

# A Phonetic and Phonological Account of the Civil Vowel Duration



A Phonetic and Phonological Account  
of the Civili Vowel Duration

By

Hugues Steve Ndinga-Koumba-Binza

**CAMBRIDGE  
SCHOLARS**

---

P U B L I S H I N G

A Phonetic and Phonological Account of the Civi Vowel Duration,  
by Hugues Steve Ndinga-Koumba-Binza

This book first published 2012

Cambridge Scholars Publishing

12 Back Chapman Street, Newcastle upon Tyne, NE6 2XX, UK

British Library Cataloguing in Publication Data  
A catalogue record for this book is available from the British Library

Copyright © 2012 by Hugues Steve Ndinga-Koumba-Binza

All rights for this book reserved. No part of this book may be reproduced, stored in a retrieval system,  
or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or  
otherwise, without the prior permission of the copyright owner.

ISBN (10): 1-4438-3609-5, ISBN (13): 978-1-4438-3609-8

# TABLE OF CONTENTS

Preface .....	viii
Overview of the Book.....	ix
Symbols & Abbreviations .....	x
Acknowledgements .....	xii
Chapter One.....	1
Introduction	
Introduction	
Potential Impact of this Study	
Methododological Approach	
Civili Socio-linguistic Situation	
Chapter Two .....	13
Backgrounds and Literature Review	
Introduction	
Phonetic and Phonological Background	
Theoretical Background	
Socio-linguistic Background	
Literature Review	
Chapter Three .....	21
Overview of the Vowel Duration Issue	
Introduction	
Phonetic-Phonological Issue	
Limitations of Previous Analyses	
Orthographic Aspect of the Problem	
The Data Issue	
Conclusion	

Chapter Four .....	42
Acoustic Aspects and Physical Nature	
Introduction	
Concepts	
Speech Data Acquisition	
Data Management	
Speech Data Analysis	
Acoustic Patterns of Vowels	
Duration Measurements	
Measurement Results	
Statistical Analysis	
Spectral Analysis	
Discussion and Conclusion	
Chapter Five .....	73
Perception of Vowel Duration	
Introduction	
Methodology	
Speech Perception, Acoustic Cues and Vowel Duration	
Preparation for Perception Tests	
The Perception Tests	
Test Administration and Data Analysis	
Perception Data and Analysis	
Discussion	
Conclusion	
Chapter Six .....	98
Phonological Implications	
Introduction	
Factors Influencing Vowel Duration	
Experimental Phonetic Outcomes	
Comparative Analysis of Minimal Pairs	
New Phonetic Features	
Phonological Analysis of Vowel Duration	
Conclusion	

Chapter Seven.....	127
Conclusion	
Introduction	
Recommendations of the Civili Orthography	
Contribution to the Phonological Theory	
Implications for Speech Technology	
Conclusions	
Appendix A: Corpus for Vowel Duration.....	136
Appendix B: Minimal Pairs Based on Vowel Duration.....	145
Appendix C: Samples of TextGrids for Test Words.....	148
Appendix D: Duration Measurements .....	155
Appendix E: Statistical Results of VD Measurements .....	166
Appendix F: List of Words Recorded for Stimulation.....	210
Appendix G: Pages, Stimuli, Responses and Answers .....	213
Appendix H: Perception Experiment Results .....	220
Endnotes .....	289
References .....	292
Index.....	308

## PREFACE

This book is the result of many years of research on one aspect of the Civili sound system: vowel duration. The research originated from a Master thesis in 2000 and has resulted with many publications, including various journal articles and in 2008 with a doctoral dissertation. This book mainly stems from the latter publication, but also includes new findings and developments in both the language system and the theoretical model. Most of the previous publications are relevantly quoted in this book.

I started re-working on the content of my PhD thesis in order to make it a book when I was granted a Combra Group Young Researcher Scholarship to conduct research at the Aarhus School of Business, Aarhus University. The research stay was from 1 April to 30 June 2010.

The necessity for this work emanated not only from various further findings following the completion of my doctoral studies and the submission of the dissertation, but also the eagerness to present this research work to broader public outside the University where the research was done. The other motivation of this book is simply my main motivation for doing research on Civili, i.e. the wish to know more about the language to which I was introduced at age 11, as well as to have the language documented in order to make it possible for other researchers and educationists to carry out research and didactic works in the language.



## OVERVIEW OF THE BOOK

This book consists of seven chapters. In Chapter 1, the specific aims of and rationale for the study are given, the research problem is demarcated, and the potential impact of the study, the methodological approach adopted and the socio-linguistic situation of Civili, the studied language, are presented. Chapter 2 deals with the literature review and various backgrounds of the research on Civili vowel duration.

Chapter 3 introduces the Civili vowel duration issue as the research problem of the study. The problem is presented as being both descriptive and orthographic. In Chapter 3, the analyses and data of previous studies related to the phenomenon are assessed. This chapter also shows the importance of using both acoustic and perceptual data when studying vowel duration in Civili.

Chapter 4 focuses on the physical nature of the Civili vowel duration. It reports on the acoustic analyses and vowel duration measurements performed on selected words from the corpus. The chapter aims to determine the natural duration as one of the acoustic features related to vowels which should be taken into consideration in various phonological analyses. Chapter 5 focuses on the auditory nature of the Civili vowel duration. It introduces the perception experiment conducted on native Civili listeners during this study for the determination of the perceived duration. It contains experimental data and analyses, and considers the input of these into the phonological analyses.

Chapter 6 details the input of experimental data to the description of vowel duration in Civili. It indicates the implication of vowel duration description for the standardization of Civili orthography. This chapter also re-explores the phonological analyses from previous studies and the present study, which integrates phonetic data and phonological analyses. Chapter 7 draws the general conclusion of this experimental study of the Civili vowel duration by listing (i) acoustic, (ii) perceptual and (iii) phonological findings. The chapter also presents implications for (i) the phonological theory, (ii) speech technology and (iii) Civili orthography. This chapter finally contains suggestions for further research.

