

BUCHREIHE DER ANGLIA
ZEITSCHRIFT FÜR ENGLISCHE PHILOLOGIE

Herausgegeben von
Helmut Gneuss, Hans Käsmann, Erwin Wolff
und Theodor Wolpers

22. Band

KARL REICHL

Categorial Grammar and
Word-Formation:
The De-adjectival Abstract
Noun in English



MAX NIEMEYER VERLAG TÜBINGEN

1982

Als Habilitationsschrift auf Empfehlung des Fachbereichs Sprach- und Literaturwissenschaft I der Universität München gedruckt mit Unterstützung der Deutschen Forschungsgemeinschaft.

CIP-Kurztitelaufnahme der Deutschen Bibliothek

Reichl, Karl:

Categorial grammar and word-formation: the de-adjectival abstract noun in English / Karl

Reichl. – Tübingen : Niemeyer, 1982.

(Buchreihe der Anglia, Zeitschrift für englische Philologie ; Bd. 22)

NE: GT

ISBN 3-484-42122-3 ISSN 0340-5435

© Max Niemeyer Verlag Tübingen 1982

Alle Rechte vorbehalten. Ohne ausdrückliche Genehmigung des Verlags ist es auch nicht gestattet, dieses Buch oder Teile daraus auf photomechanischem Wege zu vervielfältigen.

Printed in Germany.

Satz und Druck: Allgäuer Zeitungsverlag GmbH, Kempten.

Bindearbeiten: Heinrich Koch, Tübingen.

Contents

Preface	VII
Abbreviations	IX
1. Introduction	1
2. Methods of Analysis	6
2.1 Derivation as a Morphological Process	8
2.1.1 Structuralist Analyses	8
2.1.2 Formalization	14
2.2 Derivation and Syntax	21
2.2.1 Non-transformational Analyses	21
2.2.2 The Transformationalist Position	23
2.3 Derivation and the Lexicon	27
2.3.1 Pre-lexical 'Semantico-Syntax'	29
2.3.2 The Lexicalist Position	33
3. Categorical Grammars and Formal Semantics	41
3.1 Categorical Grammars	41
3.1.1 The 'Standard Model'	41
3.1.2 Applicative Grammar	54
3.2 Formal Semantics	60
3.2.1 Montague Grammar	61
3.2.2 Variants and Extensions	76
4. Word-Formation within a Categorical Framework	89
4.1 Functional Structure	89
4.1.1 The Functional Principle	89
4.1.2 Syntactical, Lexical and Grammatical Categories	92
4.1.3 Deep Structure Categorical Grammar	95
4.1.4 The Categorization of the Adjective	103
4.2 Syntax, Semantics and the Lexicon	113
4.2.1 Syntax	113
4.2.2 Word-Formation	130
4.2.3 Semantics and the Lexicon	147

5. The De-adjectival Abstract	157
5.1 Derivational Morphology	157
5.1.1 Segmentation and Derivational Types	158
5.1.2 Suffixation	174
5.2 Syntax and Semantics	189
5.2.1 Problems of Quantification	190
5.2.2 Abstraction and Nominalization	199
5.2.3 Abstract Types and Lexicalization	221
6. Conclusion	236
Bibliography	240

Preface

This study of the de-adjectival abstract noun in English is an attempt to apply categorial grammar in its various forms to a well-defined body of empirical data. This application of a theoretical framework, first formulated and predominantly explored in the field of syntax and propositional semantics, to a range of phenomena in the field of derivational morphology has led to a revision of both surface structure oriented and deep structure oriented categorial grammars. Given the restrictions of the topics to be discussed in this book, these revisions must be of a tentative nature. Further modifications might be called for when other areas of linguistic structure are investigated more thoroughly. Nevertheless, it is to be hoped that this study will contribute to a better understanding of the possibilities of a categorial grammar. As a familiarity with the various versions of categorial grammar cannot be assumed in all readers interested in derivational phenomena in English, a rather large part of this book is devoted both to an exposition of the principles of categorial grammar and a discussion of the theoretical model adopted here. It is hoped that this exposition and discussion will prove helpful for the evaluation of the analyses and interpretations proposed in Chapter Five.

This book is the revised English version of my German *Habilitationsschrift*, submitted to the *Fachbereich Sprach- und Literaturwissenschaft I* of the University of Munich. I am grateful to the *Deutsche Forschungsgemeinschaft* for a generous research grant. I am furthermore grateful to Professor Dr. Helmut Gneuss, who has been most encouraging during my years of studying and teaching at the English Department of the University of Munich, and to Professors Dr. Hans Käsmann, Dr. Leonhard Lipka and Dr. Theo Vennemann for their helpful criticism of this study, as well as to Dr. Raymond Hickey for correcting the English version. Any shortcomings in this book, however, remain my responsibility. I would also like to thank Professor Dr. Winfried Lenders and Dr. Gerd Willée of the Department for Linguistic Computer Research in the *Institut für Kommunikationsforschung und Phonetik* at the University of Bonn for their help with the *Brown University Corpus*. Finally, my

thanks are also due to the editors of the *Buchreihe der Anglia* and to the publisher for kindly accepting my study.

It is customary to end the preface by thanking one's wife for having typed the manuscript. Having typed (and re-typed) the manuscript myself, I would prefer to thank my wife and children for having prevented me from becoming too engrossed in my scholarly work and thus missing out on all the other joys of life.

