



VOLUME FOUR

# ENCYCLOPEDIA OF LANGUAGE & LINGUISTICS

## SECOND EDITION

## 语言与语言学百科全书

(第2版)

EDITOR-IN-CHIEF  
KEITH BROWN

CO-ORDINATING EDITORS  
ANNE H. ANDERSON  
LAURIE BAUER  
MARGIE BERNIS  
GRAEME HIRST  
JIM MILLER



 上海外语教育出版社  
外教社 SHANGHAI FOREIGN LANGUAGE EDUCATION PRESS

VOLUME FOUR

4

# ENCYCLOPEDIA OF LANGUAGE & LINGUISTICS

---

SECOND EDITION

语言与语言学百科全书

(第2版)

EDITOR-IN-CHIEF

**KEITH BROWN**

CO-ORDINATING EDITORS

ANNE H. ANDERSON

LAURIE BAUER

MARGIE BERNIS

GRAEME HIRST

JIM MILLER

 上海外语教育出版社  
外教社 SHANGHAI FOREIGN LANGUAGE EDUCATION PRESS

## 图书在版编目(CIP)数据

语言与语言学百科全书. 4 / (英)布朗(Brown, k.)主编.

—上海: 上海外语教育出版社, 2008

ISBN 978-7-5446-0699-8

I. 语… II. 布… III. 语言学—百科全书—英文 IV. H0-61

中国版本图书馆 CIP 数据核字(2008)第 036555 号

图字: 09-2007-815

This second edition of Encyclopedia of Language and Linguistics 14-volume set, by Keith Brown is published by arrangement with Elsevier Ltd, of The Boulevard, Langford Lane, Kidlington, Oxford, OX5 1GB, UK.

This edition is licensed for distribution and sale in China only, excluding Taiwan, Hong Kong and Macao, and may not be distributed and sold elsewhere.

本书由爱斯唯尔出版社授权上海外语教育出版社出版。

仅供在中华人民共和国境内(香港、澳门和台湾除外)销售。

项目总负责: 庄智象

责任编辑: 孙 玉 孙 静 梁晓莉 许进兴

出版发行: 上海外语教育出版社

(上海外国语大学内) 邮编: 200083

电 话: 021-65425300 (总机)

电子邮箱: bookinfo@sflep.com.cn

网 址: <http://www.sflep.com.cn> <http://www.sflep.com>

印 刷: 上海中华商务联合印刷有限公司

经 销: 新华书店上海发行所

开 本: 889×1194 1/16 印张 49 字数 2265 千字

版 次: 2008 年 5 月第 1 版 2008 年 5 月第 1 次印刷

印 数: 3 000 册

书 号: ISBN 978-7-5446-0699-8/H·0310

定 价: 5000.00 元 (全十四册)

本版图书如有印装质量问题,可向本社调换

# EXECUTIVE EDITORIAL BOARD/HONORARY EDITORIAL ADVISORY BOARD

---

## EDITOR-IN-CHIEF

**Keith Brown**

University of Cambridge, UK

## CO-ORDINATING EDITORS

**Anne Anderson**

University of Glasgow, Scotland

**Laurie Bauer**

Victoria University of Wellington, New Zealand

**Margie Berns**

Purdue University, USA

**Keith Brown**

University of Cambridge, UK

**Graeme Hirst**

University of Toronto, Canada

**Jim Miller**

University of Auckland, New Zealand

## SECTION EDITORS

**Keith Allan**

Monash University, Australia

*Semantics (logical & lexical)*

**Anne Anderson**

University of Glasgow, Scotland

*Psycholinguistics*

**Alex Barber**

The Open University, UK

*Philosophy & Language*

**Laurie Bauer**

Victoria University of Wellington, New Zealand

*Morphology*

**Margie Berns**

Purdue University, USA

*Applied Linguistics*

**James P. Blevins**

University of Cambridge, UK

*Syntax*

**Billy Clark**

Middlesex University, UK

*Foundations of Linguistics*

**Östen Dahl**

Stockholm University, Sweden

*Semantics (grammatical)*

**Marcel Danesi**

University of Toronto, Canada

*Semiotics*

**Peter T. Daniels**

Independent Scholar, USA

*Writing Systems*

**Philip Durkin and Kathryn Allen**

Oxford English Dictionary, UK

*Glossary*

**Catherine Emmott**

University of Glasgow, Scotland

*Text Analysis & Stylistics*

**John Esling**

University of Victoria, Canada  
*Phonetics*

**Erik Fudge**

University of Reading, UK  
*Religion & Language*

**John Gibbons**

Hong Kong Baptist University, China  
*Law & Language*

**Mark Hale**

Concordia University, Canada  
*Historical & Comparative Linguistics*

**Patrick Hanks**

Berlin-Brandenburgische Akademie der Wissenschaften,  
Germany  
*Lexicography*

**Bernd Heine**

University of Cologne, Germany  
*Typology & Universals*

**Graeme Hirst**

University of Toronto, Canada  
*Natural Language Processing & Machine Translation*

**Kurt R Jankowsky**

Georgetown University, USA  
*Biographies*

**Dennis Kurzon**

University of Haifa, Israel  
*Law & Language*

**Jennifer Lai**

IBM Research, USA  
*Speech Technology*

**Elena Lieven**

Max Planck Institute for Evolutionary Anthropology,  
Germany  
*Language Acquisition*

**Andrew Linn**

University of Sheffield, UK  
*History of Linguistics*

**Kirsten Malmkjær**

Middlesex University, UK  
*Translation*

**Lutz Marten**

School of Oriental and African Studies  
University of London, UK  
*Countries & Language*

