

INTELLIGIBILITY AND LANGUAGE BOUNDARIES AMONG THE CANGIN PEOPLES OF SENEGAL

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This article reports the results of lexicostatistical research and intelligibility testing as measures of the relatedness of five Cangin languages of Senegal (Northern branch, Atlantic group) with each other and with Serer-Sine. The five Cangin varieties constitute five inherently unintelligible languages; Ndut and Palor cluster together, as do Non and Lehar, while Safen constitutes a separate unit. All of these are more closely related to each other than to Serer-Sine. The article further reports on language use and language attitudes, indicating a strong preference for the mother tongue alongside widespread use of other Cangin languages and Wolof, and specific roles for French and Arabic.

Cet article est une présentation des résultats des recherches lexicostatistiques et des tests d'intercompréhension comme mesures de parenté entre cinq langues cangin du Sénégal (branche nord, groupe atlantique) entre elles-mêmes et avec le sérère-sine. Les cinq parlers cangin se sont montrés cinq langues fondamentalement non-intercompréhensibles; le ndut et le palor s'approchent l'un à l'autre, le non et le lehar également, tandis que le safen est une unité à lui-même. Les langues cangin sont plus apparentées les unes avec les autres qu'avec le sérère-sine. Il y a aussi une discussion de l'usage de ces langues et les attitudes des locuteurs autochtones envers ces langues, ce qui indique une forte préférence pour la langue maternelle n'excluant pas un usage répandu d'autres langues cangin et le wolof. Des rôles spécifiques sont donnés au français et à l'arabe.

1. INTELLIGIBILITY

It has long been realized that making distinctions between speech varieties is a delicate question, one fraught with sociolinguistic and practical complexities. There are no discrete boundaries between lects, and the process of grouping and/or separating several of them into 'dialect' or 'language' categories is largely governed by the purposes of such classifications. Different criteria are likely to be used, for example, depending on whether one is seeking to understand diachronic developments within a group of speech varieties, or to guide present-day decisions about the respective roles of several varieties in an area. For those engaged in language development and literacy work, the problem is not just a matter for theoretical speculation, but involves decisions that are critical to planning.

The Summer Institute of Linguistics (SIL) has an ongoing program of language survey in many parts of the world, in an effort to assess the overall language situation in preparation for work in developing indigenous languages. The results of such research are compiled in the *Ethnologue* (Grimes 1992 is the latest edition), as well as in other SIL publications. Determining the status of related speech varieties is a many-faceted project; it includes considerations of lexical (and grammatical) comparison, intelligibility testing, and sociolinguistic information (language attitudes, patterns of language use, multilingualism factors), as well as more general sociological information on the region under study.

The present paper is a report of one such survey project, conducted among the Cangin language groups, which are found in the area near the city of Thiès, Senegal.¹

¹ This survey of the Cangin languages was carried out from 28 December 1986 to 21 May 1987 under the auspices of the Summer Institute of Linguistics, Inc. The survey team consisted of Jo-Lynn Eller Amdahl, Steven Baughman, Jennifer Baughman, Elizabeth Masland Carlton, Sue Goddard Jenkins, Sharon Rand, Gordon Williams, and Sara Williams.

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A more detailed report of the methods and results of this survey is given in Williams et al. 1994.

These idioms are clearly related, but how closely? The use of intelligibility testing provides a method of assessing these relationships, by taking into account factors beyond mere lexical comparisons derived from word lists. Sociolinguistic research into language use and attitudes complements the intelligibility testing and lexicostatistical work in giving a fuller picture of the whole communication situation.

2. THE CANGIN PEOPLES AND THEIR 'LANGUAGES'

The five groups called 'Cangin', first designated as such by Pichl (1966), are found near the coast of Senegal, in the area surrounding Thiès and extending north as far as Tivaouane and southwest as far as Popenguine (see the map in (3)). A number of different names have been used in the literature to designate these Cangin groups, as shown in (1). In this report the leftmost name will be used to refer to each group. An asterisk follows the name used by the group in referring to itself, and two asterisks follow the name by which the group refers to its language if it is different from that used to identify the group:

- (1) Lehar: Lala*
 Ndut: Ndut*
 Non: Non*, Noon, None
 Palor: Waro*, Falor, Sili, Sili-Sili**
 Safen: Safi*, Safi-Safi**

According to the *Atlas National du Sénégal* (Institut Géographique National 1977), Safen is the largest group, with around 25,000 people. Ndut and Non are listed with 15,000 each; Palor has 5,000, and Lehar 2,500 people. The Cangin languages are in close contact with other languages, the most important of which are Serer-Sine (also referred to as Sereer, Seex, and Sine-Sine) and Wolof (also referred to as Waro-Waro).

The Cangin recognize distinctions in their cultures and languages, but they see themselves as related peoples with a common origin. The Safen, Non, and Ndut groups, now located in the region of Thiès, claim the Futa Toro region in northern Senegal as a common place of origin. Although no specific information was gathered regarding the history of the Lehar group, further traditions provide interesting insights into relationships among the rest of the Cangin groups. For example, the Palor and Ndut peoples claim a common origin and language. In one account it is the Palor who are said to have moved south from the village of Palo (in the Ndut region). Another story attributes the separation of the two groups to a quarrel between two brothers which resulted in the younger brother moving north out of the Palor region to form the Ndut group. A similar account gives the Safen and Non peoples a common heritage. In support of this, it is said that at one time the Non used to return to pray at the sacred wood they had left behind in the Safen region when they migrated north.

In the larger context, the Cangin peoples have generally been considered as part of the Serer ethnic group (see, e.g., Pichl 1976, Institut Géographique National 1977). As such, Mansour (1980) reports that some traditions trace the migrations of the Serer peoples from Egypt to Mauritania before 1000 A.D., and from thence to Futa Toro.

The Cangin people are predominantly Muslim and Roman Catholic, and seemingly are gradually leaving their traditional religions behind. The majority of the Catholics are found among the Lehar and Non peoples. In spite of this, there is also a large percentage of Muslims among the Lehar and Non villages in the north which are situated closer to Tivaouane, the center of the Tidjane Muslim brotherhood. Some of the larger Non villages just south of Thiès also have a substantial number of Muslims.

However, at least one Safen interviewed feels that his people continue to cling to their ancestral beliefs, in spite of their outward adoption of Muslim traditions (see also Pichl 1976). Remaining evidence of their traditional religious heritage includes the offering of the harvest firstfruits to the spirits, the retention of the 'chef coutumier' (one who performs prayers to the spirits), and the survival of certain traditional songs

shared by the Safen and Palor (sung in the Safen language). Among the Ndut there are still some animists who have adopted neither Islam nor Roman Catholicism.

The Cangin groups have an agricultural economy and subsist largely on millet as their major food staple. Cash crops such as peanuts, manioc, beans (Safen), mangoes (Palor), tomatoes, bissap (a type of hibiscus flower), and corn (Ndut) are also cultivated. Many earn additional income through temporary employment in the nearby cities of Thiès and Dakar, or even in the more distant city of Kaolack.

Catholic primary schools have been established among the Non, Lehar, and Ndut in Mt. Rolland, Pandiène, Lam-lam, Ndafac, and Fandène, and are conducted in French. There is also a local school in Palo (Ndut region) for those who cannot afford the tuition of the private institutions. The Palor have no educational facilities in their own region and are therefore obliged to send their children to boarding schools in towns such as Sangué (Safen). As a result, a lower percentage of Palor children receive formal education.

2.1 LINGUISTIC BACKGROUND

The first mention of any of the Cangin languages is a reference to Non in volume two of Migeod's *The Languages of Africa* (1913:344). Non is mentioned again by Delafosse (1924) in his discussion of the languages of the "Sudan" and "Guinea" of that time. De La Vergne de Tressan (1953) was the first to indicate that the Cangin languages were distinct from true Serer dialects (which he gives as Sine [Keguem], Ndyeguem, Fadyout, and Nyominka). The "false Serer dialects" he gives as Non, Ndut, and Safen, although he offers no explanation for his distinction. Westermann and Bryan (1952) still reflect the assumption that these languages are varieties of Serer, and mention only "Serer-Non" and "Serer-Ndut".

Pichl's important work (1966) probably did the most to bring these languages to light, and to consider the degree of their relationship to Serer. His map is shown in (3). In addition to studying Non, Ndut, and Safen, he discovered two other related languages, Palor and Lehar. It is to Pichl that we owe the term 'Cangin' to designate this language group: in these languages **cangin** [tʃangin] is the name of Thiès, the city around which these languages are all spoken.