Bonn

January, 1981

Abbreviations

AL:	<i>Acta Linguistica Hafniensia</i>
ALD:	Hornby, A.S., A.P. Cowie, eds. (1980), <i>Oxford Advanced Learner's Dictionary of Current English</i> , third rev. ed., Oxford.
BSL:	<i>Bulletin de la Société de Linguistique de Paris</i>
Chambers:	Macdonald, A.M., ed. (1973), <i>Chambers Twentieth Century Dictionary, New Edition</i> , rev. ed., Edinburgh [edition used for the compilation of the corpus].
CLS:	<i>Papers from the . . . th Regional Meeting Chicago Linguistic Society</i>
CSL:	Cambridge Studies in Linguistics
EFW:	Marchand, H. (1969), <i>The Categories and Types of Present-Day English Word-Formation</i> , second ed., München.
Eph:	Edwards, P., ed. (1967), <i>Encyclopaedia of Philosophy</i> , 8 vols., New York.
FL:	<i>Foundations of Language</i>
GCE:	Quirk, R., S. Greenbaum, G. Leech, J. Svartvik (1973), <i>A Grammar of Contemporary English</i> , second impr. with corr., London.
HEW:	Kozioł, H. (1972), <i>Handbuch der englischen Wortbildungslehre</i> , second ed., Heidelberg.
HWPph:	Ritter, J., K. Gründer, eds. (1971-), <i>Historisches Wörterbuch der Philosophie</i> , Basel, Darmstadt.
IBAL:	Internationale Bibliothek für allgemeine Linguistik
IF:	<i>Indogermanische Forschungen</i>
IULC:	Indiana University Linguistics Club
JL:	Janua Linguarum
JL:	<i>Journal of Linguistics</i>
L:	<i>Language</i>
MED:	Kurath, H., S.M. Kuhn, J. Reidy, eds. (1952-), <i>Middle English Dictionary</i> , Ann Arbor, Mich.
MEG:	Jespersen, O. (1901-49), <i>A Modern English Grammar on Historical Principles</i> , 7 vols., Heidelberg, Copenhagen.
MSSE:	Stockwell, R.P., P. Schachter, B.H. Partee (1973), <i>The Major Syntactic Structures of English</i> , New York.
NHLS:	North-Holland Linguistic Series
OED:	Murray, J.A.H., H. Bradley, W.A. Craigie, C.T. Onions, eds. (1933), <i>The Oxford English Dictionary</i> , 13 vols., Oxford. Burchfield, R.W. (1972-), <i>A Supplement to the Oxford English Dictionary</i> , Oxford.
REW:	Meyer-Lübke, W., ed. (1935), <i>Romanisches etymologisches Wörterbuch</i> , third ed., Heidelberg.

- RWEG: Lehnert, M., ed. (1971), *Rückläufiges Wörterbuch der englischen Gegenwartssprache*, Leipzig.
- SOED: Little, W., C.T. Onions, eds. (1973), *The Shorter Oxford English Dictionary on Historical Principles*, third rev. ed. with etymologies rev. by G.W.S. Friedrichsen and with rev. addenda, Oxford.
- TBL: Tübinger Beiträge zur Linguistik

I.

Introduction

This book deals with a topic which at first sight might seem rather specialized. It sets out to analyse a fairly restricted class of linguistic phenomena, the de-adjectival abstract nouns in English. Even a quite superficial characterization of de-adjectival abstracts, however, reveals that the questions to be raised and discussed in the course of this study are both of a ramified and rather complex nature, intimately connected to some of the most fundamental problems of linguistic analysis. If we look at a de-adjectival abstract like *goodness* and contrast it with other 'nominal forms' of the adjective *good* as for instance in (1) to (5), some of the most salient features of the adjective-derived abstract noun become apparent.

- (1) *His being so good surprised me.*
- (2) *He denied the bad results and admitted only the good ones.*
- (3) *The good must not be treated badly.*
- (4) *He moved his goods somewhere else.*
- (5) *He certainly is a goody.*

Without going into details at this stage, we might say that the main difference between *goodness*, *goods* in (4) and *goody* in (5) on the one hand and the nominalizations of *good* in (1) and (2) is that in the derivation of the former words a change of the lexical class of *good* is involved, while in (1) and (2) *good* is still an adjective. The so-called partial conversion of *good* in (3) is a border-line case, one of many. It is classified as a conversion, because there is no overt mark for the change of lexical class the adjective *good* has undergone in (3), as distinct from e.g. suffixation like in *goodness* or *goody*; but this conversion has been effected only in part: in (3) *good* retains some of its adjectival qualities such as modification by adverbs (cf. *the very good* etc.).¹ As to the distinction

¹ For the view that partially converted adjectives are adjectives functioning as head of a noun phrase (and that thus no change of lexical class has occurred) see *GCE*: 251-3,

between the nominalization of *good* in *goodness* on the one hand and in *goods* or *goody* on the other, it is obviously of a semantic kind; *goodness* denotes an abstract object, while *goods* and *goody* do not.

There are more syntactic and semantic differences (as well as morphological ones) between the various nominalizations of *good*; furthermore those mentioned are not yet stated in sufficient detail or with enough precision. Terms like 'lexical class', 'denote', 'abstract object' and, of course, 'nominalization' present a great number of problems and suggest the wider context in which this study is placed: the theory of the parts of speech, the lexicalist-transformationalist controversy, the relationship between propositional and lexical semantics and, from a philosophical point of view, the problem of universals, to name only the most important. Although concentrating on de-adjectival abstract nouns, a number of points which are of a more general interest will thus have to be discussed in the following chapters.

