

**Understanding the Phonological Processes at Work in Language
Contact Situations: the Case of Songhay-French Code-Switching**

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Abstract:

Several studies have been conducted about language change and the phonological processes that are involved. But few (if any) have dealt with phonological processes in a code-switching context. Some research on Songhay-French code-switching is available, but no study has been conducted on the possible phonological processes. So, this research has been conducted to uncover such phonological processes using the participant observation technique. The study is grounded on the Optimality Theory developed by Prince and Smolensky (1993). For that, free conversations of groups of students from the city of Gao (northern Mali) have been recorded, the instances of Songhay-French switches extracted and the phonological processes identified and analyzed. The results of the investigation have displayed processes of assimilation, insertion, and vowel-consonant harmony.

Keywords: code switching, assimilation, insertion, vowel-consonant harmony, optimality theory.

1. Introduction:

Mali is a multilingual country with French as the official language and, according to Skattum (2009c), there are approximately 20 languages among which thirteen have received the status of national languages: Bamanankan (or Bambara), Bomu, Bozo, Dogoso, Fulfulde, Hassaniyya, Maninkakan, Mamara, Songhay, Soninke, Syenara, Kel-Tamachek and Xassonke. The diglossic relationship between the ex-colonial European languages and the local languages in Africa leads to many phenomena of language change and variation. These phenomena are characterized by a transfer of phonological, lexical, syntactic and semantic patterns of the local languages into these European languages. And in return, the local languages receive and adapt new terms from the European languages that express concepts or ideas the native speakers do not have in their languages. At times, the speakers of those local

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languages just want to be fashionable in adopting foreign terms in their daily use of the language. From this point of view, Annamali (1989:48) noted that “*in many situations of languages in contact, constituents of one language can be found with the constituents of another language in a number of linguistic phenomena, namely lexical borrowing, transferring, interference, calquing, diffusion, relexification, code-switching and code-mixing, etc*”.

Phenomena of bilingualism and multilingualism are omnipresent everywhere in all African linguistic communities. In Mali, the sociolinguistic situation at the individual level shows that the French language is in keen competition with not only Bamanankan which is the main language, but Songhay, for instance, which is the lingua franca in the north of the country. So, in this sense, discontinuity between French and some African languages claimed by Lyche & Skattum (2010) is arguable, considering the fact that language contact is omnipresent. As a result, we can observe phenomena of code-switching and code-mixing among students and other bilingual speakers of French all over the country who alternate or mix elements of the French language together with their mother tongue in conversations as the following extract between two students:

- Est-ce que **ni koy** école **hõ**? (Have you been to school today?)
- Non, mais **ay maa subaahoo kaŋ** étudiants**ŋey** grèvé. (No, but I was told this morning that students went on strike). The bold words are Songhay and the rest is French.

Listening to such a conversation, the striking question any observer may ask is to know exactly what kind of language these speakers are using. So, it will be interesting to investigate this type of language use and comprehend the kinds of phonological processes that it involves.

Constraints in the literature of code-switching are governed by certain factors. In the Songhay-French code-switching, one can ask the question to know whether these two different phonological systems can exist in one code. In this respect, the purpose in this study is to describe the phonological features manifested in the Songhay-French switching from a language-contact perspective. More particularly, we are trying to look into substratum features of phonological processes such as assimilation/dissimilation, insertion or vowel harmony in the conversations of bilingual inhabitants of Gao carried out by the technique of participant observation in a social network setting called ‘grins’ (a place where friends usually meet after work to chat and while away time).

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The major purpose of this paper is to analyse the types of phonological processes used in intra-sentential switching by Songhay speakers of French. The study specifically seeks to:

- identify the kinds of phonological processes involved in the adoption of a French lexical item into Songhay;
- assess the impact of those processes on the Songhay language;

The following research questions have been developed to guide the study:

- What happens at the phonological level in the fusion of lexical and morphological items from Songhay-French code-switching?
- What are the phonological environments that trigger those modifications?
- Do the words and affixes in the Songhay-French code-switching maintain their original phonological forms or are they integrated into one phonological system?

The significance of this study lies in the fact that it will highlight the effects of contact between Songhay and French languages, the extent to which this linguistic contact phenomenon could deteriorate or ameliorate the Songhay language. The findings will contribute to the solutions of the national language policy and influence the political decisions about language policy in the sub-region. It will also help contribute to knowledge in the field of the study of sociolinguistics in general and contact linguistics in particular.