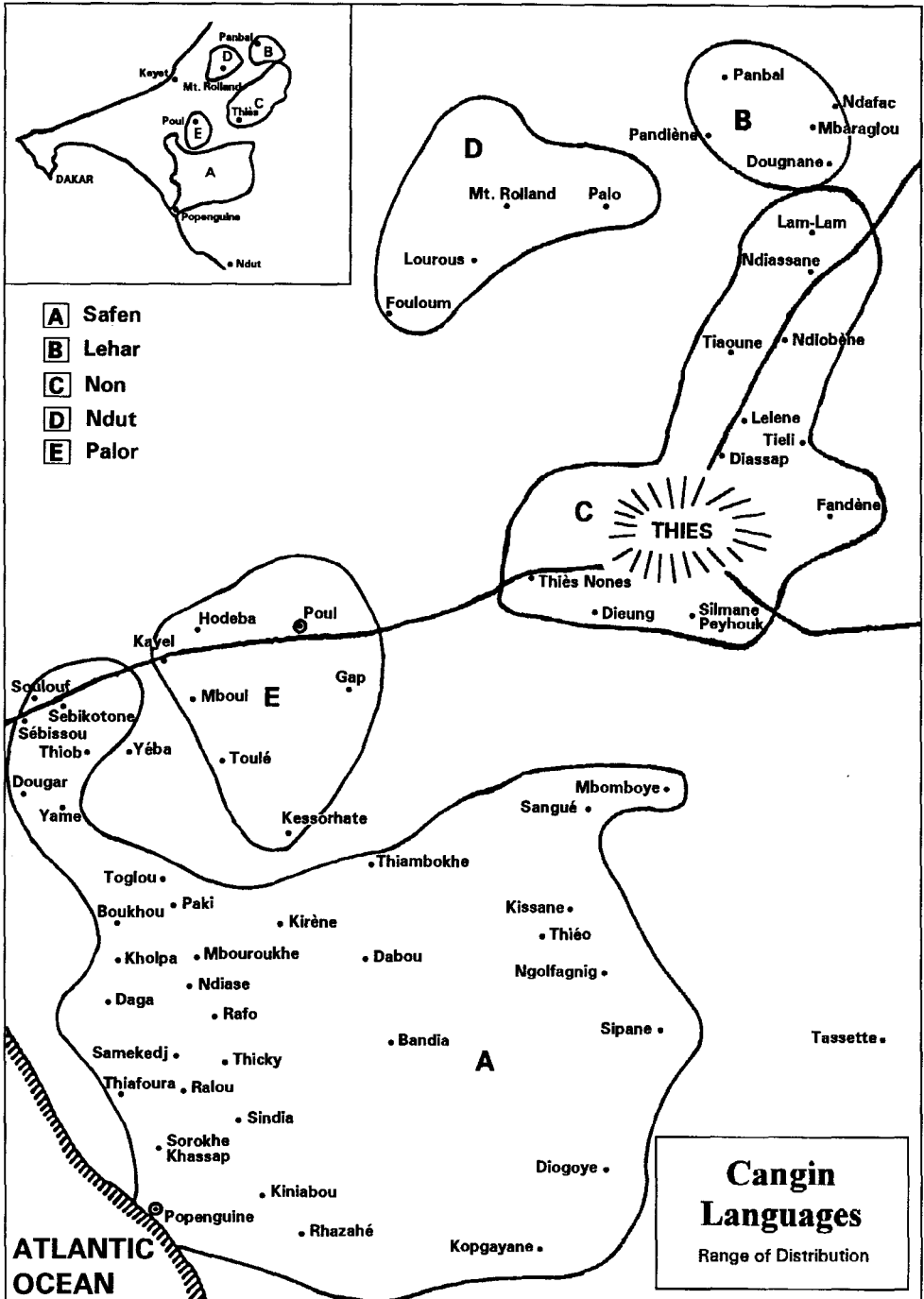
More recently, there have been a greater number of specific studies of the Cangin idioms, including several theses and university publications. The reader is referred to Gueye's (1979-1980, 1984) studies of Ndut, the works of Lopis (1980, Lopis Sylla 1985) on Non, of D'Alton (1983) on Palor, and of Mbodj (1983) on Safen.

Of the Cangin languages, Greenberg (1955) mentions only Serer-Non and Serer-Sine. Within his system of classification, then, the Cangin languages belong to the northern subgroup of the West Atlantic group of the Niger-Congo branch of the Congo-Kordofanian family, along with most other Senegalese languages. The most recent attempt at classification of the West Atlantic languages is that of Sapir (1971). His classification, based on lexicostatistics, divides the West Atlantic group into three branches, of which the Northern Branch is broken down as in (2).

(2) Northern Branch

- A. Senegalese languages
 1. a. Pulaar
 - b. Serer
 2. Wolof
- B. Cangin languages
- C. Bak languages
- D. Languages of East Senegal and Guinea-Bissau
- E. Nalu (and others)

(3) Distribution of Cangin languages (Pichl 1976)



2.2 WORD LIST MEASURES OF LEXICAL RELATEDNESS.

In order to quantify the relatedness of the Cangin idioms, we collected a word list of 170 items, for purposes of lexical comparison, in each of the five Cangin areas (the lists are given in the Appendix at the end of this article). Similar, although less comprehensive, data of this nature had already been collected by Pichl (1966), who used a 96-word list (sharing 60 words in common with our list). Sapir (1971) also compiled a set of lexicostatistic scores for the Cangin idioms (except Palor) on the basis of the traditional Swadesh 100-word list (Swadesh 1955).

Lexical similarity was judged between the sets of words from the five speech varieties by inspection. The criteria used were not strictly based on identification of cognates based on comparative reconstruction. Rather, the decision regarding whether or not any given pair of words was lexically similar had in view the more practical objective of grouping together as 'related' only those pairs which were not too distant phonologically from each other. See Blair (1990:30-32) for a full discussion of the methods and criteria used.

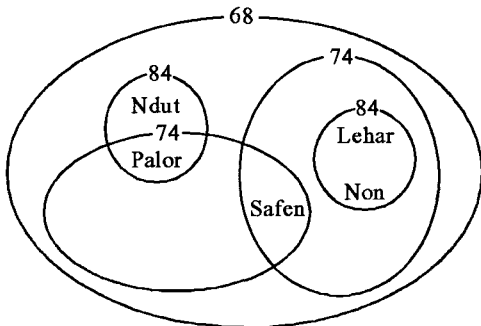
The table in (4) shows on the left the percentages of words rated as lexically similar among the speech varieties of the five Cangin groups, and between each of them and Serer-Sine, and on the right the adjustments to these figures in accordance with Simons' (1977:83-87) statistical methods to eliminate differences not statistically significant at the 10 percent confidence level.

(4) Lexical analysis - percentages of similar words

Raw Scores	Adjusted Scores
Ndut	Ndut
85 Palor	84 Palor
69 69 Lehar	68 68 Lehar
69 65 83 Non	68 68 84 Non
69 73 74 75 Safen	68 74 74 74 Safen
20 23 21 18 23 Sine	22 22 22 22 22 Sine

The contour map in (5) shows the degrees of relatedness of the five Cangin varieties, based on the lexicostatistic percentage scores. Casad (1974:46) has proposed that 80 percent or more of the lexical items must be judged similar in order for two speech varieties to be considered dialects of the same language. On this basis, then, our statistics would indicate a division of the Cangin into at least three languages: Ndut-Palor, Non-Lehar, and Safen.

(5) Lexical similarity contours for Cangin groups



One further measure of relatedness was taken from the lexical data. For those items judged to be similar, the degree of similarity was quantified by counting the number of feature differences between the corresponding segments (again, see Blair 1990:30-32 for the details of this method). The degree of phonetic difference was

then calculated, namely 100 times the number of phonetic differences divided by the total number of segments that were compared. These values, the PHONOSTATISTICS SCORES, are shown in (6). A phonostatics score of 100 would indicate an average of one phonetic difference for each pair of segments compared. If we interpret these findings in relation to their assumed effect on intelligibility, we might suppose that a ratio of more than one difference per correspondence would present a significant obstacle to comprehension between two speech varieties.

(6) Differences per correspondence (x100)

Ndut					
53	Palor				
116	111	Lehar			
113	116	86	Non		
117	114	100	102	Safen	
155	143	164	148	128	Sine

This phonostatic data allows us to make an additional observation that could not be drawn from the previous method of comparison. In (4), Safen appears to be equally related to Palor, Non, and Lehar, since 74 percent of its words are similar to any one of those three other idioms. However, when we consider the degree of similarity as measured by the phonostatic scores, we find that Safen is quite a bit closer to Lehar and Non (scores of 100 and 102, respectively) than it is to Palor (score of 114).

Phonostatic scores of less than 100 were found for only two pairs, Ndut-Palor (score of 53) and Non-Lehar (score of 86); these results corroborate the close link found from the more simple lexicostatic test described above.