## SYMBOLS AND ABBREVIATIONS

The current IPA notation as presented in the *Handbook of the International Phonetic Association* (1999) is used in this book for the phonetic transcription of linguistic items and texts. However, some of the symbols used for specific phonological and orthographic purposes of this work differ from the symbols of the International Phonetic Alphabet (IPA). As mentioned in Cresseils (1994: 26-27), it is customary for scholars of African languages to make use of some of the symbols of the African alphabet developed by the International African Institute (IAI). In addition, Gabonese linguists have developed the *Scientific alphabet for Gabonese languages* (ASG) and the *Orthography of Gabonese languages* (OLG). The latter has been used for the Civili orthographic items presented here. The symbols, mostly used in the in orthographic spellings, are:

Used	IPA
j	dʒ
y	j
ny	ɲ
ii	y
c	tʃ

Orthographic transcriptions are made using the Gabonese orthographic system revised in 1999 (Idiata, 2002). The IPA, IAI, ASG and OLG charts are included in the appendices for ease of consultation. It should be noted that in this book the marking of tones and other suprasegmental features at the orthographic level does not occur. In addition, the Civili phone [ə] is orthographically represented as a, and phonologically transcribed as /a/ at a word-final position following the traditional Civili phonological-orthographic representations.

Conventions and abbreviations not explained in footnotes but used throughout the book are the following:

	Underlying tier
/ /	Phonemic tier
[ ]	Morphemic tier
[ ]	Phonetic tier
[[ ]]	Morpheme limit in autosegmental morphology
[O]	Online reference
C	Consonant
CG	Consonant + Glide cluster
G	Glide
H	High tone
L	Low tone
Lg	Long
MP	Minimal pair context
N	Nucleus or Nasal, depending on context of use
NC	Nasal + Consonant cluster
NG	Nasal + Glide cluster
O	Onset
Sh	Short
V or v	Vowel
V: or v:	Long vowel
VD	Vowel duration
x	Timing unit or position in the skeleton

## ACKNOWLEDGEMENTS

The compilation of this work would have not been possible without the involvement of various people and institutions. First, I am grateful to the Coimbra Group and to its personnel who carefully ensured me with a successful research stay in Aarhus, Denmark. I am also thankful to the North-West University in Potchefstroom who granted me a research leave for this scholarship. The leave also benefited from a research travel grant from Stellenbosch University.

I am deeply thankful to Prof Henning Bergenholtz (Aarhus University) for supervising the research work done during this period. I also present my appreciation to Jonna Pedersen, Vibeke Vrang and Joan Ottesgaard Petersen of the Department of Language and Business Communication at Aarhus School of Business, Aarhus University for making the research stay possible and enjoyable. Thank you for every single help.

Words are insufficient to express my gratitude to Prof Justus C. Roux (North-West University) for his mentorship, friendship and support on my research views, projects and career. I am also thankful to Dr Frenette Southwood (Stellenbosch University) and Prof Paul A. Mavoungou (Omar Bongo University) who graciously reviewed and proofread the earliest version of this work. The work also gained valuable insights from the committee members who evaluated this work as doctoral dissertation, i.e. Prof J.T. Kwenzi Mikala (Omar Bongo University), Prof A.E. Kotzé (University of South Africa) and Prof Christa van der Walt (Stellenbosch University). Thank you for your insightful comments and challenging questions.

I cannot fail to say a little word of thanks to my daughter, Anne-Sophie, for the joy of being a father despite pressure and fatherhood responsibilities. Last but not least, I am truly thankful to Carine, my wife, for her consistent and encouraging support every time I am passionate or struggling about a project, a book or an article. I am forever indebted to my wife and daughter for sacrificially allowing me to work or travel during the time that is supposed to be theirs.

None of the people and institutions mentioned above should be accountable of views contained in this book. I am also solely responsible of any oversight that could be found in this book.

# CHAPTER ONE

## INTRODUCTION

### **Introduction**

This work focuses on phonetic and phonological aspects of vowel duration in Civili, an African language spoken in Gabon and a few of its neighboring countries<sup>1</sup>. This book is based on the works by Ndinga-Koumba-Binza (2008). A number of publications have been made as outcomes of the research undertaken for the purpose of the doctoral work contained in Ndinga-Koumba-Binza (2008). These publications are duly quoted in this text where necessary. This book also attempts to bring new insights to existing views on the phenomenon of vowel lengthening, and to assess the implications of these views for the creation of a standard orthography in this language.

This study addresses problematic aspects related to vowel duration in Civili. The study is not only theoretical in nature but also includes an empirical component. Broadly stated, the primary aim of this study is to present an experimental description of vowel duration in Civili as prerequisite for standardization of the orthography of the language. More specifically, the aims of this study are as follows:

- (i) to determine the physical nature of the phenomenon of vowel duration in Civili, i.e., at acoustic and perceptual levels;
- (ii) to refine existing phonological descriptions of Civili vowel duration in view of new experimental data obtained in this study; and
- (iii) to contribute towards orthographic standardization in Civili.

Eventually, the knowledge of the Civili vowel system obtained in this study is expected to contribute to the advancement of Gabonese languages in general.

## Potential Impact of this Study

This study presents the first set of experimentally verified acoustic-perceptual data on the vowel system of Civili, which in turn may be relevant for the following:

- (i) A reassessment of the orthography of the language.
- (ii) Linguistic studies, especially future phonological and phonetic studies.
- (iii) Applications in the field of speech therapy, in the sense that the study will provide some form of normative data on Civili.
- (iv) Future speech technology applications, in that the results may be of use when devising automatic speech recognition systems and/or speech generation systems.