**Susan McKay**

University of Queensland, Australia  
*Media & Language*

**Raj Mesthrie**

University of Cape Town, South Africa  
*Society & Language*

**Miriam Meyerhoff**

University of Edinburgh, Scotland  
*Variation & Language*

**Jacob L. Mey**

University of Southern Denmark, Denmark  
*Pragmatics*

**Marc Naguib**

University of Bielefeld, Germany  
*Animal Communication*

**Jon Oberlander**

University of Edinburgh, Scotland  
*Cognitive Science*

**Sarah Ogilvie**

Oxford University Press, UK  
*Languages of the World*

**Allan Ramsay**

University of Manchester, UK  
*Computational Linguistics*

**Françoise Salager-Meyer**

Universidad de los Andes, Merida, Venezuela  
*Medicine & Language*

**Michael Silverstein**

University of Chicago, USA  
*Linguistic Anthropology*

**Rosanna Sornicola**

Università di Napoli Federico II, Italy  
*Spoken Discourse*

**Bernard Spolsky**

Bar-Ilan University, Israel  
*Education & Language*

**Robert J. Stainton**

University of Western Ontario, Canada  
*Philosophy & Language*

**Harry Whitaker**

Northern Michigan University, USA  
*Brain & Language*

**Richard Wiese**

University of Marburg, Germany  
*Phonology*

**Ruth Wodak**

University of Lancaster, UK  
*Politics & Language*

**Bencie Woll**

University College London, UK  
*Sign Language*

HONORARY EDITORIAL ADVISORY BOARD MEMBERS

**Barry Blake**

La Trobe University, Australia

**Yueguo Gu**

Chinese Academy of Social Sciences, China

**Yukio Otsu**

Keio University, Japan

**Sally Thomason**

University of Michigan, USA

**Nigel Vincent**

University of Manchester, UK

# GUIDE TO USE OF THE ENCYCLOPEDIA

---

## Structure of the Encyclopedia

The material in the Encyclopedia is arranged as a series of articles in alphabetical order. To help you realize the full potential of the material in the Encyclopedia we have provided several features to help you find the topic of your choice: an Alphabetical list of Articles, a Subject Classification, Cross-References and a Subject Index.

### 1. Alphabetical List of Articles

Your first point of reference will probably be the alphabetical list of articles. It provides a full alphabetical listing of all articles in the order they appear within the work. This list appears at the front of each volume, and will provide you with both the volume number and the page number of the article.

Alternatively, you may choose to browse through the work using the alphabetical order of the articles as your guide. To assist you in identifying your location within the Encyclopedia, a running head line indicates the current article.

You will also find 'dummy entries' for certain languages for which alternative language names exist within the alphabetical list of articles and body text.

For example, if you were attempting to locate material on the *Apalachee* language via the contents list, you would find the following:

Apalachee See Muskogean Languages.

The dummy entry directs you to the *Muskogean Languages* article.

If you were trying to locate the material by browsing through the text and you looked up *Apalachee*, you would find the following information provided in the dummy entry:

|                                            |
|--------------------------------------------|
| <b>Apalachee</b> See: Muskogean Languages. |
|--------------------------------------------|

### 2. Subject Classification

The subject classification is intended for use as a thematic guide to the contents of the Encyclopedia. It is divided by subject areas into 36 sections; most sections are further subdivided where appropriate. The sections and subdivisions appear alphabetically, as do the articles within each section. For quick reference, a list of the section headings and subheadings is provided at the start of the subject classification.

Every article in the encyclopedia is listed under at least one section, and a large number are also listed under one or more additional relevant sections. Biographical entries are an exception to this policy; they are listed only under biographies. Except for a very few cases, repeat entries have been avoided within sections, and a given

article will appear only in the most appropriate subdivisions. Again, biographical entries are the main exception, with many linguists appearing in several subdivisions within biographies.

As explained in the introduction to the Encyclopedia, practical considerations necessitate that, of living linguists, only the older generation receive biographical entries. Those for members of the Encyclopedia's Honorary Editorial Advisory Board and Executive Editorial Board appear separately in Volume 1 and are not listed in the classified list of entries.

### 3. Cross-References

All of the articles in the Encyclopedia have been extensively cross-referenced. The cross-references, which appear at the end of each article, serve three different functions. For example, at the end of *Norwegian* article, cross-references are used:

1. to indicate if a topic is discussed in greater detail elsewhere

Norwegian

*See also:* Aasen, Ivar Andreas (1813–1896); Danish; Inflection and Derivation; Language/Dialect Contact; Language and Dialect; Linguistic Varieties; Morphological Typology; **Norway: Language Situation**; Norse and Icelandic; Scandinavian Lexicography; Subjects and the Extended Projection Principle; Swedish.

2. to draw the reader's attention to parallel discussions in other articles

Norwegian

*See also:* Aasen, Ivar Andreas (1813–1896); **Danish**; Inflection and Derivation; Language/Dialect Contact; Language and Dialect; Linguistic Varieties; Morphological Typology, Norway: Language Situation; **Norse and Icelandic**; **Scandinavian Lexicography**; Subjects and the Extended Projection Principle; **Swedish**.

3. to indicate material that broadens the discussion

Norwegian

*See also:* Aasen, Ivar Andreas (1813–1896); Danish; Inflection and Derivation; Language/Dialect Contact; Language and Dialect; Linguistic Varieties; Morphological Typology; Norway: Language Situation; Norse and Icelandic; Scandinavian Lexicography; Subjects and the Extended Projection Principle; Swedish.

### 4. Subject Index

The index provides you with the page number where the material is located, and the index entries differentiate between material that is an entire article, part of an article, or data presented in a figure or table. Detailed notes are provided on the opening page of the index.

### Other End Matter

In addition to the articles that form the main body of the Encyclopedia, there are 176 Ethnologue maps; a full list of contributors with contributor names, affiliations, and article titles; a List of Languages, and a Glossary. All of these appear in the last volume of the Encyclopedia.

