

RELATIONSHIP BETWEEN SECOND LANGUAGE INSTRUCTION AND LEXICAL ATTRITION AND DEFICIENCY IN THE NATIVE LANGUAGES OF MAURITANIANS*

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ABSTRACT

The purpose of this study was to investigate the relationship between French instruction and the phenomena of discontinued lexical development, lexical attrition, and lexical deficiency in the speech of Mauritanian speakers of Hassania, Pulaar, Soninké, and Wolof, who have been educated in French for twelve years at least but who have received no formal instruction in their own native language. The population for the study included college and secondary school students, educators, school administrators, workers, civil-servants and private business individuals.

The research questions sought to find out whether Mauritians code-switch, what relationship exists between code-switching and native language fluency, what factors influence code-switching, and whether the diglossic situation between Hassania and Arabic influences the frequency of Hassania-French mixing among Hassania speakers. The study also sought to find out about the attitudes of Mauritians towards bilingualism, and towards instruction in the native language relative to French and Arabic, and about their perception of their own speaking ability.

The data was gathered using a questionnaire survey answered in French and Arabic (N=306), a picture-based oral task, and interviews conducted in the native languages (N=80).

The major findings of this study were: (1) native language lexical deficiency was reflected in the occurrence of code-switching, (2) a main effect for fluency on code-switching revealed that subjects with low native language fluency code-switched more than subjects with high native language fluency, (3) younger subjects code-switched more and had lower vocabulary and fluency ratings than older subjects, (4) predominant knowledge of French or Arabic, and/or the diglossic relationship between Hassania and Arabic affected the direction and amount of code-switching, and (5) subjects were favorable towards bilingualism and considered formal instruction in the native language to be no less important than instruction in French and Arabic.

Implications from this study are that awareness of code-switching deriving from native language deficit, and instruction in the native language are necessary to counteract the problems associated with discontinued exposure to the native language.

* This article is a shortened version of a Ph.D Dissertation, University of Pittsburgh, 1990.

INTRODUCTION

Research on language attrition has been mostly related to the attrition of skills in a second language (L2) or a foreign language studied formally at school in a native language (L1) environment. Some research has also concentrated on language attrition of the L1 of immigrants. In general four major factors are reported as contributing to the attrition of language among people in those situations. These are instructional factors (Cohen, 1975; Moorcroft and Gardner, 1987; Snow, Padilla, and Campbell, 1988), socio-economic factors (Gardner, 1982), attitudinal and motivational factors (Gardner, Lalonde, and MacPherson, 1985; Edwards, 1988), and ethnic factors (Stevens, 1985; Paulston, 1986; Reilly, 1988).

The literature on code-switching stresses the importance of several factors related to sociological contexts (Gumperz, 1982; Blom and Gumperz, 1972; Scotton, 1988; Bentahila, 1983; Vald  s-Fallis, 1978), namely types of topics, interlocutors, and settings, and to communicative aspects such as conversational, stylistic, and strategic reasons (Abdulaziz-Mkilifi, 1972; Nadkarni, 1983; Miller, 1984; Di Pietro, 1978; Grosjean, 1982).

As to language deficiency, it has been associated with reduced exposure and interaction (Sawaie and Fishman, 1985; Miller, 1984; Daher, 1988).

These phenomena and the factors affecting them have not been studied in relation to native language behavior under different conditions. It is essential to understand the importance of the interaction of factors related to language attrition/deficiency and code-switching not only with regard to second and foreign language learners or bilinguals who are educated in two or more languages, but also with regard to bilinguals who are educated in the L2 alone in their own L1 context. Observation of native language behavior of individuals educated in an L2 throughout their schooling would provide new information about the factors at play in L1 deficiency in an L1 environment, and the role of L1 deficiency in code-switching relative to other factors.

More than thirty years after decolonization in Africa, the presence of the former European colonizer is still felt in most African countries by virtue of the official use of English, French, or Portuguese.

As a result of the use of these European languages for education and communication purposes, many African children have grown up not using their native language for all possible language functions.

