DISJUNCTIVE RULE ORDERING IN WORD FORMATION

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1. Since Chomsky's "Remarks on Nominalization" (1970) and the subsequent advent of numerous lexicalist theories of word formation, it has often been claimed that derivational morphology should not and cannot, in fact, be' accommodated within the syntactic component, i.e. that morphologically complex words are derived by means of special word-formation rules (WFRs), rather than by transformations.

The most comprehensive, classic model of lexicalist morphology thus far available, i.e. that of Aronoff (1976), provides a detailed characterization of WFRs of this sort. One crucial assumption made by Aronoff is that his model is "built on a strict 'one affix, ine rule' basis" (1976:89). This assumption, together with Aronoff's "unitary base hypothesis" (cf. 1976:47 ff), means, roughly, that there is a one-to-one correspondence between individual WFRs accounting for the various processes of affixation and the formally distinct affixes that can be identified in a language. Hence, he speaks about rules for *un* # prefixation, # *ment* attachment, etc.

It will be recalled, too, that every single WFR of this sort is composed of two parts: "First, there is a part which specifies the syntactic and semantic characteristics", and "Second, there is a series of positive conditions on the morphology of the base" (1976:62—3).

It is remarkable that the "one affix, one rule" principle is implicitly or explicitly adopted in virtually all generative lexicalist studies of word formation published after Aronoff's contribution, as well as in those few that appeared in the first half of the 1970's.[1]

Before we concentrate on the validity of this principle, let us address the

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[1] There are a few available exceptions: Jackendoff (1975) and several studies by Beard (e.g. 1976, 1981).

central issue of this paper, namely the notion of rule ordering, as it is occasionally employed in lexicalist treatments of word formation.

2. Since lexicalist morphologists have rejected the transformational derivation of complex words, they are no longer in a position to relegate the whole problem of rule ordering to putative ordering relations holding within blocks of transformations. Yet, the question of ordering remains a real one, in view of the fact that the derivation if numerous multiply complex words involves several subsequent stages, whereby individual affixes are attached to base-forms which themselves are product of some other affixation processes. Simply speaking, one often finds cases of "derivations within derivations" (see Beard (1981:138)), with several affixes stacked up linearly upon a single root-morpheme.

Therefore, a priori at least, it might be reasonable to expect that different WFRs participating in the derivation of a complex word like *trans-form-ation-al-ly* do not apply in a random order — not only in this particular form, but also elsewhere. Unfortunately, this apparently self-evident and very tempting conclusion is (partly, at least) rejected in most recent lexicalist studies — generally speaking, on the grounds that it is simply contradicted by the language data. Thus, to give only the most spectacular argument, it has been pointed out that (extrinsic) ordering of WFRs in English is impossible: "it would rule out the pair *industrialize* and *organizational*, since *-ize* and *-al* appear in opposite orders" (see Roeper and Siegel (1978:202)).

The whole discussion of putative rule-ordering principles governing lexicalist word formation seems to have been inaugurated by two studies by Chapin (1967, 1970). He focused his attention on the unquestionably marginal, though interesting cases of so-called iterative rule-application which can be found, among others, in words like (?) *organ-iz-ation-al-iz-ation*. In conceivable words of this length and complexity, a three-suffix set is said to operate more than once on a given, well-specified base.

In order to provide a cogent formal solution for such intriguing cases, Chapin (1970) put forward his "epicycle hypothesis": assuming that in principle WFRs may be viewed as linearly ordered, he insisted that in the particular cases where one is confronted with the iterative application of certain groups of WFRs, these rules should be treated as operating cyclically, rather than linearly. The essence of Chapin's proposal was then that some rules, at least, apply in an extrinsically determined order.

Later on, proponents of lexicalist morphology rejected the idea of ordered WFRs and were particularly critical of Chapin's solution. Thus, for instance, Aronoff, who paraphrased Chapin's proposal to the effect that "WFRs must be ordered in a similar manner to syntactic rules", dismissed the whole idea out of hand, claiming simply that "This is impossible within our theory, for the ordering of WFRs requires that speakers always carry out deriva-

tional processes for complex words, and the improbability of this forms the basis of the present work" (1976:56).

In spite of this, it must seem fairly clear that there are certain tendencies, if not strict principles, which delimit the possibilities of combining various affixes within a word, i.e. which determine to some extent their linear succession. This means that the order in which WFRs apply cannot be entirely free and random. If any limitations of this sort do exist, they are an inherent property of the language system, rather than extrinsic, arbitrarily imposed restrictions. (Cf. in this connection such often-cited phenomena as the peripherality of inflectional affixes with respect to derivational ones, or the existence of "closing morphemes" in the sense of Nida (1965), i.e. derivational affixes that cannot be followed by any other (derivational) affix within a word).

In fact, a similar spirit permeates the initial sections of Halle's (1973) contribution. He observes (1973:3) that speakers possess some kind of knowledge about the proper ordering of individual morphemes within a word, so that, for instance, the five morphemes in *trans-form-at-ion-al* "cannot be concatenated in most other ways". Halle concludes this part by saying that a grammar must reflect somehow the speakers' knowledge of this sort.

Nonetheless, this fundamental observation is left unaccounted for in the hypothesis that Halle ultimately proposes, as far as the ordering of WFRs is concerned. Actually, he rejects the view that WFRs are ordered among themselves: "... I have yet to come across any clear instances where word formation rules have to be ordered in that tightly constrained fashion that is constantly encountered in true phonological rules". Halle juxtaposes the convention of linear order satisfactorily employed in the case of phonological rules with the still undiscovered principles that may govern the operation of WFRs. He suggests, rather speculatively, that in the latter case *simultaneous application* seems to be the most probable solution.

It will be recalled that Aronoff also discarded the idea of ordered WFRs, arguing that "... WFRs are not extrinsically ordered among themselves. The only possible ordering among WFRs will then be intrinsic, which means in effect that WFRs are unordered" (1976:61).