The major limitation of the study is to get fresh and spontaneous data from Songhay speakers of French living in Gao. This could not be possible without some hindrances and difficulties. Since we met participants in an informal setting, some of them did not feel comfortable with the presence of the tape-recorder and the researcher who is not familiar to them, and therefore did not provide spontaneous and valuable data at the beginning. To go around this, after the first visits in the sites, we asked one of the participants to do the recording of the conversations so that the others could not notice the presence of the tape-recorder.

In terms of delimitation, the study attempts to describe and analyze phonological processes of assimilation, dissimilation, insertion and vowel harmony of the switched forms.

2. Literature Review

Understanding phonological processes in language contact has been the focus of several studies. Little literature, if any, exists on Songhay-French code-switching and on ensuing phonological processes. Most of what we have found are either related to other linguistic subfields or do not specifically involve our problem.

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Lyche & Skattum (2010), in a survey on the identification of native speakers' accents, came to the conclusion that the so-called "Français du Mali" (Malian French) is nothing but a plurality of languages in which linguistic structures of L1 play the central role.

An investigation by Aliero (2015) on the morphophonological processes of the C'Lela nouns (Nigeria) displays the existence of several instances of vowel harmony or vowel copying (Stark, 2010) especially in the plural formation of nouns, cases of metathesis, vowel lengthening, and (final) vowel deletion. While the study was not specifically about code switching, it did uncover important phonological processes affecting change.

Akumbu and Asonganyi (2010) demonstrate inter alia the phonological influence of Fulfulde on Kejom in Cameroon. For instance, Fulbe speakers may take fricatives and affricates and use them for other fricatives: [s] is replaced by [ʃ] and [ts]. The Kejom four high vowels [i, i, u, u] systematically undergo a process of vowel reduction to the Fulfulde high vowels [i, u]. In this sense, there seems to be a regular sound change resulting from the influence exerted by the Fulbe native language on their use of Kejom. The consequence is the emergence of a new variety of Kejom.

Akumbu and Asonganyi (2010) is a contrastive analysis aiming at demonstrating the influence of native fulbe speakers' L1 on the use of Kejom which is their L2. In the vein, Kadenge (2009) has focused on the phonological processes at work in Zimbabwean native Shona speakers of English who are assumed to indigenize the English language and therefore "*avoid complex vowels such as phonemically long vowels, diphthongs and triphthongs in their speech*" (Kadenge, 2009:158). Indigenization is carried out through a series of phonological processes of glide epenthesis with the insertion of epenthetic glides [weit ---- wajiti; juə ---- juwa] in diphthongs, the monophthongisation of diphthongs with the loss of the second vowel [leit---leti], the substitution of diphthongs with monophthongs [deitə ---- data; gəu ----go], vowel length reduction [si:k --- siki; bi:t --- biti] and the substitution of English monophthongs [hæt --- het; mæg --- mag]. In this particular context, it is clear that it is the English language which is phonologically affected by Shona.

Both Akumbu and Asonganyi (2010) and Kadenge (2009) are phonological contrastive analyses showing deviations of L2 phonological rules under the influence of the phonological system of the native L1 speakers (Fulbe and Shona). This typical contrast is noticeable with many West African languages in contact situation such Fulbe-Bamanakan, Fulbe-Songhay or Songhay-Bamanakan, etc. Many native African speakers of French or English also demonstrate the same phonological contrastive features as it will be seen in this

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paper. But the difference lies in that the phonological processes we are describing illustrate examples from an intrasentential switching between French and Songhay and are therefore not contrastive processes because they follow constraints in intrasentential switching where inserted items obey to the phonological rules of the matrix language.

Apenteng and Amfo (2014) analyze vowel harmony in the English lexical items borrowed by the Akan language in Ghana. Akan displays ATR (Advanced Tongue Root) (Dolphyne, 1988:18). In this sense, every Akan word of two or more syllables will exhibit one of the two vowel sets:

Set I (Advanced Tongue Root Vowels) - /i, e, æ, o, u /: owuo 'house/home'

Set II (Unadvanced Tongue Root Vowels) - /ɪ, ɛ, a, ɔ, ʊ /: εwɔɔ 'honey'

The investigation shows that the Akan language makes use of nativization processes which aim at simplifying the English /v/ into the Akan /ɔ/; /ʌ/ into /ɔ/ and /a/; /ə/ into /a/, /ɔ/, /ɛ/, /ɪ/; and /r/ and /l/ being free variants in Akan, the former at times replaces the latter.

