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ON INACTIVITY, PRODUCTIVITY AND ANALOGY IN DERIVATIONAL PROCESSES

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1. Troubles with derivational processes

Morphology has been one of the favourite disciplines of lin-
guistic research for a long time. In a respectable tradition
a great amount of facts and problems has been collected and
many theoretical approaches have been developed. Systematic
analysis of individual languages, historical and cross-linguis-
tic research has permanently increased theoretical generaliza-
tion of morphological phenomena. In this manifold and many-
voiced field of research generative grammar plays an important
role. In particular the hypothesis that there is an outonomous
lexical component and the assumption of a modular organisation
of human grammar has stimulated morphological research anew in
the past decades. Of course, we should not conceal the inter-
esting problems and results of typologically oriented directions
of morphological research, in particular of natural morphology.
In this paper, however, I wish to draw attention to derivational
morphology in the framework of generative grammar.

Inspired by CHOMSKY's (1970) article 'Remarks on Nominaliza-
tion' and his modular conception of linguistic structure, inter-
esting proposals concerning universal principles underlying
morphological structures and their parameters in certain lan-
guages have been put forward. Yet, it seems to me, we are still
only in the beginning of deeper theoretical insights into the
nature of morphological processes. There are many competetive
hypotheses claiming to resolve the same type of problems and a
great number of questions imerging from empirical observation
seems to be rather mysterious.

The different approaches within generative grammar share the conviction that morphological structures are governed by rules. The proper task of morphological research, then, is to find out the general form of such rules and the way they interact with different grammatical and extragrammatical subsystems and principles in determing the internal and external structure of morphological constructions. Empirically this claim is justified by highly productive morphological processes which can be observed in many languages. But there are also phenomena which can hardly be covered by the usual notion of linguistic rules. In particular, in derivational morphology the assumption of rules has to be contrasted with phenomena which can not be captured by rules, or which at least call for a modified concept of rules.

The problems referred to are well known. The usual notion of a rule takes a rule to specify possible configurations of units of a certain type and to assign to them a particular structural representation. Complex structures predicted by rules need not to be stored separately. In the case of highly productive processes it is, without any doubt, reasonable to make up rules which predict well-formed morphological structures. Inflectional rules typically have this property. In derivational morphology, however, also lexicalized complex words have to be taken into account. Such morphologically complex words included in the vocabulary may have a long history of their own. In this history the former origin from a rule may have been darkened considerably. Lexicalized derivatives, nevertheless, contain some regular information which can be described by rules. The peculiarity of these rules is their inability to produce new words, they are inactive or dead rules. This is tantamount to saying that native speakers have not only knowledge of the structure of individual lexicalized derivations, but also of the relatedness of similar derivatives in their vocabulary. JACKENDOFF (1975) called this kind of regularities dependent information, separating it from independent, i.e. idiosyncratic, information in the representation of a lexical entry (hereafter LE). In derivational morphology, consequently, two types of rules have to be considered, rules of production and rules of analysis.

Lexicalized derivatives present many unresolved problems. In particular the relationship between production rules and rules of analysis (hereafter PR and AR, respectively) has to be studied in detail. If we look for an explanation it is not sufficient merely to state the existence of lexicalized words and to describe their regular properties. There must be an explanatory framework which enables us to answer questions like: why may derivatives be lexicalized and why is lexicalization not a general property of the use of morphological rules? Word formation rules in general are not constrained to produce new LE, they may as well, like syntactic and inflectional rules, serve to derive ad hoc constructions.

If derivational morphology is considered, immediately phenomena come to mind which are covered by the term productivity. Productivity of morphological processes is 'one of the central mysteries of derivational morphology' as ARONOFF (1976: 35) puts it. 'Indeed, mere mention of the subject seems to be taken by many as an open invitation to anecdotalism.' ARONOFF tried to isolate some of the complex factors, the interplay of which presumably forms the result of what is called productivity.

Productivity is often distinguished from word formation by analogy. Analogous word formation is conceived to depend on actually almost unknown mechanisms which in any case are not part of the subject matter of grammatical theory. BAUER (1983: 63), following LYONS, makes a distinction between two kinds of coining new words, rule-governed word formation and non-rule-governed, or creative word formation. Only rules of rule-governed word formation may be restricted in productivity by extralinguistic factors. Analogous word formation is, by definition, not based on rules, i.e. its output is unpredictable.

In any case it is the task of a theory of word formation to explain why a large subset of derivational processes in many languages depends on rules which are more or less restricted as to productivity. The explanatory framework need not necessarily be involved in the theory of grammar. It plays, however, et least a heuristical role in grammatical analysis. To have just some

preliminary ideas about this framework is necessary in order to
be able to justify the borderlines of a theory of grammar. For
example, if there is a theoretical distinction between rule-
governed word formation and analogy, examples of the latter type
must be excluded from the analysis of word formation rules.

In this paper some issues and, admittedly, mysteries arising
in the above-mentioned context will be discussed in more detail.

2. Properties of production rules

Highly productive processes in German word formation are, e.g.,
deverbal adjectives with the suffix -bar (erkenn-bar, versteh-
bar, hör-bar), denominal adjectives with -los (arbeits-los,
verständnis-los, besitz-los). Further examples can be drawn from
nominalization, e.g. agent nouns (Abschreib-er, Putz-er, Zu-
schneid-er), deverbal nouns with -ung (Vernein-ung, Wiederhol-
ung, Abrechn-ung) and deadjectival nouns with -heit/-keit
(Frei-heit, Dumm-heit, Nützlich-keit, Einsam-keit). These pro-
cesses are well studied in German word formation. The general
properties underlying these types of derivation may be accounted
for by PR, i.E., by rules determining exactly the domain of
application and the structural change. In other words, we may
assume rules in the strict sense.

The form of derivational rules has been the subject of recent
research in theoretical morphology, in particular in the work of
ARONOFF (1976), JACKENDOFF (1975), SELKIRK (1982), LIEBER (1981)
and TOMAN (1983). These authors share some fundamental claims of
CHOMSKY and HALLE. Many important modifications and supplemen-
tary issues have been added by other linguists working in this
framework. It is not our aim to report the state of the art in
this direction of research. Albeit it is necessary for further
discussion to point out some fundamental theoretical claims and
assumptions more precisely.