More recent lexicalist studies of word formation have not substantially altered this overall picture of ordering relations among WFRs. In fact, the whole issue is usually treated in a very cursory manner — cf., for instance, the contribution of Roeper and Siegel (1978) quoted above.

A similar attitude to the problem is adopted by Scalise, although his conclusion is less authoritative in tone: "Almeno a livello di organizzazione generale della grammatica (e in mancanza di dati specifici), si può qui concludere che le RFP [=WFRs] non sono ordinate o, quanto meno, che non sono ordinate nel modo in cui lo sono le transformazioni" (1983:127).

Likewise, Bauer (1983), in his recent introduction to English word forma-

tion, assumes a detached attitude to this unresolved problem. In a single, brief comment devoted to the question he refers to Roeper and Siegel's statement mentioned above and notes merely that "the pair of forms quoted [by them] is not sufficient evidence to exclude the extrinsic ordering of WFRs" (1983:168). Unfortunately, Bauer does not proceed to suggest any alternative, more adequate theory accounting for the interaction of WFRs.

A considerable departure from the strict principle of "unordered WFRs" may be noticed in the works of Siegel (1974) and, in particular, Allen (1978), who also in the main subscribe to the lexicalist school. Both Siegel and Allen suggested that WFRs may sometimes be extrinsically ordered and this theoretical concession enabled them to put forward the model of level-ordered morphology. Allen (1978), who refined and elaborated Siegel's original version of the theory, argues that the rules of the morphological component are organized into extrinsically ordered blocks or levels (depending on the kind of morphological boundary associated with a given affix), "although no ordering is imposed on individual rules of word formation" within a single level (see Allen (1978:7)).[2]

Thus Allen claims to have found evidence for the division of the English morphological component into three distinct levels.

Since then attempts have been made to apply the theory of level-ordered morphology to the systems of other languages (cf., for instance, Pesetsky's (1979) analysis of certain areas of Russian word formation within this framework). However, the theory does not seem to be applicable in describing numerous other word-formation systems (such as the Polish one), and therefore it probably has no universal validity. In fact, its adequacy with reference to the English data alone has also been questioned recently (notably by Strauss (1982)), on the grounds that boundary distinctions, on which this theory is based, are hardly anything more than pure fiction.

3. Leaving aside for a while the question of whether rule ordering may play any significant role in lexicalist word formation, we would like to pause in this section to consider what seems to be a substantial modification of the "one affix, one rule" approach to morphology. The formal model to be outlined below may be called a *categorial* lexicalist model of word formation.

The major theoretical innovation offered by this model pertains to the form and function of rules for word-coining. It derives from the recognition of the fact that, contrary to the assumptions underlying the "one affix, one rule" approach, in no system of word formation is there a strict one-to-one correspondence between form and meaning, i.e. between phonologically isolable affixal morpheme-shapes viewed as formal counters and the possible (ranges of) meaning attributable to each of them.

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[1] A more recent model of level-ordered morphology may be found in Selkirk (1982)

This idea has been emphasized in the whole tradition of Slavic word-formation studies, where it is often pointed out that, on the one hand, one finds numerous instances of so-called *multi-functional affixes*, i.e. affixes which display more than one regular meaning (cf. English $-ish_A$, Polish $-n(y)_A$, and, on the other hand, so-called *co-functional* (iso-functional) *affixes* — a term applied to cases where a single semantic function is rendered by means of several formally distinct affixes (cf. Polish diminutives: $-ik/-yk$, $-ek/-k(a)/-k(o)$, feminine names: $-k(a)$, $-in(i)/-yn(i)$; English Nomina Actionis: $-ation$, $-ment$, $-al$, $-ure$, $-age$, $-y$, $-\begin{Bmatrix}a\\e\end{Bmatrix}nce$, $\emptyset$). The phenomenon is illustrated in Fig. 1:
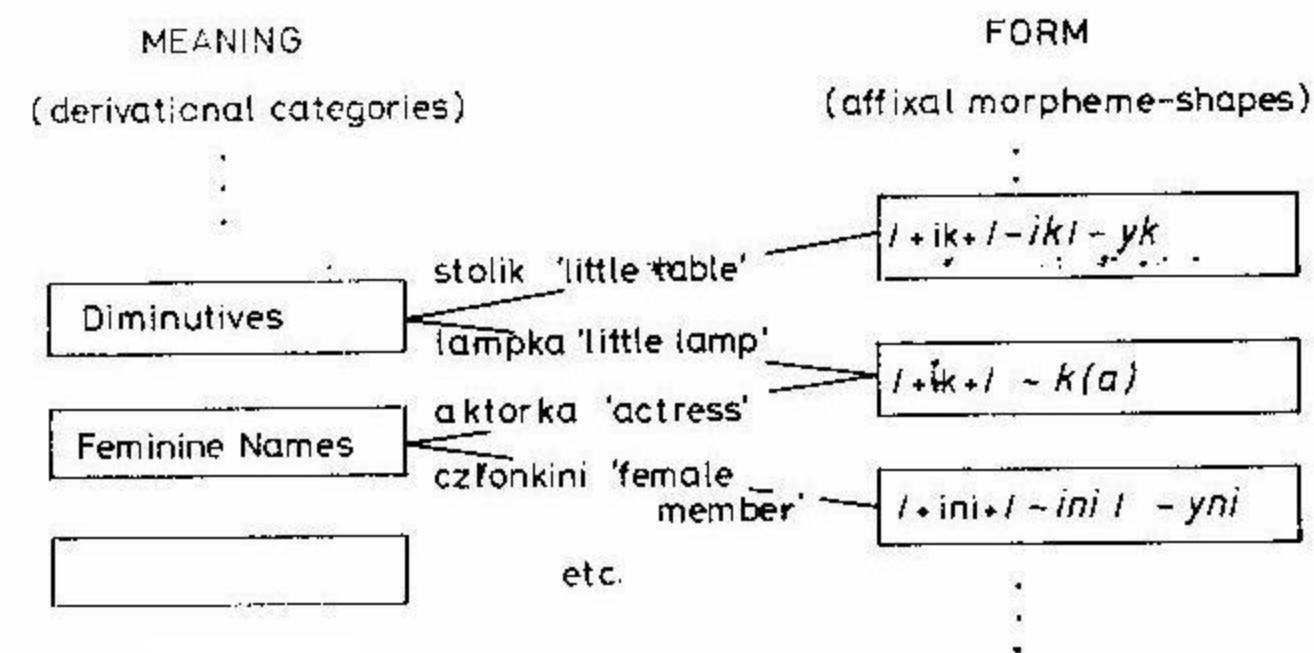

Fig. 1.