The derivation of an abstract noun from an adjective was seen as a predominantly philosophical problem in traditional linguistic theory. If nouns denote substances, more specifically 'substances with quality' as Priscian and Donat had taught, what kind of substances do abstracts like *albedo*, "whiteness", denote, the medieval grammarians asked. Do they only signify the 'form' of substances or merely 'qualities' inherent in substances? Petrus Helias, a twelfth century grammarian, brings a lengthy and tortuous discussion of this problem in his *Summa* on Priscian, and the definition of abstracts continued to intrigue grammarians and logicians alike throughout the Middle Ages.²

The analysis of abstracts as words standing for 'abstract ideas' is intricately bound up with the theory of knowledge in rationalist and empiricist philosophy, and this aspect is also reflected in philosophically oriented grammatical treatises, as for instance in James Harris' *Hermes*:

Agen, by a *more refin'd operation of our Mind alone*, we *abstract any Attribute* from its necessary subject, and consider it *apart* devoid of its dependence. For example, from *Body* we abstract to *Fly*; from *Surface*, *the being White*; from *Soul*, *the being Temperate*.

AND thus 'tis *we convert even Attributes into Substances*, denoting them on this occasion by proper *Substantives*, such as *Flight*, *Whiteness*, *Temper-*

1010-1; for the interpretation of partially converted adjectives as class abstractions cf. below 5.2.2. The full conversion of adjectives is treated in Bergener (1928); see also Biese (1941) and EWF: 359ff.

² Cf. De Rijk (1962-7: II, 221 ff.), Reichl (1976: 167ff.).

ance; or else by others more general, such as *Motion*, *Colour*, *Virtue*. These we call ABSTRACT SUBSTANCES; the second sort we call ARTIFICIAL. (Harris, 1751: 37–8)

Henry Sweet, at the end of the 19th century, still used, in his *New English Grammar*, the distinction between a substance as something concrete and an attribute as something abstract to define abstract nouns (cf. Sweet, 1892–8: I, 12, 61–2).

In post-Saussurean modern linguistics, however, the tendency towards a formal approach to language has led to a dissociation of the various questions the analysis of abstracts poses. With the definition of word classes by non-semantic criteria, as exemplified in the works of C.C. Fries and Z.S. Harris for instance, the problem of what sort of entities abstract nouns denote ceased to puzzle linguists. Abstract nouns are now merely a sub-class of nouns, with whose morphological and syntactical behaviour alone a grammar has to cope. It is only with the increasing influence of logic and analytic philosophy on linguistics that the semantic aspect of abstracts has again come into the range of grammatical theory, where it can now be formulated with more precision than in traditional treatments of language.

It is in this vein that the following study attempts to consider the morphological, syntactic and semantic characteristics of the abstract noun in English, more precisely of the de-adjectival abstract. The limitation to de-adjectival nouns was necessitated by reasons of length; many of the observations made apply also to deverbal abstracts, however. It was with a view to analysing abstracts on the various linguistic levels that a categorial framework was adopted. Categorial grammars were first formalized in the fifties and have received new attention through the development of formal semantics, notably in 'Montague grammar'. While the earlier versions of categorial grammar—especially in the form of an 'applicative grammar'—are particularly suitable for the analysis of the morphological structure of derived lexemes, the model-theoretic categorial grammars advocated by R. Montague, D. Lewis, M. Cresswell and others provide a precise instrument for the description of their semantic structure. It will be one of the concerns of this book to show how some of the insights of a philosophically oriented categorial grammar can be fruitfully integrated into a linguistic theory with a categorially based syntax.

Before, however, explaining the basic notions of categorial grammar and formal semantics in Chapter Three, the various possibilities of

analysing de-adjectival abstracts—and word-formation processes in general—according to the most widely accepted grammatical models are discussed in Chapter Two. In Chapter Four the theoretical framework adopted in this book is sketched, while in Chapter Five this framework is applied to the empirical data collected.

This study is based on a corpus which was compiled from *Chambers Twentieth Century Dictionary*, supplemented by the *Shorter Oxford English Dictionary* and M. Lehnert's *Rückläufiges Wörterbuch der englischen Gegenwartssprache*. On approximately 3200 index cards the de-adjectival abstracts have been arranged in 'word-families' (more properly 'derivational nests', cf. 3.1.2), that is to say, that together with the abstract its base adjective is listed; if more than one abstract is derived from the base adjective, these are also recorded; if the base adjective is itself derived its base and all adjectival derivations from this base with their de-adjectival abstracts are also listed; this process is repeated for all derived bases (cf. 5.1 for the application of this information). In addition to this the *Brown University Corpus* has been used for frequency counts and the nouns ending in *-ness* and *-ity* contained in that corpus have been analysed as to their syntactic environments.³

A last point to be made in this introductory chapter concerns some technical matters of definition and typographical convention. The terms 'grammar' and 'derivation' are both used in their wider sense, unless otherwise indicated; this means that by 'grammar' not only the morphology and syntax of a language are understood, but the systematic description of the language structure as a whole. Likewise the term 'derivation' (and analogously 'derivational') covers all kinds of word-formation processes, including composition. For the purposes of this study the terms 'word', 'lexeme' and 'lexical item' are treated as being interchangeable (for details see 2.1.2); furthermore, no distinction is drawn between a 'lexical class' and a 'word class'. When there are two lexical items A and B, and B is derived from A, A is called the 'base' or 'base-form' and B the 'derived form'. The terms 'free form', 'bound form', 'unique form' and 'morpheme' are understood as defined by L. Bloomfield (cf. 2.1.1), although his principles of morphological analysis will have to be modified in the course of this study (cf. 5.1). The definition of 'stem', however, is not taken over from Bloomfield; this term

³ *The Standard Corpus of Present-Day Edited American English* contains 500 texts of approximately 2000 words each from 15 areas of writing, ranging from various journalistic styles to different forms of fiction. This corpus was compiled at Brown University during 1963 and 1964 under the direction of W. Nelson Francis.

will be used only occasionally, designating the form of a word which is not overtly marked for some morphological category (cf. 2.1.2). As general terms for linguistic units of various kinds—excluding, however, semantic units—‘expression’ and ‘form’ or ‘linguistic form’ are used.