In comparison with our calculations based on Pichl's (1966) word lists and with Sapir's (1971) figures, our lexicostatic results suggest a closer relationship among the languages than do theirs. This difference may be due to our having used a larger number of words as the basis of our comparison. In addition to the differences in absolute numbers, the relative degree of relationship among the different varieties also differs somewhat from what Sapir found, in that we found the greatest lexical similarity to be between Lehar and Non, while for Sapir it was between Lehar and Safen. (Sapir gives no figures relating to Palor.)

3. SOCIOLINGUISTIC CONSIDERATIONS

Before proceeding to the measurement of (inherent) intelligibility among the several Cangin varieties, we administered a sociolinguistic questionnaire in the area. The questionnaire was designed to measure language attitudes, language use, and language contact, but we were also interested to see if any trends in language evolution among the Cangin groups might emerge. The information thus gathered was also used to help interpret the results of other measures of relationships between the Cangin idioms. Special attention was given to the role of Wolof, the principal local trade language, in each of the five groups.

3.1 THE QUESTIONNAIRE

A trial set of questions was first tested in several villages during the initial stages of the survey, in order to evaluate the usefulness of each question, according to the respondents' reactions and/or responses, as well as the ease of administering the questionnaire. Several questions were modified in order to make them clearer, to avoid influencing or coloring the responses, or to avoid emotional responses where factual information was desired.² Included were personal data about each respondent (sex, age group, mother tongue, and education); information on language use in various domains of life and in different communication situations,

² The questionnaire is given in Williams et al. 1994.

considering degrees of monolingualism or bilingualism; and indications of attitudes toward the mother tongue and toward Wolof.

3.2 ADMINISTERING THE QUESTIONNAIRE

For each variety, care was taken to include villages which speakers said would be “a good place to live if you want to learn to speak the language right.” Given our interest in language choice and bilingualism, however, it was also important to include locations where the likelihood of use of more than one language was high. Locations were therefore more likely to be chosen if they were near an area associated with another language, be it Cangin or otherwise, or near to main roads, where the likelihood of use of Wolof was high (see Williams et al. 1994 for more on the criteria used in choosing the locations). The locations chosen for each of the five Cangin groups were Dougnane (Lehar); Palo and Mt. Rolland (Ndut); Tiaoune and Silmane (Non); Kessorhate, Toulé, Mboul, and Kayel (Palor); and Paki and Boukhou (Safen). Additional testing was done for comparison among the Serer-Sine in the village of Tassette. Seven members of the survey team administered the questionnaire with the help of mother-tongue assistants in each locality.

There were 60 respondents to the questionnaire in all, 12 from each of the Cangin groups: two men and two women from each of three age groups, arbitrarily divided into ‘young’ (age 17-25), ‘middle’ (26-40), and ‘old’ (over 40). Although the sampling was stratified for these two parameters of sex and age, firsthand demographic information was not available for the population as a whole, so our sample may not have been completely representative. In addition, of course, each of the six categories formed by the intersection of sex and age was represented by only two individuals. As to education, 40 of our respondents had had no formal education (of these, 58 percent were women and 42 percent were men; 20 percent were from the young age group, 35 percent from the middle, and 45 percent from the old age group). The general lack of education may have been a factor influencing the interviews, and later, the facility in taking tests such as the intelligibility test that was posed to the respondents. Other factors related to the interview situation also may have influenced the results (variety of administrators and assistants, repeated translation from French to the local language and back again, etc.), but the overall results were consistent and were corroborated by results from other methods used in the survey.

3.3 DOMAINS OF LANGUAGE USE

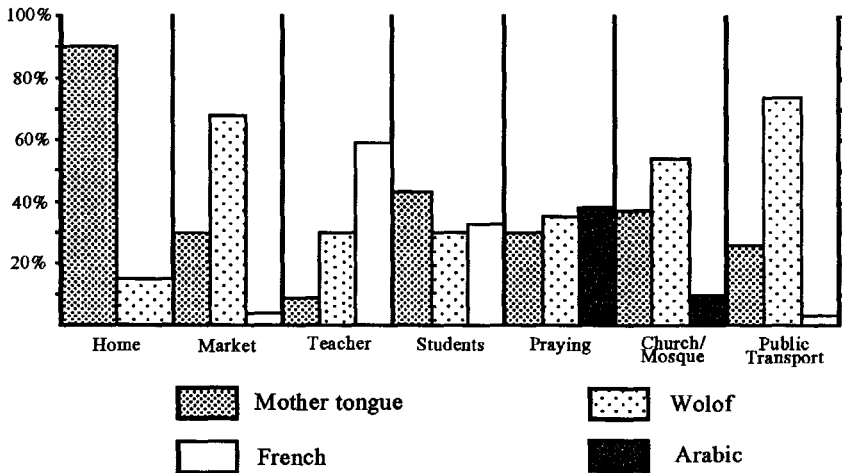
The overall impression given by the responses to the question, ‘Are there people in your village who speak only your language?’, is that there are few monolinguals among the Cangin. Given that this is so, what determines the choice of the language to be used in everyday interactions?

Respondents reported which language they used in seven different social situations. In each case the language used was either the mother tongue (MT), Wolof (W), French (F), or Arabic (A). Interestingly, none reported using any of the other Cangin idioms in these interactions, even though many could speak other Cangin languages (see §3.4 below). The graph in (7) presents the accumulated results of all areas investigated, as a percentage of all responses. (Some respondents gave more than one answer for a single domain.)

Based on impressions received from informal interactions with the people, the ‘Home’ domain was considered to include the totality of village life. For example, initial responses gathered from the trial questionnaire indicated the use of the mother tongue for arguments and gatherings under the meeting tree and other activities occurring in the village. It appears, then, in the Cangin groups as a whole, that the mother tongue is the language of family (‘Home’) and friends (‘Student’s outside the classroom’); it is important as well for prayer according to one-third (21 out of 60) of those surveyed. (One-half of these latter coupled their response with Wolof or Arabic.) Wolof stands out as the principal language of inter-group communication, indicated by its high scoring in such public domains as ‘Market’, ‘Mosque/Church’, and ‘Public

transportation'. It is also used, to some extent, in the schools. (It must be remembered that this result represents reported language use, not language use observed by the researchers. The use of Wolof and the mother tongue may actually be quite a bit higher depending on the location of the school.) French, however, is perceived by a greater number to be the language of use in an educational setting. Arabic is used only for religious activities. It is interesting to note, however, that the mother tongue and Wolof are almost equally important for use in prayer and that the latter is actually more widely used in a formal religious institution, a setting which would require interaction with people from different language groups.

(7) Domains of language use



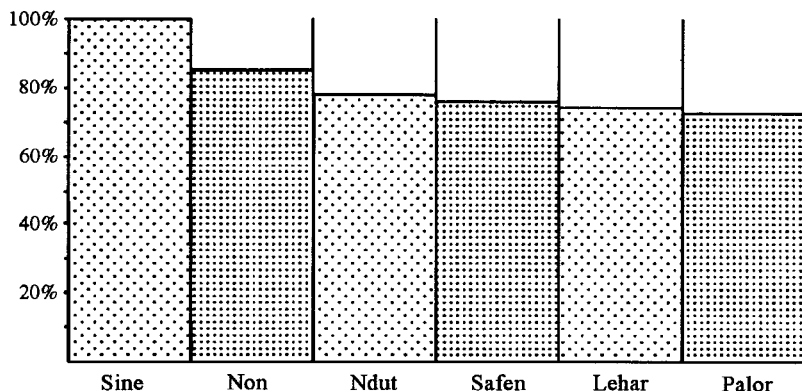
In summary, then, we find that among the Cangin groups the mother tongue is used for the 'intimate' domains: in the home/village, in prayer, and with school friends. Wolof is used in public situations such as in the market, in public transportation, in school, in the mosque/church, and for prayer. French is used as the language of education at school, and Arabic is used for religious activities such as prayer and at the mosque.

3.4 INTERGROUP LANGUAGE USE

Part E of the questionnaire explored more deeply the questions of language use with respect to the mother tongue of speaker and addressee in dyadic interactions. In all cases, the languages used by the respondents were either Wolof (the language of wider communication), the mother tongue of the speaker, or the mother tongue of the addressee. Wolof is the most widely used of these languages: 70 to 80 percent of the respondents in each Cangin group indicated that they preferred to use Wolof when speaking either to a member of another Cangin group or to a Serer-Sine speaker as seen in (8). Many indicated that in a marriage between members of different Cangin groups, Wolof would be the language used in the home.

