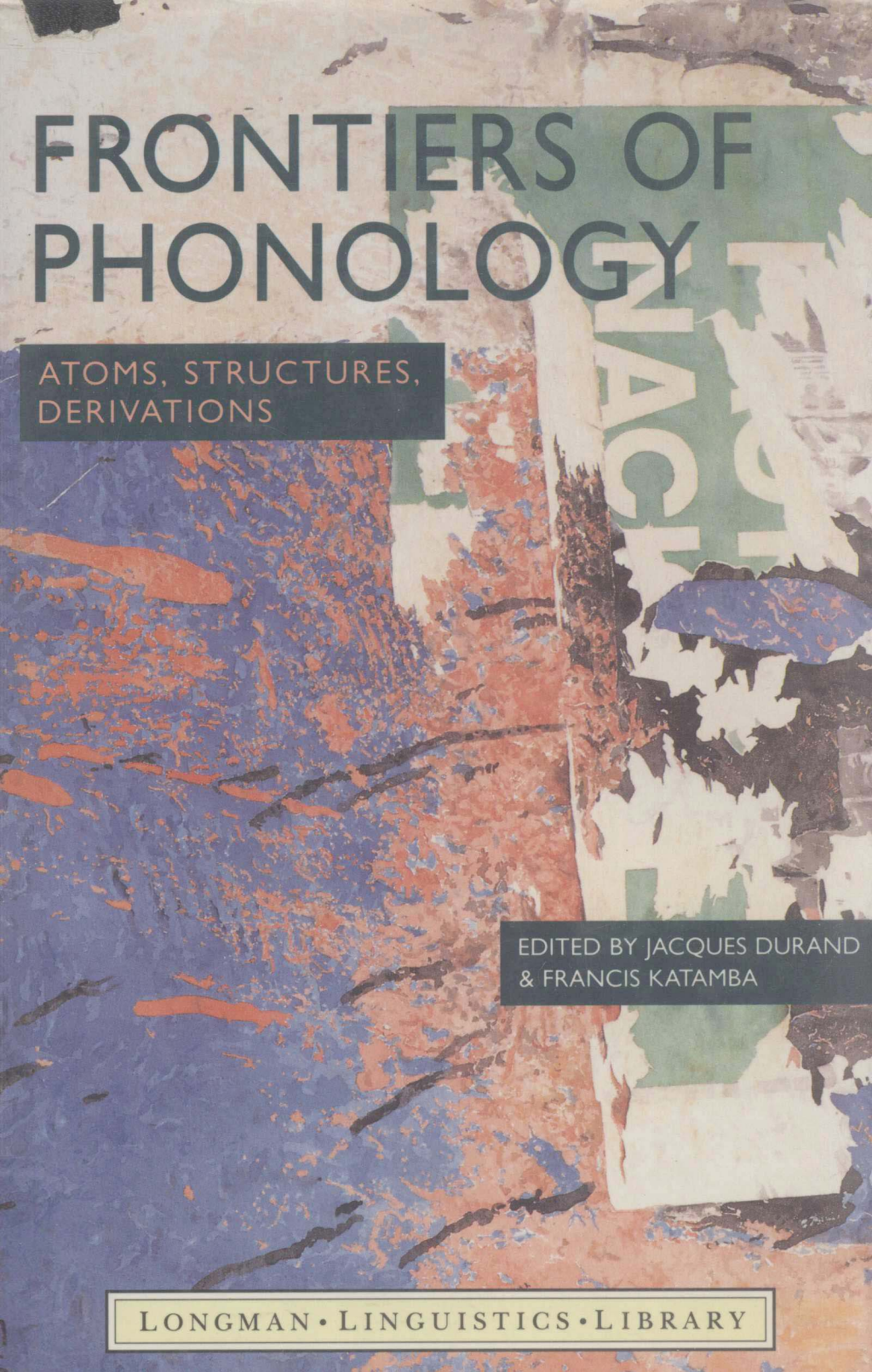


FRONTIERS OF PHONOLOGY



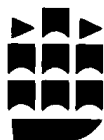
ATOMS, STRUCTURES,
DERIVATIONS

EDITED BY JACQUES DURAND
& FRANCIS KATAMBA

LONGMAN • LINGUISTICS • LIBRARY

Frontiers of Phonology: Atoms, Structures, Derivations

Edited by Jacques Durand and Francis Katamba



LONGMAN
LONDON AND NEW YORK

Longman Group UK Limited

Longman House, Burnt Mill,
Harlow, Essex CM20 2JE, England
and Associated Companies throughout the world.