Furthermore, the study presents a specific phonological analysis of a relatively unknown language, which puts certain theoretical concepts within non-linear phonological theories to the test.

As regards orthography, Civili is not standardized as far as vowel duration is concerned (see Chapter 3 for details). The re-exploration and a better explanation of vowel duration in Civili could contribute to the revision and standardization of the writing system of the language<sup>7</sup>.

In addition, Civili is the only Gabonese language that belongs to Guthrie's zone H. It is usually grouped among zone B languages within an internal classification of Gabonese languages (for details, see Kwenzi-Mikala 1987, 1990 & 1998; Ndinga-Koumba-Binza 2000). Hence, it is important that Civili is described accurately and comprehensively in order to sort out its particular properties. This will lead to an accurate classification of Civili within the internal classification of Gabonese languages (Idiata 2002 & 2005; Ndinga-Koumba-Binza 2010a). Language description is an indispensable preliminary to the establishment of language typology; so is language typology to any language policy.

Lastly, this work can contribute to the overall development of Civili, which is a marginalized Gabonese language, and may be used as an example for similar developments in other Gabonese or other marginalized African languages. Being the first study of its kind employing experimental techniques to analyze a Gabonese language, it can stimulate further research in the speech sciences. In this specific case, I hope to make a theoretical and practical contribution towards a better understanding of African languages in general and Civili in particular, in the field of phonetics/phonology.

## Methodological Approach

The vowel system of Civili is re-examined herein within a methodological framework that integrates both phonology and phonetics, namely within the framework of experimental phonology. I have expended on this approach in Ndinga-Koumba-Binza (2009 & 2011a) and in Roux & Ndinga-Koumba-Binza (2011). I should therefore limit myself to a summary in this portion of the book.

According to Ladefoged (1997: 137),

“There are remarkably few extensive phonetic descriptions of languages. A few well known languages, such as English, French and Japanese have recently become well documented from the phonetic point of view, because of the needs of speech synthesis systems. But in places where there is no commercial need for detailed phonetic knowledge, often only the most prominent phonetic features of the language have been described” (Ladefoged 1997: 137).

Based on this view, it could be said that the phonetic descriptions of many smaller languages (and this includes Civili) are merely impressionistic by nature. Very often these descriptions have not moved beyond the articulatory level.

Due to their very nature, the types of data emanating from these descriptions have proven to be inaccurate, incomplete, non-representative and even misleading. Any phonological theory attempting to explain sound patterns is bound to run into difficulties if it relies on data of this kind. It is ironic that well construed phonological theories are often lenient with respect to the acceptance of any set of (impressionistic) phonetic data (Roux 1979): should the phonological theory not be able to account for the data, it is often the theory that is changed, rather than the data that are reconsidered (Hale & Reiss 1999; Haris & Lindsey 2000).

The availability of reliable experimental methods remains a prerequisite for adequately testing various claims. Many experimental paradigms have been proposed for testing phonological hypotheses (Ohala 1995: 714), and well-established methods exist for discovering the physical correlates of different linguistic messages in cases where these physical correlates are uncertain or disputed.

This phonetic-phonological study adheres to the framework of post-generative phonological theories and models. In order to understand the structure and the phonological behavior of any language, it is necessary to have absolute clarity on the physical aspects constituting the particular language. The physical aspects of a language are attested at three levels,

namely at *articulatory level* (the actual production of sounds), at *acoustic level* (the transmission of sounds) and at *perceptual level* (the recognition and interpretation of sounds). This study takes place within the realm of experimental phonology and focuses on the experimental verification of Civilian phonetic structures and on the interpretation of problematic phonological processes in terms of an appropriate phonological theory.

According to Clark & Yallop (1995: 416), experimental phonology, also known as laboratory phonology, represents an attempt to draw together at least three research styles, namely experimental phonetics, experimental psychology, and phonological theory. In this regard, Ohala (1997: 682) states that there is nowadays “*substantial overlap between phonological, phonetic, and psychological studies of speech*”. Experimental phonology is not a theoretical model of phonology as such, but an approach that usually serves as a tool for modern phonological theories. In the words of Clark & Yallop (1995: 416), experimental phonology can be said:

“to submit hypotheses about phonological organization to testing and validation of the kind which is standard in the experimental sciences, and which has been taken over, to some extent at least, by researchers in fields such as psychology, psycholinguistics and instrumental phonetics” (Clark & Yallop 1995: 416).

In essence, experimental phonology attempts to provide clear answers to the following three general questions (Beckman & Kingston 1990: 1):

First, how, in the twin processes of producing and perceiving speech, do the discrete symbolic or cognitive units of the phonological representation of an utterance map into the continuous psychoacoustic and motoric functions of its phonetic representation? Second, how should the task of explaining speech patterns be divided between the models of grammatical function that are encoded in phonological representations and the models of physical or sensory function that are encoded in phonetic representations? And third, what sorts of research methods are most likely to provide good models for the two components and for the mapping between them? (Beckman & Kingston 1990: 1)

Regarding the relationship between the phonological and the phonetic components, Beckman & Kingston (1990: 3) note the following:

"How can we use the physical models and experimental paradigms of phonetics to construct more viable surface phonological representations? Conversely, what can we learn about underlying phonetic representations



and processes from the formal cognitive models and computational paradigms of phonology? Determining the relationship between the phonological component and the phonetic component demands a hybrid methodology. It requires experimental paradigms that control for details of phonological structure, and it requires observational techniques that go beyond standard field methods". (Beckman & Kingston 1990: 3)

Furthermore, Beckman & Kingston (1990: 3) claim that

"the techniques and attitudes of this hybrid laboratory phonology are essential to investigating the large group of phonic phenomena which cannot be identified *a priori* as the exclusive province of either component".