# ALPHABETICAL LIST OF ARTICLES

## VOLUME 4

---

Note: Readers are urged to use the comprehensive name and subject indexes and the Classified List of Entries extensively, since the contents presented here represent only the broad framework of the *Encyclopedia*.

- |                                                |                                               |
|------------------------------------------------|-----------------------------------------------|
| Du Cange, Charles du Fresne, Sieur (1610–1688) | El Salvador: Language Situation               |
| Dual-Mechanism Morphology                      | Elamite                                       |
| Duan Yucai (1735–1815)                         | Electrical Stimulation of Cortex and Language |
| Dubbing                                        | Elicitation Techniques for Spoken Discourse   |
| Dubois, Jacques (Sylvius) (1489–1555)          | Ellipsis                                      |
| Ducrot, Oswald (b. 1930)                       | Ellis, Alexander John (né Sharpe) (1814–1890) |
| Duden, Konrad (1829–1911)                      | Ellis, Francis Whyte (ca. 1778–1819)          |
| Dummett, Michael Anthony Eardley (b. 1925)     | Elphinston, James (1721–1809)                 |
| Duponceau, Pierre Étienne (1760–1844)          | E-mail, Internet, Chatroom Talk: Pragmatics   |
| Durkheim, Emile (1858–1917)                    | Embera <i>See</i> Choco Languages             |
| Dutch                                          | Emblems                                       |
| Dutch and Flemish Lexicography                 | Emeneau, Murray Barnson (b. 1904)             |
| Dyadic Constructions                           | Emotion: Stylistic Approaches                 |
| Dynamic Semantics                              | Empiricism                                    |
| Dynamic Syntax                                 | Empty Names                                   |
| E-Language versus I-Language                   | Encyclopédie                                  |
| Early Historical and Comparative Studies       | Endangered Languages                          |
| Early Irish Linguistics                        | England, Nora C.                              |
| Early Socialization and Language               | English in the Present Day (Since ca. 1900)   |
| Eblaite                                        | English Spelling: Rationale                   |
| Eco, Umberto (b. 1932)                         | English, African-American Vernacular          |
| Eco, Umberto: Theory of the Sign               | English, Early Modern                         |
| Ecuador: Language Situation                    | English, Later Modern (ca. 1700–1900)         |
| Edgerton, Franklin (1885–1963)                 | English, Middle English                       |
| Education in a Former Colonial Language        | English, Old English                          |
| Education in a Multilingual Society            | English Lexicography                          |
| Educational Failure                            | English: World Englishes                      |
| Educational Linguistics                        | Environment and Language                      |
| Efik                                           | Epistemology and Language                     |
| Egypt: Language Situation                      | Equatorial Guinea: Language Situation         |
| Egypt: Scripts, Ancient                        | Ergativity                                    |
| Einstein, Albert (1879–1955)                   | Eritrea: Language Situation                   |
| 18th Century Linguistic Thought                | Esalen <i>See</i> Hoka Languages              |

- Eskimo-Aleut  
 Esperanto  
 Essential Indexical  
 Estonia: Language Situation  
 Estonian  
 Estonian Lexicography  
 Ethiopia as a Linguistic Area  
 Ethiopia: Language Situation  
 Ethiopian Semitic Languages  
 Ethnicity  
 Ethnolinguistic Vitality  
 Ethnologue  
 Ethnomethodology  
 Ethnoscience  
 Etymology  
 Europe Alphabets, Ancient Classical  
 Europe as a Linguistic Area  
 Europe, Christian: Alphabets  
 Evaluation in Text  
 Evans, Gareth (1946–1980)  
 Evenki  
 Event-Based Semantics  
 Evidentiality in Grammar  
 Evoked Potentials  
 Evolution of Phonetics and Phonology  
 Evolution of Pragmatics  
 Evolution of Semantics  
 Evolution of Syntax  
 Evolutionary Theories of Language: Current Theories  
 Evolutionary Theories of Language: Previous Theories  
 Ewe  
 Existence  
 Experimental and Instrumental Phonetics: History  
 Experimental Methods for Study of Variation  
 Experimental Phonology  
 Expletives and Dummies  
 Expression Meaning versus Utterance/Speaker Meaning  
 Expressive Power of Language  
 Extensionality and Intensionality  
 Externalism about Content  
 Face  
 Factivity  
 Falc'hun, François (1909–1991)  
 Falkland Islands: Language Situation  
 False Friends  
 Family Speak  
 Fanagalo  
 Fant, (Carl) Gunnar (Michael) (b. 1919)  
 Faroe Islands: Language Situation  
 Feature Organization  
 Ferguson, Charles A. (1921–1998)  
 Fick, August Konrad Friedrich (1833–1916)  
 Fictional Discourse: Philosophical Aspects  
 Figurative Language: Semiotics  
 Figures of Speech  
 Fiji: Language Situation  
 Fijian  
 Fillmore, Charles J. (b. 1929)  
 Finck, Franz Nikolaus (1867–1910)  
 Fingerspelling  
 Finland: Language Situation  
 Finnish  
 Finnish as an Agglutinating Language  
 Finnish Lexicography  
 Finno-Ugric Languages *See* Uralic Languages  
 First Grammatical Treatise  
 Firth and the London School  
 Firth, John Rupert (1890–1960)  
 Firthian Phonology  
 Fischer-Jørgensen, Eli (b. 1911)  
 Fish Communication  
 Fishman, Joshua A. (b. 1926)  
 Fleuriot, Léon (1923–1987)  
 Flores Languages  
 fMRI Studies of Language  
 Focus  
 Focus Particles  
 Fodor, Jerry (b. 1935)  
 Folk Etymology  
 Folk Linguistics  
 Food: Semiotics  
 Foot  
 Foregrounding  
 Foreign Language Teaching Policy  
 Formal Models and Language Acquisition  
 Formal Semantics  
 Formalism/Formalist Linguistics  
 Formosan Languages  
 Formulaic Language  
 Formulaic Speech  
 Foucault, Michel (1926–1984)  
 Fowler, Henry Watson (1858–1933)  
 Fowler, Roger (b. 1938)  
 Frajzyngier, Zygmunt (b. 1938)  
 Frame Analysis  
 Frame Problem  
 Frame Semantics  
 France: Language Situation  
 Franglais  
 Frege, Gottlob (1848–1925)  
 Freire, Paulo (1921–1997)  
 French  
 French Guiana: Language Situation  
 French Polynesia: Language Situation  
 French Southern Antarctic Lands: Language Situation  
 French Lexicography