The authors mentioned have the convection in common that a
theoretical account of productive processes in morphology forms
the very basis of the description and explanation of phenomena
in the area of word formation. They further assume respective

rules to be part of the linguistic competence of native speak-
ers, i.e., to convey knowledge which has a certain function in
performance processes. Derivational rules are assumed to operate
on LE. Their particular form is taken to be an argument in fa-
vour of the autonomy of the lexicon. A further important common
assumption is the modular organisation of morphological struc-
tures. This has, in particular, the consequence, that the notion
'possible complex word in Language L' has to be conceived as the
product of the more elementary notions 'phonologically possible
word in L', 'semantically possible word in L' and 'pragmatically
possible word in L', since the respective modules presumably
interact in determining the structure of complex words. It will
be demonstrated that this differentiation of the notion 'possi-
ble word' is important for the analysis of phenomena involved
in productivity.

In recent research hypotheses of universal constraints on
word structure rules have been discussed. In general it is
claimed that the study of morphological properties of a lan-
guage has to take into account:

(i)   the universal constraints on the form of morphological
        rules,

(ii)   general language-specific constraints on structures ad-
        mitted by (i). An example are the rules accounting for
        the behavior of neutral and non-neutral affixes in English,

(iii)   systematic language-specific relations which contrast with
        universal constraints. To give an example, in German there
        are derivations of the following type:
        dreitürmig, Dreimaster, friedliebend.
        The analysis of these words presupposes rules admitting
        phrases as the base of the derivative. These rules are
        highly productive. At any rate it is impossible to analyze
        the base as a word structure, because there are no rules
        deriving structures of the format Cardinal Numeral-Noun and
        N-V in German. That words like Dreiturm, Dreimast, fried-
        lieben do not exist is not accidental but due to the ab-
        sence of respretive rules. The conceptual structure under-

lying Numeral-Noun combinations seems to be generally exclu-
ded from word structures. If words of this type occur (cf.
Dreirad and Dreieck) they have to be interpreted as exo-
centric compounds ('a vehicle having three wheels', 'a
figure having three angles'). For arguments that compounds
of the format N-V are disallowed, see WUNDERLICH (1986),

(iv) all particularities of PR, e.g. the restrictions on the
      base word imposed by different rules.

It may be claimed that PR have to provide the following sort
of information:

(1) (i)   the phonological form of the affix,
    (ii)   the syntactic category and subcategory frame of the
           derivative,
    (iii) restrictions defining the class of base words to which
           the affix is attachable,
    (iv)   diacritic features of the derivative,
    (v)   the semantic form of the derivative.

On general grounds PR have to generate representations of the
morphological structure of well-formed complex words. A proper
representation of the structure of derivatives has to provide:

(2) (i)   a representation of the base word,
    (ii)   a representation of the affix including all information
           the affix adds to the description of the derivative,
           i.e. (1)(i), (ii), (iv) and (v),
    (iii) an indication of the constituent structure of the
           derivative.

Note that the representation of complex words does not contain
information of the type (1)(iii), because it would be entirely
redundant. Properties defining the class of words to which an
affix is attachable are only information pertaining to the rule.
The derivative can be the input of different PR, or of inflectio-
nal rules. It is finally inserted into syntactic structures. None
of these contexts demands the indication of information of the

type (1)(iii). To put it another way, the representation of a
derivative has to provide all information restricting its occur-
rence in word-internal and word-external contexts. A further
important requirement has to be mentioned. Since there is in
some PR a regular relation between the subcategory frame of the
base and that of the derivative and since the subcategory frame
is related to the theta-grid, the form of a PR has to take care
of these inheritance regularities.

It can easily be demonstrated that word formation rules pro-
posed by ARONOFF do only partially fullfill the above-mentioned
requirements. His rules have roughly the form (3) and (4).

(3) $[x]_{C_i} \longrightarrow [\text{pref } [x]_{C_i}]_{C_j}$

     semantics:
     conditions on the form of the base:

(4) $[x]_{C_i} \longrightarrow [[x]_{C_i} \text{ suff}]_{C_j}$

     semantics:
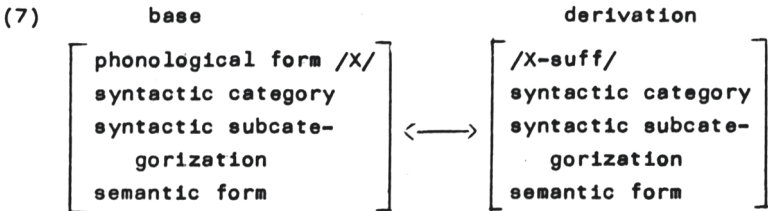   conditions on the form of the base:

Rules of this type select a word $[x]$ pertaining to a certain
major lexical category C_i and having the properties indicated in
the conditions and add an affix to it. The derivative is indicated
as a member of the category C_j. Since there is no instruction of
how the semantic effect of the rule has to be inserted in the
representation of the derived word, the rule yields only frag-
mentary representations like (5) and (6):

(5)
$$C_j$$
$$\text{pref} \quad [x]_{C_i}$$

(6)
$$C_j$$
$$[x]_{C_i} \quad \text{suff}$$
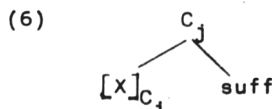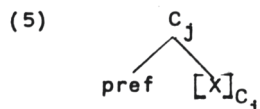
If $[x]$ is allowed to be a complex word, i.e. the output of a PR
or a lexicalized derivation, binary branched tree structures will
result. This is a strong constraint on PR, although not <u>a priori</u>
excluded. Representations of the form (5) and (6) do not provide

information of the subcategory frame of the derivative, of its
diacritic features and of its semantic form.