According to Ngugi (1986), colonization has created a situation in Africa in which the European language and the African language perform varying functions. Usually the European language is used as the language of conceptualization, thinking, formal education, and mental development, whereas the African language is limited to daily interactions within the family and the community.

A more accurate characterization of language-related functions is spelled out by Miller (1984:8), who observes that "certain languages may be less adapted to particular functions such as for use in disseminating information on scientific, musicological or legal matters. One of the inherent properties of natural languages is their adaptability."

It is fair to say that the lack of instruction in the African languages and the lack of opportunity for African languages to meet some of the functions mentioned earlier may have perpetuated the gap between them and the language of instruction.

This state of affairs has created deficiencies in the native language performance of people who have been educated in the colonial language throughout their schooling. Altoma (1970) reports that in Algeria, in North Africa, it was not uncommon in 1962, the year of independence, to see most members of the Algerian Constituent Assembly incapable of expressing themselves in formal contexts in their national language, modern standard Arabic. This was echoed by an Algerian writer who was quoted by Bentahila (1983:24) as saying "I am separated from my homeland less by the Mediterranean than by the French language! I am incapable of expressing in Arabic what I feel in Arabic".

Given the different functions of the African language and the European language (Ngugi 1986; Miller, 1984), African children who are receiving formal education in the European language only are likely to find themselves borrowing a large proportion of words from the European language for the purpose of filling gaps caused by reduced interaction with or exposure to their native language, or from some inadequacies inherent in the native language. Nadkarni (1983:152) claims that "languages spoken in Asia, Africa, and Latin America are still in the process of modernisation and lack the resources needed to deal with modern developments in science and technology."

While the phenomenon of code-switching is common between languages that come into contact (Trudgill, 1983), the existence of deficiencies and loss in the lexical repertoire of the African who has been educated in a European language seems to stem from a limited use of the African language. In such a situation, it is hypothesized here, the borrowing from the European language may reveal more the inability of the educated African to speak fluently in his language than the phenomenon of switching, a characteristic of bilinguals. Thus, the purpose of the present study is to investigate the relationship between the use of a second language in instruction and code-switching; specifically, the study investigates how the use of French as an official language of instruction in Mauritania relates to hypothesized discontinued lexical development, lexical attrition, and lexical deficiencies in the speech of Mauritanian speakers of Hassania, Pulaar, Soninké, or Wolof. Additionally, the study examines Hassania-Arabic mixing and characteristics of such mixing compared to native language-French mixing.

METHOD

The population for this study included secondary school and college students, school administrators, educators, workers, civil-servants and private business individuals. The instruments used consisted of a questionnaire, interviews in the native languages, and a native language picture-based oral task.

For the questionnaire, the overall sample (N=306) was obtained through simple random sampling and was comprised of samples of members of populations of college students, secondary school students, educators, workers, civil-servants, and private business individuals. The pool of names to sample was obtained from appropriate school services, and administrative and business offices.

Twenty individuals from each of the four native language groups (Hassania, Pulaar, Soninké, and Wolof) were selected to participate in the interview and picture-based oral task. The sample in each group was drawn based on a stratified sampling technique so as to include four college students, four college preparatory school students, four educators, four workers/civil-servants, and four private business individuals.

However, since only two private business individuals were available by the end of the data collection period, it was decided to change this category to a mixed category. Therefore, individuals from mixed socio-professional groups were selected as members of this category.

Fifty per cent of the subjects ($N=40$) who were interviewed and who participated in the oral task had also filled out the questionnaire survey. This percentage was accidental because when the subjects who were randomly selected for the questionnaire survey were asked to indicate whether they also wished to be interviewed and to participate in the oral task, only 40 of them agreed. The other forty subjects were selected based on the criteria of the stratified sampling described above and the need of each language group.