- 
- Freud, Sigmund (1856–1939)  
 Fries, Charles Carpenter (1887–1967)  
 Frings, Theodor (1886–1968)  
 Frisian: Etymology  
 Frisian Lexicography  
 Frog and Toad Communication  
 Fry, Dennis Butler (1907–1983)  
 Fujian *See* Chinese  
 Fujioka, Katsuji (1872–1935)  
 Fujitani Nariakira (1738–1779)  
 Fulfulde  
 Functional and Skopos Oriented Approaches to Translation  
 Functional Categories  
 Functional Discourse Grammar  
 Functional Grammar: Martinet  
 Functional Relations  
 Functionalist Theories of Language  
 Future Tense and Future Time Reference  
 Fuzhou *See* Chinese  
 Gabelentz, H. Georg Conon von der (1840–1893)  
 Gabon: Language Situation  
 Gadamer, Hans-Georg (1900–2002)  
 Galician  
 Gambia: Language Situation  
 Game-Theoretical Semantics  
 Gamilaraay  
 Gardiner, Alan, Sir (1879–1963)  
 Gauchat, Louis (1866–1942)  
 Geach, Peter Thomas (b. 1916)  
 Gedeo *See* Highland East Cushitic Languages  
 Gə'əz  
 Gelb, Ignace J. (1907–1985)  
 Gender  
 Gender and Language  
 Gender and Political Discourse  
 Gender, Grammatical  
 Gender, Sexuality and Language  
 General Semantics  
 Generalization  
 Generating Referring Expressions  
 Generative Grammar

## Du Cange, Charles du Fresne, Sieur (1610–1688)

**S Matthaios**, University of Cyprus, Nicosia, Cyprus

© 2006 Elsevier Ltd. All rights reserved.

Sieur Charles du Fresne Du Cange was a scholar, historian and lexicographer, friend of Bernard de Montfaucon (1655–1741), the founder of scientific palaeography and codicology. Du Cange came from a wealthy family, which was for centuries in the service of the royal house of France. He was born in 1610 in Amiens and attended the Jesuit college in his hometown, studied law in Orleans, and finally became an advocate, a profession which he never practiced. In 1638, he married Catherine Dupos, daughter of the treasurer of Amiens; in 1645 he succeeded his father-in-law in this position, dying in 1688 in the same town.

The circumstances of Du Canges's life enabled him to devote himself to the study of history. His research involved both the regional and the general history of France, about which he produced numerous treatises. His scholarly activities extended also to the study of Byzantine history, resulting in the editing of original sources as well as personal works on the field. Especially noteworthy is his edition of the Byzantine historian Johannes Zonaras's *Annales ab exordio mundi ad mortem Alexii Comnenis graece et latine cum notis*, and his contribution in the 42-volumed *Corpus Parisinum* of Byzantine historians, a work commissioned by Louis XIV, alongside several other important scholars of his time. Du Canges's name, however, is mainly connected with his two dictionaries, one about medieval Latin (1678), the other about the Byzantine Greek language (1688). He compiled his lexica based on his own research of the various sources, which he drew directly from the original manuscripts and not from later, edited editions, which did not yet exist for these specific authors. Due to the peculiarity of his field of research, and to the fact that the medieval Latin and Byzantine lexi-

cography attracted scholarly interest relatively late by comparison to the lexicography of the classical languages, his dictionaries remain an invaluable work of reference. Du Canges's studies go beyond the Greek and Latin languages, as was eloquently demonstrated by his posthumous work entitled *Illiricum vetus et novum* (ed. by Keglevick de Buzin, 1746), dealing with the Illyrian language.

See also: Lexicography: Overview.

### Bibliography

- Du Cange C (1678). *Glossarium ad scriptores mediae et infimae latinitatis* (3 vols). Lyon (*Glossarium mediae et infimae latinitatis, editio nova aucta ... a L. Favre*, vols. I–X, Paris. New edn., 1883–1887).
- Du Cange C (1688). *Glossarium ad scriptores mediae et infimae Graecitatis duos in tomos digestum* (2 vols). Lyon.
- Feugère L (1852). *Étude sur la vie et les ouvrages de Du Cange*. Paris: Impr. Dupont.
- Hunger H (1978). *Die hochsprachliche profane Literatur der Byzantiner* (2 vols). München: Beck (*Handbuch der Altertumswissenschaft XII 5.1–2*).
- Omout H (1892). 'Lettres d'Anisson à Du Cange relatives à l'impression du glossaire grec (1682–1688).' *Revue des études grecques* 5, 212–219.
- Pfeiffer R (1982). *Die Klassische Philologie von Petrarca bis Mommsen. Aus dem Englischen übertragen von Marlene und Erwin Arnold*. München: Beck.
- Spieser J-M (2000). 'Du Cange and Byzantium.' In Cormack R & Jeffreys E (eds.). *Through the looking glass. Byzantium through British eyes. Papers from the twenty-ninth spring symposium of Byzantine studies, London, March 1995*. Aldershot, Burlington USA, Singapore, Sydney: Ashgate. 199–210 (*Society for the Promotion of Byzantine Studies* 7).
- Wilamowitz-Moellendorf U von (1998). *Geschichte der Philologie. Mit einem Nachwort und Register von Albert Henrichs* (Neudruck der Erstauflage von 1921). Stuttgart–Leipzig: Teubner.