The nature of the phonological process of vowel harmony in Apenteng and Amfo (2014) is different from what we are dealing with in the present paper. The case we are describing in the Songhay-French intra-sentential switching is a consonant/vowel harmony. It concerns French inserted words ending with consonant sounds which harmonize with Songhay inflectional affix markers.

3. Theoretical Consideration: Optimality Theory (OT) and intra-sentential code-switching

Phonological processes such as assimilation, dissimilation, insertion or vowel harmony are common in all languages over the world. There is no doubt about the fact that most of the rules are shared by a lot of different languages but these rules are in some cases affected by particular phonotactic constraints of the languages.

According to McCarthy (2007), Optimality Theory, developed by Prince and Smolensky in 1993, is a general model of how grammars are structured. Bakovic (2005) asserted that this theory of linguistic typology has some evaluation methods that provide accounts for the uncovering nature of phonological processes, particularly in terms of variation (Coetzee, 2006). In the same vein, Wilson (2000, 2001, and 2003) states that the predictions of OT analyses are means for seriously understanding the restrictive nature of phonological processes.

OT is an approach to phonological analysis which proposes models and grammars of constraint domination hierarchies according to which observed forms of language arise from the interaction between conflicting constraints.

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The approach states that there are two patterns of constraint interaction interpreted as: “DO SOMETHING ONLY WHEN NECESSARY”, and “DO SOMETHING EXCEPT WHEN BANNED” (Prince and Smolensky, 2002:23). The first form, according to the authors, arises when a low-ranked constraint bans some structural option of a high-ranked one. The second form arises when the lower-ranked constraint favors some options that the high-ranked one rejects. OT affirms that these conflicting constraints within a particular language can violate claims about the ‘well-formedness’ of some representations. In other words, the theory argues that the rules that govern a particular grammar are often violated under some circumstances in language use.

Indeed, the language practice of code switching and code mixing of Songhay speakers of French is a phenomenon that involves some forms of constraint interaction between the phonological systems of the two languages. From this standpoint, we use OT in this study as theoretical framework to describe and analyze the phonological processes of assimilation, vowel-consonant harmony and insertion the switched words undergo in the intra-sentential Songhay-French code-switching.

These bilingual Songhay speakers of French show characteristics of phonological processes such as assimilation and dissimilation in their speech. The phonological processes are sometimes manifested according to a specific rule occurring in the context of language-contact but sometimes they are quite random in nature. In this respect, the present paper tries to explicate factors that govern phonological rules manifested in the CS of Songhay speakers of French.

4. Methodology

The research design is based on the methodologies employed by variationists such as Labov, Myers-Scotton, Poplack and Redouane when carrying out research on language variation and change phenomena in terms of field methods. The design of this study is a descriptive survey guided under an interpretivist approach of research philosophy which involves describing and examining the phonological processes in code-switching in the linguistic contact between French and Songhay languages, and the impact of this language contact situation.

The reason in choosing such design as a research method for this study is that it is the strategy that best suits the problem under consideration. One of the merits of this design is that it allows the use of flexible methods of data collection such as participant observation, questionnaire or interviews, and it also allows the use of inductive reasoning to draw

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conclusions from the data. The advantage of this method is that the researcher has the chance of experiencing the Songhay-French code-switching phenomenon being investigated in practice rather than getting it from secondary sources.

Bowern (2008) asserts that many of the techniques of data collection used in field linguistics are also applicable when working on language contact. Bowern (2008) notes also that much of fieldwork information on language contact in a field site will come from ethnographic methods of data gathering such as interviews, self-report or observation. In order to solicit information and collect data on the Songhay-French code-switching phenomenon, we use participant observation. And in order to support the observation we use a tape-recorder to have fresh data on cassettes.