The questionnaire was translated into Arabic and French and was designed to collect information (a) about the native language and other languages spoken, race, gender, age, occupational status, when applicable, and level of education, (b) on the frequency of use by the respondents of the native languages spoken in Mauritania (Hassania, Pulaar, Soninké, Wolof) and those spoken non-natively (Arabic and French), (c) on the general prevalence of use of Arabic and French in society as perceived by the respondents, and (d) on the respondents' attitudes and opinions about language issues in Mauritania. Additionally, the questionnaire was designed to (e) measure the respondents' perception of the frequency of use of Hassania, Pulaar, Soninké, Wolof, Arabic, and French by the major sources of information (newspapers, radio, T.V., and books), and the extent to which the native languages are used at home by Mauritaniens, (f) elicit data from the respondents on how they perceived their native language proficiency relative to their proficiency in other languages, how they perceived their degree of confidence in using languages, and how they perceived code-switching.

The interviews were structured and designed to collect data of two types. First, they were used to help the researcher to collect additional and more detailed information not obtainable from the questionnaire survey. Second, the interviews themselves served as an important language data source which was analyzed in relation to some of the research questions. For each language, Hassania, Pulaar, Soninke, and Wolof, 20 subjects were selected.

The native language picture-based oral task included five pictures as stimuli to elicit spoken language data that was tape-recorded. The subjects were asked to describe and interpret the pictures, or talk about a specific aspect or process identified by the examiner. The examiners were instructed to give the subjects the opportunity to speak freely about each picture or picture set. The examiners were also instructed to direct standardized questions to the subjects in order to elicit spontaneous speech.

RESULTS

From the analysis of the questionnaire data it can be seen that most respondents felt fluent enough in their native language to be able to participate in a radio or television interview with assurance (Table 1), as supported by total group means of 4.059 for fluency on a five point-scale and a total group mean of 3.324 for degree of confidence on a four point-scale (Table 2). Furthermore, native language use at home with parents and/or family members was reported as very frequent (Table 3). However, native language use diminishes in frequency in the home setting in the company of friends (Table 3). The reduction in frequency of use is even greater at work where French plays a more prestigious role, and in the domain of information acquisition (Table 4).

Table 1
Respondents' Ratings of their Degree of Confidence in Using their Native Language, Arabic, and French, in a Television or Radio Interview (N=306)

Language	Not confident At All		A Little Confident		Fairly Confident		Very Confident	
	N	%	N	%	N	%	N	%
Native Language	17	5.5	31	10.5	94	30.7	163	53.3
Arabic	70	25.5	70	25.5	87	28.4	63	20.6
French	38	12.4	65	21.2	121	39.5	82	26.8

Table 2
Means and Standard Deviations of Reported Fluency and Degree of Confidence in Using Native Languages, Arabic, and French

Language	Fluency		Confidence	
	Mean	SD	Mean	SD
Native Language	4.059	.970	3.324	0.896
Arabic	2.825	1.277	2.412	1.145
French	3.127	1.134	2.79	1.020

Table 3

Respondents' Rating of Frequency in Using the Native Languages at Home with Family Members and/or Parents, and Friends (N=306)

Interlocutors	Up to 25% of the time		25% - 50% of the time		50%-75% of the time		75% - 100% of the time	
	N	%	N	%	N	%	N	%
Family Members and/or Parents	9	3	24	7.8	76	24.8	197	64.4
Friends	17	8.8	53	17.3	136	44.4	89	29.1

Table 4

Respondents' Self-Report on Language Use by Criteria of Switching, and Lingua Franca at Home, Work, and in General Contexts (N=306)

Criteria	Language	N	%
Language of Switching	Arabic	105	34.3
	French	172	56.0
	Hassania	17	5.6
	Pulaar	8	2.6
	Soninké	2	0.7
	Wolof	2	0.7
Lingua Franca in the Home Setting	Arabic	35	11.4
	French	192	62.7
	Hassania	64	20.9
	Pulaar	6	2.0
	Wolof	9	2.9
Lingua Franca at Work	Arabic	38	12.0
	French	241	78.8
	Hassania	25	8.2
	Pulaar	1	0.3
	Wolof	1	0.3
Lingua Franca in Other General Contexts	Arabic	44	14.4
	French	247	80.7
	Hassania	10	3.3
	Pulaar	3	1.0
	Wolof	2	0.7

... of switching. Soninké was not selected by respondents for the other three criteria

With regard to the analysis of the performance of the subjects by native language group was guided by the following questions:

- Are there differences in vocabulary rating across the four language groups?
- Are there differences in the general fluency within the languages?
- How many times do the subjects switch during the interview and picture-based task?