## Dual-Mechanism Morphology

**H Clahsen**, University of Essex, Colchester, UK

© 2006 Elsevier Ltd. All rights reserved.

Our understanding of how an adult native speaker/hearer processes inflected word forms in real time has increased considerably over the last decade. Experimental studies using a range of different

psycholinguistic methods and techniques, e.g., lexical decision, priming, and event-related potentials (ERPs), have led to a number of consistent and replicable results such as frequency effects for inflected word forms in lexical decision tasks, priming effects for inflected word forms in different kinds of priming experiments, and left-anterior negativities for incorrectly inflected word forms in ERP violation studies;

see Clahsen (1999) and Pinker (1999) for review. The theoretical interpretation of these and other results on morphological processing in adult native speakers is controversial; basically, three different approaches can be distinguished. On one side are different kinds of associative single-mechanism models claiming that all inflected words are stored and processed within a single associative system using distributed representations (see, e.g., Bybee, 1995; Sereno and Jongman, 1997, among others). The morphological structure of an inflected word is not explicitly represented in these models; instead, these models implement networks that represent the mapping relationship between different word forms through associatively linked orthographic, phonological and semantic codes. A radical alternative to these models are rule-based single-mechanism accounts in which all inflected words are formed by morphophonological rules, and memorization of inflected words is avoided as much as possible. Halle and Mohanan (1985) and related work in generative phonology in which minor rules are proposed (for example, *Lowering ablaut* deriving the past tense form *sang* from the stem *sing*) are representative of this approach; see Yang (2000) for a recent treatment of the English past tense in this framework. The third theoretical viewpoint is represented by a family of dual-mechanism models, which hold that morphologically complex word forms can be processed both associatively, i.e., through stored full-form representations and by rules that decompose or parse inflected word forms into morphological constituents (Chialant and Caramazza, 1995; Schreuder and Baayen, 1995; Clahsen, 1999; Pinker, 1999, among others). Here, we provide a brief overview of different variants of dual-mechanism models that are currently being discussed in the literature.

There is a class of dual-route models specifically concerned with the kinds of mental representation listeners consult in recognizing morphologically complex words. As is common in word-recognition research, modality-specific access representations are assumed to mediate the mapping from the orthographic or spoken input onto lexical representations in the central lexicon. Dual-route models posit that morphologically complex words can be recognized either via prelexical morphological parsing, which decomposes the orthographic or spoken input into its morphological components, or via a direct-access route, which is based on stored full-form representations for morphologically complex words. Different proposals have been made as to how these two access routes interact. For example, according to Caramazza and collaborators, full-form-based lexical access is preferred for all known words, and the parsing route is only employed for novel or extremely rare

words that are morphologically regular (Chialant and Caramazza, 1995). In contrast, according to the morphological race model proposed by Baayen, Schreuder and collaborators, both the parsing route and the direct route operate in parallel. Which of these two routes turns out to be more efficient is claimed to depend on a number of factors, including the frequency of an inflected word and its constituents, the lexical neighborhood, the phonological and semantic transparency (vs. opacity) of a morphologically complex word, and the degree of homonymy of an affix (see, e.g., Baayen *et al.*, 2003; Bertram *et al.*, 2000). Much of the empirical evidence in the context of dual-route models comes from just one experimental task, namely so-called lexical decision, in which subjects have to discriminate between existing words (which have been encountered before) and nonce words (that have never been encountered before), e.g., *houses* vs. *nouses*. Lexical decision is a rather odd task, and it is hard to tell what response times to this task actually mean; see Balota (1994) and Deutsch and Müller (1999) for discussion. It seems clear, however, that given the task demands, lexical decision encourages subjects to strongly rely on memory, in order to determine whether or not they have encountered a stimulus word before. Thus, it could be that results from lexical decision have led us to overestimating the role of full-form access (as opposed to morphological parsing) in recognizing inflected and derived words.

Another variant of dual-mechanism morphology is the *words-and-rules* model of Pinker and collaborators (see, e.g., Pinker, 1999, Pinker and Ullman, 2002). The basic claim of the words-and-rules account is that two complementary systems coexist in how our mind/brain processes and learns language: a combinatorial (rule-based) system that generalizes over symbolic categories such as N(oun), V(erb), etc. and treats all members of a given category equally, and an associative system that extracts probabilistic contingencies such as frequency distributions, similarity clusters from the input data. These two systems can be implemented as neural circuits or subroutines that do not just underlie linguistic generalization, but are claimed to be used in other domains of cognition as well, for learning, and comparing in general. The key property of the combinatorial system is that it suppresses differences between individual examples and treats all members of a group or class equally. In contrast, the associative system generalizes on the basis of resemblance to stored examples. Extending Pinker's model, Ullman (2001) has argued that the distinction between words and rules can be linked to two different brain memory systems, according to which the associative system (words) depends upon

declarative memory and is rooted in temporal lobe structures of the brain, whereas the combinatorial system (rules) is rooted in frontal brain structures. However, the evidence currently available for such a strong localist interpretation of the words-and-rules distinction has not yet convinced everybody.

Much of the empirical research on the words-and-rules model comes from the study of a rather simple inflectional system, the English past tense. Pinker argues that the two different systems of his model directly correspond to the linguistic distinction between regular and irregular past tense formation. Regular *-ed* inflection is predictable in form, readily applies to novel items, and invokes a combinatory rule (add *-ed*) that may operate on the outputs of other morphological processes (derivation, compounding). On the other hand, irregular past tense inflection (e.g., *sing-sang*) is based on stored forms that cannot be perfectly predicted by the form of the stem or root, and only tentatively extends to new forms. There is indeed a considerable body of psycholinguistic evidence for the distinctions posited by the words-and-rules model from studies of the English past tense, investigating child language acquisition (Marcus *et al.*, 1992), adult language processing (Alegre and Gordon, 1999), brain-imaging and event-related potentials (Jaeger *et al.*, 1996; Münte *et al.*, 1999), and language disorders (Marslen-Wilson and Tyler, 1997; Clahsen *et al.*, 2004).