*Published in the United States of America
by Longman Publishing, New York*

© Longman Group Limited 1995

All rights reserved; no part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without either the prior written permission of the Publishers or a licence permitting restricted copying in the United Kingdom issued by the Copyright Licensing Agency Ltd.,
90 Tottenham Court Road, London W1P 9HE.

First published 1995

ISBN 0 582 082684 CSD

ISBN 0 582 082676 PPR

British Library Cataloguing-in-Publication Data

A catalogue record for this book is
available from the British Library

Library of Congress Cataloging-in-Publication Data

Frontiers of phonology: atoms, structures, derivations/edited by
Jacques Durand, Francis Katamba.

p. cm. — (Longman linguistics library)

Includes bibliographical references and index.

ISBN 0-582-08268-4. — ISBN 0-582-08267-6 (pbk.)

1. Grammar, Comparative and general — Phonology. I. Durand,
Jacques, 1947– . II. Katamba, Francis, 1947– . III. Series.

P217.F765 1995

414—dc20

94-27527

CIP

Set by 15 in 10/11 Times Roman

Produced by Longman Singapore Publishers (Pte) Ltd

Printed in Singapore

LONGMAN LINGUISTICS LIBRARY: SERIES LIST

General editors

R. H. Robins, *University of London*
Martin Harris, *University of Manchester*

Geoffrey Horrocks, *University of Cambridge*

A Short History of Linguistics
Third Edition
R. H. ROBINS

Text and Context
Explorations in the Semantics and Pragmatics of Discourse
TEUN A. VAN DIJK

Introduction to Text Linguistics
ROBERT DE BEAUGRANDE AND
WOLFGANG ULRICH DRESSLER

Psycholinguistics
Language, Mind, and World
DANNY D. STEINBERG

Principles of Pragmatics
GEOFFREY LEECH

Generative Grammar
GEOFFREY HORROCKS

The English Verb
Second Edition
F. R. PALMER

A History of American English
J. L. DILLARD

English Historical Syntax
Verbal Constructions
DAVID DENISON

Pidgin and Creole Languages
SUZANNE ROMAINE

General Linguistics
An Introductory Survey
Fourth Edition
R. H. ROBINS

Historical Linguistics
Problems and Perspectives
EDITED BY C. JONES

A History of Linguistics Vol. I
The Eastern Traditions of Linguistics
EDITED BY GIULIO LEPSCHY

A History of Linguistics Vol. II
Classical and Medieval Linguistics
EDITED BY GIULIO LEPSCHY

Aspect in the English Verb
Process and Result in Language
YISHAI TOBIN

A History of English Phonology
CHARLES JONES

Generative and Non-linear Phonology
JACQUES DURAND

Modality and the English Modals
Second Edition
F. R. PALMER

Semiotics and Linguistics
YISHAI TOBIN

Multilingualism in the British Isles I:
The Older Mother Tongues and Europe
EDITED BY SAFDER ALLADINA
AND VIV EDWARDS

Multilingualism in the British Isles II:
Africa, The Middle East and Asia
EDITED BY SAFDER ALLADINA
AND VIV EDWARDS

Dialects of English
Studies in Grammatical Variation
EDITED BY PETER TRUDGILL AND
J. K. CHAMBERS