The raters were asked to evaluate vocabulary, fluency, and code-switching on a scale of 1 to 4. In terms of vocabulary, the performance across the four language groups varied greatly (Table 5). The mean performances of the Hassania group (3.7) and the Pulaar group (3.4) were relatively higher than the mean performances of the Soninké group (2.4) and the Wolof group (2.2) which were below the average vocabulary mean (2.9) shown in Table 5.

Table 5

Performance Means and Standard Deviations by Native Language in Three Performance Categories (N=80)

Language	Vocabulary		Fluency		Code-Switching	
	Mean	SD	Mean	SD	Mean	SD
Hassania	3.7	0.6	3.5	0.8	2.4	0.9
Pulaar	3.4	0.9	3.5	0.8	2.5	1.3
Soninké	2.4	0.5	2.3	0.7	2.0	0.7
Wolof	2.2	1.1	2.6	0.8	1.9	0.9
Average Means	2.9	1.0	2.9	0.9	2.2	1.0

In terms of general fluency, the Hassania and Pulaar groups also had higher ratings than the other two groups. Table 6 shows that the majority of participants for each language group were rated in either one of the rating scale levels. These ratings suggested more significant differences in performance across languages than differences within the language groups, that is between speakers of the same language. As set out in Table 6, the rating of 4 was given to the speech of 65 percent of Hassania participants, which meant that their speech was considered to be natural, effortless, and smooth. This was also the case for 60 percent of Pulaar participants. However, the speech of 50 percent of Soninké participants, and 60 percent of Wolof participants was judged to be frequently hesitant and lacking in focus. The rating value for these speech characteristics was 2.

Table 6

Frequency of Respondents by Language and by Rating Value of Fluency

Language	Rating Value							
	1		2		3		4	
	N	%	N	%	N	%	N	%
Hassania	-	-	4	20	3	15	13	65
Pulaar	1	5	1	5	6	30	12	60
Soninké	2	10	10	50	8	40	-	-
Wolof	-	-	12	60	5	25	3	15

In terms of code-switching, the ratings for Hassania and Pulaar were also slightly higher than those for Soninké and Wolof (Table 5). On the whole, the average mean rating of 2.2 (Table 5) suggested that the individuals who participated in the study had a frequency of code-switching which was slightly below average, that is, slightly below one switch per sentence. The rating criteria for code-switching were as follows: value of 2 for average frequency (one switch per sentence), value of 1 for high frequency (two or more switches per sentence), value of 3 for low frequency (less than one switch per sentence), and value of 4 for no code-switching. Analyses of the relationships between variables showed that differences within and across the four language groups were also related to the age of the subjects (Table 7) and were significant at the .05 level (Table 8). Scheffe post-hoc comparisons were done to determine which age groups differed. In all three analyses the older subjects (Age Groups Three and Four) had significantly higher ratings in vocabulary, fluency and code-switching (Table 7). The four age groups were formed based on the demographic data information. Age Group One (33.7 percent) were 24 years old and lower, Age Group Two (21.3 percent) were 25 to 29 years olds, Age Group Three (25 percent) were 30 to 34 years old, and Age Group Four (20 percent) were 35 years old and above. Unlike the variable of age, the variable of education significantly affected the performance of the subjects in vocabulary only (Table 9).

With respect to the relationships of education level and fluency to code-switching, the results of the analysis (Table 10) show that there is a main effect for fluency. The marginal means indicate that participants with high fluency in the native language have higher code-switching rating (2.53) than participants with low native language fluency (rating mean of 1.48). For the variable of fluency the two groups were formed based on actual scores from the interview and picture-based task. The first group (N=30) comprised individuals scoring in the two lower levels of the rating scale. The second group (N=50) was comprised of individuals scoring at the next two levels of the scale. Table 11 shows that there is no interaction effect and no main effect for education: The two education level groups were formed based on the demographic information obtained from individuals who participated in the interview and

picture-based task. The first group was made of 63.7 percent of individuals with a secondary school education (N=51) and the second group was made of 36.3 percent of individuals with university education (N=29).