The results of this line of questioning revealed further information about the sociolinguistic relationships among the Cangin idioms. The chart in (9) displays the use of the mother tongues in these situations; cells in the lower left corner indicate the percentage of respondents who use their own mother tongue, and cells in the upper right corner indicate the percentage that use the mother tongue of their addressee. Use of Wolof is not shown in the table, but accounts for the remainder of the dyadic communication (i.e., in any one cell, it would be the difference between 100 percent and the sum of the two numbers appearing in it). For example, 17 percent of the Ndut said that they would speak Palor to a Palor speaker, and 25 percent said they would speak Ndut to a Palor speaker; the remaining 58 percent of the Ndut said they would speak Wolof to a Palor speaker.

(8) Wolof as spoken by a Cangin to any other group



(9) Languages spoken between Cangin groups

MOTHER TONGUE OF SPEAKER	MOTHER TONGUE OF ADDRESSEE				
	Ndut	Lehar	Non	Palor	Safen
Ndut	—	←0 ↑42	←0 ↑8	←25 ↑17	← 8 ↑0
Lehar	←8 ↑8	—	←25 ↑17	←0 ↑17	← 8 ↑25
Non	←0 ↑0	←75 ↑8	—	←0 ↑0	←17 ↑0
Palor	←75 ↑8	←0 ↑0	←0 ↑0	—	← 0 ↑58
Safen	←0 ↑0	←0 ↑0	←17 ↑0	←75 ↑0	—

These figures reveal some patterns of language use, as well as some puzzling features, among speakers of Cangin languages. First, there is a clear nonreciprocating relationship between Safen and each of the other languages, where Safen is the only Cangin language used for intergroup communication when one of the interlocutors is a Safen speaker. In other words, Safen speakers address the others in either Safen or Wolof, but not in the others' language. This suggests a certain dominance, possibly connected with greater prestige, on the part of Safen.

A similar, although not entirely nonreciprocating, relationship may obtain between Palor and Ndut, and between Lehar and Non. Both languages are used to some extent in these last two cases, but there seems to be a predominance of one over the other. For Palor and Ndut, for example, a Palor seems to speak Palor to a Ndut speaker most of the time (75%), even when the Palor can speak Ndut. Ndut speakers, on the other hand, will often (25%) use their native Ndut when speaking to a Palor, but in a fair number of cases (17%) will defer to the Palor addressee by using the latter's language. This may indicate that Palor is perceived as more prestigious, or that Ndut is perceived as somewhat inferior. Similar considerations hold for Non and Lehar.

Second, there is a much greater tendency to use ones own mother tongue, rather than Wolof, in the case of Non and Lehar speakers conversing, and of Ndut and Palor speakers conversing, than for other language pairs. The relatively high bilingualism suggested by this result within each of these two pairs is confirmed in the results of the intelligibility testing (see the chart in (16) in §4.3), and also correlates with the measures of lexical similarity already described (see (4) in §2.2).

On the other hand, among the Cangin languages other than Safen, the case of highest use of ones interlocutor's language is that of Ndut speakers conversing with Lehar speakers. Yet the lexical similarity between Ndut and Lehar is significantly lower than that between Ndut and Palor, or that between Lehar and Non. Thus there is no clear correlation between the lexical similarity between two of the languages and the tendency of their speakers to address one another in their interlocutor's mother tongue. Rather, given the close geographical proximity between Ndut and Lehar, it

seems evident that bilingualism rather than lexical similarity underlies this relatively high frequency of use of Lehar by Ndut speakers.

There is also a lack of correlation between lexical similarity and the tendency to use ones own language rather than Wolof with speakers of other Cangin languages: Safen speakers use Wolof exclusively with Lehar (and also Ndut) speakers, but sometimes use Safen with Palor and Non speakers; yet Safen is not significantly more similar lexically to any one of these languages than to the others.

3.5 LANGUAGE TRENDS AND INFLUENCES

As mentioned before, there seem to be very few monolinguals among the Cangin people. Wolof has a strong influence on the society as a whole. As mentioned above, Wolof is often used even in the home where the marriage is across Cangin groups. (Some respondents additionally remarked that in such cases Wolof would be used at first, but that there would be a switch to the husband's tongue later on. (It is possible that others may have answered similarly if questioned further about this, and further investigation may be in order to gauge the continuing influence of Wolof on the society as a whole.) There is also a fairly consistent consensus across the Cangin groups that Wolof is learned by children before the age of eight, viz., school age in (10). Most interviewees also expressed a desire to improve their command of Wolof.

(10) Threshold age for learning Wolof

Age	All	Safen	Palor	Ndut	Lehar	Non
1-4	45%	25%	25%	67%	58%	50%
5-8	47%	67%	58%	25%	33%	50%
9-12	5%	8%	17%	0%	0%	0%
12+	2%	0%	0%	0%	2%	0%

In light of these indications, we were prompted to investigate the degree of bilingualism in Wolof. A diagnostic bilingualism test was conducted as a rough measure in Paki, a Safen village, and in Toulé, a Palor village. The same kind of test used to measure inherent dialect intelligibility (see §4) was used here. Although the test only measured passive bilingualism in Wolof, patterns of proficiency and use of Wolof were indicative of its place in these societies. The scores on the test were relatively high in general: mean percentages were 81 percent for the Palor village, and 79 percent for the Safen village. The sex difference did not have a statistically significant effect on the scores, and the level of education similarly showed no consistent patterns. Age did make a difference, however; in general, subjects between the ages of 17 and 40 scored higher than either the younger or older subjects. This may simply indicate that the most effective use of Wolof occurs during the time of life when one has the most frequent contact with non-Cangin speakers. We note also that the use of Wolof is also quite domain-specific: it is used for buying and selling (whether at the local shops or in the market), when traveling or in the city, or when speaking with Wolofs or other outsiders. For more details on this test, see the fuller treatment in Williams et al. (1994).

Other more sophisticated measures of bilingualism, such as those of the Foreign Service Institute, would be necessary to obtain a truly accurate picture of Wolof bilingualism in the Cangin areas. A recent adaptation of the FSI bilingualism test was made for use in preliterate field situations, called Second Language Oral Proficiency Evaluation (SLOPE), was also administered among the Safen, and its results have been compared with those of the present intelligibility test as measures of bilingualism; see James, Masland, and Rand (1989).

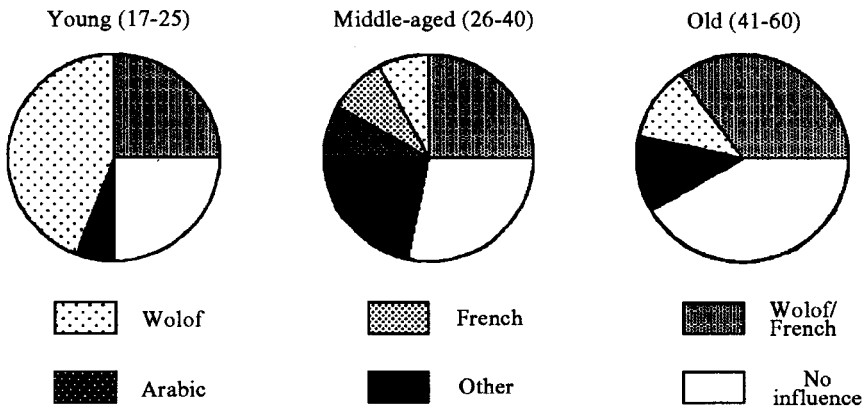
The respondents to the sociolinguistic questionnaire were asked specifically about the influence of other languages on their mother tongue.

(11) Influence of other languages

Non	Wolof/French	Wolof	French	Arabic/French	Other
37%	27%	23%	3%	2%	7%

As shown in (11), 37 percent felt that there was no such influence, but the rest indicated that other languages were influencing it, one-half mentioning Wolof, and one-third mentioning French. (This is not surprising, given the close geographical proximity of these areas to the cities of Thiès and Dakar.) Some Cangin languages were also mentioned, however, as exercising this type of influence. A few Nduts mentioned Palor and Lehar as affecting Ndut, and a few Palors felt that Safen and Ndut were influencing Palor. It is also worth noting that a greater number from the older age group did not think any other language was influencing their own, compared with the other two age groups in (12), just as few of the older people wanted to improve their Wolof.

(12) Influence of other languages, by age



The multilingual nature of the society fits in with trends and people’s attitudes about moving to and working in the city, as shown in (13). This table represents the responses given to two questions: ‘How many people leave your village to go live in the city?’ and ‘When people leave your village, how do you feel?’ The apparent increasing openness to Wolof among the younger people and the mobile nature of these societies could point to a greater use of Wolof in the future. However, strong allegiance to the mother tongue is still being maintained, as the next section shows.