Phonetic transcriptions are put between square brackets, graphemes between angular brackets— $\langle \rangle$ —and phonemic transcriptions between slanting lines; it is usually the latter that are used in the present context. Morphemes and allomorphs are here not normally marked by braces. In rules parentheses symbolize facultative linguistic forms, braces alternative forms; an arrow means that the expression to the left of the arrow is to be rewritten as the expression to the right of the arrow, a simple arrow standing for a phrase-structure expansion, a double arrow for a transformation. A simple arrow is also used to mark the derivational relationship between lexical items, the lexeme to the left of the arrow being the base for the form to the right of the arrow. Graphs for the symbolizing of derivational ‘nests’ are introduced and explained in 3.1.2. For diachronic developments a special arrow is used; $A > B$ means “A developed into B”, $A < B$ means “A developed from B”.

Unacceptable linguistic forms are preceded by an asterisk. The meaning of a linguistic expression is put within double quotation-marks; features—both semantic features and others—are enclosed by square brackets; predicates are spelled with capitals (cf. 2.3, 4.2.3). There are a number of special symbols which will be introduced and explained in the course of this study; the most important are the symbols of logic, the brackets used in set-theory (pointed brackets for ordered n-tuples, braces for sets; cf. 3.1.1, 3.2.1), and the various symbolizations of the categorial formalism (cf. 3).

2. Methods of Analysis

Before taking a closer look at the structure of the de-adjectival abstract noun in English, it will be helpful for later discussions to consider the issues involved in somewhat broader terms. The analysis of nouns like *goodness* or *stupidity* is traditionally seen as falling within the field of word-formation. To study word-formation is to study the linguistic devices a language possesses to build words (as opposed to borrowing words from other languages or dialects). These devices might be of various kinds, the most common being composition, affixation and 'modification'; an example of the former would be *darkroom* from *dark* and *room*, of the latter two *length* from *long*, where the addition of the suffix- *th* (affixation) is accompanied by a qualitative vowel-alternation (modification).¹ The rules of word-formation form, according to this view, a part of their own in the description of language, complementing the lexicon, which indicates the semantic structure of words, by specifying their morphological structure. This classification of word-formation has not remained unchallenged—witness F. de Saussure's modification of the threefold distinction morphology-syntax-lexicology according to his differentiation between associative or paradigmatic and syntagmatic relations among linguistic units (cf. Saussure, 1967-71: II, f. 302^v-308^v)—, but by and large it is typical of what might be called traditional grammatical theory.

The place of word-formation within a grammatical model rests on at least three preconditions: the definition of what is to count as a derivational process, the structure of the language under investigation, and the linguistic theory one subscribes to. Crucial for the definition of a derivational process is the point of view adopted. Linguist A might be studying

¹ For a more detailed distinction of morphological processes—differentiating between affixation, reduplication and modification (vowel change, suppletion, subtraction)—see Matthews (1974: 116ff.); cf. also below §.1.1.

the morphological structure of a given lexicon, taking the lexicon as a finite list of recorded lexical items and basing his analysis on the segmentability of the items; linguist B, while using the same lexicon and following the same technical procedure, might interpret this lexicon as an open class, which can be supplemented by new, unrecorded items. For B, but not for A, derivational rules will have a predictive force and B will have to take phenomena like productivity or frequency of occurrence into account when formulating his rules. Thus A and B might differ in their analysis of Modern English *length*, though their analysis of Old English *lengðu*, where *-ðu* can be regarded as a productive suffix, would presumably be identical.²

It is often asserted that grammar, meaning in the narrow sense of the word syntax and morphology, deals with the regular formations of language and the lexicon with the irregular ones. In this case derivational rules could be either part of grammar or of the lexicon, depending on the regularity of the derivational structure of the language under investigation. Languages with a 'mixed lexicon' like Modern English (cf. §.I.I) normally exhibit idiosyncrasies and irregularities which might call for a 'lexical' treatment of word-formation, while it is typical of agglutinating languages, for instance, that they are derivationally transparent and regular, a fact which might speak in favour of an incorporation of derivational rules into the morphological component of grammar. By the same token, however, it is arguable that morphological processes marking grammatical categories like tense, mood etc. should, when irregular, be treated in the lexicon, an argument that assigns to the criterion of regularity for the classification of word-formation within a linguistic model a rather dubious value.³

The most decisive factor for the position that word-formation rules are given in a grammar is of course the theoretical framework assumed. Derivational rules will have a different status in a grammar that postulates a word level of analysis than in a linguistic model where an independent word level is not recognized; similarly derivational processes will be viewed differently in grammars where the emphasis is on syntax than in grammars where the emphasis is on semantics, differently also in linguistic descriptions where the orientation is toward 'surface

² Compare the distinction between analysis and synthesis in Lyons (1968: 158 ff.) and in Lipka (1971b: 222 ff.).