Table 7

Means and Standard Deviations for Vocabulary, Fluency, and Code-Switching by Age Group (N=80)

Variable	Group 1 (N=27) 24 yrs+below		Group 2 (N=17) 25-29 yrs		Group 3 (N=20) 30-35 yrs		Group 4 (N=16) 35 yrs+above	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Vocabulary	2.3	0.91	2.76	1.03	3.25	0.96	3.62	0.61
Fluency	2.45	0.93	2.88	0.78	3.25	0.85	3.43	0.72
Code-Switching	1.55	0.69	2.17	0.72	2.5	1.10	2.81	0.98

Table 8

ANOVA Summary Table for Vocabulary, Fluency, and Code-Switching by Age (N=80)

Variable	Mean Squares Between (MSB)	Mean Squares Within (MSW)	F(3,76)
Vocabulary	2.00	0.82	8.56*
Fluency	4.19	0.71	5.88*
Code-Switching	6.32	0.77	8.20*

*P < .05

Table 9

**Means, Standard Deviations, and t Tests for Vocabulary, Fluency, and Code-Switching i . .
by Education Level (N=80)**

Education Level					
Secondary School (N=51)			University (N=29)		
Variable	Mean	SD	Mean	SD	t
Vocabulary	2.7	1.03	3.24	0.95	-2.30*
Fluency	2.6	0.93	3.17	0.84	-1.75
Code-Switching	2.2	0.96	2.10	1.04	0.48

*p < .05

Table 10

**Means and Standard Deviations for Code-Switching Rating by Educational Level and Fluency
Level**

Education	Fluency						
	Low			High			Marginal
	N	Mean	SD	N	Mean	SD	
Secondary	21	1.59	0.59	29	2.69	0.93	2.14
University	8	1.38	0.46	21	2.38	1.02	1.88
Marginal	30	1.48		50	2.53		

Table 11

ANOVA Summary Table for Code-Switching Ratings

Source	df	MS	F
Education	1	1.09	1.47
Fluency	1	17.54	23.65**
Education x Fluency	1	0.04	0.05
Error	76	0.74	

** P < .01

Table 12

Code-Switching Rating Means and Standard Deviations Across Five Groups (N=80)

Language	Mean	SD
Well-educated in Arabic	2.4	0.7
Maasania		
Poorly educated in Arabic	2.3	1.3
Paléar	2.5	1.3
Soninka	2.0	0.7
Wolof	1.9	0.9

Table 13

Raters' Evaluation of Code-Switching of Hassania Participants

Participants	Rating Value			
	1	2	3	4
	High	Average	Low	No code-switching
01 (001)	X(F)			
02				X
03 (010)	X(F)			
04			X(A)	
05			X(A)	
06	X(A>F)			
07		X(A>F)		
08		X(A)		
09		X(A)		
10			X(A>F)	
11		X(A)		
12 (131)	X(F)			
13			X(A)	
14			X(A)	
15			X(A)	
16			X(A)	
17		X(A)		
18			X(A)	
19			X(A)	
20		X(A)		

N.B. Letter in parenthesis indicates Language of code-switching: A=Arabic; F= French; A>F= Both languages are used but more Arabic than French.

Considering that there were four language groups and that the Hassania group actually had two subgroups whose characteristics were based on their level of education in Arabic, a comparison of code-switching behavior had to take into consideration five groups.

The code-switching rating means across the five groups are set out in Table 12 and show that in addition to the differences across the language groups, there are differences within the Hassania group. On average, as supported by the results in Table 12, Hassania speakers who are poorly educated in Arabic have a frequency of code-switching which is slightly higher than that of Hassania speakers who are well-educated in Arabic. While the

direction of switching of these individuals can be accounted for, their high rate of code-switching is not necessarily an effect of poor fluency in Arabic.

By comparing the performance of the Hassania participants in the interview and picture-based task in terms of some of their characteristics (e.g. bilingualism type, command of Arabic, predominant language) as reported in the questionnaire survey, some possible instances of relationship between education level in Arabic/French and code-switching characteristics were analyzed. For example, Table 13 indicates that in fifty percent of the participants whose code-switching frequency ranged from average (N=6) to high (N=4) the switching was done in the predominant language which was Arabic for seven participants, and French for three participants. For example, a rather low but significant correlation ($r = .30$, $p < .05$) was found between level in Arabic and code-switching in Arabic (Table 14).