However, despite all the evidence that has been accumulated on the English past tense, there are many reasons to extend research on dual-mechanism morphology to a wider range of languages. Note, for example, that the English past tense has only one productive form (*-ed*) and that regularity is confounded with both the presence of an overt affix and with type frequency. Regular verbs in English are much more frequent (95%) than irregular ones (5%); see Marcus *et al.* (1995), and regular past tense forms contain a segmentable affix, whereas irregular forms typically do not have affixes. These two confounding features leave room for several alternative interpretations of the same set of facts. Potential differences, for example, between forms such as *walk-ed* and *came* in acquisition and processing could be effects of frequency differences and/or effects of the presence or absence of an overt affix, rather than the result of different mental representations.

To address these concerns, psycholinguistic studies have examined a range of typologically different languages from the perspective of dual-mechanism morphology: German: Clahsen (1999); Hebrew: Berent *et al.* (1999); Italian: Say and Clahsen (2002); Spanish: Clahsen *et al.* (2002a), Rodríguez-Fornells *et al.* (2002); Catalan: Rodríguez-Fornells

*et al.* (2001). These studies focus on the question of whether and how the fundamental distinction between lexical storage and combinatory rules extends to linguistic systems other than the English past tense (see Pinker 1999, Chap. 8 for review). The results of these studies revealed contrasts that were similar to those obtained for regular and irregular inflection in English even though the vocabulary distribution, the surface morphology, and other properties of the language were different from those of English past tense formation. For example, psycholinguistic examination of the German noun plural system revealed that even though the *-s* plural is the least frequent plural allomorph in German, it exhibits the same experimental effects as the regular past tense *-ed* in English (Marcus *et al.*, 1995). The same is true for past participle formation in German although, unlike English, German has two segmentable participle endings, the regular *-t* and the irregular *-n*, and the vocabulary distribution for regulars and irregulars is different from that of the English past tense (Clahsen, 1999). Priming experiments revealed regular/irregular differences for German participles even though the phonological and orthographical distance between the participle forms and their corresponding stem forms tested was identical for both regular and irregular verbs (Sonnenstuhl *et al.*, 1999). For example, an irregular participle such as *geschlafen* 'slept' is as similar to its base form (*schlaf*) as a regular participle (e.g., *geöffnet* 'opened') is to its base stem (*öffn-*), and despite these formal similarities, the regular form produced full priming and the irregular one did not, exactly as in corresponding experiments on the English past tense (Stanners *et al.*, 1979). These results show not only that the words-and-rules model extends to morphological systems other than the English past tense, but also that alternative nonmorphological factors (e.g., the frequency distribution and the surface properties of inflected word forms) that may hold for the English past tense cannot explain the observed contrasts between lexically based (frozen) and rule-based (built) inflected word forms.

Dual-mechanism morphology can be implemented into an explicit linguistic theory in different ways. One direct implementation is Wunderlich and colleagues' morpheme-based model (Wunderlich, 1996) according to which irregularly inflected forms are lexically represented as subnodes of structured lexical entries, while regular inflection involves combinatorial rules that concatenate an affix with a lexical entry. An alternative implementation within realization-based models of morphology reconstructs this contrast in terms of the distinction between rules that contain variables and those that have a constant output; see, e.g., Blevins (2004). Irregular inflection,

for example, the form *is* of the verb *to be*, is encoded as a realization rule that has a constant formal spell-out (<[V, 3sg, pres, ind, BE], is>), whereas combinatorial (regular) inflection such as the regular 3sg present tense *-s* in English is based on a realization rule (<[V, 3sg, pres, ind], X + s>) that adds the exponent 's' to the base form represented by a variable (X) yielding inflected word forms for any verb that is not blocked by a more specific rule. Thus, although dual-mechanism morphology can be construed in terms of an opposition between rules and entries, the basic distinction between built and stored elements can also be expressed in alternative all-rules models of morphology.

From a linguistic perspective, dual-mechanism morphology and the accompanying empirical studies suggest that structural differences between built and frozen forms correspond to differences in the way they are mentally represented and processed by the speaker/hearer and acquired by children. This raises the question of whether there is any psycholinguistic evidence for more complex morphological concepts and operations that go beyond the simple opposition between built and frozen forms, a question that my colleagues and I have investigated in a number of recent studies using psycholinguistic experiments and other sources of evidence. We have studied, for example, the mental representation of stem allomorphy (Clahsen *et al.*, 2001a, 2002b), the role of inflectional paradigms in language processing and disorders (Clahsen *et al.*, 2001a, 2001b), and the effects of the split between derivation and inflection on morphological processing (Clahsen *et al.*, 2003). Even though further study is required to determine whether the results obtained generalize to other morphological systems, the findings from these studies suggest that morphological distinctions (beyond words-and-rules) do indeed play an important role in the organization of the mental lexicon and that morphological notions and concepts are not only useful descriptive tools for linguists, but also contribute to a better understanding of how the speaker/hearer processes morphologically complex words.

See also: Inflection and Derivation; Morphology in Parallel Distributed Processing; Psycholinguistic Research Methods; Psycholinguistics: Overview.