JACKENDOFF's (1975) redundancy rules observe all essential
requirements indicated in (1) and (2). The relatedness of LE in
a given lexicon which is taken into consideration in JACKENDOFF's
approach is provided by rules of the type indicated in (7):

(7)   base   derivation

$$
\begin{bmatrix}
\text{phonological form /X/} \\
\text{syntactic category} \\
\text{syntactic subcate-} \\
\quad \text{gorization} \\
\text{semantic form}
\end{bmatrix}
\longleftrightarrow
\begin{bmatrix}
\text{/X-suff/} \\
\text{syntactic category} \\
\text{syntactic subcate-} \\
\quad \text{gorization} \\
\text{semantic form}
\end{bmatrix}
$$

In (7) conditions on the base beside syntactic category and
subcategorization, and diacritic features are omitted.

JACKENDOFF discusses two possible interpretations of his
rules. In the framework of a full-entry theory they may only
state the relatedness of LE, each LE being conceived as fully
specified. In the framework of an impoverished entry theory
the rules add all dependent information to the LE. Although
JACKENDOFF considers only the analysis of lexicalized deriva-
tives his rules may, without any problem, be interpreted as PR.
PR of type (7) operate in the following way: They select a base
word which fits the conditions indicated in the left part of
the rule and add the affix with all information included in the
right part of the rule. In order to obtain constituent struc-
tures, some conventions have to be supplemented. The two con-
stituents of the derivative have to be connected by a binary
branching indication, say a tree. The syntactic category of the
base word has to be transferred to the knot immediately domi-
nating it, and the syntactic category as well as all informa-
tion needed to account for the internal and external distri-
bution of the unit have to be transported to the knot dominat-
ing the two constituents. Note that there is no need to claim
that the information given in the right part of the rule must
be attached exactly to the suffix. It is present in the repre-

sentation the rule derives and since the base is represented
separately it turns out that the remaining part of the repre-
sentation is conceived as pertaining to the affix.

A third type of rules has been put forward for consideration
by SELKIRK, TOMAN and LIEBER. In their theories affixes are
separate LE, i.e., they are not introduced by PR but by lexical
insertion. There are rewrite rules deriving word structure trees
into which LE, including LE for affixes, are inserted. The most
attractive refinement of the basic idea, in my opinion, has been
presented by LIEBER. In her theory only a very simple rule
determining well-formed word trees with unlabelled knots is
necessary. To the final knots of a tree LE's may be atteched.
A set of conventions ensures the transport of all information
needed to account for further internal and external relations of
the derivative to the respective knots of the tree. Obviously,
in this theory the essential aspects of derivational processes
are included in the representation of affixes. In particular,
all information of restrictions imposed by the affix on the base
to which it may be added have to be indicated in the LE of an
affix. Thus, the LE representation in this approach includes not
only properties needed in the representation of derivatives but
also properties of a PR. The capacity of an affix to be added
to a class of base words is essentially the information of rules
proposed by ARONOFF and JACKENDOFF. If we use the term PR we
refer to mechanisms roughly of the form indicated in (7). We
further assume that all requirements discussed above are ob-
served.

We share the view that derivational processes are basically
combinations of signs, i.e., they are linguistic devices which
allow for the linguistic expression of the combination of some
semantic units. The technics available are manifold. DRESSLER
(1986). Some of them do not involve affixes. The problems re-
sulting from this fact are omitted in our present discussion.
MOTSCH (1987). In this paper we are concerned with affixation.
The sign interpretation of derivational processes has some
important implications:

(i) Different rules may have the same semantic effect, i.e.,
they derive words which are synonymous. On the other hand,
there must be different rules if the affix conveys differ-
ent meanings.
(ii) There is no reason for a strict separation of mere affix-
ation and sementicosyntactic aspects in derivational
processes.

The latter implication is denied by BEARD (1986) and SZYMANEK
(1985). BEARD pleads for a strict separation of the units of
morpheme and lexeme, each of which is considered to establish
a separate subsystem of grammar. While lexeme-based morphology
is supposed to be based on semantic and syntactic principles,
morpheme-based morphology is considered to be constrained by
entirely different, purely morphological principles. Of course,
there must be an interplay of both subsystems. It is supposed
that lexemic rules generate lexeme structures with empty places
for affixes. Thus, to give an example: riesig, riesenhaft,
riesenartig, riesenmäßig, all meaning roughly 'like a giant',
presuppose only one lexemic rule but four rules which insert
the affixes.

The advantages of the separation hypothesis are, on the one
hand, purely technical. In this sense it has been already
considered in JACKENDOFF (1975). The more essential aspect of
this hypothesis, however, has to be proved. In particular it
has to be demonstrated that there are separate principles
determing the form and combinatorics of affixes without any
semantic and syntactic information.

In the study of properties of PR morphological processes
have been favoured which are highly productive and involve
affixes which may be added to large classes of base words. In
German, for example, the suffix -bar forms adjectives from
transitive verbs which can be passivized. The suffix -los
derives adjectives from nouns. In other cases morphological
and phonological restrictions on the base may be involved in
the process. Restrictions of this sort may in part govern the
choice of alternative affixes like -heit and -keit in German.

It is interesting to note that even restrictions may occur which
are based on connotation. The distribution of German -chen and
-lein depends on dialect distinction. In general, semantic prop-
erties of the base may function as conditions on the base word,
although examples from clearly productive processes are rare.
Technically there are no troubles including semantic conditions
in the set of restrictions on the base. It is, however, not
possible to describe pragmatical restrictions in a PR. For
example, in German word formation there is a fully productive
process generating adjectives with -frei from nouns:

   atomwaffen-frei, staub-frei, nikotin-frei.

A corresponding rule, among others, predicts the words reichtum-
frei, and gesundheitsfrei. These words, however, sound odd. This
is due to a positive attitude included in the meaning of -frei.
Adjectives containing -frei do not only indicate the absence of
some object but they maintain the absence to be desired. An
interpretation which maintains that the absence of wealth and
health is desired presupposes a rather strange experience. How-
ever, decisions of this sort are founded on extralinguistic
knowledge, although the positive attitude should be analysed as
a semantic property of -frei derivatives.