Table 14

Correlation Coefficient Between Level in Arabic and Frequency of Code-Switching in Arabic
(N=40)

Level in Arabic	
Frequency of Code-Switching in Arabic	0.30

However, one question arises in connection with the code-switching performance and the characteristics of some participants. How do we account for the performance of Hassania participants who reported poor fluency in Arabic, best fluency in French, but code-switched into Arabic rather than French, though at a below average frequency, when speaking?

DISCUSSION

Lexical deficiency in the native language was reflected in the occurrence of code-switching. In support of this interpretation was the acknowledgment of some of the subjects that the L2 words they code-switched to existed in their native language but were not available in or retrievable from their own lexicon. In fact, the raters' judgments of the performance of the eighty subjects during the interview and the picture-based oral task indicated that on average the subjects used at least one switch per sentence. Even though the interviewers did not ask all of the eighty subjects whether they knew the words in their native language when they code-switched, most of those who were asked had no knowledge of the native language words. Additionally, data from the interview not directly related to language performance showed that 51 of the interviewees (63.75 percent) associated their code-switching with aspects of native language deficiency. A case in point would be the non-intentional code-switching reported by the majority of the interviewees (92.5 percent) which suggests that code-switching is more the outcome of linguistic constraints than strategic or stylistic reasons. It was not surprising, therefore, to find that the participants in this study tolerated code-switching into

French and Arabic. Code-switching into Arabic was perceived by Hassania speakers as unavoidable and normal because of the diglossic relationship between Hassania and Arabic. Additionally, it was preferred over Hassania-French mixing.

Even though lexical deficiency was found to be evidence for code-switching among the subjects in this study, it would be inaccurate to associate code-switching with deficiency alone. In fact, the language situation in Mauritania and the backgrounds of the subjects in this study would make it difficult to draw a line between deficiency and attrition. In previous studies of language attrition the part or parts of an individual's language that were lost could be identified, as the individual's prior knowledge of the language was established. Typical attrition cases include loss of L1 in an L2 environment, loss of L2 in an L1 environment, loss of L2 in an L2 environment, and loss of L1 in an L1 environment (Van Els, 1986). In this study, information on the subjects' language ability prior to the study was not available and evidence of loss or extent of loss would be difficult to establish. However, it is possible that the discontinued native language development and the declining use of the native language by Mauritanian subjects in bilingual/multilingual situations could cause some loss of already acquired vocabulary. In any case, it seems that both lexical attrition and lexical deficiency constitute a sound explanation for the phenomenon of code-switching among Mauritians. There is also some sociolinguistic influence from the factors of topic, setting, and interlocutor.

The ANOVA for code-switching revealed that there is a main effect for fluency on code-switching. However, a sound explanation of code-switching would need to take into consideration the contribution of several other factors. Some of these factors were measured (e.g. vocabulary), others were not (e.g. exposure).

With respect to fluency, the results of the study indicated that subjects with low native language fluency switched more than subjects with high native language fluency. The moderately strong correlation between fluency and code-switching ($r = .57, p < .01$) provided further support for this finding and brought into focus the relative dependence of fluency and lexical development on each other. In that sense, one could make a case for the dependence of fluency on lexical development and argue that adequate lexical development may enhance fluency. This seemed to be the case for the four groups of subjects who participated in the interview and the picture-based oral task and whose fluency means reflected their vocabulary means (see Table 7). It can be noted, for instance, that Group Four which had the highest vocabulary mean (3.62) also had the highest fluency mean (3.43), whereas Group One which had the lowest vocabulary mean (2.3) also had the lowest fluency mean (2.45). These figures are further evidence of the importance of lexical development and support the finding that lexical deficiency is reflected in code-switching. However, these relationships would be meaningless without consideration of the age variable. In fact, younger subjects had lower ratings in vocabulary and fluency than older subjects. Additionally, their amount of code-switching was higher as indicated by their lower ratings compared to older subjects.