## Bibliography

- Alegre M & Gordon P (1999). 'Rule-based versus associative processes in derivational morphology.' *Brain & Language* 68, 347-354.
- Baayen H & Dijkstra T R (2003). 'Frequency effects in regular inflectional morphology: revisiting Dutch plurals.' In Baayen H & Schreuder R (eds.) *Morphological structure in language processing*. Berlin: Mouton de Gruyter. 355-390.
- Balota D A (1994). 'Visual word recognition: The journey from features to meaning.' In Gernsbacher M A (ed.) *Handbook of psycholinguistics*. San Diego, CA: Academic Press. 303-349.
- Berent I, Pinker S & Shimron J (1999). 'Default nominal inflection in Hebrew: evidence for mental variables.' *Cognition* 72, 1-44.
- Bertram R, Schreuder R & Baayen H (2000). 'The balance of storage and computation in morphological processing: The role of word formation type, affixal homonymy, and productivity.' *Journal of Experimental Psychology: Memory, Learning, and Cognition* 26, 419-511.
- Blevins J P (2004). 'Stems and paradigms.' *Language* 79, 737-767.
- Bybee J L (1995). 'Regular morphology and the lexicon.' *Language and Cognitive Processes* 10, 425-455.
- Chialant D & Caramazza A (1995). 'Where is morphology and how is it processed? The case of written word recognition.' In Feldman L (ed.) *Morphological aspects of language processing*. Hillsdale, NJ: Erlbaum Press. 55-76.
- Clahsen H (1999). 'Lexical entries and rules of language: a multi-disciplinary study of German inflection.' *Behavioral and Brain Sciences* 22, 991-1060.
- Clahsen H, Eisenbeiss S, Hadler M & Sonnenstuhl I (2001a). 'The mental representation of inflected words: an experimental study of adjectives and verbs in German.' *Language* 77, 510-543.
- Clahsen H, Sonnenstuhl I, Hadler M & Eisenbeiss S (2001b). 'Morphological paradigms in language processing and language disorders.' *Transactions of the Philological Society* 99, 247-277.
- Clahsen H, Avelledo F & Roca I (2002a). 'The development of regular and irregular verb inflection in Spanish child language.' *Journal of Child Language* 29, 591-622.
- Clahsen H, Prüfert P, Eisenbeiss S & Cholin J (2002b). 'Strong stems in the German mental lexicon: evidence from child language acquisition and adult processing.' In Kaufmann I & Stiebels B (eds.) *More than words: a festschrift for Dieter Wunderlich*. Berlin: Akademie-Verlag. 91-112.
- Clahsen H, Sonnenstuhl I & Blevins J P (2003). 'Derivational morphology in the German mental lexicon: a dual mechanism account.' In Baayen H & Schreuder R (eds.) *Morphological structure in language processing*. Berlin: Mouton de Gruyter. 125-155.
- Clahsen H, Ring M & Temple C (2004). 'Lexical and morphological skills in English-speaking children with Williams Syndrome.' In Bartke S & Siegmüller J (eds.) *Williams Syndrome across languages*. Amsterdam: Benjamins. 221-244.
- Deutsch W & Müller O (1999). 'Chomsky's new clothes.' [Commentary to Clahsen 1999]. *Behavioral and Brain Sciences* 22, 1020.

- Halle M & Mohanan K (1985). 'Segmental phonology of modern English.' *Linguistic Inquiry* 16, 57–116.
- Jaeger J, Lockwood A, Kemmerer D, Van Valin R, Murphy B & Khalak H (1996). 'A positron emission tomographic study of regular and irregular verb morphology in English.' *Language* 72, 451–497.
- Marcus G F, Pinker S, Ullman M, Hollander M, Rosen T & Xu F (1992). 'Overregularization in language acquisition.' In *Monographs of the Society for Research in Child Development*, vol. 57 (4, Serial No. 228).
- Marcus G F, Brinkmann U, Clahsen H, Wiese R & Pinker S (1995). 'German inflection: the exception that proves the rule.' *Cognitive Psychology* 29, 189–256.
- Marslen-Wilson W & Tyler L (1997). 'Dissociating types of mental computation.' *Nature* 387, 592–594.
- Münste T F, Say T, Schiltz K, Clahsen H & Kutas M (1999). 'Decomposition of morphologically complex words in English: Evidence from event-related brain potentials.' *Cognitive Brain Research* 7, 241–253.
- Pinker S (1999). *Words and rules*. New York, NY: Basic Books.
- Pinker S & Ullman M (2002). 'The past and future of the past tense.' *Trends in Cognitive Sciences* 6, 456–462.
- Rodríguez-Fornells A, Clahsen H, Lleo C, Zaake W & Münste T F (2001). 'Event-related brain responses to morphological violations in Catalan.' *Cognitive Brain Research* 11, 47–58.
- Rodríguez-Fornells A, Münste T F & Clahsen H (2002). 'Morphological priming in Spanish verb forms: An ERP repetition priming study.' *Journal of Cognitive Neuroscience* 14, 443–454.
- Say T & Clahsen H (2002). 'Words, rules and stems in the Italian mental lexicon.' In Nooteboom S, Weerman F & Wijnen F (eds.) *Storage and computation in the language faculty*. Dordrecht: Kluwer. 93–129.
- Schreuder R & Baayen H (1995). 'Modeling morphological processing.' In Feldman L (ed.) *Morphological aspects of language processing*. Hillsdale, NJ: Erlbaum Press. 131–154.
- Sereno J A & Jongman A (1997). 'Processing of English inflectional morphology.' *Memory & Cognition* 25, 425–437.
- Sonnenstuhl I, Eisenbeiss S & Clahsen H (1999). 'Morphological priming in the German mental lexicon.' *Cognition* 72, 203–236.
- Stanners R F, Neiser J J, Hernon W P & Hall R (1979). 'Memory representation for morphologically related words.' *Journal of Verbal Learning and Verbal Behavior* 18, 399–412.
- Ullman M (2001). 'A neurocognitive perspective on language: the declarative/procedural model.' *Nature Reviews Neuroscience* 2, 717–727.
- Wunderlich D (1996). 'Minimalist morphology: the role of paradigms.' *Yearbook of Morphology* 1995. Dordrecht: Kluwer. 93–114.
- Yang C D (2000). *Knowledge and learning in natural language*. Unpublished Ph.D. diss., MIT.