3. Some aspects of lexicalization

Until now we have only considered PR, neglecting the role of the
lexicon as a storage of simple and complex words. There are two
questions which have to be answered by theoretical approaches to
morphology:

(i)   Why do products of PR enter the lexicon?
(ii) What are the requirements imposed by lexicalized
      derivatives on grammatical description?

   If there was no particular reason for lexicalization PR would
be quite sufficient to generate new words in any speech situa-
tion where they are needed. This is the typical function of
other sorts of rules, in particular of syntactic and inflec-
tional rules. Note that the lexicon could be much simpler in

this case. We do not pretend to have a satisfactory answer to
this question. Nevertheless some hints of a more serious answer
are obtainable. Surely, it can be expected that the theoretical
background of the answer to this question lies beyond the border-
lines of grammar. It is very likely that it depends on conditions
of performance processes and on social and cultural aspects of
language use.

Results of psychological studies have demonstrated that
complex linguistic structures may be stored in memory,although
they are the predictable output of some rule. BECKER (1975),
BOLINGER (1976), MILLER (1978), PAWLEY & SYDER (1980). The
access to stored structures seems to be psychologically simpler,
than the access to the output of rules. Thus, it is likely that
derivatives which are often used enter special storage in memory.
This may, in turn, be the beginning of processes veiling the
dependence of the derivative on the corresponding rule. It be-
comes more or less autonomous. BYBEE (1985). But the frequency
of use of a derivative need not result in an increasing distance
from the rule. There are many nominalizations in German and
adjectives with -bar which are very frequently used without any
consequence as to their relatedness to PR. If the frequency of
use generally effected idiomatization it could be expected that
the same effect was involved in the use of syntactical and
inflectional rules. But this is obviously not true. Consequent-
ly, there must be particular reasons why products of rules may
enter the vocabulary and, as a tendency, become autonomous
signs. These reasons will also explain why lexicalization is
not a general property of the output of PR.

In part the solution of the problem depends on different
functions of PR. It is well known that derivatives and compounds
may serve different functions. On the one hand, they may serve
to form new LEs, i.e., their function is the naming of concep-
tual structures which have some socio-cultural relevance, and,
on the other hand, they may be used for recategorization or
transposition of certain types of syntactic phrases. MOTSCH
(1979; 1983), PLANK (1981), KASTOVSKY (1982; 1986). Gerundial
nominalization and adverbalization by -ly in English, the

nominalized infinitive in German and nominalization by -enie in Russian are clear examples of recategorization. If participles are analysed as deverbal adjectives they would be a further example. All rules restricted to recategorization produce words which very rarely enter in the lexicon. In many cases, cf. the nominalized infinitive in German and gerundial nominalization in English, the output of rules serving only recategorization lacks properties of the syntactic category to which it is attached by the rule. On the other hand, it may retain properties of its original category. Nominalized infinitives cannot be counted, are restricted in the choice of determiners and may take the same complements like verbs in verb phrases.

Nominalized infinitives which have entered the German lexicon are, among some others:

das Leben,... das Rennen, das Leiden.

They all differ remarkably from the representation the PR underlying this process assigns to the same word structures. There is one fundamental difference. The lexicalized words name conceptual structures which are relevant to human orientation in natural and socio-cultural environments. As KLIX (1971: 618) pointed out, LE are marks for conceptual classes with a high value for the orientation of human behavior. In order to be entered in the lexicon, a derivative should not only denote objects and relations between objects or properties of objects being singled out in ad hoc situations but classes and relations which are relevant to many situations and are therefore stored in the system of conceptual structures which serves as the fundamental grid for the analysis of environments. As a rule, PR resulting in recategorization serve to denote ad hoc situations.

We may ask two questions in this context:

(i) Are there linguistic properties restricting structures which may be lexicalized?

(ii) What are the anthropological and socio-cultural conditions determing the naming relevance of possible word structures?

I have nothing to say with respect to (ii), although there
are interesting observations in anthropological research. As
for (i), I would like to draw attention to KLIX (1972) who
considers the forming of classes from a psychological point of
view. Results of word formation analysis may also yield impor-
tant hints. As we have pointed out above, there are no word
structures expressing a conceptual configuration conveyed by
the combination of cardinal numerals and nouns. Cardinal numer-
als are not able to distinguish classes of objects. Another
aspect of nameability seems to be the linguistic form of an
expression. Derivatives and compounds are obviously more suit-
able to naming than syntactic phrases. In this paper some obser-
vations concerning the functions of PR will be discussed.

While some PR serve nearly exclusively recategorization and,
as far as nouns are concerned, do only denote ad hoc classes,
rules underlying agent nouns may be used with different func-
tions. On the one hand, they may produce words with a purely
contextual function. Agent nouns may, for example, be used to
ensure coherence in a given text, cf.:

Die Schulstunde wurde durch lautes S̲c̲h̲r̲e̲i̲e̲n̲ gestört.

Der Lehrer rächte sich an den S̲c̲h̲r̲e̲i̲e̲r̲n̲ mit schlechten Noten.

In this context S̲c̲h̲r̲e̲i̲-̲e̲r̲ denotes some persons which have
shouted in a restricted situation, i.e., in the situation
identified by the preceding sentence. There is no need to
store conceptual structures of this ad hoc sort. On the other
hand, the conceptual structures conveyed by S̲c̲h̲l̲e̲i̲f̲e̲r̲, D̲r̲e̲h̲e̲r̲,
B̲e̲t̲r̲ü̲g̲e̲r̲ comprehend classes of persons which are characterized
by the activity denoted by the verbal base of the respective
nouns. A person who is a S̲c̲h̲l̲e̲i̲f̲e̲r̲ or D̲r̲e̲h̲e̲r̲ performs the ac-
tivity indicated by the verb professionally, a person is a
B̲e̲t̲r̲ü̲g̲e̲r̲ if he deceives habitually and not randomly. We may
assume that lexicalization effects the addition of features
like professional and habitual. The use for syntactic or tex-
tual purposes, on the contrary, demands reference to a particu-
lar situation. However, this requirement is not due to the

semantic form of the derivation. The semantic representation
yielded by the rule is open to both functions. The same holds
for nominal compounds. It is interesting to note that there
are syntactic differences between lexicalized and non-lexicali-
zed agent nouns:

(1) <u>Er ist Schleifer.</u>   (2) <u>Er ist ein Betrüger.</u>
    <u>Er ist Dreher.</u>   <u>Er ist ein Angeber.</u>
  *<u>Er ist Betrüger.</u>   <u>Er ist ein Schreier.</u>

Predicative use without article is only possible if the agent
noun denotes a profession. (2) is the correspondent predicative
use of agent nouns denoting a habit, i.e., the indefinite
article must occur in this case. In both contexts the <u>ad hoc</u>
interpretation is excluded.