Unfirtunately, this phenomenon tends to be neglected, or rather trivialized, by the majority of linguists working on English word formation. One notable exception here is Beard (1976, see also Beard (1981, chapter 5)). He expressly observes that "some suffixes may serve multiple semantic functions, while any one function may be served by as many as ten different suffixes" (1976:109). But again, the evidence that prompted this remark comes from a Slavonic language (Russian adjectives).

However, as we have already noted, similar cases do exist in English, which is in fact recognized by Aronoff himself, when he speaks of the so-called "rival suffixes" (=co-functional suffixes), in connection with the English "deverbal abstract action nouns" (=Nomina Actionis) in $-ation$, $-ment$, $-al$, etc. (see Aronoff (1976:54, ftn. 8)). Yet, Aronoff does not consider any of the theoretical (formal) consequences following, for the model that he proposes, from evidence of this sort. One such rather obvious consequence is, for instance, that by strictly adhering to Aronoff's "one affix, one rule" principle one is unable to

express or encode somewhere in the word-formation component the fact the suffixes -ation and -ment are related to each other (semantically) in a way in which, say, -ation and -ity are not.

Conversely, Beard attributes much greater theoretical significance to the above phenomenon, maintaining that "Since the overlap of meaning and structure classes is two-way the rules generating meaning and those generating structure must be separate. In other words, derivation is a process wholly distinct from suffixation" (1976:109).

Similarly, the recognition of this "two-way overlap" of meaning and form has served as a conceptual background and justification for the fundamental distinction made in the tradition of Slavic word-formation studies, i.e. the differentiation of derivational categories and derivational types (see, for instance, Grzegorczykowa (1979:23-4)). A given semantically established derivational category subsumes one or more derivational types (affixal exponents).

It appears then that the prevalent trend in current lexicalist work on English word formation is to make little (if any) use of the elsewhere predominant practice of splitting the semantic and the formal aspect of word-coining. Moreover, the atomistic treatment of affixes by Aronoff and others seems to be too formalistic, i.e. performed at the cost of semantically insightful analysis and generalization.

Superficially, Aronoff appears to pay heed to the basic (regular) meaning of the affixes and the derivatives he chooses to analyse. Recall that the only sample WFR that he presents in full, the un # prefixation (p. 63), falls into two distinct parts, i.e. (a) a semantic part defining (roughly) the predictable meaning of the derivatives, and (b) a part specifying the acceptable "forms of the base", i.e. providing a set of formal conditions on the rule. However, one would be interested in knowing how Aronoff would handle, within a single rule, the semantics of a suffix like # ish, i.e. a case where the derivatives with a formally uniform suffix may be classified into several semantically distinct and coherent groups. It seems that, when striving to preserve the formal identity of such a process (# ish attachment), Aronoff would be forced to accept a disjunction in the semantic part of the rule, and this brings us only a step away from viewing this rule as in fact several distinct, semantically at least, processes. To put it differently, a WFR of the type proposed by Aronoff often presents itself as a disguise for a set of some more elementary rules in which the principle of one-to-one correspondence between the form and the meaning of the formatives would not be violated. As it stands, Aronoff's practice appears to be in fact subordinated to a tripartite prerequisite, namely a "one affix — one rule — one meaning" idea which, unfortunately, is untenable for a majority of the intricate patterns of word formation.

The argument presented above should make it clear why we prefer an alternative view of the form and function of the rules deriving complex words in

a language. The solution that we would like to develop derives from the assumptions laid out in Laskowski (1981) and relates to Beard's remarks quoted above. Laskowski argues that it is necessary to distinguish two types of rules constituting the derivational component of a language: Rules of Derivation (DRs), which are semantic in their nature and correspond to the traditional concept of derivational categories, and the spell-out Rules of Affixation (ARs), which may be coupled with the notion of derivational types. "Rules of derivation play a crucial role as they define the network of functional relations among elements of the lexicon, characteristic of a given language" (Laskowski (1981:115), translation mine — B.S.). That is to say, a rule of derivation takes care of the semantic side of any process of word-coining; it expresses the fact that in language L a certain specific semantic category has some formal exponents in the realm of derivational morphology, and, by way of paraphrase, it specifies this category, providing part of the regular (predictable) semantic content of the class of derivatives.

It follows from our earlier discussion that a given rule of derivation may have one or more rules of affixation which are subordinated to it, depending on the number of formal exponents of the category the DR relates to.

Functionally speaking, the rules that we propose may be of two kinds: they may have the status of mere redundancy statements in the sense that they generalize on certain types of unproductive (or weakly productive) derivations which, in any case, must be fully and individually represented in the Permanent Lexicon; or they may predict both the form and the categorial meaning of whole classes of formations representing the more productive processes of word formation. The output of the latter will constitute the Conditional Lexicon of a language. The concept of Permanent vs. Conditional Lexicon is adopted here from Allen (1978) (see also Malicka-Kleparska (to appear) and the evidence therein).

Within the present approach, we lay great emphasis on the proper encoding, in the formal mechanism, of the active character and generative potential of the productive rules of derivation/affixation. They should be a true reflection of the word-formation competence of every native speaker who is capable of producing a virtually unlimited number of potential words. We maintain, in other words, that the mental strategies of a native speaker (e.g. the choice of a suitable affix) are, to a large extent, governed by the synchronic rules of derivation and affixation which themselves are part of a generative grammar of a language.