Participant observation is useful to our study because, according to Bowern (2008), it is a source of potential information and a very powerful tool for investigating language contact. Bowern (2008) said also that it is a core tool in sociolinguistics. It also permits the researcher to do an exploratory work to find out what people actually do in language use. The advantage of this instrument to our study is that it provides spontaneous data through verbal interactions between the participants. Another advantage of this instrument is that it gives the opportunity to record information as it happens in the setting, with the researcher being either active or passive in the activities.

In one word, observing permits us to gather live data from live situations. In order to get spontaneous data, we observe participants through unplanned self-induced verbal interactions. While observing participants, we carefully record on tapes all the utterances of the participants involved in verbal interactions to notice any code-switching employed in that context of language use. We believe that observing participants in free conversations can provide valuable information about the problem being investigated.

In order to achieve the aims of this study, we choose groups of participants, each being centred on a “grin” in the urban city of Gao, the site for the study. The choice of this site is to account for the urban exposure to the use of both French and Songhay languages. Gao is the regional capital city representing the standard dialect of the Songhay language. Urban residents are more exposed to the use of French than rural residents because of the great number of administrative infrastructures, schools and other modern technologies.

The stratified sampling method is used to select the “grins” as we choose to frequent only those attended by people provided with schooling, but participants within the “grins” are

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selected randomly, this is to allow all members in the “grins” to have an equal chance of becoming a participant in the study. The participants must be native residents of Gao.

Following coding practices employed by Poplack (1993) and her colleagues to identify participants, we adopt in this study a coded number for each participant indicating the number of participant (from the first one until the sample size of the ‘grin’ is reached), the number of the “grin” and the first letter of the name of the site of the field study (for instance, ‘G’ for Gao). Example: **G6** (participant number 6 in Gao). For female participants, **F** precedes the coded number, for example **F62** (participant number 2 in Gao).

Before transcribing the data in French and in Songhay scripts, we repeatedly listen to the tapes. After the transcription, we repeatedly read the transcripts and translate them into English. Then the data are analysed qualitatively using inductive reasoning to draw conclusions regarding the stated research questions and existing relationships between the categories.

The researcher passively takes part and records the conversations, as a native speaker of the Songhay language. This ensures self-confidence. Most of the participants are not aware of the recording, and those who know ignore about the purpose of the study; they only know that it is for a survey. The conversations are free and spontaneous.

5. Results

A number of phonological processes have been uncovered in our study. The processes involve instances of assimilation (that can be partial or total, progressive or regressive, coalescent or reciprocal), insertion and consonant-vowel harmony.

5.1 Assimilation

Assimilation, in general, occurs when a sound becomes more like a neighboring sound. It occurs when one oral constriction is made for two sounds or when a sound is assimilated in its place of articulation to the following sound. Assimilation can also occur within a word or between words and may be progressive or regressive, partial or complete.

Progressive assimilation is when the sound affected by the assimilation becomes more like the following sound. This type of assimilation is referred to as **left-to-right assimilation**. It is also called anticipatory because the sound which changes anticipates the following sound. **Regressive** assimilation is when a sound becomes more like the preceding sound. It is also known as **right-to-left assimilation**. Coalescent or reciprocal assimilation occurs when there is mutual influence or fusion of sounds. For instance, ‘*don’t you*’ would be pronounced as /dəuntʃu/, fusing /t/ and /ju/ to produce the affricate /tʃ/. **Complete or total assimilation** is

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when the sound affected by assimilation becomes exactly the same as the following sound that causes the assimilation like in the English phrase ‘ten mice’ pronounced as /tem mais/.

Partial assimilation is when the sound becomes the same in one or more features, but remains different in other features; the English phrase, ‘ten bikes’ would be pronounced in colloquial English as /tem baiks/, with the /n/ falling under the influence of /b/, adopting its bilabiality, but not its plosiveness. Last, assimilation can be contiguous like in /tem baiks/ or non-contiguous (distance assimilation) like ‘turn up trumps’ that may be pronounced as /tə:mʌptɹʌmps/ under the effect of later sounds.

In our study, the data have shown that the phonological systems of French and Songhay involved in CS interact. Such interaction has been found in the form of phonological assimilation of vowel sounds. This phonological assimilation of vowel sounds is manifested only in the types of intra-sentential switches. Constraints exclude its manifestation in inter-sentential switches.