## Duan Yucai (1735–1815)

**B-C Kwok**, The Chinese University of Hong Kong, Hong Kong, China

© 2006 Elsevier Ltd. All rights reserved.

Duan Yucai (also known as Duan Ruoying and Duan Maotang) is regarded as one of the most outstanding scholars in the study of Chinese philology in the Qing dynasty (1644–1911). He was a native of Jintan County in Jiangsu Province and grew up there. In 1763 he met the eminent scholar Dai Zhen (1725–1777) in Beijing and later became his disciple. Duan's development was deeply influenced by his teacher.

Duan's works on etymology and phonology have held dominant positions in their respective areas. His *Shuowen jiezi zhu* (*Annotation on the Shuowen jiezi*), a nearly thirty-year effort, inspired a golden era of study on the *Shuowen jiezi*. The *Shuowen jiezi*, compiled in the first century, is the earliest extant etymological dictionary of Chinese characters. While

numerous attempts had been made before Duan to amend the *Shuowen jiezi*, it was not until Duan's work that the *Shuowen jiezi* really was thoroughly and systematically analyzed. His lengthy annotation covered many areas, with the following contributions particularly worth mentioning: (1) by using evidence from the dictionary itself and other classical documents, a large number of original annotations and even old writings of characters in the *Shuowen jiezi* were corrected; (2) the meanings of various technical terms employed in the *Shuowen jiezi* were explained in detail; (3) the format of the entries in the *Shuowen jiezi* was explicated, which in turn enabled Duan himself to correct and amend the dictionary; (4) the original meaning, the derived meanings, and any phonetic loan uses of each character were discussed, and their semantic changes were well illustrated with reference to classical documents; (5) sets of cognate words were identified, paving the way to the modern study of Chinese word families. One of the many reasons why Duan succeeded in the annotation is

that he applied his phonological theories properly to tackle the puzzling problems in the dictionary. The preface of the annotation, written by Wang Niansun (1744–1832, see Wang Nien-Sun (1744–1832)), confirmed this point.

Duan's phonological theories can be found in his *Liushu yinyun biao* (*Phonological table of six character types*). He divided Old Chinese into seventeen rhyme categories, eight less than Dai Zhen. Another important theory put forward by Duan is "(characters with) the same phonetic element must be in the same rhyme category." This principle was thoroughly applied in the *Shuowen jiezi zhu*, where every word was assigned to one of his seventeen categories. His observations on intercategory rhyming practice and sound changes were also innovative.

It is not an exaggeration to say that Duan's work had turned the trends of the studies on Chinese philology. His followers inherited the method of linking etymology and phonology together, and

applied it in the interpretation of various classical texts. Eventually fruitful results were achieved.

See also: Chinese; Wang Li (1900–1986); Wang Nien-Sun (1744–1832).

## Bibliography

- Baxter W H (1992). *A handbook of old Chinese phonology*. Berlin: Mouton de Gruyter.
- Duan Yucai ([1776] 1983). *Liushu yinyun biao*. Beijing: Zhonghua shuju.
- Duan Yucai ([1815] 1981). *Shuowen jiezi zhu*. Shanghai: Shanghai guji chubanshe.
- Hummel A W (ed.) (1967). *Eminent Chinese of Ch'ing period (1644–1912)*. Taipei: Ch'eng Wen Publishing Company.
- Wang Li (1992). *Qingdai guyinxue*. Beijing: Zhonghua shuju.

## Dubbing

**F Chaume-Varela**, Universitat Jaume I, Castelló de la Plana, Spain

© 2006 Elsevier Ltd. All rights reserved.

Dubbing is a type of Audiovisual Translation mainly used in Germany, Italy, France, Spain, Austria, Switzerland, Hungary, the Czech Republic, Slovakia, Turkey, Brazil, China, Japan, most Asian countries, and some North-African countries, consisting of a replacement of the original track of a film containing the source language dialogs, for another track on which translated dialogs in the target language are recorded. The remaining tracks are kept inviolable (the soundtrack – including music and special effects – and the track containing the images). Audiovisual Translation, a generic term equivalent to Screen Translation or Media Translation and opposed to written and oral translation, not only includes dubbing but also subtitling – the other major type of Audiovisual Translation – voice-over, narration, free commentary, and partial dubbing (Luyken *et al.*, 1991; Gambier, 2000; Díaz Cintas, 2003; Chaume, 2004a). The term *revoicing* also can be used as a synonym for dubbing, but it also includes the process of intralingual postsynchronization (when the original dialogs of a film are subsequently recorded in a studio). When revoicing is just used as a synonym for dubbing or interlingual postsynchronization, the term

includes all dubbing types (dubbing properly, partial dubbing, narration, voice-over, etc.).

## The Dubbing Process

The process of dubbing begins when a TV channel or a movie house decides to buy (the exhibition rights of) a foreign film in a foreign language in order to offer it in the local language. Then the TV channel or movie house commissions the translation and the dubbing process to a dubbing studio. In the studio, a dubbing director selects the voices (professional dubbing actors and actresses) that will give life to the translation, and stimulates and instructs the actors to put on the most adequate and accurate acting performances. At the same time, the studio commissions the translation to a professional translator. The translation brief usually consists of a literal translation that reflects all the idiosyncrasies of the source text and culture – the so-called rough translation. Then a dialog writer rewrites the translation (sometimes this is also done by the same translator), making it sound like natural speech and taking care of the three kinds of synchronization described below. This text is then passed on to the dubbing actors and actresses who, under the supervision of the dubbing director, will utter and fit all sentences into the mouth of the original source actors and actresses of the film. A sound technician or engineer will then record the target dialogs on a