Among the factors that influence the operation of word-formation processes, conditions statable on the rules play a most important role. Formally speaking, those conditions fall into two types: positive conditions (PCs) and negative conditions (NCs), i.e. constraints. Their nature may be manifold: syntactic, semantic, pragmatic, lexical, morphological and phonological. Some higher-order and more general conditions may be imposed directly on a given rule of derivation; others are linked to individual rules of affixation. Both PCs and NCs should

define classes of possible bases of a given rule of derivation/affixation, i.e. they operate on its input by having access to lexical representations of base-forms.

Rules of word formation are seldom as regular and exceptionless as those of syntax and phonology. That is why, in cases when the distribution of a given affix is not (or not fully) predictable on the basis of a general rule and corresponding conditions, we may have to resort to the convention of lexical government, analogical to that proposed in Aronoff (1976:40). It means that some (preferably: a small number of) bases may have to be marked individually in the lexicon as undergoing a given rule of affixation, which is ensured by means of a diacritic feature [+AR: x]. (Naturally, the rule itself must contain the same diacritic in the specification of its base.) This feature will stipulate that an item which bears it should combine with a certain affix although it does not meet the general (absolute) condition(s) imposed on the affixation rule in question. To put it differently, a diacritic [+AR: x] (with the coefficient 'plus') will define a limited set of 'positive exceptions' to the affixation rule 'x'.

Similarly, sporadic 'negative exceptions' to a particular affixation rule, i.e. items which do meet its concomitant conditions but none the less should be removed from the domain of its application, need to be provided in the lexicon with a diacritic [−AR: x].

To sum up, a rule of derivation with a set if co-functional rules of suffixation subordinated to it may be represented by meas of the following general formula:

$$DR: [Y]c^1 \rightarrow [[X]c + y_{suff}]c^1.$$

semantics: (paraphrase)

$$Ar(s): y_{suff} \rightarrow \begin{cases} /.../, \text{ if } [X]c \text{ is (conditions/diacritics)} \\ (/.../, \text{ if } ...) \\ (/.../, \text{ if } ...) \\ \cdots\cdots\cdots\cdots\cdots\cdots \\ (/.../) \text{ 'elsewhere'} \end{cases}$$

where

C   — category marker of the base
C'   — category marker of the derivative
X   — abstract symbol of the base
Y   — abstract symbol of the derivative
y_{suff} — abstract symbol of the suffix(es)
/.../ — one of the lexical (phonological) exponents of y_{suff}

Let us stress again that such dynamic, 'active' rules of word formation will not function as mere redundancy statements. On the contrary, they will help to remove a gret deal of redundancy from the lexicon because, firstly, hierarchical ordering of the rules of affixation (see below) will prevent repetition of conditions on the attachment of individual affixes (what is a positive condition on one affix may often be a negative condition on another 'rival' affix), and, secondly, regular predictable products of the productive processes will not have to be entered in the Permanent Lexicon (at least not in that part of their semantic reading which follows from the paraphrase and is not idiosyncratic). Cf. Allen (1978:198): "In the Overgenerating Morphology, a derived word whose form and meaning is predictable in all aspects from the base and the WFR is not entered in the permanent lexicon", which means that "only derived words which are in some sense exceptional are entered in the permanent lexicon".

4. Before we turn to some extra mechanisms and formal solutions that may prove indispensable for an adequate treatment of the diverse word-formation patterns, let us stop and give some illustration of the theory outlined so far.

It has been noted that the lexicalist theories adhering to the "one affix, one rule" idea are particularly well-suited to simple cases where only one affix serves as a formal exponent of a given category. It is worth pointing out that cases of this sort are in a minority as far as Polish word formation is concerned; in any event, they can be as easily handled within the variety of the theory that we propose.

As an example, consider the Polish suffix -aw(y)/+av+/, which derives the so-called "adjectival diminutives", i.e. deadjectival adjectives paraphrasable as 'somewhat__', 'approximating the quality denoted by the base adjective'. (cf. English -ish in this particular usage). Examples:

biały   'white' — białawy 'whitish' etc.
czarny   'black' — czarnawy
zielony 'green' — zielonawy
gruby   'fat'   — grubawy
słodki   'sweet' — słodkawy
łysy   'bald'   — łysawy

Three things should be noted in connection with this suffix: firstly, it has a rather unique position in the system of Polish word formation in the sense that its semantic function is invariably as specified above (except: *rdzawy* 'rusty' and *łzawy* 'tearful'), i.e. the suffix is not multi-functional and due to this fact we get semantically compositional derivatives; secondly, the category in question is not rendered by any other means — -aw(y) is its sole exponent; thirdly, the suffix seems to be fairly productive, in spite of the rather small number of "actual" formations listed in the dictionaries of Polish (about 100 in the "Indeks a Tergo"). On the basis of the latter finding we may conclude that the domain of /+av+/ attachment is heavily restricted by certain conditions on the pertinent rule of affixation.

For lack of space, we now give a final, though tentatively formulated statement of the rule for Polish "adjectival diminutives," which we have justified in greater detail elsewhere (see Szymanek (1981:255)):

DR: $[Y]_A \rightarrow [[X]_A + y_{suff}]_A \, ([Q])_N$

Semantics: $[Q]_N$ is somewhat $[X]_A$, approximates the quality denoted by $[X]_A'$

AR:

$$Y_{suff} \rightarrow /+\text{av}+/ \text{ if } [X]_A \rightarrow \begin{cases} \begin{bmatrix} +\text{colour} \\ -\text{relational} \end{bmatrix} & 1) \\ \begin{bmatrix} +\text{qualitative} \\ -\text{relational} \\ +\text{native} \\ -\text{intensive} \\ -\text{binary} \\ [C_0VC_1(_N+\text{in}+)]_A \end{bmatrix} & 2) \\ [+AR: /+\text{av}+/_A] & 3) \end{cases}$$

The formal shape of the rule makes it obvious that only one suffix renders the category "adjectival diminutive" — note a single affixation rule. The conditions defining the applicability of the suffix $/+\text{av}+/$ are sensitive to three sets of potential base-forms:

1) Adjectives of colour which, however, cannot be relational, cf. *piaskowy* 'sandy (colour)' *piaskowawy*, *szmaragdowy* 'emerald-green' — *szmaragdowawy*.