³ This is also realized by Sweet, who uses this distinction between regular and irregular processes to define the domain of grammar and lexicon, respectively; cf. Sweet (1892-8: I, 7-10). Cf. also Levkovskaja (1952).

structure' than in those where one operates with more 'abstract' underlying structures. There are roughly three main approaches to derivational processes in modern linguistic theory. (1) One might argue from a predominantly morphological point of view that *goodness* for instance is a noun derived from an adjective *good* by means of the suffix *-ness* just as *friends* is derived from *friend* by means of the suffix *-s*. (2) There are also arguments in favour of a syntactic view of derivation, in this case stressing the relationship between *goodness* in *John's goodness* with *good* in *John is good*. (3) This relationship can be interpreted not only—and not even primarily—as a syntactic one, but rather as a semantic relationship between lexical items, which has to be analysed on the 'sub-lexemic' level. We will consider these positions in turn before giving a fourth alternative, the treatment of derivation within a categorial framework.⁴

2.1 Derivation as a Morphological Process

2.1.1 Structuralist Analyses

A 'classical' formulation of the first approach is found in Leonard Bloomfield's *Language*. Bloomfield presents the grammatical structure of a language in terms of a hierarchy of linguistic levels: at the bottom lies the phonological level, then come the morpheme level, the word level, the level of syntactic constructions, and finally the sentence level. The immediate constituents of the sentence—which is defined as "an independent linguistic form, not included by virtue of any grammatical construction in any larger form"—are syntactic constructions, which, depending on the complexity of the sentence, might have other syntactic constructions as immediate constituents.⁵ When the immediate constituents of a construction are what Bloomfield calls 'minimum free forms' the word level is attained. Words can be further analysed if they show

⁴ For a general discussion of the approaches to derivational morphology see Pennanen (1972), Serebrennikov (1970-3: II, 344-393), (1973-6: II, 284-320), Lloyd (1964) [Romance languages], Stepanova (1968), (1973) [German], Erben (1975) [German]; see also DeArmond (1969) for the morphological approach to word-formation. An introduction to English word-formation is Adams (1973); standard reference books are *MEG*: VI, *HEW* and especially *EWf*. For bibliographical references cf. Seymour (1968) [Germanic languages], Stein (1973) [English].

⁵ Bloomfield (1935: 170); cf. also Lyons (1968: 172-180). For a discussion of immediate constituent analysis see Wells (1947).

partial phonetic-semantic resemblances to other words, as e.g. *birds* to *girls*, both having the same element *-s* meaning roughly “several”. A morpheme is then defined as “a linguistic form which bears no partial phonetic-semantic resemblance to any other form”, as is the case with *bird* when compared to *girl*.⁶ With the morpheme level the ultimate constituents of a sentence are reached. Outside the bounds of sentence analysis lies the phonological level, the level of linguistic units that differentiate meanings but are in themselves meaningless. The phoneme is the domain of phonology, words and morphemes fall within morphology, sentence types and syntactic constructions are dealt with in syntax.

Word-formation is in this model part of morphology:

By the *morphology* of a language we mean the constructions in which bound forms appear among the constituents. By definition, the resultant forms are either bound forms or words, but never phrases. Accordingly, we may say that morphology includes the constructions of words and parts of words, while syntax includes the constructions of phrases. (Bloomfield, 1935: 207)

Bloomfield distinguishes on the morpheme level between free forms (*room* in *rooms*), bound forms (*-s* in *rooms*) and unique forms (*cran-* in *cranberry*), on the word level between primary words and secondary words.⁷ Primary words are free forms which have no free forms as constituents. There are two kinds of primary words, derived primary words, which contain more than one bound form, and morpheme-words, which consist of only one free morpheme. An example of the first kind is *receive* (*re-* plus *-ceive*), of the second *man*. Secondary words are free forms which have free forms as constituents. Here too there are two categories: compound words, which are made up of free forms (*door* and *knob* in *door-knob*), and derived secondary words with only one free form among their constituents (*boy* in *boyish*).

This classification entails three types of derivational processes: composition (yielding compounds), secondary derivation (yielding derived secondary words) and primary derivation (yielding derived primary words). It is important to realize that for Bloomfield the class of derived words comprises words like *boyish* and words like *glasses*, i.e. that by

⁶ Bloomfield (1935: 161); compare also Lyons (1968: 180–94), Matthews (1974: 77–95), Bierwisch (1962).

⁷ Cf. Bloomfield (1935: 160, 209ff., 237ff.). Cf. also the classification into simple stems, secondary derived stems and primary derived stems in Hockett (1958: 240).

the term derivation both word-formation and inflexion are covered. The distinction between the two is one of degree: while inflectional affixes constitute the outer morpheme ranks of a word, derivational affixes constitute its inner ranks.⁸

There are further distinctions which Bloomfield drew in his analysis. If a morpheme has different forms depending on whether it occurs as a free form or as the base of a derived form, he differentiates between a kernel (as *German*) and a stem (as *Germano-* in *Germanophobia*). Primary words like *hammer* can be split into two elements by analogy to secondary words like *leader*; Bloomfield calls *hamm-* in *hammer* a root, *-er* a primary affix. Words that do not admit of this analysis, as for instance *boy*, are termed primary root-words. From this follows that there are free and bound roots (*boy* vs. *hamm-*). Secondary words derived by means of a zero-affix (as the verb *man* from the noun *man*), whose underlying free form is a root, are classified as secondary root-words.

Secondary words can also be formed from phrases; Bloomfield's example is *old-maidish* from *old maid*. If this derivation is not formally marked, as in *jack-in-the-pulpit*, the derived forms are phrase-words, cases which lie on the border between morphology and syntax:

As a border region we have phrase-words (*jack-in-the-pulpit*) and some compound words (*blackbird*), which contain no bound forms among their immediate constituents, and yet in some ways exhibit morphologic rather than syntactic types of construction. (Bloomfield, 1935: 207)

It is at this point that morphology and syntax meet. Bloomfield makes this clear in his discussion of compounds (cf. Bloomfield, 1935: 227-37). In principle, however, he restricts derivational processes to the morphological level of grammar and stays within the bounds of a 'morphological model' of word-formation.