The hypothesis that education level has a bearing on native language performance was supported to a lesser degree than predicted. Education was found to be significant in the vocabulary performance of the subjects, but not significant in their fluency and code-switching. However, the argument made earlier about the possible interaction of certain variables such as vocabulary and fluency, on the one hand, and fluency and code-switching, on the other hand, enables us to speculate that since education affects vocabulary it could be a determining factor in the switching behavior of the subjects.

Another factor that appears to affect the language performance of the subjects is exposure. Data from the questionnaire survey and the interview revealed that many subjects thought that diminished interactions with parents and family members as well as lack of full-time exposure to the native language in urban environments could be reasons for their deficient fluency. The associations made by the subjects in this study between exposure to the native language and code-switching are consistent with theory and previous findings (Sawaie and Fishman, 1985; Daher, 1988; Cohen, 1986), which support the role of exposure and linguistic factors in code-switching. Sawaie and Fishman (1985) found that the reduced native language proficiency among younger generations of Arab-Americans was linked to lack of sufficient exposure to Arabic at home.

Daher's study (1988) revealed characteristics of reduced language among Lebanese-Americans whose speech was slow, hesitant, and narrow in terms of range of styles and registers. Daher argues that native language exposure was a major factor in their proficiency.

Cohen's explanation (1986) is that continued exposure to a word enables recognition and production of that word while reduced contact or no contact with a word may temporarily or permanently reduce the control over the word to the extent of losing it from memory. This argument agrees with the argument made in this study about the interrelationship between language deficiency and code-switching. Essentially, it was stated that the speech of people who code-switch out of linguistic needs can be characterized as deficient. In this sense the deficiency is linked with acquisition/developmental factors.

One related finding which did not seem to support the idea that code-switching is generated by linguistic needs was the use by a few subjects of both a French word and a native language word in the same answer. The repetition of the same things in both languages is cited as one of the most common discourse functions of code-switching (Zentella, 1981, cited in Romaine, 1989). One could consider intentional style-shifting as an explanation for this behavior, but other explanations are possible including habit and/or spontaneity.

A comparison of the performance of the subjects during the interviews and the picture-based oral task revealed differences across the native language groups on the native language categories (vocabulary, fluency, and code-switching). The rating means for Soninke and Wolof were significantly lower than those for Hassania and Pulaar (Table 5). The suspicion that these differences had to be interpreted cautiously was triggered by another finding, that age was a significant factor in language performance. Even though the language groups were similar in academic and professional background, the age of the participants was not controlled or controllable. A review of the age groups of the participants in each language group (20 subjects) revealed that indeed the Soninke and the Wolof groups each contained more younger subjects in the two lower age groups than the Hassania and the Pulaar groups. Group One were those 24 years old and below. Group Two were those between 25 years and 29 years old. The two groups combined (44 subjects; 55 percent) included 13 Soninke subjects (65 percent), 14 Wolof subjects (70 percent), 10 Hassania subjects (50 percent), and 7 Pulaar subjects (35 percent). Group One alone (27 subjects) included 9 Soninke subjects, 8 Wolof subjects, 6 Hassania subjects, and 4 Pulaar subjects. This finding shows how language performance varied across the languages and within each language group in relation to the age of the participants. This finding seems to suggest that even though education level was not

found to affect language performance as significantly as age, it should not be discarded all together because education level and age are normally related.

Data based on the questionnaire survey and the performance of the subjects on the interviews and picture-based oral task revealed that the direction of switching and the frequency of switching into either French or Arabic were dependent to some degree upon the dominant language of the subjects. In other words, assuming knowledge of both French and Arabic, it appeared logical that an individual who is poor in Arabic would switch into French, and that an individual who is poor in French would switch into Arabic. Therefore, it was not surprising to see most of the subjects in this study switch into French as most of them had been educated in French for most of their schooling. That switching into Arabic was peculiar to Hassania subjects including some who were bilinguals (Arabic-French) was expected. Even though the possibility of switching into Arabic among subjects from other language groups was not ruled out, the occurrence of switching into Arabic among those groups was not significant.