2) A large class of (other) qualitative adjectives, subject to a few additional semantic constraints (cf. above) and one whose nature is morphological: most bases that combine with this suffix are synchronically unmotivated root adjectives. Those few that are not, are all denominal adjectives with the suffix *-n(y)* $/+\text{in}+/$, e.g. *chłodny* 'cool' — *chłodnawy* (exceptionally a different adjective-forming suffix in *kulisty* 'globular' — *kulistawy*).

3) Finally, there are a few (less than 10) $/+\text{av}+/$ derivatives that do not correspond to the general pattern. These are forms like.

    okrągły 'round'   — okrągławy
    bolesny 'painful'   — bolesnawy
    kulisty 'globular'   — kulistawy

Items of this sort may be handled in two ways. One way out is to treat them as being actually derived by the rule in question, which can be guaranteed by providing each of them with a diacritic marker $[+AR: /+\text{av}+/_A]$. This interpretation is implicit in our rule, note the presence of this same diacritic in the formula above.

An alternative solution, which after all may seem to be more natural, is to treat the adjectives like *okrągławy* as lexicalized forms, fully represented in the Permanent Lexicon. Consequently, they need not be accounted for by the rule itself. However, a disadvantage of this approach is that it gives no opportunity of encoding the obvious derivational relationship between the base and the derivative.

Needless to say, while constructing a rule like the one above we are drawing on the concept of 'Overgenerating Morphology' (in the sense of Allen (1978)), since our rule will derive items belonging to the Conditional Lexicon (including potential words), and not just the forms attested in the dictionaries of Polish.

It is only in cases analogical to the Polish *-aw(y)* suffixation (in the sense of one-to-one equivalence between form and meaning) that there is no substantial difference between the lay-out and function of WFRs á la Aronoff and those that we propose. In fact, the two rules above (DR and AR) could be collapsed into a single rule format like that of a WFR, which seems to indicate that, in this particular case at least, our presentation is formally speaking hardly anything else but a notational variant of Aronoff's WFR-schema.

5. Let us now see how a categorially oriented WF component would handle certain more complex cases of derivations. What we have in mind are cases where a given derivational category is spelled out by several 'rival', co-functional affixes. It will turn out that in most situations of this sort any interpretation along the lines of the standard WFR theory is bound to be very costly (if at all feasible) in terms of the formulation of the respective rules. It appears that various very productive (in particular the so-called "categorial") processes of word formation should be accounted for in a different manner, crucially involving a novel conception of affixation-rule interaction.

According to Grzegorczykowa (1979), the Polish system of word formation comprises such "categorial" processes as, for instance, the derivation of Nomina Actionis and Nomina Essendi. The process of deverbal Nomina Actionis formation is said to be "categorial" in the sense that (almost) any Polish verb lends itself to this process. Another such process in Polish, whose domain is close to categorialness, is the derivation of Relational Adjectives (Rel. Adjs — denominal attributive adjectives with the general meaning 'pertaining/referring to what is denoted by the base noun', cf. *biblioteka uniwersytecka* (≫*uniwersytet*) 'university library'). We have attempted to demonstrate elsewhere (see Szymanek (1981)) that the vast majority of Polish nouns, both native and foreign, common and proper, may derive corresponding Relational Adjectives. The problem, however, is that there are as many as 6 formally distinct suffixes which (partly, at least) "specialize" in rendering this derivational function. These are:

	Rel. Adj.
/+j+/, e.g. kobieta 'woman'	— kobiecy
/+æn+/, e.g. ziemniak 'potato'	— ziemniaczany
/+i+/, e.g. ryba 'fish'	— rybi
/+ĭn+/, e.g. szkoła 'school'	— szkolny
/+ĭsk+/, e.g. uniwersytet 'university'	— uniwersytecki
/+ov+/, e.g. dom 'house'	— domowy

If we assume that we are faced here with a single derivational category (i.e. a single Rule of Derivation), it will follow that the six different suffixes (plus their variants) should be viewed as being attached to nominal bases by six cofunctional affixation rules. Naturally, the distribution of every single suffix (i.e. the domain of applicability of each AR) should be defined and delimited by means of appropriate conditions and constraints. Now we come to a vitally important question: should we treat the ARs under discussion as an unordered set and maintain that the information (conditions) contained in any such rule is completely independent of that encoded in the remaining five rules? Our answer is: no. It seems much more advantageous to view the six ARs as a *disjunctively ordered* set, beginning with the rule attaching the suffix /+j+/ — a rule with the narrowest domain of application, and ending with the AR for /+ov+/ attachment, which is the 'elsewhere' case, since this suffix appears to be the most productive within the set.

Further implications of imposing disjunctive ordering on blocks of co-functional affixation rules are discussed below.

On the whole, it seems reasonable to expect that the formal solution suggested above for the interpretation of Rel. Adj.-derivation in Polish may prove to be of real value also in the analysis of equally productive patterns found in other languages. In order to test the validity of this solution against the English data, one would first have to cope with some quite elementary problems of classification. The difficulty follows from the fact that virtually all analyses of the English word-formation component thus far available (both traditional and generative) avoid the question of classifying individual affixes into distinct derivational categories. Even in the most reliable accounts the principle of presentation of the various formatives is simply alphabetic, based on either their orthographic or phonetic shape. Any division proposed does not normally go beyond the assignment of affixal derivatives to distinct syntactic categories (N, V, Adj, Adv) and is only occasionally followed by some elementary subcategorization.

