19%

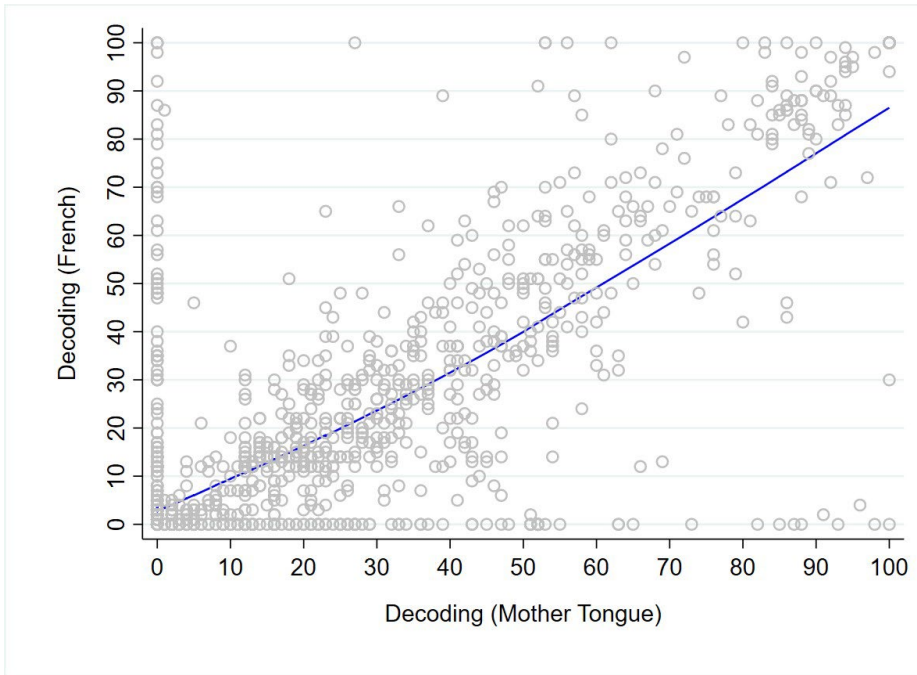**Figure A3. Scatterplot of L2 Decoding- L1 Decoding**

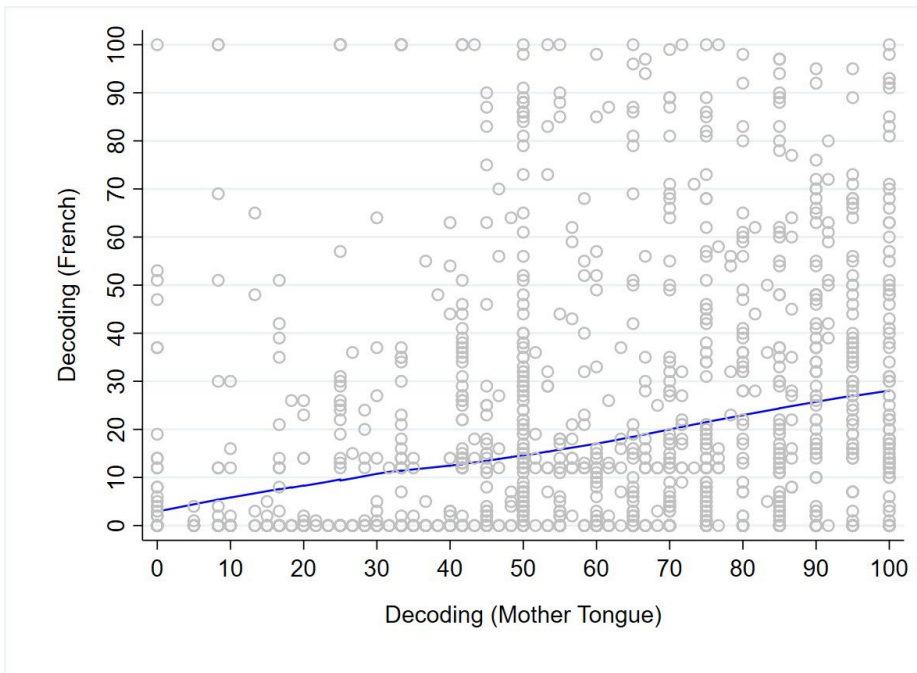**Figure A4. Scatterplot of L2 Decoding- L2 Language Comprehension**

Senegal

Table A3: Performance on modified EGRA constructs

Sub-task	French	Mother Tongue
Language Comprehension Score (%)	69%	73%
Decoding Score (%)	50%	48%
Reading Comprehension Score (%)	36%	35%

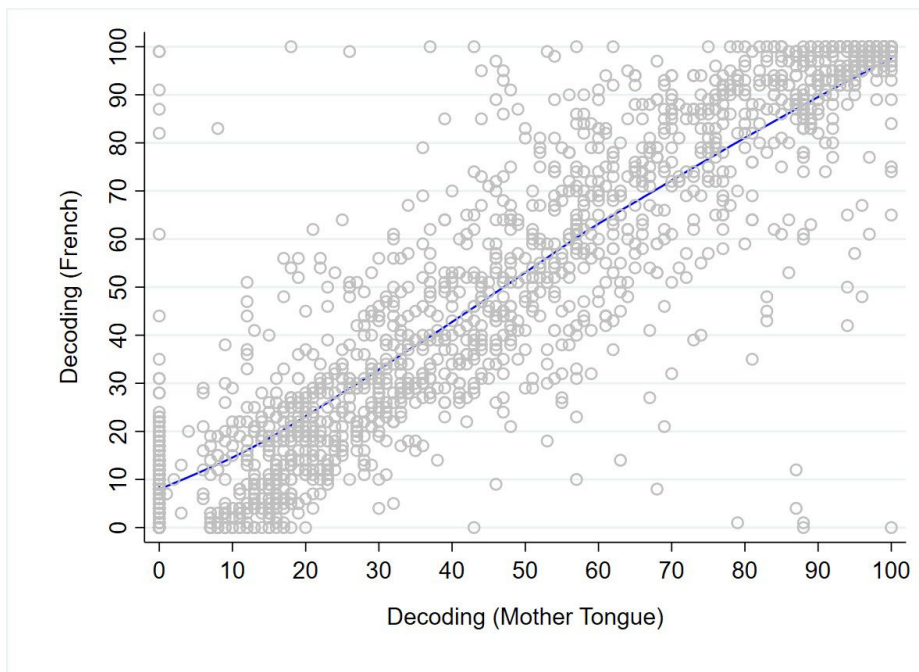### Figure A5. Scatterplot of L2 Decoding- L1 Decoding

Figure A6. Scatterplot of L2 Decoding- L2 Language Comprehension