This model is characterized on the one hand by the assumption of a hierarchy of linguistic levels, among them a word level, which, although part of a higher level, can be studied by itself. It is immaterial in this context whether the word is defined, with Bloomfield, syntactically as a minimum free form, stressing the independence and isolability of the word, or whether semantic or formal criteria are employed in its defini-

⁸ Cf. Bloomfield (1935: 222). Compare also Jespersen's treatment of derivational and inflectional morphology in *MEG*: VI. The interdependence of the two is stressed in Stankiewicz (1962).

tion.⁹ Secondly, it is typical of this model that words are treated as linguistic units which can be broken down into constituents by purely formal procedures, analytic procedures that were formulated in great detail by E. Nida in his book on morphology.¹⁰

In contemporary linguistic theory Bloomfield's conception of language as a hierarchy of linguistic levels with a clearly circumscribed word level is best represented by tagmemic and by stratificational grammar. K. Pike's tagmemic theory systematically extends the notion of the function of a linguistic unit as Bloomfield defined it to all linguistic levels.¹¹ A linguistic form cannot be analysed correctly, so tagmemic grammarians argue, if it is segmented only into formal or only into functional elements. To take an example: The sentence *John ran* is neither a concatenation of word classes—noun + verb—nor just a sequence of functions—subject + predicate—, but both (for the notion of a function cf. below 3.1.1, 4.1.1). It consists of two pairs, tagmemes, each of which is the correlation of a functional element or slot to a formal element or filler; the sentence can thus be represented by the formula S:N + P:V, i.e. a subject position filled by a noun plus a predicate position filled by a verb (cf. Cook, 1969; Elson, Pickett, 1965: 57–8; Pike, Pike, 1977: 35ff.).

On the word level, where derivation is treated on a par with inflexion, words are also segmented into tagmemes. Thus the abstract noun *goodness* is in tagmemic terms a noun stem (ns), consisting of the slot 'core', which is filled by an adjective stem (ajs), and the slot 'nominalizer' (nom), which is filled by one of a set of nominalizing morphemes (*-ness*): ns = core:ajs + nom: {*-ness*} (cf. Cook, 1969: 116–39; Elson, Pickett, 1965: 75–81).

Similar to this is the position word-formation has in the stratificational model developed by S. Lamb. There language is viewed as a hierarchy of stratal systems, where syntactic processes are specified by the 'lexotactics' and morphological phenomena—of an inflectional and derivational kind—by the 'morphotactics':

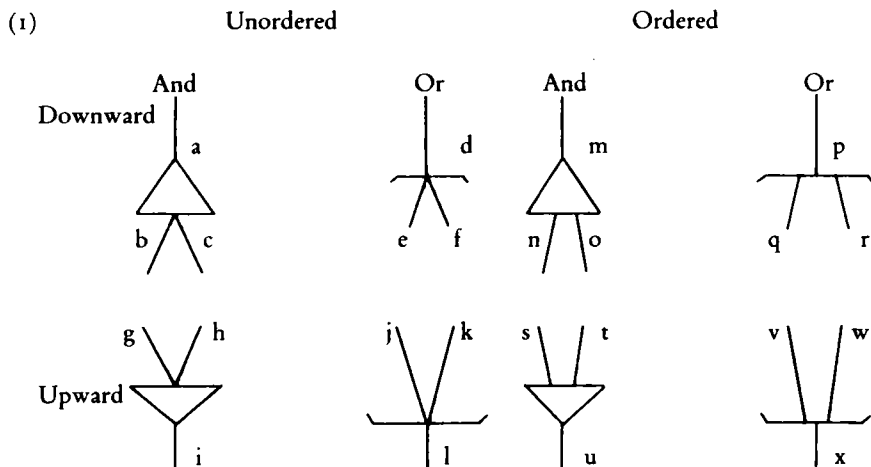
⁹ For the various criteria of definition see Krámský (1969: 17–40) and the critical bibliography by Juilland, Rocerio (1972); cf. also Lyons (1968: 202–4).

¹⁰ Cf. Nida (1949: 6–61); cf. also Harris (1951: 5–6, 15–16) for the distributional criteria of morphemic analysis.

¹¹ The different use of the term 'tagmeme' by Bloomfield and the tagmemic grammarians is discussed in Pike (1958). For tagmemic theory see Pike (1967), Elson, Pickett (1965), Cook (1969), Pike, Pike (1977). A 'formans model' of word-formation influenced by Pike's tagmemics is advocated in Pilch (1968).

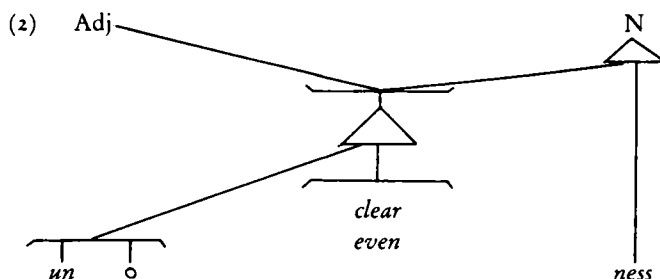
The *morphotactics* deals with the specifically morphological tactic features of the language, accounting for inflectional and productive derivational patterns. It has the grammatical word as its basic domain.¹²