Apparently, there are PR which are specialized in the syn-
tactic function. There are also PR which serve both the syn-
tactic function and the naming of conceptual structures to be
stored in the vocabulary. The naming function is connected with
lexicalization. In this case a rule product is at least claimed
to be a candidate for enriching the lexicon. Whether it really
enters the standard vocabulary depends on intricate social
conditions. Are there also rules specialized in the naming
function? This seems to be the case with adjectives containing
the suffix -<u>los</u> in German:

   <u>einfalls-los</u>, <u>hoffnungs-los</u>, <u>land-los</u>.

These adjectives denote the absence of the object identified
by the base noun. Of course, the chance of a possible word of
this type to enter the lexicon depends on conditions of rele-
vance and in part also on conditions of social norm changing.
We may assume that the use of derivations in <u>ad hoc</u> situations
is in contrast with the conditions of lexicalization. We may
further assume that the use of PR specialized in the naming
function is only a claim to offer candidates for enriching the
lexicon. However, the syntactic function is not the only type
of function which is in contrast with lexicalization. There
are also PR which neither serve a syntactic function nor offer
candidates for the vocabulary. An example of this sort is the

German diminutive suffix -chen. Diminutives are in line with
inflectional categories like plural, comparative, past tense.

   Summarizing the observations above, the following hypotheses
can be formulated:

(i)   There are particular conditions for lexicalization.

(ii)   Several functions of PR can be distinguished:
       - naming conceptual structures, i.e., lexicalization,
       - use in syntactic contexts, i.e., recategorization,
       - systematic modification of the meaning of the base.

(iii) PR may be specialized in one of these functions. It seems
       to be the case that rules effecting only recategorization
       primarily serve to form ad hoc words, i.e., words which
       are only made up for the actual speech situation. Rules
       which involve recategorization and semantic effects may
       serve as naming devices and syntactic functions. (Cf.
       agent nouns, nominalization with -ung and adjectives with
       -bar). Rules which do not change the category seem to
       have a tendency toward inflectional processes.

4. Rules of analysis

As already mentioned lexicalized derivations exhibit regulari-
ties which can be covered by the term dependent information. We
may assume that native speakers have access to this kind of
information. If we omit psychological aspects we may postulate
rules of analysis (hereafter AR) which cover all dependent
information of LE in the vocabulary of a language. AR, then,
have a purely abstract function. The notion dependent informa-
tion needs some refinement. It does not comprehend arbitrary
relations between LE but only regularities pertaining to deri-
vational processes. The domain of these processes is determined
by the nature of PR. In this technical sense we may say that AR
are degenerated PR. We may also imagine a non-technical inter-
pretation of the term degenerated, i.e., consider the histori-
cal perspective. In this case, however, dependent information
conveyed by an AR need not necessarily go back to a former PR.

Processes of lexical change may well lead to common properties
of LE. Thus the polysemy of many affixes in lexicalized deriva-
tives need not be based on rules. In our view the description
of dependent information in LE and the psychological reality of
this information are two levels of scientific consideration.

To give an impression of the descriptive task, some examples
will be considered. It seems to be plausible to distinguish at
least four types of Lexicalization:

(i)   There are derived words which are only derivatives as to
        their morphological form:
        aus-merzen, aus-wend-ig, ein-sam, ver-lier-en, offen-bar,
        laut-bar, sonder-bar, Bür-de, ...
        These words are semantically opaque, i.e., their meaning
        is not composed from the meaning of the two constituents.
        Neither the base nor the affix includes a separate meaning.
        Nevertheless some morphological regularities are recogniz-
        able. Although the bases of these words are not related to
        separate LE the affix has to be analyzed as an affix. This
        analysis is necessary because there are some regular mor-
        phological processes which refer to the respective infor-
        mation. For example, ver-lieren has to be analyzed as a
        prefix verb, since the rule for past participle refers to
        this information. Cf.:
        binden   ge-bund-en
        ver-binden   ver-bund-en
        ver-lieren   ver-loren
                      *ge-ver-loren

(ii)   In other cases the meaning of the affix is lost but the
        base has a separable meaning. Cf.:
        frucht-bar, kost-bar, ehr-bar, Kehr-icht,
        Dick-icht, Zier-de, ...
        -icht and de are nominal affixes which are not involved
        in any active process in modern German morphology. -bar
        appears only in deverbal adjectives in contemporary German.
        Although the affix has no separate meaning the meaning of
        the base is transparent in the semantic form of the deri-

vative. <u>Frucht-bar</u> is derived from <u>Frucht</u> in the non-
literal sense 'success' and paraphrased by 'Frucht eintra-
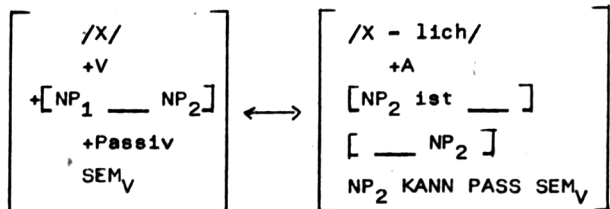gend' (producing success).