In the Songhay-French intra-sentential switching, some French nouns undergo right-to-left or regressive assimilation processes. These processes are common to the Songhay phonological system because Songhay words undergo the same phonological rules in rapid speech. This confirms Myers-Scotton’s insertion theory of The Matrix Language Frame Model, which states that the inserted words adapt the rules of the base language. We present below various instances of assimilation.

5.1.1 Songhay inflectional affix “-o” merging with French “e muet” (“mute e”) before /l/, /r/, /k/, /g/:

In the Songhay-French intra-sentential switching of word-final schwas, the French schwa (/ə/), also called “e caduc” (“dropped e”) and “e muet” (“mute e”) merges with Songhay back vowel /oo/, the singular definite inflectional marker. This type of assimilation is regressive because the trigger for that assimilation is the Songhay inflectional affix marker ‘-oo’ for singular definite nouns, and the target which is affected by the assimilation is the French schwa (/ə/), like ‘**Bibl(e)oo**’, ‘**profil(e)oo**’ ‘**histor(e)oo**’, ‘**couroo**’, ‘**arbitag(e)oo**’, ‘**musiquoo**’ in the following extracts:

- **G1:** A ga **Bibl(e)oo feuilley** kortu deh a g’i bibiri. “He tore out the **sheets** of the **Bible** and rolled them up in pieces.”

In this extract, the word ‘**Bibl(e)oo**’ is pronounced with the Songhay back vowel /o/ affecting the French schwa /ə/.

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- **FG2**: Ada ... Ada **profil(e)oo face** ga cijin. “Ada’s ... Ada’s **profile** on **facebook** yesterday night.”

Speaker **FG2** also pronounced ‘**profil(e)oo**’ with the Songhay back vowel /o/ affecting the French schwa /ə/ which is dropped.

- **G1**: **Non**, za a cindi ... ay ka dirɲa nga **histor(e)oo** takaa. “**No**, since he was ... I now forgot what his **story** was like.”

‘**histor(e)oo**’ is also pronounced with the Songhay back vowel /o/ affecting the French schwa /ə/.

- **G14** : Nda a dii kaɲ n’ si **avancé** deh a ga ni **couroo** kayandi. “If he noticed that you don’t **improve**, he stops the **course**.”

In this extract, the Songhay back vowel /o/ triggered the occurrence of the French schwa /ə/ in the pronunciation of the word ‘**couroo**’.

G13 : [...].Sanda ay si bay, **peut-être arbitrag(e)oo** no. “[...] I really don’t know ... **maybe** it was a **refereeing** error.”

The word ‘**arbitrag(e)oo**’ undergoes the same process as explained above. But, in the transcription, we keep here the spelling ‘**arbitageoo**’ instead of ‘**arbitagoo**’ to make the difference between the French affricate /ʒ/ and the French stop /g/ because the word is pronounced in French.

- **FG2**: Heh, Miguel nda Luciana **musiqu(e)oo**. “Heh, that’s the **music** of Miguel and Luciana.”
- **FG2**: [...] (0.2) N’ga bay kaɲ ir **dixièm(e)oo** ra, ir **grinɲoo** kul no i n’a **renvoyé** kala ir nda ... ir nda Youba. (0.2) Youba **passé**, agay **redoublé**. Fifiyaɲ kul, i n’i gaaray. “You know, when we were in **tenth form**, all our **grin** members were **expelled** except Bouba and me. Bouba **moved to the next class** and me, I **repeated**. Fifi and all the others were expelled.”

The word ‘**musiqu(e)oo**’ is also pronounced with the Songhay back vowel /o/ affecting the French schwa /ə/. The second /o/ is added to show the definite marker. **Dixièm(e)oo** just like **histor(e)oo** and **musiqu(e)oo** undergo the same phonological process of assimilation.

5.1.2 Songhay inflectional affix “-o” merging with French nasals /ã/, /ɛ̃/, /õ/:

French has four nasal vowels. Unlike oral vowels which are produced within the oral cavity, French nasal vowels are produced when air passes simultaneously through the nose

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and the mouth. The nasal consonants /n/ and /m/ are not pronounced when they follow a nasal vowel. There is a complete assimilation of these consonants into a vowel pronunciation.