Introduction to Bilingualism
CHARLOTTE HOFFMANN

Verb and Noun Number in English:
A Functional Explanation
WALLIS REID

English in Africa
JOSEF SCHMIED

Linguistic Theory
The Discourse of Fundamental Works
ROBERT DE BEAUGRANDE

The Meaning of Syntax
A Study in the Adjectives of English
CONNOR FERRIS

Latin American Spanish
JOHN M. LIPSKI

A Linguistic History of Italian
MARTIN MAIDEN

Modern Arabic
CLIVE HOLES

Frontiers of Phonology:
Atoms, Structures, Derivations
EDITED BY JACQUES DURAND
AND FRANCIS KATAMBA

Contributors

Lee Bickmore is Assistant Professor of Linguistics and Cognitive Science at the University of Albany, State University of New York. His contributions to the field include descriptions and analyses of some lesser-known Bantu languages on which he has collected the primary data. His work addresses various factors which influence the application of tone rules, especially those which are syntactic or metrical in nature.

Wiebke Brockhaus is Lecturer in German at the University of Huddersfield. She has worked mainly on aspects of the phonology of German, especially on final devoicing, about which she is now writing a book (based on her 1992 University of London PhD thesis). Having participated in a Government Phonology-based automatic speech recognition project at the School of Oriental and African Studies (University of London) in the past, she is currently involved in a similar undertaking at the University of Huddersfield.

John Coleman is Director of the Phonetics Laboratory at the University of Oxford. He has written many papers on declarative phonology, and has a special interest in developing computational implementations of non-segmental phonology and phonetics in speech synthesis. He is co-author (with J. P. Olive and A. Greenwood) of *Acoustics of American English Speech* (1993).

Jacques Durand is Professor of French and Linguistics at the University of Salford (Greater Manchester). His research work has mainly been in the areas of Machine Translation and Phonology (both general and applied to French) where he has published

widely. His publications include *Generative and Non-Linear Phonology* (1990) and as editor or co-editor *Dependency and Non-Linear Phonology* (1986), *Explorations in Dependency Phonology* (1987), *Essays in Grammatical Theory and Universal Grammar* (1989). He was the Chairman of the Department of Modern Languages at Salford between 1992 and 1994, and in 1993 he became the Director of its European Studies Research Institute.

John Harris, Reader in Linguistics at University College London, writes on phonological theory, language change and the history of English. He is the author of *Phonological variation and change* (1985, Cambridge University Press) and *English sound structure* (1994, Blackwell).

Harry van der Hulst is Associate Professor in the department of general linguistics and the Holland Institute of Generative Linguistics (HIL) of the Leiden University (in the Netherlands). His publications deal mainly with issues in non-linear phonology, and in particular with stress, segmental structure and phonological aspects of sign language. He has edited over ten books on phonology and is currently Editor-in-chief of the international linguistic journal 'The Linguistic Review' (since 1990) and series editor of 'Linguistic Models' (Mouton de Gruyter).

Francis Katamba is Lecturer in linguistics at Lancaster University. He is the author of *An Introduction to Phonology* (1989), *Morphology* (1993) and *English Words* (1994). He has also written on the implications of Bantu for phonological and morphological theory. His edited books include *Bantu Phonology and Morphology* (1995).

Jonathan Kaye is Professor of General Linguistics at the School of Oriental and African Studies (University of London). The author of many books and papers on various aspects of phonological theory, notably *Phonology: A cognitive view* (1989), 'Coda' Licensing (1990) and *Constituent structure and government in phonology* (1990, with Jean Lowenstamm and Jean-Roger Vergnaud). Along with the two last mentioned linguists, he is one of the originators of the theory of Government Phonology.

Geoff Lindsey is Lecturer in Linguistics in the University of Edinburgh's Linguistics Department. He has directed the Department's Laboratory, and has published in phonetics and phonology. He is also known for work on the semantics of intonation.

Douglas Pulleyblank is Associate Professor at the University of British Columbia. His research has centred on autosegmental representations, with a focus on West African languages. He is the author of *Tone in Lexical Phonology* (1986) and *Grounded Phonology* (with Diana Archangeli, 1994).

Draga Zec is Assistant Professor of Linguistics at Cornell University. Her contributions to phonological theory fall into three general areas: prosodic structure, lexical phonology, and the phonology–syntax interface. She is a co-editor of *The Phonology–Syntax Connection*, and her dissertation recently appeared in the ‘Garland’ series.