An example will illustrate this. If we take two linguistic units A and B, say the words *stone* and *wall*, these two elements can be in what Lamb calls an And-relationship or in an Or-relationship. *Stone* and *wall* stand in an And-relationship (or syntagmatic relationship) in *stone wall*, i.e. they are linearly ordered, they stand in an Or-relationship (or paradigmatic relationship) in *The () is big*, where either *stone* or *wall* can be inserted for (): These relationships can be ordered or unordered; from *roof* and *garden* both *roof-garden* and *garden-roof* is formable (unordered And-relation), while from *good* and *-ness* only *goodness*, but not **nessgood* is derivable (ordered And-relation). Finally, a relationship can be upward or downward; it is downward when an element is realized by another element, it is upward when an element realizes another element. The relationship between *stone*, *stone wall* and *stony* is downward when looking at the way *stone wall* and *stony* are segmentable into *stone* plus some other element, it is upward when looking at the way *stone* can become part of different words, like *stone wall* and *stony*. The symbols for these relationships are as follows (Lamb, 1966: 9):



¹² Lockwood (1972: 114); cf. Lamb (1966: 21). Tagmemic theory and stratificational grammar are compared in Lockwood (1972: 254-7); for improvements on the stratificational model see Lockwood (1972: 120-6).

If we now take the nouns *clearness* and *evenness*, their structure could be reflected in the following (simplified) diagram:¹³



That is to say, the class of adjectives consists of two ordered elements (middle triangle), a prefix, which is either *un-* or zero, but not both together (left downward brace), and some base adjective, as *clear* or *even* (middle downward brace). These adjectives—so far *clear*, *even*, *unclear* and *uneven*—can either stand by themselves as adjectives or be part of a noun (middle upward brace). The class of nouns consists in the present example of two ordered elements, an adjective and a suffix *-ness* (right triangle), and comprises according to (2) *clearness*, *evenness*, *unclearness* and *unevenness*.

In spite of the interconnections between the various stratal systems, every stratum can be analysed by itself. This means that the derivational structure of a language, though related to syntactical processes via the stratal network, is seen as a predominantly morphological process.¹⁴ The same can be said of M. A. K. Halliday's systemic grammar, where there is a similar system of interrelations between various linguistic levels, but where nevertheless the analysis of grammatical and derivational morphology is mainly confined to the level of grammatical form.¹⁵

As a last example for this kind of analysis one could mention Z. S. Harris' procedure in his *Methods in Structural Linguistics*. Harris, who works from the phoneme upward to the sentence, represents the latter as

¹³ In the following diagram the linguistic units are left unspecified; for the terms 'morphons', 'morphemes', 'lexons', 'lexemes' as used by stratificational grammarians see Lamb (1966: 18–21), Lockwood (1972: 14–25).

¹⁴ See also the comparison of stratificational and transformational grammars in Lockwood (1972: 263–270).

¹⁵ Cf. Berry (1975–7: I, 68–9). For the linguistic levels postulated by systemic grammar see Halliday (1961).

a sequence of morpheme classes (and single morphemes, if the class consists of only one element), listing among his morpheme classes also classes of derivational morphemes. Hence a word like *goodness* is seen by Harris as an instance of the morpheme class sequence consisting of A (adjective) and An (class of suffixes which, when combined with adjectives, yield nouns) (cf. Harris, 1951: 262–80). The sentence

- (3) *I admire goodness.*

would then have the following structural formula (with I = class of pronouns):

- (4) I V A An

This formula can be simplified, insofar as the sequence A An stands in a paradigmatic relationship to N, as is seen when substituting *Mary* for *goodness*:

- (5) a. *I admire Mary.*
b. I V N

There is thus a functional equivalence between A An and N in certain syntactic structures (cf. Harris, 1951: 275 ff.). Before, however, pursuing this syntactic aspect of word-formation, a formalization of the morphological model of word-formation might help to clarify some of the problems connected with this view of derivation.

2.1.2 Formalization

A formalization along the lines of algebraic linguistics conceives the subpart of grammar in which derivational processes are treated as a set of rules which specify the class of well-formed lexical items of the language described. These rules can be brought into the form of a context-free grammar, with L (lexical item) as the 'axiom' of the system, analogous to the category S of a phrase-structure grammar.¹⁶

What is meant by L in this context needs some clarification. If we take the morphemes to be the ultimate constituents of the sentence as Bloomfield did, including with him among bound morphemes morphological processes like vowel-alternation etc., and if we take the word to be a free form consisting either of one morpheme or an internally coherent se-

¹⁶ For an introduction to algebraic linguistics see Wall (1972). For other formalizations see Motsch (1962) [includes transformations], Kiefer (1973a), Brockhaus (1975).

quence of morphemes, we can define the lexeme or lexical item as an abstract entity standing for a class of words which differ from each other only in respect of their grammatical morphemes. There is thus a difference between the lexeme or lexical item and the word (or more precisely the various word-forms). In addition to this the lexeme has a citation-form, i.e. a form that customarily appears in the lexicon. In a language like English it is this citation-form which enters into derivational constructs; compare *manful* vs. **menful* or **man'sful*. It so happens that the citation-form of lexemes in English is the word-form not overtly marked by grammatical morphemes, i.e. morphemes marking categories such as number, person, tense etc.; of course, this does not mean that these word-forms do not express some grammatical category (cf. *man* encoding [singular] for instance). More correctly these particular word-forms are from the point of view of derivation 'stems'; as these stems are, however, formally identical with lexemes in their citation-form, the practice of loosely equating lexemes with words and stems has been adopted for this study.¹⁷

If L then stands for the class of objects to be defined by the grammar, we might postulate as the auxiliary alphabet the categories 'simple' or 'underived lexical item' (SL), 'complex' or 'derived lexical item' (CL) and 'derivational element' (D). The basic alphabet would then consist of simple lexical items like *man*, *power* etc. and derivational elements like *-ful*, *-ness* etc. Adding to this a context-free rewrite rule we can formulate the following 'grammar':