In the Songhay-French intra-sentential switching, these French nasals are triggered by the Songhay inflectional affix marker “-oo” for singular definite nouns. This type of assimilation is also regressive in that the trigger for the assimilation is the Songhay inflectional affix, and the target sound which is affected by the assimilation is the French nasal sound /n/, like in ‘temps’. It is the same process in the next extracts with ‘grinṅoo’ and ‘terrainṅoo’:

- **FG2:** Abba, ay nee, n’ga bay, ir **tempsṅoo** ga, ir ga aru tee, **mais** ir cine arey banda ir ga hanga. (0.2) **Mais** sohō da, woy-ize buoney, arubeerey no ... “Abba you know, in our **times** we made friends with men of our like. **But** nowadays, small girls are making friends with elder men ...”

Here, the French nasal sound /n/ in the pronunciation of ‘temps’ as /tã/ is velarized into ‘tempsṅoo’ with the Songhay velar /ŋ/ heard in the pronunciation. Likewise, the nasalization in the pronunciation of ‘grin’ /gɛ̃/ changes into a velarization ‘grinṅoo’ where the Songhay velar /ŋ/ is heard in the pronunciation.

- **G1:** Bi foo, ir **matchoo** woo ga, **il y avait un joueur qui est blessé**, a goo **terrainṅoo** ra. I mana a kaa taray, **ils ont marqué un but**. “The day before yesterday, during our **football match, there was a wounded player** lying on the **ground**. They didn’t take him out, **and they scored.**”

The word ‘terrainṅoo’ undergoes the same process as pointed out earlier.

5.1.3. Other categories of inserted words involving any case of assimilation

In the Songhay-French intrasentential switching, apart from definite singular nouns, there is no assimilation process in the insertion of other categories of words like singular indefinite nouns, verbs, adverbs, adjectives, conjunctions, etc. These types of inserted words keep their initial phonetic properties in French.

Singular indefinite nouns:

Singular indefinite nouns, unlike singular definite nouns, do not undergo any assimilation process in intra-sentential switching of Songhay speakers of French, as seen in the following extracts:

- **G13:** Jean mma goo nda nga **Bible** foo kaŋ, wallaahi, **drogue** deh a n’i kul cendi hal’a ben. (h) [...] “Jean got a **Bible** that he tore out till the last page because of **drugs.**”

We can notice that the words ‘Bible’ and ‘drogue’ are pronounced without any assimilation process.

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- **FG2:** Hal ay na ... haywana ... ay na **invitation** sanba a se cijin vers minuit ... “I ... I sent her an **invitation** yesterday night around midnight ...”

‘**invitation**’ is also pronounced without any assimilation process.

- **G15:** A šii nda **âge**. “There is no **age limit**.”

‘**âge**’ is also pronounced without any assimilation process.

Plural nouns:

Plural definite and indefinite nouns do not undergo any assimilation process in intra-sentential switching of Songhay speakers of French, as seen in the following extracts:

- **FG2:** Woo no ma bay kaŋ **starey** ti ir. (0.2) Ay nee **tellement que starey** ti ir, a si hin ka šelen ya ne. “It is a fact that we are **stars**. I say we are **stars**, that’s the reason why she couldn’t talk with me.”

Verbs:

Verbs also do not undergo any assimilation process in intra-sentential switching of Songhay speakers of French, as seen in the following extracts:

- **FG2:** Wani n’ka **joué** hō? “Has Wani **played** today?”
- **G1:** I nee Ha-Ko ka **gagner** un à zéro. “They said that Ha-Ko **won** one to zero.”
- **G1:** Ayyo! Ba hanoo kaŋ ngi nda Mazaa borey **joué** là, i yenje. “Yes! Even the day when they **played** against Mazaa people, they quarrelled.”

Adjectives:

Adjectives also do not undergo any assimilation process in intra-sentential switching of Songhay speakers of French, as seen in the following extracts:

- **FG2:** Bouba, ir k’a gar. (0.2) Bouba, n’ti **onzième** n’a goo, ir goo **dixième**. “Bouba, we came after him. While Bouba was in the **eleventh form**, we were in the **tenth form**.”

Adverbs, Conjunctions, exclamations:

Adverbs, conjunctions and exclamations also do not undergo any assimilation process in intra-sentential switching of Songhay speakers of French.