(iii) There are lexicalized derivatives which are fully trans-
parent but not the product of an active PR. The German
lexicon for example includes many derived adjectives with
-<u>lich</u> and -<u>sam</u> which, as to their semantic form, corre-
spond to the productive PR introducing the suffix -<u>bar</u>.
<u>begreif-lich</u>, <u>bestech-lich</u>, <u>beweg-lich</u>, <u>erschwing-lich</u>,...
<u>bieg-sam</u>, <u>einpräg-sam</u>, <u>(un)aufhalt-sam</u>, <u>unbeug-sam</u>, ...

(iv) In general we may assume that PR produce words which can
be lexicalized, if certain conditions are met. The depend-
ent information of the lexicalized items is in this case
identical with the information provided by the represen-
tation of products of the PR. There are, for example,
lexicalized derivatives of the highly productive PR's
generating -<u>bar</u> and -<u>los</u> adjectives:
<u>eßbar</u>, <u>genießbar</u>; <u>zweifellos</u>, <u>sorglos</u>, <u>arglos</u>, ...

    The analysis of cases like (i) has to provide LE for each
derivative which comprehend all idiosyncratic properties. The
very restricted regularity that <u>ver</u>- and -<u>bar</u> are considered
affixes may be represented in the description of the phonological
form of the derivative. The information may, of course, also be
attached to an AR introducing the affix, its lexical category
and diacritic features. In this case the LE has to include a
rule feature, say +(AR-bar).

    The same description is appropriate for (ii). The difference
to (i) is simply that the base in (ii) is identical with an LE.
This relation can be accounted for if we assume that there are
word families, i.e., systems which order derivatives of the same
base. Each distinct meaning of an LE may have its own family.

    As far as (iii) is concerned the dependent information can
be described by AR illustrated in (1):

(1)   AR-lich$_1$

$$
\begin{bmatrix}
/X/ \\
+V \\
+[NP_1 \text{——} NP_2] \\
+Passiv \\
SEM_V
\end{bmatrix}
\longleftrightarrow
\begin{bmatrix}
/X - lich/ \\
+A \\
[NP_2 \text{ ist ——}] \\
[\text{——} NP_2] \\
NP_2 \text{ KANN PASS } SEM_V
\end{bmatrix}
$$

There seems to be no fundamental difference between AR-lich$_1$
and the corresponding PR introducing -bar. The only difference
is that AR-lich$_1$ does not allow for the generation of new words.
If we accept the impoverished-entry theory, which seems to pro-
vide the simplest description, each lexicalized derivative to
which the rule applies has to be marked properly, e.g.:

$$
\begin{bmatrix}
/erträg -/ \\
+[AR-lich_1]
\end{bmatrix}
$$
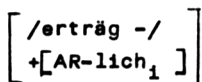
Lexicalized products of an PR do not demand any particular
AR. The dependent information, in this case, may be supplemented
by the respective PR, i.e., we may assume that PR may also
function as AR. The LE of the lexicalized derivative has to be
marked as to the PR, e.g.:

$$
\begin{bmatrix}
/ \text{genieß} \text{——} / \\
+[PR -bar]
\end{bmatrix}
$$
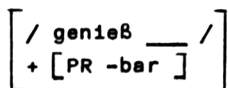
If we restrict grammatical analysis to a formal representation
of regularities in derived words there is no reason to make up
an LE if the derivative in question is entirely analyzed by a
PR, i.e., we need only provide an LE in case (iv) if the deri-
vation exhibits idiosyncratic information. In our view
ARONOFF's (1976: 23) conviction that 'each word may be entered
in the dictionary as a fully specified separate item ... Inde-
pendent item dictionary entries are not dependent on one an-
other or on rules. Each one is a complete sign in itself' may
only be proved on extragrammatical grounds.

5. On semi-productive processes

In the preceding sections we consired PR and AR presupposing
a clear-cut distinction between active and non-active processes.
Although there are some highly productive derivational pro-
cesses in German and many other languages we should not over-
look, that the majority of derivational processes creates
troubles as to the question whether it is active or non-active.
There is a scale of productivity ranging from fully productive
processes to entirely unproductive ones. Productivity is under-
stood as the probability of a potential rule product to appear
in texts. This definition is slightly different from ARONOFF's
(1976: 37) who restricts the notion to the probability of a
potential derivation to be entered in the lexicon. This, how-
ever, takes only one of the functions of derivatives into
account.

   In practical research two sorts of troubles very often
arise:

(i) It is, in some cases, extremely difficult to define the
     class of bases and the semantic effect of a morphological
     process. MOTSCH (1979).
(ii) The output of tententive rules is, in many cases, not
     really acceptable, i.e., the tentative word sounds somehow
     strange and odd.

Because acceptability judgements may depend on the adequacy of
the description of a rule the problems are still further com-
plicated. A second desadvantage is the lack of sufficiently
elaborated acceptability criteria.

   To go into more detail, let us consider some examples from
German word formation. It is important to note that even highly
productive rules may predict words which are not fully accep-
table. Take, for example, German agent nouns like:
   Weiner, Hoffer, Lerner, Kocher.
These derivatives are not part of the German vocabulary and
occur scarcely in ad hoc usage. Albeit occasional use must not
be excluded. The German writer H. HESSE has formed Lerner in

contrast with Lehrer, as ERBEN (1973: 10) observed. To explain
the strangeness effect of Lerner and Kocher, a phenomenon
called blocking has been claimed. ARONOFF (1976: 181). Lerner
and Kocher are blocked by the LE Schüler, Lehrling and Koch,
respectively. More precisely, not an LE blocks the rule, but
the lexicalization of a rule product may be blocked if there is
a synonymous LE. In this case the ad hoc use may be restricted,
too. Thus, blocking is a phenomenon which does not enter the
description of PR.

An example of semi-productive processes in German deriva-
tional morphology are the following prefixed verbs:

ent-last-en, ent-rost-en, ent-staub-en, ent-öl-en,
ent-laus-en, ent-wanz-en, ent-keim-en, ent-grät-en, ...