Ohala (1990), who claims a fundamental unity between phonological and phonetic representations, argues that phonetic considerations should constrain the phonological description directly, by including in the phonological model the primitives and principles of (i) aerodynamics, (ii) the mapping from vocal tract shape to acoustic pattern, (iii) peripheral auditory processing of the signal, and so on. He suggests that, since such constraints are not an inherent or derivable property of autosegmental formalisms, more general physical ones should simply replace autosegmental representations.

This study provides an account of the phonetic-phonological interaction in Civili. This interaction comes within the principles of mapping from vowel tract shape to acoustic pattern (Ohala 1990) and of perceptual testing.

The specific experimental procedure employed in this study consisted of the following:

- (i) Gathering appropriate data on the relevant aspects of Civili phonology. In other words, the acoustic waveform of sounds of speech was examined in detail.
- (ii) Evaluating the obtained data by means of statistical methods.
- (iii) Making a generalization based on the data.
- (iv) Expressing this generalization as a fact, and fitting the facts into a model.

This discussion serves to justify the use of scientific procedures (acoustic and auditory) for the description of problematic Civili vowel phenomena. This study integrates the orientation inspired by authors such as Roux (1979, 1991 & 1995a), Ohala (1986; 1995), Ohala & Jaeger (1986) and Clark & Yallop (1995). The latter two authors affirm that

“this move [experimental phonology] is not always free of the implication that phonology is speculative and that evidence obtained experimentally is superior to any other kind of evidence” (Clark & Yallop 1995: 416).

## Civili Socio-linguistic Situation

A language can be defined as the phenomenon of vocal and written communication among human beings (Matthews 1997: 198). In other words, a language is a system of vocal (and/or written) signs, specific to a given community that uses it as instrument of communication. Because a language, in this case Civili, is linked to a community (or communities), Civili's geolinguistic, geographic and historical features will be introduced. An extensive account of the socio-linguistic situation of Civili can be found in Mavoungou & Ndinga-Koumba-Binza (2010a & 2010b). In this overview, I intend to focus on the denomination of the language, its classification, its location, and its dialectal varieties.

The term *Civili* is the denomination of the language that the Bavili people speak. Phonetically, it is transcribed as [tʃiβil̥] according to the International Phonetic Alphabet. This glossonym is also sometimes written Tchivili, according to a French-based orthography. The form of spelling that government uses is usually Vili (i.e., without the Bantu noun prefix Ci-)<sup>8</sup>. Catholic and Evangelic missionaries, colonial administrators and speakers of other languages have granted the language with some other appellations such as *Monvili*, *Fioti* or *Fiote*, *Loango*, and *Lwangu*, or *Balwango* (Mabika Mbokou 1999: 9).

These terms are generally indicative of the history of the language or its speakers or of the social behavior of the speakers. For instance, the ethnic group of Bavili comes from the former Loango kingdom (Raponda-Walker 1967: 119). They distinguished themselves as Black people (*Fioti* or *Fiote*, terms still used to refer to some inhabitants of the Zaire province, north of Angola) in order to dissociate themselves from the Portuguese people who invaded the kingdom early in the 17<sup>th</sup> century (Merlet 1991). Also, because Civili was the standard language of the court and of the middle class during the former Loango kingdom era, it has been called as *Cilwango* [tʃilwã:ngũ], which means “the speech form of Loango” (Ndinga-Koumba-Binza 2000: 10; Mavoungou & Ndinga-Koumba-Binza 2010a & 2010b).

As far as Civili is concerned, the administrative denomination *Vili* can lead to misunderstanding, for two reasons. The first is that it refers not only to the language (Civili), but also to the ethnic group (Bavili) and the

individual (Mvili). The second reason is that *Vili* is the administrative denomination of not only Civili, but also Yivili, a speech form of another Gabonese language, namely Yinzebi (Raponda-Walker 1998: 17, 91-92; Kwenzi-Mikala 1998: 217; Ratanga-Atoz 1999: 49-51)<sup>9</sup>. Importantly, Civili and Yivili are not mutually intelligible and their vocabularies differ greatly (Kwenzi-Mikala 1998; Ndinga-Koumba-Binza 2000: 10).

After attainment of independence, the newly established Gabonese administration maintained as administrative denomination the confusing spelling of glossonyms and ethnonyms of Gabonese languages and ethnic groups. It is recommended that the denomination of Civili be standardized as *Civili*, amongst other reasons because this is what Bavili people themselves call their language. The spelling of this denomination adheres to the orthography accepted for Gabonese languages in 1999 (Idiata 2002).

Civili is part of the Kongo group (H10) of the Bantu linguistic branch. According to Guthrie's (1948) classification, Civili is referred as "H12a". However, according to the geographical-administrative classification proposed by Kwenzi-Mikala (1988: 61, 1990: 122, 1998: 217), Civili is regarded as part of the Merye group. In Kwenzi-Mikala's inventory, Gabonese speech forms ("*parlers*", including languages and dialects) are grouped into 10 language units. In the understanding of Kwenzi Mikala (1998; 1990), a language unit is a group of different speech forms that are mutually intelligible. In order to establish the Gabonese language units, Kwenzi-Mikala used the criteria of intercomprehension (i.e., mutual intelligibility) and the greeting formality opening *I say that* (Emejulu & Nzang-Bie 1999: 2; Nyangone Assam & Mavoungou 2000: 254).

Jacquot (1985), and later Ndinga-Koumba-Binza (2000: 11), argued that there is no primary mutual intelligibility (such as that which exists within the H10 group) between Civili and Guthrie's B40 languages that comprise the Merye language unit, with the exception of the Yilumbu variety also spoken in Mayumba in Gabon. However, Civili is mutually intelligible with B40 languages at a secondary level due to the co-habitation of speakers of various languages. Ndinga-Koumba-Binza (2000: 12) points out that the phrase *I say that* is *mitye* [mítýè] in Civili, and not *merye* as Kwenzi-Mikala assumed. Therefore, Civili would have been included in the Kwenzi-Mikala's other language unit named *Metye*, if the mutual intelligibility between Civili and Guthrie's B50 languages – which comprise the *Metye* language unit – were possible.