(13) Attitudes toward mobility (H: happy; S: sad; I: indifferent; A: angry)

NUMBER MOVING TO CITY	L A N G U A G E																			
	Safen				Palor				Ndut				Lehar				Non			
Many	o	o			o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
Some	o	o		o					o				o	o						
Few	o	o			o	o			o	o			o	o						
Attitude	H	S	I	A	H	S	I	A	H	S	I	A	H	S	I	A	H	S	I	A

3.6 LANGUAGE ATTITUDES

Section D of the questionnaire probed people’s attitudes toward their mother tongue, and toward other languages of the area. As shown in (14) and (15), an overwhelming majority prefer their mother tongue over other languages. For their second choice, more than half designated Wolof, and more than 90 percent considered Wolof one of the three most important languages (see (15)). French was similarly listed by most respondents among the top three, although it clearly fell behind Wolof in the overall standings.

(14) Attitude toward mother tongue (20 respondents in each age category)

	Young	Middle	Older
'I love my language and prefer it above all others.'	90%	85%	95%
'There is no advantage in speaking my language.'	10%	15%	5%

(15) Best language to know

Choice	M. T.	Wolof	French	Other	No Answer
#1	92%	3%	5%	0%	0%
#2	2%	57%	23%	17%	2%
#3	5%	33%	40%	13%	8%

The young people were the least ambivalent in their responses, a full 100 percent giving the mother tongue as first choice; 70 percent of the young gave Wolof as second choice, and 70 percent gave French as third choice. This helps us interpret their positive attitude toward Wolof: they see Wolof as an important second language, but not one to replace their own.

A goal of future research should be to ask specifically about the people's feelings about Wolof, and about each of the other Cangin idioms, for several of these were rated as important languages by the interviewees. As many as 30 percent of the respondents listed another of the Cangin idioms as one of their people's three most important languages. This indicates at least some patterns of interaction among the several groups, and may also point to a position of dominance of one of these languages over others. Eight of the Palor mentioned Safen in response; four Nduts mentioned Lehar; one Lehar gave Ndut; one Safen gave Serer-Sine; and another Safen mentioned Non.

In response to a question asking directly about attitudes toward the mother tongue, 90 percent of the respondents said that they loved their language, with only 10 percent indicating that they saw no advantage in it over other languages (see (14)). This is but another indication of the people's strong identification with their own language.

3.7 CONCLUSIONS

In our search to discover which languages are most important to the Cangin peoples, certain patterns of use and attitude regarding the mother tongue, other Cangin languages, and Wolof became evident. In spite of a low level of education, the Cangin societies appear to be highly mobile and multilingual. Certain of these groups have closer ties than others; specifically, it appears that there are strong links between the Ndut and the Palor, between the Non and the Lehar, and between the Safen and the Palor, as shown by answers to the questions about language use and language preference.

As expected in view of the high degree of interaction the Cangin have with peoples from other language groups, Wolof plays a dominant role in daily life, particularly in public spheres of activity. Arabic and French are restricted to the religious and educational domains, respectively. The mother tongue remains the preferred language for use in intimate domains such as at home, with friends, and in prayer. It was chosen decidedly by all groups as the best language for the people to know. Although Wolof is a very important language for these people, the mother tongue is the language with which they truly identify.

4. INTELLIGIBILITY TESTING

The relatedness of the Cangin idioms is evident from the word list comparisons, corroborated by traditional historical accounts. But in practical terms, how 'closely related' do speech varieties have to be for speakers of one variety to effectively use materials in another? As our ultimate goal is the planning of literacy and language development programs, we need to have additional information on how widely an individual program might succeed. The sociolinguistic profile of the community (as

described in the previous section) is important to foresee any social and political barriers and/or advantages to such programs, but equally important are the more specifically linguistic factors that need to be taken into account. Are all the Cangin idioms 'close enough' together, in the strictly linguistic sense of lexical and other similarity and/or in the more sociolinguistic sense of acquired bilingualism, that a single program would suffice for all of them?

At this point we proceed with the assumption that intelligibility among the various speech varieties is the appropriate criterion for distinguishing significant differences between 'languages' for our purposes. It is important to note that 'intelligibility' here does not directly refer to inherent intelligibility or linguistic similarity between varieties, but to 'comprehensibility', or the ability of speakers of one variety to understand another variety. That is, if two linguistic communities can understand each other's speech with no problem, we will assume that a single program of literacy and language development can serve both groups (as long as the social factors support this conclusion, and do not militate against it, of course). This relationship need not be symmetrical: thus if members of one linguistic community readily understand the speech of another, while the reverse is not the case, then a single program of language development may serve, again given the right social conditions. (Reasons of economy and practicality encourage us to choose as efficient a program as is workable.) We need, then, some way of measuring intelligibility between linguistic groups.

A common method of intelligibility testing, based on Casad (1974), involves the elicitation of a natural text of 3-5 minutes' length from a speaker of the speech variety that is to be tested. Questions based on the content of the text are then formulated to serve as test items. After checking the reliability of the test with other native speakers of the speech variety in question, the test is ready for use in other communities, to see how well they can understand the speech variety of the first community. Casad proposes a threshold of 75 percent for acceptable intelligibility; those who answer at least 75 percent of the questions correctly can be assumed to have adequate intelligibility of the speech idiom being tested.³

4.1 THE TEST

One problem with using for testing purposes the natural elicited texts most often associated with the Casad method is the unforeseeable variety in the degree of difficulty of the texts elicited in different locations. In an effort to control this variability, a series of recorded sentences was used instead in the present survey. In this way, the content of the test is kept constant, so that the only variable to compare across tests is the speech variety that is under examination.⁴

A series of sentences were thus extracted from a French translation of stories and myths of various Senegalese ethnic groups (Publication du Centre d'Etude des Civilisations 1980, 1982), in order to maintain some semblance of a natural text and a culturally familiar context. Care was taken that the specific content of the myths not be well enough known that subjects could give correct answers on the basis of their previous knowledge, rather than on the basis of their understanding of the sentence heard. Some sentences were also created from scratch or modified from the stories if no natural examples could be found of the simplicity or of the type desired. In this way a series of 21 sentences was compiled, arranged in order of increasing grammatical complexity (increasing embedding, relativization, and similar complexities) and, it was assumed, corresponding difficulty. A question corresponding to each sentence

³ Casad (1974) and Simons (1979), building on earlier work, have come to provide an informal standard for SIL researchers carrying out intelligibility testing. For a history of intelligibility testing, see Simons (1979).

⁴ An added benefit to this type of test is that the examiner can design the types of test items as desired. We took advantage of this option, choosing sentences that contained a variety of grammatical constructions. This allowed us to collect data that would also be of use in grammatical analysis and comparison, since each sentence had to be translated into each of the five Cangin idioms being tested. Although grammatical comparison was not a primary aim of our survey, the development of this type of test provided an opportunity to collect more useful data of this type (compare Extensive Questionnaire 3 in Bouquiaux and Thomas (1976), which was set up for similar purposes).

was formulated to constitute the test, and both sentences and questions were translated into each of the idioms to be tested.

There are admitted limitations to this type of test. Isolated sentences lack context, and the loss of linguistic structures above the sentence level may add to the unnaturalness of the test items, as noted by Casad (1974:104-105). Greater variation in test scores often results, especially in situations of low intelligibility. However, the Cangin group had been considered to be comprised of closely related idioms; in such cases it has been claimed that sentence tests such as ours give more sensitive measures (see Casad (1974), Biggs (1957)).

The sentences and questions were destined to be used in the five Cangin idioms and Serer-Sine. A local native speaker of each speech variety helped to translate, transcribe, and record the sentences and their corresponding questions into his variety, and to give, as much as possible, a morpheme-by-morpheme gloss. Once translated and transcribed, the sentences were recorded with their corresponding questions.⁵

4.2 ADMINISTERING THE TEST

A "hometown test", in which subjects answered questions about the text recorded in their own language variety, was administered to 12 subjects in each of the six testing sites selected. This procedure allowed us to improve the sentences and to eliminate poor sentences and questions.⁶

As for the sociolinguistic questionnaire, subjects were chosen according to age and sex. A total of twelve subjects in each location was tested (two men and two women from each of the three age categories) on each of the four other Cangin varieties and Serer-Sine. Thus a total of 72 tests (12 hometown tests plus 60 more tests in the other speech varieties) were conducted in each linguistic area. The Serer-Sine group was the only exception since only one-way testing (the hometown control test) was being done with this group. Thus a total of 372 subjects was tested according to the stratified sampling described. A local assistant at each test site helped with the preparation and administration of the several tests.⁷

4.3 SCORING AND EVALUATING

The sentence tests turned out to be of a significant degree of difficulty for the subjects. In the hometown tests items missed more than 75 percent of the time were discarded. With this criterion, only 17 of the original 21 sentences were retained in the Ndut test, and as few as 13 were retained in Serer-Sine. For the items that were left, the hometown scores never exceeded 94 percent, and were as low as 86 percent in the Palor test.