This is also the standard approach of the recent lexicalist studies which are biased towards illuminating the formal aspects of word-coining, even at the cost of neglecting important semantic generalizations.

A perusal of the final sections in Bauer (1983) compels one to the observa-

tion that there is now a growing awareness of the fact that there must be something fundamentally wrong about treating the word-formation component as an atomistic system of mutually unrelated affixes (i.e. a system of non-interacting WFRs). Bauer (1983:270) notes that "... there are problems connected with suffixation which are not discovered by an analysis of each suffix separately". He is led to this conjecture after examining two categories of English derivatives: adjectives from personal names (suffixes: -ese/-esque/-ic/ -ine/ -ish/ -ist/ -ite) and subject (agentive) nominalizations, represented by -er/ -ant/ -ee/ Ø. With reference to the former, Bauer rightly observes that "The problem is to decide, in any given case, which of several competing suffixes will be added to a given base to form an adjective" (1983:268). Somewhat later (p. 286) he concludes that "Little attention has been paid to the question of how it is known which affix should be used. In some cases it is not a problem: -able is the only affix with a meaning of the type 'able to be Ved', and -ee is the only suffix with the meaning 'person who is Ved'. [cf. our example of Polish -aw(y)above] In other cases, as was shown with the competing adjectival suffixes [...], the problem can be considerable".

So it may seem that Bauer is quite aware of the qualitatively new problems that arise when one chooses to interpret word formation from a categorial, semantically oriented view-point. Unfortunately, Bauer's recognition of this fact does not bear fruit in his study in the form of a revised model of word formation. Specifically, he does not arrive at a solution comparable to our disjunctive-ordering hypothesis, and even the split of derivation and affixation is not consistently accomplished. However, he implicitly introduces the *Elsewhere condition*/inherent in the disjunctive ordering principle: when discussing the class of agentive nominalizations, he clearly views the suffix -er which is the most productive within the competing set, as an elsewhere case (cf. above our interpretation of the Rel. Adj. -forming suffix -ow(y) in Polish). Thus, he argues as follows: "To the extent that there is any general principle operating in this set of data [...] it seems to be that -er should be used unless there is a reason not to use it" (1983:289).

Coming back to disjunctive ordering itself, it should be pointed out that our suggestion of employing this particular convention of rule interaction in the analysis of derivational morphology is not a completely new or original idea. Matthews (1974:229 ff) reports on successful attempts to employ disjunctive ordering in generative analyses of inflectional morphology (see Wurzel (1970)).

We must admit, however, that in either case (derivation or inflection) the convention of disjunctive ordering, if it proves of real value, will bear only partial resemblance to its analogue satisfactorily employed in the realm of phonology. The most visible difference is connected with the putative relationship between disjunctive ordering and the notational convention of parenthesis,

as they are used in phonology. The standard SPE model of phonology assumes that "two adjacently ordered elementary rules that can be abbreviated by the parenthesis notation will be disjunctively ordered" (Kenstowicz and Kisseberth (1979:349)). This means that abbreviability by parenthesis was treated by Chomsky and Halle as a necessary condition for imposing disjunctive-ordering relationship. It is obvious that such a strong requirement would make no sense with our disjunctively ordered sets of morphological ARs. However, the SPE claim is now said to be too strong even for phonological rules (for argument and alternative proposals see Kiparsky (1973), Kenstowicz and Kisseberth (1979:350 - 1)): two or more rules adjacent to one another need not be collapsable by parenthesis, and still may be treated (in otherwise determined cases) as disjunctively ordered.

Another point of difference is that in phonology the very position of a rule within a disjunctively ordered set can usually be argued about and determined in much stricter terms than is now possible in derivational moprhology. The morphologist, unfortunately, has to rely on such loose and impressionistic notions as the greater or lesser productivity of an AR, or the amount of conditioning information (how should we measure both?).

It is because of differences like the ones above that Halle's (1973) scepticism about the existence of any direct parallels between the interaction of phonological rules and rules of word formation seems quite understandable.

Now, in order to better clarify the place and function of disjunctive ordering in a categorial model of word formation, let us return to our example of Rel. Adj. derivation in Polish. The six co-functional suffixes given there are said to be disjunctively ordered, which means that the choice of a suitable suffix for any given nominal base will begin with the first AR on the list following the pertinent Rule of Derivation. This is the affixation rule distributing the suffix /+j+/. If the conditions which are part of this AR allow the attachment of the suffix /+j+/, to from a potential adjective, any further derivation will be blocked. On the other hand, if, which is more likely, the rule attaching the suffix /+j+/ is barred from application by virtue of the concomitant conditions, the nominal base in question passes on to the next AR(s) on the list, until the concatenation process is successfully accomplished. All the nominal bases that are still "in play", having failed to meat the conditions on rules 1-5, will automatically fall under the domain of the last AR, viz. /+ov+/ attachment. This is then the 'elsewhere' stage in the whole process under discussion.

It may be noted that the model of derivation outlined above is based on the following specific assumptions:
1). Conditions on a given AR within a disjunctively ordered set are complementary to the conditions on, and the operation of, other co-functional

ARs being ordered "higher" in this set. One may observe as well that due to the application of disjunctive ordering virtually all absolute conditions on individual ARs may be stated in positive terms — exclusion of ceratin forms in the input of a given AR (negative conditioning) will be a function of the ordering relationship thus imposed.
2). Disjunctive ordering of co-functional affixation rules presupposes that there should be, in principle, no cases of so-called parallel formations or "doublets". As far as the derivation of Polish Rel. Adjs is concerned, indeed it seems that parallel formations arise very infrequently (but cf., for instance, *wieśniak* 'peasant' — *wieśniaczy*//*wieśniacki* — Rel. Adj.). In order to correctly account for such cases, it seems necessary to modify or relax the effect of disjunctive ordering, since in its present form it clearly does not provide for the possibility of coining two parallel formations on a single base. A possible way out, which needs further investigation, is to treat one of the parallel forms as a lexicalized item, whereas the other one would be coined with occasional suspension of the mechanism of lexical blocking. On the other hand, there are, admittedly, certain areas of Polish word formation where "doublets" are a common phenomenon (for instance, derivation of expressive nouns and adjectives) and here the concept of disjunctive ordering will obviously present itself as inadequate and inapplicable. An original lexicalist treatment of Polish diminutives, which also pose the same problem, is suggested in Malicka-Kleparska (1985).