Finally, Jacquot (1978), and later Ndinga-Koumba-Binza (2000: 13), suggest a unique class, of which Civili is the only component within a geographical-administrative classification of Gabonese languages. In fact, in Gabon, as mentioned earlier, Civili is the only language of those in

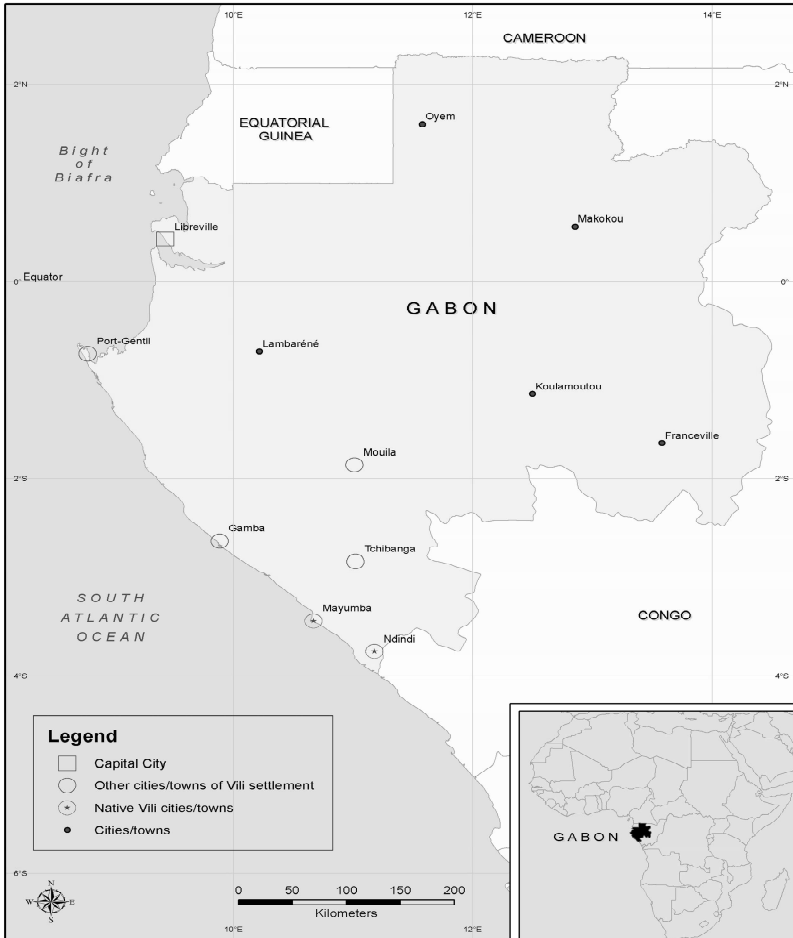
Guthrie's group H10 in which languages such as Kiyoombi (H12a) and Bembe (H11) are mutually intelligible.

Civili is mainly spoken in two towns, namely Mayumba (3°23'S, 10°38'E) and Ndindi (3°46'S, 11°10'E) in the 5<sup>th</sup> administrative province of Gabon, referred to as the "Nyanga Province". This study focuses mainly on the variety spoken in Mayumba, where linguistic data were collected during on-field recordings and experiments. Nowadays, Mayumba constitutes the largest settlement in the north of what it used to be called *Sya Bavili* ("Land of Bavili") of the former Loango kingdom from Angola to Gabon (cf. Ndamba 1977).

In Gabon, Mayumba is where Civili is under the most pressure from other languages, namely French, Yilumbu and Yipunu, as people are becoming more bilingual or trilingual: in Mayumba, a speaker of Civili often also speaks Yilumbu fluently, and a speaker of Civili often understands Yilumbu without the need of any interpreter, and vice versa, for instance. Conversation in which interlocutors make use of two languages, one speaker using Civili and the other Yilumbu, are very common in Mayumba.

Bavili (the ethnic group whose mother-tongue is Civili) and Balumbu (the ethnic group whose mother-tongue is Yilumbu) mostly populate Mayumba. However, people from other Gabonese ethnic groups as well as from other countries also live in Mayumba, for business reasons or because they have government-appointed positions. Therefore, three languages are commonly in use in Mayumba, namely Civili, Yilumbu and French. By contrast, only two languages (Civili and French) are commonly in use in Ndindi. Although Civili is mainly spoken in Mayumba and Ndindi, there are a number of native Civili speakers who were born in and/or live in other Gabonese towns and cities in other provinces, such as Libreville (the Capital city of Gabon), Port-Gentil, and Mouila (Raponda-Walker 1967: 119) (see Fig. 1-1).

Civili is also spoken in some other countries of Central Africa (cf. Lumwamu 1978). For example, Civili is the main native language in the towns called Nzambi and Loango, and in the city of Pointe-Noire in the Kouilou Province of the Republic of Congo (Brazzaville). According to Mabilia (1992: 141), Civili occupies in the Republic of Congo the whole coastal plain which is 170 kilometers long and 50 kilometers wide.



**Fig. 1-1: *Civili area and Vili settlement in Gabon***

(By A. van Niekerk for Ndinga-Koumba-Binza 2008)

Furthermore, Civili is, together with Portuguese, the dominant language of the enclave of Cabinda (cf. Tele-Pemba 2009). Some varieties of the language, known as dialects of the Kongo language (Mudimbe 1978), are also found in the hinterland of Angola and in the Democratic Republic of Congo (DRC – Kinshasa) (see Fig. 1-2). Languages such as Koci, Lindji, and Yombe, all spoken from DRC to Angola (Mabiala 1992: 144), are usually considered to be Civili speech forms<sup>10</sup>.