As would be expected, the scores of these tests in other areas were consistently lower. In only a few test situations were all the questions actually administered, for the reasons explained in footnote 4; this shows that there was much difficulty even with what were considered the easier questions. As a result, we decided to use and compare two methods of scoring the responses. The first method was to simply assign a right/wrong value to each test item; the results of this scoring system yielded very low scores, shown in (16). But is this all the information that we could draw from these tests?

⁵ For the test tapes, each sentence was repeated twice in the variety being tested, followed by the question in the native variety of the subject; the sound of a spoon striking a glass separated the sentence from its question.

⁶ The final versions of the tests are given in Williams et al. 1994.

⁷ Adequate bilingual assistants were always available to explain the test procedure to each subject and to provide several practice examples before the actual test was undertaken.

It should be noted that not all the test questions were given to each subject. If the subject did not give a correct answer during the first five questions, then testing was terminated. Since the questions increased in difficulty, it was assumed that further testing would be fruitless. If the subject gave one or more correct answers during the first five questions but was obviously struggling with every question, testing was terminated after three additional and consecutive incorrect answers. In this case, the minimum number of questions administered was eight. The subject's score, however, was based on the total number of points scored divided by the total number of questions possible on the test. This testing criterion saved much time in testing and was less humiliating to the subject as it did not force him to listen to the entire test if virtually no comprehension was possible.

A second method of scoring was used in order to determine not only comprehension, but also the degree of recognition of the content of the tests. The idea for this alternate method of scoring was taken from Simons (1979:10) and was an attempt to approximate the scores that would have resulted from testing of a natural text. This method used a graded scale of 0-3, giving partial credit for certain responses rather than just a simple score of 'correct' or 'incorrect'. The subjects had been instructed to answer according to the content they recognized, and careful notes were taken of their exact responses. The following scale shows how this second system of evaluation was then carried out:

- 3 - a correct response or a repetition of the entire test sentence in other than the test language
- 2 - the question repeated in other than the test language or significant parts of the test sentence repeated in other than the test language, but no full comprehension
- 1 - one or several words recognized and repeated in other than the test language
- 0 - an incorrect response or no response

(16) Mean scores in percent; sex and age combined.

GROUP	TEST ADMINISTERED					
	Ndut	Palor	Lehar	Non	Safen	Sine
Ndut	94 a 7.9	32 b 17.1	5 c 9.8	6 d 13.7	2 d 3.2	0 b 0
Palor	55 b 26.1	86 a 9.3	1 d 2.0	1 d 2.0	27 b 29.1	1 b 2.3
Lehar	5 c 5.2	3 c 5.7	93 a 7.3	52 b 18.9	6 d 8.3	1 b 2.3
Non	4 c 3.0	1 c 2.3	68 b 26.6	90 a 12.2	16 c 13.4	0 b 0
Safen	1 c 2.3	11 c 13.6	11 c 13.8	19 c 18.9	89 a 8.7	5 b 6.7
Sine						88 a 8.3

Top figure = sample size; bottom figure = standard deviation. Different letters a, b etc. within a column indicate significant differences between the scores thus labeled; in the Safen column, the differences between scores b and c, and between c and d, are barely significant (confidence level < 90).

The scores thus obtained were significantly higher, as shown in (17), where each cell gives the score by the second method on the left, and the score by the first method (from (16)) on the right:

(17) Comparison of graded scale to right/wrong scale

	Ndut	Palor	Lehar	Non	Safen	Sine
Ndut		55/32	22/ 5	23/ 6	15/ 2	4/ 0
Palor	74/55		6/ 1	11/ 1	47/27	5/ 1
Lehar	24/ 5	17/ 3		63/52	26/ 6	7/ 1
Non	23/14	16/ 1	80/68		40/16	8/ 0
Safen	16/ 1	27/11	27/11	37/19		16/ 5

Although the scores by the second method are much higher, the relative closeness of relationship between the different speech varieties remains the same (the rank-order correlation between the two sets of scores = .95).

Returning now to (16), and noting there both the mean scores and the standard deviations, we interpret these results following Blair's (1990:25) observations on the general relationships between the mean and standard deviation, summarized in (18).

(18) Four analytical situations - Mean scores vs. Standard deviations

MEAN SCORE	STANDARD DEVIATION	
	High	Low
High	Situation 1 Many people understand the sentences well but some have difficulty.	Situation 2 Most people understand the sentences well.
	Situation 3 Many people cannot understand the sentences but a few are able to answer correctly.	Situation 4 Few people are able to understand the sentences.

Several of the results in (16) exhibit a high standard deviation (*s*): Ndut comprehension of Palor (17.1), Palor of Ndut (26.1) and of Safen (29.1), Lehar and Safen of Non (both 18.9), and Non of Lehar (24.6). In addition, *s* for Ndut comprehension of Non (13.7), Non of Safen (13.4), and Safen of Palor (13.6) and of Lehar (13.8), are also rather high. Especially for the former set of scores, these high values for *s* strongly suggest that part of the comprehension indicated by the mean scores is a result of bilingualism rather than inherent linguistic similarity between the varieties tested. On the other hand, the fact that *s* for the Non hometown test is as high as 12.2 raises the possibility that the high *s* values are partly due to other factors, such as the nature of the tests themselves.

Another measure of the degree to which comprehension test scores reflect bilingualism rather than inherent intelligibility is the difference between the scores of X speakers listening to variety Y and Y speakers listening to variety X. For example, the mean score for Ndut speakers listening to Palor was 32, while that for Palor speakers listening to Ndut was 55. This particular difference is in fact significant ($.02 < p < .05$) by t-test), indicating the likelihood of acquired knowledge of Ndut by Palor speakers.⁸ None of the other differences between X-Y and Y-X scores is statistically significant.

To judge the significance of the difference between these scores, we used the t-test⁹ to test the null hypothesis that the scores of the speakers of Y on the test of language variety X might be a sample from the scores that speakers of X might have received. We assume that the mean score for X-speakers on the X-test is the mean hometown test score for idiom X. Taking the scores on the Ndut test as an example, we first determine that the mean score for a Ndut speaker on the Ndut test is 94 percent in (16). Is it reasonable to believe that our sample of scores by Palors on the Ndut test could be those scored by a population of Ndut speakers on the Ndut test? Comparing the hometown, or X-X, score with each of the Y-X scores (comprehension of X by speakers of Y), the difference was found to be significant ($p < .005$ by one-tailed t-test) for all ten possible pairs of the five Cangin varieties tested.

5. CONCLUSION

Based on lexical similarities alone, the Cangin group is seen as vastly different from Serer-Sine, a result confirmed by the dialect intelligibility test results.

⁸ A non-linguistic indication of the likelihood of such acquired knowledge is the participation of Ndut and Palor speakers in joint annual festivals.

⁹ The t-test is a test to calculate the standard deviation of the difference between two figures to determine whether they are significantly different at a given confidence level.

Within the group itself, the closest lexical similarities (at 84%) occur in two pairs of languages: Non-Lehar and Ndut-Palor. The Safen language falls between the two above groupings. However, according to lexico- and phono-statistics combined, it is seen as being in closer relationship with Non and Lehar. Patterns of language use and stated language preference also indicate strong links between the Ndut and the Palor and between the Non and the Lehar (as well as between the Safen and the Palor).

The higher lexical similarity between Safen and Palor at 74 percent, as opposed to that of only 68 percent between Safen and Ndut, is presumably related to the higher bilingualism scores between Safen and Palor (Palor speakers scored 27 on the Safen test, Ndut speakers only 2; Safen speakers scored 11 on the Palor test, only 1 on the Ndut test) and to patterns of language use among these groups (75 percent of Safen speakers reported using Safen with Palor speakers, but all reported using Wolof with Ndut speakers).

These relationships are again substantiated by dialect intelligibility test results. Highest intelligibility scores are found between Non-Lehar (68/52), Ndut-Palor (32/55), and Safen-Palor (11/27).

The percentages from both lexicostatistics and intelligibility testing are below accepted values for considering two varieties to be dialects of the same language. Therefore the Cangin group is seen as comprised of five inherently unintelligible languages, indicating that none of the groups can be adequately served by language development programs carried out only in the language of another group. The clearly expressed strong preference for the mother tongue, and its use in intimate domains, further encourage the use of each of these varieties in any language development which may be undertaken.

Other languages, however, do have clear roles in the Cangin societies: Wolof is dominant in public spheres, while Arabic and French are used in religious and educational domains, respectively.