In order to see some of the formal consequences of the model proposed here, let us briefly consider the distribution of the most productive Rel. Adj.-forming suffix, viz. /+ov+/, which is found to combine with hundreds of both native and foreign bases, e.g. *książka* 'book' — *książkowy*, *śniadanie* 'breakfast' — *śniadaniowy*, *strajk* 'strike' — *strajkowy*, *parking* 'car-park' — *parkingowy*, *izotop* 'isotope' — *izotopowy*. The main and most important contraint on the application of /+ov+/ is semantic in nature: according to the traditional analysis (cf. for instance Satkiewicz (1969:130)), the suffix /+ov+/ does not derive Rel. Adj. from common presonal nouns. If we put aside the so-called "possessive adjectives" from (masculine) Christian names like *Adam* 'Adam' — *Adamowy*, *Piotr* 'Peter' — *Piotrowy*, which sound a little obsolete in Modern Standard Polish (evoking associations with the archaic style of the Bible), we may reverse the above conditions and state it in positive terms: *suffix /+ov+/ derives Rel. Adjs from (certain classes of) common non-personal nouns.*

Any further delimitation and narrowing down of the domain of /+ov+/ attachment, if undertaken in isolation and abstracted from other Relational suffixes, would have to result in a series of minute conditions overloaded with redundancy. Thus, one would be forced, for instance, to define and enumerate several morphological classes of non-personal nouns which sys-

tematically *do not* combine with /+ov+/ but with some other 'rival' suffix (ordered "higher" in our model of derivation — e.g. certain latinate nouns in *-cj(a)*, *-sj(a)*, *-zj(a)*, which combine with /+in+/, native nouns in *-alni(a)*, *-arni(a)*, *-owni(a)*, or names of animals, taking /+i+/ or /+j+/, etc.). Finally, exhaustive lists of exceptions would have to be enclosed to this putative account.

It follows then that such an asystemic description, if at all feasible, would be very costly in terms of formalization: this is so since (as we have already noted) often *what appears to be a positive condition defining the application of one suffix (say /+in+/) may at the same time be taken as a negative condition on one of its rivals* (e.g. /+ov+/).

By ordering the co-functional affixation rules we are able to considerably simplify the rule-component, since there will be no superfluous repetiton of the context-defining information. That is to say, by formally linking various co-functional ARs it is possible to eliminate a great deal of redundancy from the lexicon.

To conclude the discussion of our illustrative category — the class of Relational Adjectiven in Polish — we have to introduce one more formal innovation if we want to account for this derivational pattern (or any other equally productive one) in a completely satisfactory manner. Recall that Rel. Adj.-formation is a near-categorial process. This means that relatively few Polish nouns do not derive Rel. Adjs by any means, i.e. none of the six suffixes may combine with them. In order to accommodate such systematic or sporadic exceptions within our model of derivation we propose a special mechanism which may be referred to as an *Input Blocking Device*. We assume that before any nominal base-forms are processed and concatenated with appropriate suffixes to yield Rel. Adjs, the derivational apparatus should dispose of those nominal entries which cannot derive potential Rel. Adjs by any means. This is precisely the task of the Input Blocking Device. This blocking mechanism will exempt from the domain of the DR in question items of two sorts: (1) nominal entries which correspond to various 'systematic gaps' in the output; i.e. by means of generalized statements which are nothing else but *negative conditions on the DR itself* it will be ensured that whole classes of nouns such as Nomina Actionis, Nomina Essendi, Nomina Attributiva — which are established on a semantic basis, or classes of nouns ending in *-owicz,-owiec*, etc. — established on morphological basis — do not, in principle, undergo the process of Rel. Adj.-derivation; (2) disparate nominal entries which may be coupled with the 'accidental gaps' in the output. Here it must be lexically determined that, for instance, there is no Relational Adjective from *policjant* 'policeman' (cf. *policjancki* vs. *komediant* 'comedian' — *komediancki*) or from *osa* 'wasp' (cf. *osi* vs. *pies* 'dog' — *psi*).