**Fig. 1-2: Overview of the Bavili land**  
(By A. van Niekerk for Ndinga-Koumba-Binza 2008)

To date, the dialectological system of Civili has not been the subject of any systematic study, except for very few attempts from Ndinga-Koumba-Binza (2000), Mabiala (1992) and Mavougou & Ndinga-Koumba-Binza (2010a). The attempt by Ndinga-Koumba-Binza (2000) is an overview of the dialectology of the language as it is spoken in the Republic of Gabon. Whereas Mabiala (1992) highlighted some aspects of the dialects of Civili as it is spoken in the Republic of Congo. These studies were undertaken on the basis of field observations. Mavougou & Ndinga-Koumba-Binza

(2010a) suggested a cross-border list of Vili dialects as spoken in Gabon, Congo and Cabinda, but nevertheless fell short to identify and analyse the specific characteristics of each dialect due to the lack of sufficient data and proper methodology.

This sub-section does not contain a comprehensive dialectological description of Civili; rather, it discusses some dialectological issues in order to justify why the variety of Civili spoken in Mayumba was selected for investigation in the present study. As stated above, Civili is spoken from Gabon to the northern province of Angola. In Gabon, native speakers mention at least four distinct speech patterns of their language, namely:

- (i) Civili ci moongu “upper Civili” (literal translation: “Civili of upper reaches”);
- (ii) Civili ci waanda “lower Civili” (literal translation: “Civili of lower reaches”);
- (iii) Civili ci basë baanyi “Eastern Civili” (literal translation: “Civili of those from Banio lagoon”); and
- (iv) Civili ci basë lukweeku “Western Civili” (literal translation: “Civili of those from the beach” – on the Atlantic Ocean).

At first glance, this subdivision seems to represent four distinct dialects in Civili. However, meticulous observations will refute such a claim. In fact, this subdivision is made on the basis of geographic elements, namely the Banio lagoon and the beach on the Atlantic Ocean.

Upper Civili is spoken in areas around upper reaches of the Banio lagoon; this includes towns such as Ndindi and Nzambi (the latter is a border town in the Republic of Congo). Lower Civili is spoken in the lower reaches of the Banio lagoon; this includes places such as Mayumba and Malembe village. Eastern Civili is spoken along the right shore of the Banio lagoon and on the edge of the Mayombe Forest; this includes villages such as Mambi, Tchanzi, and Tiya. Western Civili is spoken along the Atlantic Ocean, including the south-west area of Mayumba and the little village of Mpilakoumbi. One may note that this subdivision is mainly a regional subdivision of the language rather than a pure dialectal subdivision that requires a systematic dialectological study.

In fact, there is no dialectal homogeneity in every distinguished area. For instance, in Eastern Civili, two strong variants are found, namely Civili ci basë Cyaanzi “Civili of Tchanzi” (literally, ‘Civili of those from Tchanzi’) and Civili ci Tiya “Civili of Tiya”. The latter variant is closer to the speech form of Ndindi, whereas the former is different from both the Mayumba and the Ndindi variants. The speech form spoken in Mambi, which is equally part of the Eastern Civili, is also distinctive.

Civili as spoken in the Republic of Congo presents a very different dialectological situation. First, the dialectology of Civili is associated with Kiyoombi (H12b) and Kikongo (H16c). Kiyoombi is claimed to be a dialect of Civili, while both are claimed to be dialects of Kikongo (Mabiala 1992: 143; Lumwamu 1978: 505; Mudimbe 1978: 512). According to Mabiala (1992: 143), the claim that Kiyoombi is merely a variety of Civili is debatable, whereas the claim that both languages are variants of Kikongo is undisputable. However, Bavili people tend to call Yoombi speakers as the “Bavili that live in the forest” (Bayoombi villages are mostly found in the Mayombe Forest), as the Bavili as such live in coastal savannas and plains along the Atlantic Ocean.

Moreover, Civili is usually said to have three dialectal varieties in the Republic of Congo. These are geographically bound, determined by the three main roads from the city of Pointe-Noire suitable for motor vehicles. These three varieties are the following, as introduced by Mabiala (1992: 144):

- (i) Pointe-Noire – Malélé (N1).
- (ii) Pointe-Noire – Nzassi (Cabindan border).
- (iii) Pointe-Noire – Madingo-Kayes.

To conclude: Although not ideal, the least confusing practice would probably be to identify each Civili speech form or dialectal variety according to the town or the village where it is spoken, e.g. Civili of Mayumba, Civili of Ndindi, Civili of Loango, Civili of Pointe-Noire, etc., until such time as a comprehensive dialectological study has been done on Civili. Civili of Mayumba is the variety that is described in this study.

With the exception of Pointe-Noire in the Republic of Congo, Mayumba is the place where Civili is the most in contact with other Bantu languages, on the one hand, and with the French language, on the other. It is also the place where the language is rapidly developing in terms of both vocabulary and sound change (Mabika Mbokou 1999). Moreover, Mayumba is traditionally viewed to be a bilingual town because both Bavili (speakers of Civili) and Balumbu (speakers of Yilumbu) are native inhabitants of the town. Nevertheless, Mayumba remains the town with the largest population of Bavili. Recall that Bavili and Yilumbu are mutually comprehensible; people from each language converse (each of them speaking his/her mother-tongue) without any interpreter.

Mention must also be made that nowadays speakers of other languages also inhabit Mayumba due to business or government positions. It is also noticeable that these people mostly learn Civili rather than Yilumbu, for various unspecified reasons.



# CHAPTER TWO

## BACKGROUNDS AND LITERATURE REVIEW

### **Introduction**

Civili is a developing language. Although there are some works on the history and oral literature and others offering grammatical overviews of the language, scientific information on Civili is very limited.