Introduction

Jacques Durand and Francis Katamba

Frontiers of Phonology: Atoms, Structures, Derivations is a collection of essays that present a selective overview of recent trends in the linguistic analysis of sound structure. During the 1970s and the 1980s a fairly radical reconfiguration of the field of phonology took place, largely against the backdrop of Chomsky and Halle's *The Sound Pattern of English* (1968), hereafter abbreviated as SPE. The need to move away from the spartan approach to phonological representations advocated in SPE is now universally accepted but the range of solutions provided within current frameworks can be quite confusing for the non-specialist. Our aim is not to attempt to provide an exhaustive, panoramic coverage of the entire field, but rather to explore theoretical issues in three core areas of phonological theory from a number of different perspectives. The questions fall into three broad categories:

1. The nature and representation of phonological features (Are they unary or binary? What is the architecture of featural representations? Is underspecification justified?).
2. The role and structure of the skeletal tier and syllable structure.
3. The competing claims of derivational and declarative approaches to phonology.

All these issues are controversial. A major objective of this book is to provide a forum for the discussion of important theoretical topics from the standpoint of frameworks such as Autosegmental and Multidimensional Phonology, Moraic Phonology, Dependency Phonology, Government Phonology and Declarative Phonology.

Not surprisingly, no one approach has found all the answers to all the questions. So, in phonology, as in many other fields of inquiry, much is to be gained from constructive criticism, debate and dialogue with those who adopt a stance different from one's own.

Further, we hope that the light thrown on these matters by dialogue will facilitate the task of judging the relative merits of the competing post-SPE models. This should be a welcome result for anyone who is sometimes left bewildered by the claims made by adherents of phonological models which are in some respects radically different and in other ways quite similar – in spite of what their proponents might say.

This book is intended for a variety of readers: advanced linguistics students and professional linguists, psychologists, speech scientists and scholars in related fields who are interested in finding out what modern phonologists are up to today. While we expect the reader to have more than a nodding acquaintance with post-SPE generative phonology, a serious effort has been undertaken to provide essays which are self-standing and do not presuppose a specialist knowledge of the issues under discussion. Readers who feel that their background is not sufficient for coming to grips with the issues discussed in this book are referred to Durand (1990a) or Katamba (1989).

Part 1 of the book deals with the atoms of phonological representation. In SPE it is assumed that segments are made up of unordered sets of phonological features and that these features are binary. Both these assumptions have been challenged within a variety of frameworks but the dust has not yet settled on these debates. In Douglas Pulleyblank's 'Feature geometry and underspecification' (Chapter 1), it is first of all argued that to account properly for assimilatory processes one needs to move radically away from the SPE model. But it is not enough to organize features in different tiers or planes as is done in Autosegmental Phonology. The best account of assimilation processes requires a geometric organization of features, i.e. that features should be intrinsically organized into a hierarchical set of a universally defined nature. Pulleyblank's Chapter then turns to the degree of specification of phonological features. While in SPE all features are fully specified as + or –, evidence is given that underspecified representations (which allow for only one feature-value to be present) can be advantageous from the point of view both of phonology and of phonetic implementation. This does not mean, however, that only unary (or monovalent) features should be countenanced. While the class nodes of geometric representations are inherently monovalent, Pulleyblank argues that the terminal features which hang from

class nodes are binary in nature. Both values (+ or -) of features such as [ATR] or [voice], define a natural class and both can be manipulated by phonological processes.

In marked contrast with Pulleyblank's Chapter, John Harris and Geoff Lindsey in Chapter 2, 'The elements of phonological representation' claim that phonological primes are inherently unary. It should not be assumed, however, that the atoms of phonology (which they call 'elements') are the standard distinctive features minus the assumption of binarity. Harris and Lindsey put forward the idea that the elements are different from classical features in being independently interpretable – a hypothesis most vigorously defended within Government Phonology but also associated with Dependency Phonology and Particle Phonology. They then exemplify the theory of elements and show how phenomena assumed to require binary features can be appropriately handled with unary elements within a Government Phonology framework. The paper is also challenging in criticizing underspecification, and in tackling the question of the cognitive basis of phonological primes. In the wake of Jakobson, Harris and Lindsey argue strongly in favour of primes which are mappable in the first instance not onto articulations, but onto sound patterns. As part of the discussion, the authors offer a description of the elemental acoustic patterns which characterize a few of the primitives.