- (6) (i) $L \rightarrow \left\{ \begin{array}{l} L + L \\ SL \\ CL \end{array} \right\}$
- (ii) $CL \rightarrow \left\{ \begin{array}{l} SL + D \\ CL + D \end{array} \right\}$
- (iii) $SL \rightarrow \{man, power\}$
- (iv) $D \rightarrow \{-ful, -ness\}$

This grammar generates among other lexical items *man*, *power*, *man-power*, *manful*, *powerful*, *manfulness*, *powerfulness*. Unfortunately it also generates a great many (to be precise, infinitely many) incorrect lexical items, such as **powerlessnessful*, **powerfulpowerful*, **manpower-*

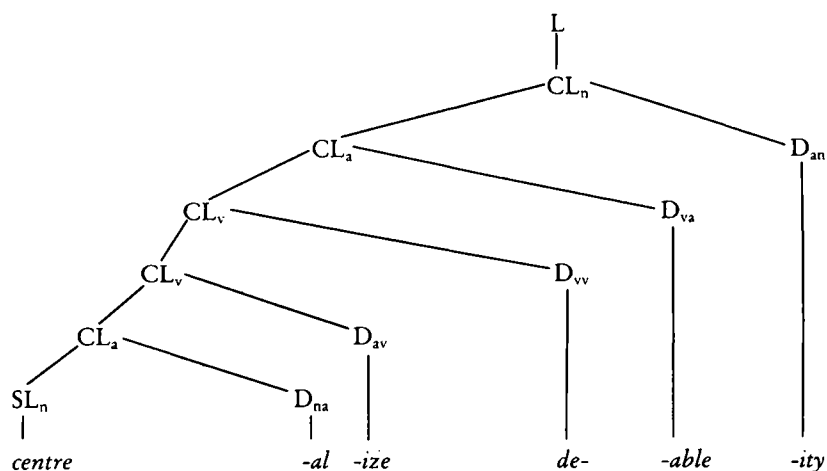
¹⁷ Cf. Lyons (1968: 197-8), Matthews (1974: 20-35), Lyons (1977: I, 18-25).

nessfulman etc. Certain refinements will have to be introduced in order to make (6) into an acceptable generative device. Some of the incorrect forms, like **powerness* or **powerfulful*, can be 'filtered out' if we sub-categorize the lexical items into lexical classes; *-ful* is characteristically added to nouns, while *-ness* can be suffixed only to adjectives. Restricting ourselves for simplicity's sake to the word classes 'noun', 'verb' and 'adjective', a more realistic 'word grammar' of English would be the following (for lexical classes see 4.1.2):

- (7) (i) $L \rightarrow \left\{ \begin{array}{l} L + L \\ SL_n \\ SL_v \\ SL_a \\ CL_n \\ CL_v \\ CL_a \end{array} \right\}$
- (ii) $CL_n \rightarrow \left\{ \begin{array}{l} \{SL_n\} + D_{nn} \\ \{CL_n\} \\ \{SL_v\} + D_{vn} \\ \{CL_v\} \\ \{SL_a\} + D_{an} \\ \{CL_a\} \end{array} \right\}$
- (iii) $CL_v \rightarrow \left\{ \begin{array}{l} \{SL_n\} + D_{nv} \\ \{CL_n\} \\ \{SL_v\} + D_{vv} \\ \{CL_v\} \\ \{SL_a\} + D_{av} \\ \{CL_a\} \end{array} \right\}$
- (iv) $CL_a \rightarrow \left\{ \begin{array}{l} \{SL_n\} + D_{na} \\ \{CL_n\} \\ \{SL_v\} + D_{va} \\ \{CL_v\} \\ \{SL_a\} + D_{aa} \\ \{CL_a\} \end{array} \right\}$
- (v) $SL_n \rightarrow \{man, centre, power \dots\}$
- (vi) $SL_v \rightarrow \{grow, read \dots\}$
- (vii) $SL_a \rightarrow \{free, good \dots\}$
- (viii) $D_{nn} \rightarrow \{-hood \dots\}$

- (ix) $D_{vn} \rightarrow \{-th \dots\}$
 (x) $D_{an} \rightarrow \{-dom, -ity, -ness \dots\}$
 (xi) $D_{nv} \rightarrow \{-\phi \dots\}$
 (xii) $D_{vv} \rightarrow \{de-, over- \dots\}$
 (xiii) $D_{av} \rightarrow \{-\phi, -ize \dots\}$
 (xiv) $D_{na} \rightarrow \{-al, -ful \dots\}$
 (xv) $D_{va} \rightarrow \{-ing, -able \dots\}$
 (xvi) $D_{aa} \rightarrow \{un- \dots\}$

This grammar generates besides compounds and simple lexical items the following complex lexical items (among others): *manhood* ($SL_n + D_{nn}$), *growth* ($SL_v + D_{vn}$), *freedom* ($SL_a + D_{an}$), *(to) man* ($SL_n + D_{nv}$), *overgrow* ($SL_v + D_{vv}$), *(to) free* ($SL_a + D_{av}$), *powerful* ($SL_n + D_{na}$), *growing* ($SL_v + D_{va}$), *unfree* ($SL_a + D_{aa}$), but also more complex lexical items like *decentralizability*:



The rules as they stand are however still insufficient, quite apart from the incompleteness of the basic vocabulary and the restriction to only three lexical classes. A number of morphological and morphophonemic rules have to be added. Thus adjustments will have to be made for the correct placement of prefixes. One way of doing this is to introduce a transformational rule (for transformational rules see 2.2.2) which puts