This language has not yet been studied systematically making use of experimental phonetic data. The present study addresses two problems related to vowel duration in Civili, namely the phonetics-phonology overlap and the issue of the orthography of vowels. These two problems are discussed in detail in Chapter 3; however, they are briefly discussed here in order to contextualize the research problem.

### **Phonetic and Phonological Background**

The first systematic description of the phonetics and phonology of Civili was that of Ndinga-Koumba-Binza (2000), who explained certain phonological processes, such as lengthening, assimilation, vowel harmony, and nasalization, and listed the phonemes of the language.

However, his description was based entirely on impressionistic phonetic data he had gathered (Ndinga-Koumba-Binza 2004 & 2008). Ndinga-Koumba-Binza (2000) only partially explained a number of phonological phenomena on the basis of data at hand. For example, as far as vowel duration is concerned, he was not able to distinguish between phonological lengthening, natural underlying long vowels and the sequencing of two identical vowels.

He overcame this problem by establishing a phonetic lengthening rule, which is contextually predictable, and a compensatory lengthening rule that stems from several phonological processes such as semivocalization, prenasalization and elision. This would have been an adequate solution, had he used more reliable data, and had the contexts in which phonetic lengthening took place and those in which phonological processes took place not overlapped.

A review of previous studies on Civili vowel lengthening shows that phonetic and phonological contexts often overlap (see Ndinga-Koumba-Binza 2004). This overlap had made the phenomenon of vowel lengthening in Civili difficult to examine in an accurate manner. This obviously has an effect on the credibility of the lengthening rules for Civili proposed by Ndinga-Koumba-Binza (2000). Moreover, Ndinga-Koumba-Binza (2000) did not provide any information on the acoustic and perceptual status of vowel duration in Civili. This is problematic because, as stated by Sara Garnes (1973: 273), “*if the resulting surface forms are not attested in the spoken language itself, the phonological analysis loses its credibility*”.

The phonetics-phonology interface debate has shown that there is a close relationship between phonetic data and phonological analyses (Roux 1979, Ohala 1990). That is to say, a phonological analysis can be confirmed or refuted on the basis of phonetic data; alternatively, the phonetic output predicted by phonological theories could lend credibility to or negate an analysis. Ladefoged (2003: 2) remarks that

“without knowing the phonology of a language you cannot describe the phonetics... Of course, without some knowledge of the sounds, you cannot describe the phonology of a language”.

There are obviously different views on the nature of phonetic data. However, when focusing on vowel phenomena, Ladefoged (2003: 57) is of the opinion that “*the best way of describing vowels is not in terms of the articulations involved, but in terms of their acoustic properties*”. Both the fact that previous studies made use of impressionistic data only and the flawed explanations given to above-mentioned phonological phenomena motivated the present experimental study of Civili vowel duration.

## Theoretical Background

The theoretical background of the research problem in this work is the phonetics-phonology interface debate. In fact, the relation between phonetics and phonology has been on debate for the last four decades (Garnes 1973; Fromkin 1975; Keating 1988 & 1996; Ladefoged 1988; Blumstein 1991; Ohala, 1990a, 1990b & 1997; and Cohn 1998). Arguments have been presented supporting the existence or non-existence of the phonetics-phonology interface<sup>2</sup>.

The acknowledgement of this interface refers to the acceptance of the co-existence of “*two separate domains (phonetics and phonology) with their own specific boundaries... that these two domains are connected in*

*one way or the other*” (Roux 1991: 35). On the other hand, the negation of such interface has recently been the argument of phonetics-phonology integration (Kohler 1991; Ohala 1991 & 1995a; Roux 1991; Clements & Hertz 1996; Warner 1998; Hyman 2001; Naidoo 2005). This study supports the view of Ohala (1990a) as supported and verified by Roux (1991) with materials from African languages (particularly languages of the Bantu phylum of the Niger-Congo family). According to Ohala (1990a: 154), “... *phonology and phonetics are mutually autonomous or independent whether as part of the speech universe or as disciplines*”.

In addition, Roux (1991: 36) has indicated that a mutually exclusive phonetics-phonology dichotomy, as promoted by specific phonological theories, may actually (i) obscure understanding of many phenomena and (ii) cause abstract phonological descriptions to lose credibility. At the understanding of Roux (1991) and Naidoo (2005) an (inclusive) integrated approach of phonetics and phonology may “*lead to better understanding of a particular situation*” (Roux 1991: 36). In this approach, which is “*bridging the phonetics-phonology dichotomy*” (Naidoo 2005: 107), phonetic representations or outcomes are being duly incorporated into phonological descriptions (Ohala 1995a).

The integrated approach of phonetics and phonology has been applied in the study of a number of phenomena. The contributions of these studies follow two perspectives:

- (i) either to demonstrate the phonetics-phonology integration (Roux 1979 & 1991),
- (ii) or to better describe problematic phenomena (Ohala 1991; Roux 1979 & 1995a; Naidoo 2005; Roux & Ntlabezo 1996)

Vowel duration within the phonetics-phonology interface or integration has been the topic of few studies (Delattre 1962; Nooteboom 1972; Lehiste 1976; Lyberg 1977; Wissing & Burger 1991). The present research work comes within the integrated approach of phonetics and phonology in the sense that (i) it aims to contribute to the illustration of the phonetics-phonology integration and (ii) it utilizes experimental information in order to facilitate the phonological description of vowel duration. I have previously tried not an extensive but a comprehensive outline in Ndinga-Koumba-Binza (2009).