In 'Radical CV Phonology: the categorial gesture', Harry van der Hulst offers a discussion of phonological primitives from the standpoint of a revised version of Dependency Phonology. The symbols C and V in his title do not refer to the skeletal units in the sense of Clements and Keyser (1983), as used in Bickmore's article here, but to two phonological features which play a central role in his account. As in classical Dependency Phonology, van der Hulst assumes that phonological primes are grouped in hierarchical sets, called gestures, but unlike standard accounts of feature geometry (see Pulleyblank this volume) the dependency relation is seen as central to the internal structure of segments. For reasons of space, this article concentrates on the 'categorial' gesture. It includes an outline of classical Dependency Phonology proposals concerning this gesture (see Anderson and Ewen, 1987) which provides a clear point of departure for van der Hulst's own radical proposals.

Part 2 of the book is devoted to the skeletal tier and its relation to aspects of suprasegmental structure (in particular, the syllable). During the 1970s and 1980s, a lot of effort was devoted to the reintroduction of the syllable, and other units of the prosodic hierarchy, within phonological theory. It became accepted that phonological representations should be multidimensional and that

the various planes should be organized around a set of timing or weight units (Cs and Vs, Xs or morae according to the framework), often referred to as the skeleton or the skeletal tier.

Lee Bickmore's Chapter 4, 'Accounting for compensatory lengthening in the CV and moraic frameworks' begins with a survey of the developments in skeletal phonology that led to the rise of moraic theory. Bickmore then goes on to present a detailed analysis of compensatory lengthening of vowels in current moraic theory. The thesis offered in this chapter is that moraic theory presents a more adequate account of compensatory lengthening phenomena than skeletal accounts formulated in terms of either Cs and Vs or Xs. In Chapter 5, 'The role of moraic structure in the distribution of segments within syllables', Draga Zec defends the idea that the mora is the unit in terms of which segments are regulated and syllable structure is projected. She advances this thesis through an explanatory account of complex nasal interactions in Pali. This chapter is also interesting in presenting an account of phonological structure in terms of Prince and Smolenski's Optimality Theory (1993). This approach is based on constraints and constraint-interactions and claims that constraints (unlike classical phonological rules) do not impose absolute requirements but vary in degrees of strength and can be ranked accordingly. Next, in Chapter 6, is Wiebke Brockhaus's committed, but not uncritical, review of Government Phonology, with special emphasis on the representation of skeletal and syllabic structures. A major claim made by Brockhaus in 'Skeletal and suprasegmental structure within Government Phonology' is that in Government Phonology, neither the mora nor the syllable is needed as a unit of phonological structure, contrary to the claims of moraic phonology and other contemporary theories of syllable structure: licensing is the motor that drives phonology. In the last chapter in this section, Chapter 7, 'Skeleta and the prosodic circumscription of morphological domains', Francis Katamba takes a different standpoint. He sees virtue in moraic phonology. However, unlike the first two moraic phonology chapters by Bickmore and Zec, Katamba's concern is not structure below the syllable, but rather the place of skeletal structures in the circumscription of phonological structures to which morphological processes apply.

In Part 3, the nature of phonological derivations is reexamined. Jacques Durand in his 'Universalism in phonology: atoms, structures and derivations' (Chapter 8) argues that a strong universalist position in phonology is the best methodological stance. After examining universalism with respect to atoms and structures, he

focuses on the derivational issue. Should the theory of phonology allow for rules with transformational power as assumed in SPE and reaffirmed by Bromberger and Halle (1989) or, on the contrary, should it be structured like other components of linguistic description which in many current theories do not allow such operations? Durand argues strongly against a 'transformational' approach to phonology and surveys a number of arguments in favour of 'mirroring' between the various modules making up the language faculty.