The process corresponds to English debug, delouse, defrost.
There is a considerable list of words pertaining to this type.
We observe that the process is not inactive. The rule takes
nouns, adds the prefix ent- and yields verbs meaning roughly
'to cause that the object denoted by the noun disappears'. In
addition a positive attitude is involved, i.e., the state of
affairs that an object denoted by the noun is present is
evaluated negatively. Words like *ent-freud-en 'to take away
pleasure' and *ent-lust-en 'to take away desire' are not accept-
able, but this depends on pragmatic knowledge. Grammatically
the application of this rule is restricted to non-complex words.
*ent-kehr-icht-en, *ent-ab-fall-en, *ent-fett-fleck-en are not
well-formed. Potential new words are:

ent-dreck-en, ent-schmutz-en, ent-schäl-en, ent-hüls-en,
ent-sand-en, ent-kies-en, ent-stroh-en, ent-heu-en,
ent-knoch-en.

These words sound somehow strange, although they are easily
analyzable. Ent-schälen is perhaps blocked by the synonymous
simple verb schälen. We do not see any reason why the conceptual
structure pertaining to entgräten, i.e., 'to remove fish-bones'
is stored in memory but the corresponding entknochen, i.e., 'to
remove bones' is not. ent-bein-en seems to be antiquated.

Another example are deadjectival adjectives with -lich:

ärm-lich, ält-lich, dümm-lich, dick-lich, läng-lich,
rund-lich; ...
gelb-lich, röt-lich, weiß-lich, bläu-lich, grün-lich, ...

The underlying rule has the semantic effect of restricting the
property denoted by the base. The rule is restricted to simple,
i.e., non-derived and non-compound words. Cf. ˣ**fleiß-ig-lich**,
ˣ**streb-sam-lich**, ˣ**be-greif-lich-lich, ein-sam-lich.** While colour
adjectives enter, without any problem, the rule, its application
to other sorts of adjectives is problematic. Cf.:

?**reich-lich**	(**ärm-lich**)
?**jüng-lich**	(**ält-lich**)
?**klüg-lich**	(**dümm-lich**)
?**breit-lich**	(**läng-lich**)

It can hardly be decided whether this rule is restricted to
colour adjectives or productive in a low degree.

The same troubles arise with adjectives denoting that some-
thing is made from a certain material. Cf.:

hölz-ern, gläs-ern, eis-ern, stähl-ern, silb-ern, gold-en
metall-en, granit-en, smaragd-en, woll-en, seid-en,
brokat-en, ...

The underlying rule is restricted to nouns denoting solid mate-
rials ˣ**mehlene Suppe,** ˣ**milchener Brei,** ˣ**butterne Figuren,**
ˣ**wässerner Saft** are not well-formed. Although coinings with
nouns denoting trees, stones and metals have a high frequence
among the lexicalized words of this type, the following deriva-
tives are strange and will scarcely appear in texts:

?**pinie-n,** ?**erl-en,** ?**lind-en,** ?**zeder-n,** ?**pappel-n,** ?**ahorn-en;**
?**türkis-en,** ?**topas-en,** ?**opal-en,** ?**spinell-en;**
?**wolfram-en,** ?**osmium-en,** ?**iridium-en,** ?**platin-en.**

We have to take into account that there are two alternative
types of linguistic structures expressing the same semantic
content, compounds and prepositional phrases of the form **aus**
noun. Cf.:

Pinien-holz, Erlen-holz, Topas-einlage, Wolfram-draht,
Iridium-spitze;
aus Pinie, aus Erle, aus Topas, aus Wolfram.

To give a further example, there is a rule in German deriva-
tional morphology which forms adjectives from nouns with the
semantic effect 'something is similar to the object denoted by
the noun'. Cf.:

schwamm-ig, kalk-ig, milch-ig, ...
aff-ig, bull-ig, fisch-ig, fuchs-ig, ...
flegel-ig, knirps-ig, ries-ig, schuft-ig, ...
klump-ig, kegel-ig, kapsel-ig, spiral-ig, bauch-ig, ...

The property denoted by these adjectives has to be inferred
from properties of the base word. In lexicalized adjectives the
inferred property seems to be part of the semantic form of the
LE. strohig means 'dry like straw', riesig 'large like a giant',
kuglig 'round like a ball'. If, however, a new word is made up,
a typical property of the base noun has to be inferred. MOTSCH
(1977: 184). Adjectives like:

stock-ig, brett-ig, turm-ig, gert-ig, löw-ig, schlang-ig

are odd because they contain base nouns denoting objects which
exhibit no typical property. The type of knowledge involved
seems to be prototype knowledge. It is not part of the semantic
representation. The existence of idiomatic expressions like:

steif wie ein Stock, hart wie ein Brett, hoch wie ein Turm,
schlank wie eine Gerte, falsch wie eine Schlange

does not necessarily exhibit prototype knowledge. Therefore the
existence of a formula of this type does not predict the accept-
ability of corresponding adjectives. PLANK (1981: 164). We may
summarize that some of the words the rule predicts are outruled
by the violation of pragmatic conditions on interpretation.

It should be noted that there are many affixes entering pro-
cesses with the same semantic effect. Cf. the following exam-
ples:

äff-isch, säu-isch, hünd-isch, dieb-isch, närr-isch, ...
damen-haft, papageien-haft, schurken-haft, knaben-haft, ...
burg-artig, löffel-artig, turm-artig, schiffs-artig, ...
damen-mäßig, jäger-mäßig, kinder-mäßig, ...

The productivity of these processes may differ in degree but
there is no doubt about the activity of the underlying rules.
Note that there is scarcely blocking involved:

aff-ig, äff-isch, affen-haft, affen-artig, affen-mäßig.
schurk-ig, schurk-isch, schurken-haft, schurken-artig,
schurken-mäßig.

Blocking seems to be restricted to areas of the vocabulary call-
ing for more or less fixed terminologies, e.g. the terminology
of occupational names contains Koch and blocks Kocher. If a
conceptual structure is not integrated in such systems of lexical
ordering no blocking occurs. There are, on the contrary, sorts
of texts which demand stilistic variability. In this case syno-
nymy is not excluded but desired rather. DORNSEIFF (1959: 50),
MOTSCH (1983: 116). PR making up adjectives which denote a
similarity between the governing noun and the base noun are
essentially of this kind. If there esists a fixed lexical system
a word is taken from this system. It would be an offence against
valid norms to use a new mark for the stored and socially agreed
word. If, however, stilistic variability is demanded the use of
rules to make up new words is very likely. But again we are
beyond the borderlines of grammar.