## Socio-linguistic Background

The Republic of Gabon has been in the process of promoting its languages for the past few decades. Judging by the recommendations of the Gabonese General States for Education and Training held on 17-23 December 1983, and those recently held on 17-18 May 2010, the Republic of Gabon attaches great importance to the development of native languages as well as to their integration into the education system. This is also demonstrated by the actions of the Ministry of National Education, on one hand, and that of the Ministry of Higher Education and Research, on the other hand. These actions include the following:

- (i) The organization of seminars, workshops and conferences, like *Séminaire sur l'alphabet scientifique des langues du Gabon*<sup>3</sup> (20-24 February 1989), *Première table-ronde sur les politiques linguistiques et l'enseignement des langues gabonaises*<sup>4</sup> (9-11 December 1997) and *Session de concertation sur l'orthographe des langues gabonaises*<sup>5</sup> (8-10 April 1999).
- (ii) The creation of the Department of Language Sciences at Omar Bongo University in Libreville (1994).
- (iii) The creation of the Department of Applied Linguistics at the College of Education for teachers' training in Libreville (1998)<sup>6</sup>.
- (iv) The introduction of the teaching of five African languages in the Department of Anthropology at Omar Bongo University (1998).
- (v) The creation of the Department of National Languages at the National Pedagogical Institute (1999).
- (vi) The creation of the section for national languages in the Department of Language Sciences at Omar Bongo University (2001).
- (vii) The creation of the Department of African Literature at Omar Bongo University (2002).

Proceedings of most of the scholarly meetings mentioned above in (i) have been published and the recommendations made are progressively being put into practice, but at a very slow speed.

Scientific knowledge of Gabonese languages could be a fundamental asset to the promotion of these languages and their introduction into the education system. Thus, linguistic and phonetic research enables didactic transpositions for teaching and learning's sake as well as durability of these languages. However, research on the phonetics of Gabonese languages is still at an embryonic level, as language sciences are new

study and research fields in Gabon. According to Idiata (2002: 45), phonetic and phonological studies constitute about 40% of the linguistic work done on Gabonese languages from 1975 to 2000. However, these phonetic and phonological studies mainly focused on articulatory aspects of sounds as proper means to enable phonological analyses. No review of phonetic studies of Gabonese languages records a one on acoustic and/or perceptual aspects of any Gabonese language (see Ndinga-Koumba-Binza 1999 & 2004; Idiata 2002).

## **Literature Review**

A comprehensive synchronic study of any language would be more relevant when it reflects the actual language. For this reason, this study aimed to consider linguistic items from a geographical area in which Civili is growing and also changing. This enables one to take into account new phonic and lexical developments. These are the reasons why the form of Civili spoken in Mayumba was selected for this experimental study of the vowel-sound system of the language. However, when and where needed comparisons are made with other variants of Civili.

A first literature review of Civili was done by Ndinga-Koumba-Binza (1999). This was then updated in Ndinga-Koumba-Binza (2008). The present literature review takes account of recent publications on the language. Information on the sound system of Civili is now available that was not available for inclusion in the previous two surveys. Apart from studies focusing mainly on the sound system, the present survey also takes into account some other, more general, studies on the Civili language.

Except for phonological analyses based on articulatory descriptions of sounds, no acoustic-perceptual study has ever been applied to Civili (or to any other Gabonese language) before the dissertation by Ndinga-Koumba-Binza (2008) on which this book is based. However, some works on Civili phonology and tonology are available (Ndamba 1977; Blanchon 1984 & 1990; Blanchon & Nsuka-Nkutsi 1984; Mabika Mbokou 1999; Ndinga-Koumba-Binza 2000). These studies are generally focused on the inventory of phonemes and their description, and on the analysis of some phonological processes that occur in the language.

The dissertation by Ndamba (1977) constitutes the first systematic linguistic description of Civili. It is mainly a study of noun phrases of the Civili variety spoken in Pointe-Noire (Republic of Congo). The study of phonology is regarded as the necessary preliminary to any complete grammatical description, and Ndamba (1977) broaches the phoneme

inventory according to the functionalist approach of the French linguist André Martinet. The phonemic processing is mainly paradigmatical.

Blanchon (1990) presented a brief overview of the Civili phonological system within the framework of a conference on the *Alphabet Scientifique des Langues Gabonaises* ("scientific alphabet of Gabonese languages"). Due to the brevity of this paper and the nature of the information provided, it is not possible to ascertain which variety of Civili was studied. However, on the basis of a Blanchon's previous paper on Civili – comparing Civili with Yilumbu and Yipunu from a story narrated in Yilumbu (Blanchon 1984) – and on the basis of Ndamba's work (Blanchon & Nsuka-Nkutsi 1984) one can assume that Blanchon (1990) does not take into account dialectal varieties of the language.

On the basis of Ndamba's grammatical study and from linguistic data gathered from Civili native speakers from Mayumba, Mabika Mbokou (1999) studied Civili analogical phenomena at the phonological level as well as at the morphological level. Her work also presents a preliminary overview of the phonology and the morphology of the language. The phonological study focuses on the phoneme inventory and on an explanation of allophones according to a functionalist approach based on Trubetzkoy's phonological principles.

In his *Phonologie du civili de Mayumba* ("Phonology of Civili as spoken in Mayumba"), Ndinga-Koumba-Binza (2000) deals with the phonology of Civili in the domains of segments and processes according to a non-linear generative approach. Two aspects of this study distinguish it from aforementioned studies of the sound system of Civili: firstly, this approach has not been used before in the description of the Civili sound system, and secondly, Ndinga-Koumba-Binza preceded his phonological analyses by identification and description of Civili phones from phonetic data he had gathered. However, this description of phonic features was only articulatory in nature.

Ndinga-Koumba-Binza (2004) is the first evocation of the Civili vowel duration issue. In a comprehensive article, the author defines the research problem and shows the need for a re-examination of the so-called Civili vowel-length. The publication was the launch of an extensive research on the vowel duration of the studied language. Chapter 3 of this book is mainly based on that publication.

Ndinga-Koumba-Binza (2006) is an evocation of another issue in the Civili vowel-sound system: the quality of mid-vowels. The author interprets the relationship between mid-vowels within the phenomenon of vowel harmony. Distinctive features of vowels are determined in order to analyze the vowel harmony system and to explain the distinction between