Summing up, the overall relatioships holding between the nominal base and the output of the rule deriving Rel. Adjs in Polish may receive the following simplified graphic representation:
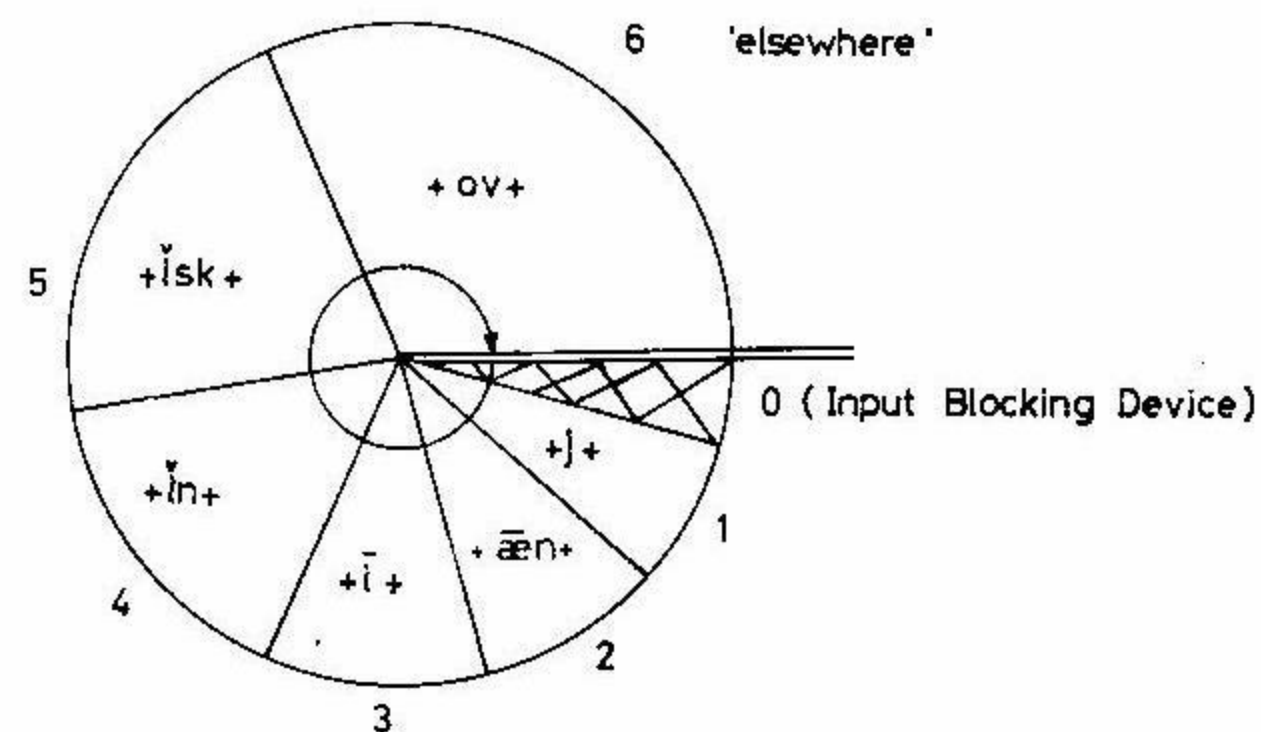

Fig. 2

Only when equipped with this model of derivation are we able to provide detailed answers to general questions of the following sort: Is it possible, in Polish word formation, to convey the meaning 'pertaining/referring to what is denoted by the base noun' (i.e., is it possible to derive Rel. Adjs) and, if so, *which Polish nouns, and by what formal means, lend themselves to the process of Rel. Adj. derivation?*

It may be observed that the way the question is stated is rather untypical of the characteristic approach to word formation represented by other lexicalist scholars: their questions usually focus on the distribution (and possibly also: meaning) of *individual* affixes, whereas we are primarily interested in what categorial meanings may be expressed on the level of word formation in a particular language, and only then — by what formal means. In this sense our approach seems to illustrate "a theory of word-formation that takes its starting point in some kind of semantic or cognitive structure" (Bauer (1983:286)).

6. It has already been hinted in passing that the formal innovations proposed in this paper, i.e. disjunctive ordering of co-functional Affixation Rules, plus the Input Blocking Device (if needed) are of limited applicability. On the whole, these solutions seem to be useful and justified in the analysis of, some at least, highly productive, almost categorial patterns of derivational morphology.

However, first and foremost, the distinction between Rules of Derivation and Rules of Affixation is immaterial and offers no real gain over the standard WFR-theory in the infrequent cases when there is really a one-to-one corres-

pondence between form and meaning, i.e. in cases like Polish -*aw(y)* or English -*able* (disregarding the semantic exceptions).

Otherwise, the formal modifications proposed above should be seriously considered in any instance where a given derivational category is rendered by more than one affix. Unfortunately, even in such cases, disjunctive ordering need not always be called for. Too little categorially oriented work on word formation has been done so far to give a clearly convincing support and illustration of this point. Suffice it to say that the problem seems to manifest itself, for instance, in Górska's (1981) analysis of the category Nomina Loci in Polish. According to Górska, there are four basic co-functional suffixes capable of rendering the categorial function in question: These are: -*alni(a)*, -*owni(a)*, -*ni(a)*, and -*arni(a)* (cf., respectively, *przebieralnia* 'changing room', *żaglownia* 'sail room', *pakownia* 'packing-room', *palarnia* 'smoking room').[3] Assuming Górska's analysis to be correct, it turns out that the distribution of these four formatives is, by and large, *mutually disjoint and unrelated*, and may be specified individually in terms of syntactic and morphological conditioning. (Moreover, the rules she discusses fail to meet Aronoff's "unitary base hypothesis", since the base forms are both nouns and verbs). If this is indeed the case, then one can hardly speak here of any interaction of ARs, and consequently imposing disjunctive ordering on them offers little help to the analyst.

Similar conclusions follow from an analysis of the class of causative deadjectival verbs in English, reported in Gussmann (to appear). Again the distribution of such formatives as -*en, en-, en-...-en, be-, -ify, -ize*, Ø seems to indicate that the respective Rules of Affixation do not significantly interreact with one another.

7. A final conclusion to be drawn from our presentation above may be that disjunctive ordering of co-functional Affixation Rules seems to be a viable solution whenever there exists any marked functional interplay among these rules. Disjunctive order is then a formal reflection of this interplay, additionally justified by the requirements of simplicity and economy (cf. a similar conclusion with reference to disjunctive ordering in phonology in Anderson (1974:107)).

A more general conclusion is that the nature of various productive word-formation patterns is not underlyingly uniform—on the contrary, there seem to exist important functional differences in the ways in which affixes of all sorts (or rather affix-shapes) are brought into use. Consequently, these differences, if taken seriously, will result in a model of word formation which may probably

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[3] Since the four putative suffixes exhibit a common morphemic element -*ni(a)*, they could in fact be viewed as allomorphic extensions of the principal suffix, thus $\left(\begin{Bmatrix} al \\ ov \\ ar \end{Bmatrix} \right)$ +*ni*+(*a*).

be criticized for its formal heterogeneity but which, at this cost, will be more capable of accounting for a variety of derivational phenomena. Just which of the repertoire of formal means is to be employed must be decided upon individually for every single category, the ultimate criterion being consistence with the facts, formal adequacy and economy of the description as well as the insightfulness of the analysis.

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