Though the belief that the degree of knowledge of a language had something to do with how much an individual would switch into that language was supported, evidence was also found in the Hassania group that suggested that a good command of Arabic may reduce or render unnecessary the code-switching into French among Hassania speakers for whom the reported best spoken language was French (N=3), Arabic (N=2), or Hassania (N=1) (Table 13).

Furthermore, the fact that some Hassania subjects switched moderately into Arabic and the fact that some of them even spoke Arabic only may suggest that in addition to linguistic factors attitudinal factors may be at play. This was obvious during data collection when many of the Hassania respondents to the questionnaire and some of those who participated in the interview and picture-based oral task claimed that there was no difference between Hassania and Arabic and that "Arabic" should be used to refer to "Hassania".

It is noteworthy to mention that some of those who had high and/or average frequency of code-switching into Arabic were fluent in both Arabic and French. It was also interesting but surprising to find out that some subjects who reported poor fluency in Arabic, and some subjects who reported best fluency in French, code-switched into Arabic rather than French, although at a below average frequency when speaking Hassania.

The study revealed that subjects feel that formal instruction in the native language is no less useful than instruction in Arabic and French. The study also revealed that despite overwhelming exposure to non-native languages at school and at work and despite the implications of such exposure, bilingualism was perceived as a viable option for Mauritania. The perception by the respondents that bilingualism (Arabic-French) is the educational option for Mauritania is quite revealing in many respects of new attitudinal trends inspired by practical concerns. The creation of an Institute of National Languages has, without a doubt, eased tension associated with educational policy. Arabic is now more and more accepted as a language of instruction for all Mauritians, but there is also a feeling among most Mauritians that resorting to Arabic alone could lead to political turmoil usually inherent in gain/loss in social and economic benefits, in as much as it could reduce or eliminate the access to knowledge and expertise from the Western world.

The fact that French is still the most frequently used language at work suggests that practical motives outweigh political ones at least for the time being. This study reveals that in practice the role of French extends to the home and various other situations where it serves as a lingua franca among Mauritians and as a preferred language of switching for purposes of acquisition of knowledge and information. This was corroborated by favorable attitudes based on perceived practical advantages which included job opportunities, scientific knowledge, and intercommunication.

In Mauritania as in Morocco, Algeria, and Tunisia, the maintenance of bilingualism despite strong nationalist trends is indicative of the concerns usually associated with the adoption of maximum Arabization of an educational system which until the years of independence was French-based.

This study found that more than 85 percent of the people interviewed in each language group had a preference for bilingualism (Arabic-French) over instruction solely in Arabic or solely in French. The questionnaire data revealed similar results. In all cases, the preference was motivated by practical concerns.

Alongside bilingualism the research associated with the plan of teaching Pulaar, Soninke, and Wolof in schools is making progress. Materials are being developed, teachers are being trained, and experiments are being carried out. A question in order was whether instruction in those languages would face problems of the same or of a larger scope than Arabic. It is not much expected that the teaching of these languages would be in competition with Arabic and French, but the psychological satisfaction it provides to their speakers should be recognized. Additionally, the use of these languages for progressive teaching of science and technology as well as literary subjects would unquestionably help the speakers of those languages to overcome the problems that this study has pointed to all along: deficiency in native language fluency reflected in code-switching.

To the extent that the diglossic relationship between Hassania and Arabic is not conducive to formal instruction in Hassania, it would seem that Hassania speakers learning Arabic would be forced to code-switch into Arabic. Since Hassania-Arabic code-switching was recognized as normal by the Hassania subjects, the question that arises is to what degree it is acceptable to monolingual Hassania speakers. It should be borne in mind that in the context of Mauritania code-switching could be considered as a mark of dependency, especially if it is linguistically motivated, no matter what language is involved.

CONCLUSION

The level of native language fluency is a significant factor in how well individuals can maintain speech solely in the native language without resorting to another language (code-switching). Inasmuch as code-switching could be regarded as a mark of deficiency in native language speech, this study supports the need for formal native language instruction. It is believed that formal native language instruction would help Mauritians to develop and maintain their native language skills.

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