5.2 The phonological process of insertion:

When Songhay speakers of French insert some French lexical items beginning with the consonant sound /r/ like ‘radio’ ‘recreation’, an additional front vowel sound is pronounced in the surface phonemic form. For instance, the word ‘reunion’ would be pronounced as ‘**é-réunion**’ (VC) instead of ‘**réunion**’ (CV). It is the same in the following

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words with ‘**é-R(e)FI**’ instead of ‘**RFI**’, **a-renvoyé**’ instead of ‘**renvoyé**’, **é-redoublé**’, instead of ‘**redoublé**’, under the influence of the vowel immediately following the /r/ sound beginning the French words. It may also be the addition of /a/ like ‘a-radio’, ‘a-rabi’, ‘a-ravin’, or /u/ in ‘u-rue’, etc.

- **FG2**: Agay woo, ya nka duu **chance** i ma n’ay **renvoyé**. (0.2) N’ga bay kaŋ ir **dixième** ra, ir **grin**oo kul no i n’a **renvoyé** kala ir nda ... ir nda Youba. (0.2) Youba **passé**, agay **redoublé**. Fifiyaŋ kul, i n’i gaaray. “Me, I was lucky they didn’t **expel** me. You know, when we were in the **tenth form**, all our **grin** members were **expelled** except Bouba and me. Bouba **moved to next class** and me, I **repeated**. Fifi and all the others were expelled.”

5.3 Vowel-consonant harmony

In phonological assimilation processes, not all types of harmony involve only vowels. Some types of harmony involve consonants and are known as vowel-consonant harmony. This process involves an interaction between vowels and consonants where vowels harmonize with consonants.

In the Songhay-French intra-sentential switching, French inserted words ending with consonant sounds which harmonize with the Songhay inflectional affix marker for definite singular nouns like ‘**matchoo**’, ‘**parkingoo**’, ‘**I.F.Moo**’, as seen in the following extracts:

- **G1**: Bi foo, ir **matchoo** ga, **il y avait un joueur qui est blessé**, a goo **terrain**oo ra. I mana a kaa taray, **ils ont marqué un but**. “The day before yesterday, during our **football match**, there was a **wounded player** lying on the **ground**. They didn’t take him out, and they scored.”

IN THE PRONUNCIATION OF ‘**matchoo**’, the Songhay back vowel harmonizes with the French fricative /tʃ/. The double /oo/ is to show the definite singular marker.

- **G1**: Jigiba woo, n’ti **parkingoo** no a cindi a g’a lakkal? “That Jigiba, wasn’t he watching over the **parking**?”

IN THE PRONUNCIATION OF ‘**parkingoo**’, the Songhay back vowel harmonizes with the French stop /g/. The double /oo/ is to show the definite singular marker.

- **FG2**: **I.F.M.**oo ra, ay si bay **première année** wala **deuxième année** côtéoo ga taka. **Deuxième année** no ni goo? “In the **I.F.M** ((Institut de **Formation des Maîtres**, Teachers’ Training School)), I don’t remember if it was on the side of the **first year** or the **second**. Were you attending **second year**?”

IN THE PRONUNCIATION OF ‘I.F.Moo’, the Songhay back vowel harmonizes with the French bilabial /m/. The double /oo/ is to show the definite singular marker.

All the speeches where the assimilation processes occur are from participants of the same selected “grin”, that of Gao. Speeches of participants of other “grins” do not involve such phonological processes. More research needs to be done in this domain for new findings.

Conclusion and Recommendations

This investigation has displayed a number of phonological processes at work in Songhay-French code-switching. The processes identified cover various aspects of assimilation, insertion and vowel-consonant harmony. While definite singular nouns and adjectives appear to be particularly affected at the level of their article markers, adopting the Songhay grammaticality as the base code, the other language categories like conjunctions, adverbs, prepositions, etc do not. Despite these findings, the researchers suggest further investigations on phonological processes in language contact. They propose that future research studies be done to generate new data and new findings on the problem of code-switching of Songhay speakers of French for further refinements, especially at the level of phonological processes. Research also needs to be done on vowel harmony in the intra-sentential switching of Songhay speakers of French. Last, it will also be interesting to undertake more research work on phonological processes in code-switching issues on other languages in the Malian linguistic landscape: Songhay speakers of Bamanankan, Bamanankan speakers of French, Fulani speakers of French, and speakers of other Malian national languages.

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