   In the framework of GG problems of productivity have been
discussed extensively by ARONOFF, BAUER (1983: 82), PLANK (1981).
These authors share the view that semi-productivity has to be
treated as an extralinguistic phenomenon. In the morphological
component of a grammar only the distinction between PR and AR
is allowed which establiches two kinds of research; word_forma-
tion and word_analysis. It is also agreed that there is a third
area which contributes to the study of possible words, i.e.,
word_formation_by_analogy. This area is also called creative
word formation in contrast with rule-governed word formation
LYONS (1977: 543), BAUER (1983). TOMAN (1983) takes the stand
that there exists a separate module accounting for analogous

processes in morphology. This is to say, the notion *possible
word' is defined in part by rules, i.e., by devices which allow
for strict predictability and in part by analogy, i.e., devices
with probalistic predictability. Frequency of use of a PR and
acceptability of their products depend on factors which have
been partially demonstrated by ARONOFF (1976; 1983), BEARD
(1977) and BAUER (1983: 62), among others.

This clear-cut distinction between rule and analogy on the
one hand and activity and nonactivity on the other is due to
methodological prerequisites. In the framework of GG there is
no place for scales expressing degrees of properties, or simi-
larities of units. Many interesting problems put forward by
traditional grammarians and other directions of morphological
research in our time have no place in the frame work of GG,
e.g.:

(i)   Why do derivational processes typically impose strong
       restrictions on their base words?
(ii)   Is there a universal inventory of semantic categories
       preferably expressed by devices of derivational morpho-
       logy?
(iii) Why are derivational affixes polysemic in a high degree
       and why are there so many processes with the same semantic
       effect?
(iv)   What is the role of functions? Do they correspond to
       formal properties of rules?
(v)   Are there paradigms in derivational morphology and what
       is their influence on morphological processes?

This list could be continued. It is obvious that questions of
this kind can only be answered if historical and crosslinguistic
facts are studied systematically. As can be observed in ap-
proaches of DRESSLER and BYBEE, extralinguistic facts and theo-
retical instruments have to be taken into account.

A crucial point in our discussion is word formation by analo-
gy. In a previous article I argued for an extension of the
notion of analogy to all kinds of word formation processes.
MOTSCH (1977). The main issue which was inspired by PAUL, is
the following:

We may assume fully specified LE for lexicalized derivatives
and compounds. This implies that the dependent information is
not separated in the representation of a complex LE. LE enter
systems of lexical ordering like word fields, terminologies,
frames, etc.   LUTZEIER (1985). They are also integrated into
morphological networks like word families or derivational para-
digms. VAN MARLE (1985). Beside these lexical ordering systems
it is possible to detect similarity, i.e., dependent information
in LE. This capacity becomes evident if new words are coined
conforming to existing ones. The creation of new words, however,
presupposes rules. But rules need not have an existence of their
own. We may conceive of rules as the result of a process of
analysis operating on similarity of items of the vocabulary. The
task arises to find out conditions encouraging vs. restraining
the extraction of rules from information in LE and, of course,
to describe the properties of this rule extracting device. The
following assumptions seem to be serious hypotheses:

The recognizability of dependent information in an LE depends
on:

(i)   the frequency of stored words, including the same dependent
       information,
(ii)   qualitative properties of dependent information, e.g., on
       the generality of conditions of the base and on the nature
       of the semantic effect of a process,
(iii) the degree of opaqueness of dependent information,
(iv)   the frequency of rule extracting processes. It may be
       assumed that the more frequent LE with the same dependent
       information are analysed in order to extract a rule, the
       more transparent the dependent information will be.
(v)   It seems plausible, to assume that frequent reconstruction
       of dependent information may result in separate psycho-
       logical existence of PR.

These assumptions, of course, have to be justified by empirical
evidence. I believe that this is possible in principle. Without
any doubt there are facts involved which pertain to language
use, in particular to performance processes and memory storage

of linguistic expressions. In this framework the pure grammatical distinction between PR and AR is projected on to a continuum of the capacity of dependent information to be analysed and used for the creation of new words. Fully productive PR are only one end of the continuum. If there are no separate rules in the memory the forming of new words is a creative process. This may explain the stilistic evaluation of some new coinings. It can also explain the fact that writers and journalists very often create new words of a certain type which are not usual in common language. The German writer LION FEUCHTWANGER, for example, frequently uses the inactive process underlying deverbal adjectives with -sam. Cf. FLEISCHER (1983: 278)

seine gleichmäßige lehrsame Stimme

sie tanzt schamlos und rührsam.

We may assume that the native speaker has the capacity to extract rules from dependent information of LE and to store them even if the process is inactive. The form and functioning of the process of rule extraction has to be studied in more detail in order to establish a serious field of research.

In my opinion, the grammatical approach in GG and the analogy approach are not alternative theoretical approaches but consistent types of analysis pertaining to methodologically different levels of research. The grammatical analysis attempts to describe the rules determining morphologically well-formed structures in a language on universally constrained grounds. This kind of research does not care about facts like productivity, acceptability and analogical word formation. The grammatical analysis specifies representations of well-formed morphological structures and the rules determing them in a purely formal way, i.e., independent of the psychological realization of the respective knowledge. The purely computational nature of this description of knowledge must be feasible by psychological processes but this is only a very abstract condition of the grammatical description.

It is a quite different level of research if we ask for the psychological background of processes in which grammatical

knowledge is involved. To come to an end: in my view the study
of analogy in word formation is an interesting field of re-
search . It presupposes without any doubt notions defined in
the theory of grammar but essentially it pertains to another
level of research. We may also expect that increasing knowledge
about analogous processes in word formation will be useful for
deeper insight into historical and crosslinguistic issues.

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