The issue of derivation is again taken up in Chapter 9 by Jonathan Kaye's 'Derivations and interfaces'. This chapter is devoted to the notion of derivation within Government Phonology. The author discusses the lexical representation of lexical strings and their relationship to speech signals, hence the emphasis on interfaces. One of the major claims made by Kaye here is that there is no significant level of phonology as distinct from phonetics. A consequence of this claim is that, as in the other two contributors to Part 3, a derivational/transformational approach characteristic of the mainstream SPE tradition is found wanting. However, unlike Coleman who closes Part 3, the author argues that claims made in favour of notational systems such as that of *declarative phonology* do not provide the answer to the question at issue.

The final contribution to this volume is John Coleman's 'Declarative Lexical Phonology' (Chapter 10). In this chapter, Coleman criticizes the standard derivational/transformational approach to phonology and argues that many current descriptions formulated in a 'Principles and Parameters' notation (such as Government Phonology) are also close to the SPE paradigm if examined from a formal point of view. He outlines a linguistic formalism derived from unification-based grammars (cf. Shieber 1986) which does not use transformational or context-sensitive rewrite rules and yet allows for a truly restrictive, principle-based theory of sound structure. This essay is particularly interesting in offering a precise, formal description of aspects of phonological theory, a detailed critique of widely held assumptions concerning the nature of phonological derivations and a reanalysis of aspects of the phonology of English in a unification-based format.

As will be obvious from our summary of the contents of this volume, the essays offered here are wide-ranging and challenging. Many assumptions made by phonologists in their daily practice are reexamined by the contributors and debated from a variety of standpoints. We hope that the readers will gain insight into issues which are at the cutting edge of current research and, perhaps, that

they will be prodded by these chapters into contributing to this debate themselves.

Lancaster-Salford, 1995

Acknowledgements

A number of people have helped us in the preparation of this book. First of all, we address our thanks to Professors M. Harris and R. H. Robins, and Longman, for supporting our proposal for a book of this kind with enthusiasm. Elaine Kelly and Joanne Leather helped us to prepare the manuscript and provided extensive secretarial support.

The Publishers are grateful to the following for permission to use copyright material: Edinburgh University Press for our Figure 8.1 being Figure 52 in *Fundamental Problems in Phonetics* by J. C. Catford (1977) and Elsevier Science for our Figures 8.2 and 8.3 from page 88 of 'Structural Analogy and Case Grammar, *Lingua* 70 by J. M. Anderson (1986).

List of Abbreviations

A&E	Anderson and Ewen
ATR	Advanced tongue root
B&H	Bromberger and Halle
BP	Brazilian Portuguese
CFG	Context-Free Grammar
CL	Compensatory Lengthening
CP	Class prefix
CS	Context sensitive
CSG	Context-Sensitive Grammar
DN	Deverbal nominal marker
DP	Dependency Phonology
ECP	Empty Category Principle
FS	Finite state
GP	Government Phonology
H&M	Halle and Mohanan
KLV	Kaye, Lowenstamm and Vergnaud
N	Nucleus
O	Onset
OCP	Obligatory Contour Principle
R	Rhyme (rime)
RCVP	Radical CV Phonology
RE	Recursively enumerable
RTR	Retracted tongue root
SPE	<i>The Sound Pattern of English</i>
UR	Underlying representation

Contents

<i>Series List</i>	vii
<i>Contributors</i>	ix
<i>Introduction</i>	xiii
<i>Acknowledgements</i>	xix
<i>List of abbreviations</i>	xx
PART 1: ATOMS	1
1 Feature geometry and underspecification <i>Douglas Pulleyblank</i>	3
2 The elements of phonological representation <i>John Harris and Geoff Lindsey</i>	34
3 Radical CV Phonology: the categorial gesture <i>Harry van der Hulst</i>	80
PART 2: STRUCTURES	117
4 Accounting for compensatory lengthening in the CV and moraic frameworks <i>Lee S. Bickmore</i>	119
5 The role of moraic structure in the distribution of segments within syllables <i>Draga Zec</i>	149