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APPENDIX

Wordlists

	REF	NDUT	SILI	SAFI	LALA	NONE	SINE
1. eye	ʔil	ʔil	xas	kos	k ^u as	'ngid	
2. head	ʔaf	ʔaf	xaf	xaf	haf	hox	
3. tooth	sis	sis	sis	sis	si:s	nɪɲ	
4. tongue	'pɛrem	'pɛrem	pɛʔdem	'perim	'pɛfem	'dɛlem	
5. nose	nɪɲ	nɪn	kɪɲɪn	'kumun	'kumɔn	nɪs	
6. ear	nœf	nuf	nœf	nɔf	nɔf	nɔf	
7. neck	lum	lum	mbox	bo ^o l	bɔl	cɔoq	
8. breast	ʔɪp	ʔɪp	ʔɪp	ʔɪp	ʔɪuʔ	dɛn	
9. fingernail	'cɕigilan	'cɕigi'lan	cɕak ^a na	tʃogo'na:	'cɕogɔna	'bafan	
10. belly	lɔ ^o	lɔ ^o	rɔq	lɔq ^h	lɔq	βem	
11. navel	'sɔru	'kɔsin	kuzun	gusu:n	'gujun	daβ	
12. knee	dɪ	yɪ	yɪ	dɪ:	ʔɪ	'nguba ⁱ	
13. skin	'lipfan	'hɔn'fan	ʔun	ʔɔn	ʔon	dɔl	
14. feather	lam	lam	pap	mul	mul	pax	
15. horn	yit	jic ^h	yic ^h	vɪi	yit	ʃjan	
16. tail	luq	luq	kɔ'ze	kɔ'se ⁱ	'kɔje	las	
17. egg	wah	wax	wɔq	wɔq	wak	gun	
18. milk	mi:s	mis	mis	mis	mi:s	sis	
19. man	yɔl	yɔl	yɔr	yɔl	βɔʔ	ko:r	
20. woman	'βɛlep	'βɛlep	βitip	'βɛtɛ	'βɛtɛ ⁱ	te ^u ʔ	
21. father	cac ^h	cɕacɕ	cɕacyɔr	cɕa ⁱ cɕatmun	'cɕacɕa	fap	
22. husband	'yali	yɔl	yɔrfu	yɔl cɕɛ	'ha ⁱ ʔ'βɛtɛ ⁱ	kor	
23. wife	'βɛlɛ'βi	'βɛlep	βitifu	'βɛtɛ cɕɛ	'ha ⁱ ʔ'ɔal	te ^u ʔ	
24. name	ti:	t ^h i:	tik	tɛ:k	tek	gɔ ^o n	
25. night	'ʔɛlek	'ʔɛlek	kɔ'xɔβi	yɛk ^h	yɛk ^h	ʃɛɲ	

26.	moon	'cein	c ⁱ ʌn	cçabin	'ɲun	ɲun	'ŋol
27.	star	xɔl	xol	xɔr	?ɔl	?ɔl	xor
28.	sun	na?	na?	nɔh	nɔx	nɔh	'ŋjɛc
29.	cloud	ner	yol	huyi	ʃfabɔ?	'na ⁱ jol	?ɛl
30.	rain	tɔp	tɔp	tɔp	'fɛtɔq	to ^u ?	tɛʃ
31.	ground	fe:i	'fe ⁱ fa	keke ⁱ	keke ⁱ	'kakei	laŋ
32.	dust	'pəndə	'pəndə?	ɖuku	pəndə?	'pəndəl	?ut
33.	stone	la?	la?	?atɔx	a'tɔx	a'tox	gɔcç
34.	water	məlop	'mɔlop	mazup	'musu	'm ^u ɔju?	fof
35.	fire	ki:	ki: ^ə	ʃɔŋk ^h ah	kis	ki:	'fidɛl
36.	firewood	'kɪlik	'soqɔŋ	səkɔŋ	sakɔŋ	'səkɔŋ	ʃjuɖ
37.	smoke	'dukə	'dukə	ɖuku	'ifɔn	'i'wɔl	sun
38.	ash	jet	jet ^h	yet ^h	yet ^h	yet	'nda ^u
39.	chicken	pɑ:n	pɑ:n	p ^h ambi	'pabet	'pabɛ?	cçɛk ^h
40.	cow	'fana?	'fana?	?inɔx	enox fə'βete	'?enoh	na:k ^h
41.	dog	βɔh	βox	βu	βu	ba ⁱ	βox
42.	elephant	cça:	cça: [?]	cçɔx	cçɔx	cçox	ɲig
43.	goat	pɛ?	pɛ?	pɛ?	pɛ?	pɛ?	'famβɛ?
44.	bird	yaq	yaq	sɛl	y ⁱ up	sɛl	rid
45.	snake	gɔŋ	'jun ⁱ fe ⁱ	?ɲ	gɔŋ	gɔŋ	βod ^ə
46.	louse	ɖɲ	ɖɲ	ɖɲ	ɖɛŋ	ɖɛŋ	βal
47.	tree	'kɪluk	'kilik	kidik	kedek	'kedek	'ndaxar
48.	bark	həp 'kɪluk	hop	?ɔp	?o ^u p	?ɔ ^u ?	pəs
49.	leaf	saf	saf	saf	po ^u ?	pə?	tad
50.	root	nil	nil	niç	nil	nil	pac
51.	fat	'fəjum	fə'ju:m	fajum	'fojɔm	'fəjum	'ne ⁱ βaŋ
52.	one	jinə	'jino?	juno?	jen:o	'ji'nɔ	leŋ
53.	two	?ana	'?ana?	kanak	kanak	'kanak	ɖik ^h
54.	three	?eo	'?eje?	kaha ⁱ	ka'ha ⁱ	ka:i	'tadik ^h
55.	four	?ini:l	'?inj	nikis	'ni:kis	'ni'kis	'nahe ⁱ k ^h
56.	five	?ip	?ip	jatus	'jetus	'jət ^h us	'βetik ^h
57.	walk	'tilɛ	til	t ^h in	'kɔtin	kə'tin	ɲac
58.	hit	'labɛ	lap	labit	dul	kə'fɛk	xa ^o
59.	bite	'ɖɔβɛ	ɖɔp	ɖɔp	ɖɔp	'kɔ'ɖo ^u	ɲat ^h
60.	wash	xɔs	hɔs	nau	na ^u	kə'tis	dap ^h
61.	eat	ɲam	ɲam	ɲam	ɲam	ka'ɲam	ɲam
62.	drink	han	han	?an	?an	ka'?'an	jeŋ
63.	vomit	βɔt	βɔ ^ə t ^h	βɔt ^h	βɔt	ka'βo ^ə t	tɛs
64.	suck	βa:s	βap	βus	ma ⁱ ?	ka'βab	num
65.	spit	tɔl	to:l	tuhus	meto ^ə s	ka'tɔs	'dufidɔ
66.	blow	'fulil	'fu ⁱ lil	fudis	furis	kə'fɔris	wu'sidɔ
67.	whistle	'furɲ	'forn ⁱ ɔx	fu'ɲuk	kifurin	kə'fɔriŋ	wɔy ⁱ
68.	sleep	nɛ?	nɛ?	nɛx	kaneh	ka'nɛx	ɖan
69.	push	jeŋ	jeŋ	jeŋ	jin	ka'je ⁱ ?	ruŋ
70.	pull	hec	nɔ:q ^h	nɔq	nɔq	ka'noq	qicç
71.	throw	bac	heŋ	ŋjaf	yes	'ka'yes	bet ^h
72.	sing	ye:k	yɛk	yɛk ^h	yɛk	ka'yɛk	k ^h im
73.	smell	'he ⁱ ɲsə	fu:p	?ɛŋ	'?ɛ ⁱ ɲjɔk	ka'?'ɛɲɖuk	qit ^h
74.	hear	kelɔx	kelɔx	kerax	kalax	ka'kelɔh	nan

75. swim	nər	'fe:ji	yec	fwi	kə'buluk	wey
76. sit	tə:q	xɔm	bof	kamik	ka'jɔŋ	mɔf
77. lie	'fanɔx	'fanɔx	fanuq	ka'fa:nɔq	ka'fanɔk	'ʔɔndɔx
78. stand	'kɔlɔx	'kɔlɔx	kuruk	qɔlɔq	kə'kolɔq	baf
79. fall	k ^e en	'k ⁱ en	ken	kake ^a n	ka'k ⁱ en	jen
80. pour	ji:n	juf	'am	kɔxɔp	kə'ʔam	baŋ
81. laugh	yɛn	yɛn	nyɛn	kayɛn	kə'yɛn	cɔal
82. scratch	'hɔcɔɔx	'xɔcɔɔx	ɔcɔuq	ka'ʔocɔɔq	kə'oc	'nahaj
83. bark	bɑ	ba	bau	kaɔɔf	kə'bof	xɔf
84. wash	'bɔhɔ	bo:x	boquq	ka'boqɔq	kə'bɔkuk	'boɔɔx
85. cough	bof	bof	bof	kaɔɔf	kə'bof	'ʔoqatɔx
86. warm	tam	tam	dam	'kalɔx	'tamoh	dɔx
87. cold	sas	so ^a :s	sɔs	'so ^u so ^s	'fejɔs	'cɔɔɔɔɔ
88. red	lɔ:m	lɔ: ^a m	rumun	'ogiʔ	jɔx	'jeq ^h
89. black	su:l	su:l	suzus	susus	'sujus	ba:l
90. white	na	na:ʔ	jano ^u	jana ^u	'dana ^o	tan
91. tall	'ot	'ot ^h	hut	karit 'dɔq	ho	cɔɔɔɔ ^a
92. short	lu	lux	rɔhɔ ^t	karit 'dɛmo: lɔ'ho ⁱ ʔ		'tabu
93. long	'ot	'ot ^h	hut	xɔt ^h it ^h	'ho	'cɔɔɔɔɔ ^h
94. year	kil	ki:l	k ^h is	ki:s	mə'ju	'ndig ^a
95. house	fam	fa:m	kahan	kan	kan	'mbun
96. pot	'kolɔŋ	kolɔŋ	sɔye	ʃjeta	ke'ta	'xudɔx
97. stool	naŋ	nan	bovoha	dun	dun	dɛk
98. village	gun	gun	kur	dɔk	dɔk	sax
99. rope	nih	nih	niʔ	ni	niʔ	ba ^h
100. knife	gat	'jɔepil	ʃɔpil	go ^a t ^h	goa	'nyja
101. heart	'gumiɔn	keŋ	ŋgum	'kuluŋ ⁱ on	'kuluŋ'jon	—
102. liver	keŋ	keŋ	keŋ	keŋ	ken	—
103. intestines	lil	lil	liɔ	'lil	lil	'lao
104. urine	'mizɔq	'mizɔq	mizɔq	'mɛsɔq	'mejoq	'se:d ^a
105. bone	yɔ	yɔx	'jɔx	yɔx	ɔɔh	kiy
106. wind	'ŋgilao	'purus	puɔis	'urɔs	'ɔris	'ŋgeŋ
107. path	wal	wa:l	was	was	waz	'dad
108. mountain	daŋ	'tagoʔ	taŋɔ	tundəʔ	'taŋɔl	'lodɛmak
109. river	la:h	'xulup	lax	dɛx	lɔs	xur
110. fish	ʃɔn	'jɔŋ	cɔurun	ʃɔn	'kanda'b ^w ul	liɔ
111. tortoise	'mɔnat	kɔf	xɔm	xɔ ^a m	'digel	xɔm
112. spear	'hoha	'salma ^a	yes	nuʔ	nuʔ	'salma ^a
113. war	ha:	'ʔin ⁱ ɔʔ	hiɔx	he ⁱ n	'ka'apoh	ɔɔx
114. animal	'jebitɔ	'jɔntaŋ	inataŋ	ra ^u p	ra ^u ʔ	'mbafal
115. salt	'mera:	'mɔra:	mida	mɛra	'mera	ʃɛm
116. human	'ɔ ^u	'ɔ ^u ʔ	bo	boʔ	yal	kin
117. seed	'tisɔx	'tisɔx	tizɔx	pezɔx	'teɔx	'ax
118. come	'ac	'ac ^h	ha ⁱ ja	xacɔ	kə'ha ⁱ	gar
119. see	'ɔt	'ɔt ^h	xɔt ^h	xɔt	kə'hot	gi ^a
120. fly	p ^h un	pun	p ^h un	pun	kə'p ^w un	jet ^h
121. give-birth	liɔm	liɔm	rim	lum	kə'lim	'basil
122. split	ɔat	bes	bes	ɔarɔx	ka'ɔa	'seɔ ^a
123. give	jet	jet	'ɔnɔx	'ɛdo	kə'ɛ ⁱ	'cɔɔɔɔ

124. steal	loh	lox	roq	loq	kə'loq	guḏ
125. kill	hap	hap	ʔap	ʔap	kaʔap	war
126. play	'hegiləʔ	'he:loʔ	ʔa'ndjox	ʔʌŋjox	kə'ʔeŋjox	ŋas
127. fear	nɛ:h	'dɔfas	nek ^h	nɛ:k	kə'nek	'did ^o
128. say	wan	wan	wɔ	wɔ ^o	ka'woʔ	neḏ
129. show	te'p	te ^o p	tebox	te ^u ʔ	ka'teo	'lalit ^h
130. know	juh	juh	ʔinax	ʔunʌx	kə'ʔunoh	'ʔand ^o
131. count	kin	kin	kɪn	kɪn	kə'kin	lim
132. marry	kə ^o t	'taʔka	tɔq	ʔʌk ^h	kʌ'paŋ	'giliŋ
133. burn	'təkɪt	tam	dɔx	tam	kə'təkɪ	'kɛβɪn
134. swell	'hɔfil	lot ^h	uvis	ʔuwis	kə'ʔu ⁱ s	ʔut ^h
135. want	'fahaʔ	wa:q	waʔ	waʔ	ka'wa:ʔ	buḏ
136. send	wʌl	wʌl	wɔzɔx	wʌs	ka'wos	lul
137. leave	'gətɔ	sa ⁱ ŋ	cɔt	ʔa ⁱ zuq	ka'yah	kaḏ
138. die	hul	xul	kan	ka'kan	kʌ'kan	xɔŋ
139. press	p ^h o't	po ^o c	dɪf	yɪf	ka'po ⁱ	piy'
140. good	'wɔɛn	ba:x	bax	xa ^u p	ʃjof	fax
141. new	has	has	ʔas	jeʔas	ʔas	qas
142. hunger	jap	ja:p	ʔat	ʔaʔ	ja ^o	'ŋɛx
143. round	'mʌlɔŋ	'ndereŋ	tembit	bər'ŋɔl	'kur'kundul	'molɔŋɔx
144. dry	su	suh	su ^{io}	su:	suʔ	wɛr
145. sky	'suŋkɔ	fan	elcɛi	kɔx	'dɔqɔh	ʔɛl
146. child	'kəkɛ ⁱ	'kuko ⁱ	kɔmaki	ɔ:max	ɔmah	—
147. small	'jutu ^t	yɪn	yɪsut ^h	ʃjut ^h ut ^h	ʃjutut	teβ
148. many	tul	cɛa:q	lajit	jemen	'jeyen	'maju
149. full	lif	lif	rɪf	lif	lif	maj
150. all	βɛp	tuh	ʃjen	βaβeoʔ	'βeiʔ	fɔp
151. who	'dɪwah	dɪwa	jaba	ya:βa	βah	ʔan
152. what	'dɪji	daji	je ^o	jija	jah	xar
153. why	'jitah	jih	waje	gandaka	'ndaxjah	lam'xar
154. mouth	βuk	βuq	ŋɔp	ku:	ku	dɔŋ
155. hair	fɛn	fɛn	fɪnfan	mul	fɛn	βɪŋ
156. hand	jaʔ	yaʔ	ʔjax	jax	jax	βa ⁱ
157. foot	qɔt ^h	qɔt	k ^h ɔt ^h	qɔt	qot	cɛaf
158. buttock	tal	tal	tas	ta ^u ʔdɛs	'fɛnɔ	fud
159. wing	pap	pap	pap	pa ^u ʔ	pa ^u ʔ	paβ
160. dew	mal	mal	maʔ	ʔe ^o ʔ	'ʔeoʔ	lim
161. sand	'koleŋ	fe ⁱ	merɛx	mela ⁱ	'koleŋ	lang
162. six	'pə:nə	'po ⁱ noʔ	ʃɪsnajɪnoʔ	jet'ne:no	'ʃɪt'ne:no	'βet'fu'leŋ
163. seven	'pana	'pa:naʔ	ʃɪsnakanak	jet'nakanak	'ʃɪtnakanak	'βet'fu'dɪk ^h
164. eight	'peje	pe ⁱ ʃɛʔ	ʃɪsnakahaj	jet'nakaha ⁱ	'ʃɪtnaka ⁱ	'βet'fu'tadik ^h
165. nine	'pa ⁱ nil	'pa ⁱ nil	ʃɪsnanikis	jet'nanikis	'ʃɪtnənikis	'βet'fu'nahe ⁱ k ^h
166. ten	'sabɔ	'sabɔx	ndaŋkax	dʌŋkɪx	'daŋkɛx	'xar'βahai
167. cultivate	lɪn	yɪx	gur	'kəlɪn	kə'lin	qoq ^h
168. bury	'su ^t	xacc	ʔum	kəs ⁱ	kə'ʔum	ʔup ^h
169. iron	tɪŋ	'tiyɪŋ	tiyin	piŋ	piŋ	'ŋɪʃɛlem
170. blood	niʃ	niʃ	niʃ	niʃ	niʃ	foyeʔ