STUDIES IN DERIVATIONAL MORPHOLOGY

by

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ABSTRACT

This thesis develops a theory of derivational morphology incorporating
a lexical structured by rules. A notation is introduced which relates
lexical deep-structure to surface-structure, and the notion of _deriva-
tional function_ is introduced. Various derivational functions of
English are examined, in particular the _derived nominal_. Arguments
are presented favoring the structured lexicon over the unstructured
lexicon and opposing the lexical analysis of generative semantics.
Finally, some problems raised within the structured lexicon are
discussed, including accretion and the classification of adjectives.
Major primitive lexical categories are isolated--noun, adjective,
and verb--and each of these is shown to be morphologically related
to the others.

Thesis Supervisor: Paul Kiparsky
Title: Professor of Linguistics

For my grandmothers, who wanted to see it finished.

And as no man knows the ubicity of his tumulus nor
to what process we shall thereby be ushered nor
whether to Tophet or to Edenville in the like way
is all hidden when we would backward see from what
region of remoteness the whatness of our whoness
hath fetched his whenceness.

--James Joyce
Ulysses [394]

ACKNOWLEDGEMENT

CONTENTS

CHAPTER ONE - INTRODUCTION

1.1 THE RELATEDNESS OF WORDS

Like other components of generative grammar, morphology seeks to relate

sound and meaning. Generative syntax grew out of the discovery that certain

surface sentence types could be systematically derived from deep structures

by rule. Generative phonology evolved from a similar discovery about sound

segments. Generative morphology, in turn, is based upon the hypothesis that

certain patterns at the word level are basically systematic, that words can

be related by rule, that there is such a theoretical level as lexical deep

structure. Morphology establishes sound and meaning correspondences within

the lexicon, and thus it involves phonology and semantics--and syntax in

that each derivative must be assigned a syntactic category.

1.1.1. EXAMPLE

Let us begin with an example. We observe that in English, country

names and adjectives of nationality (often also language names when used

as nouns) are morphologically paired:

(1) England/English, France/French, Wales/Welsh, Ireland/Irish,

Tibet/Tibetan, Germany/German, Sweden/Swedish, Norway/Norwegian,

Denmark/Danish, Vietnam/Vietnamese, Russia/Russian, China/Chinese,

Finland/Finnish, Hungary/Hungarian, Italy/Italian, Peru/Peruvian,

Spain/Spanish, Portugal/Portuguese, Iceland/Icelandic, Afghanistan/

Afghan, Belgium/Belgian, Holland/Dutch, Israel/Israeli, Switzerland/

Swiss.

Each of these pairs differs phonologically from each of the others.

(Although some common endings occur, such as -ese, -an, -ish, the roots vary

widely). The syntax and semantics of these pairs are similar, however. In
the lexicon we may represent the meaning relationship of the noun and
adjective in parallel ways. Once we have appropriately defined the noun, we
may list the adjective as meaning PERTAINING TO N, where N is the country in
question.

The ending -ish may be taken as standing for the lexical function
that maps each of the proper nouns of (1) onto an adjective. We term this
correspondence "functional" because it is a one-to-one pairing of forms.
Picking -ish (somewhat arbitrarily) as the underlying suffix, we can
abstractly represent all the adjectives as N-ish in deep structure. Once
this ending is defined derivationally for the adjective English, coming
from England, it will be economical to define all the other national adjectives,
whatever their shape. Even Holland/Dutch is semantically regular, the
adjective being represented in deep structure as [Holland]-ish .
                                                          N   A

The derived adjectives of (1) may themselves be mapped onto nouns like
Englishman. The function which performs this mapping may be named -man
and assigned the meaning ETHNIC REPRESENTATIVE:

(2)   English/Englishman, French/Frenchman, Welsh/Welshman, Irish/

      Irishman, Tibetan/Tibetan, German/German, Swedish/Swede,

      Norwegian/Norwegian, Danish/Dane, Vietnamese/Vietnamese, Russian/

      Russian, Chinese/Chinese, Finnish/Finn, Hungarian/Hungarian,

      Italian/Italian, Peruvian/Peruvian, Spanish/Spaniard, Portuguese/

      Portuguese, Icelandic/Icelander, Afghan/Afghan, Belgian/Belgian,

      Dutch/Dutchman, Israeli/Israeli, Arabic/Arab, Jewish/Jew, Swiss/

      Swiss.

This time some regularities in the phonology can be observed, such as the
fact that adjectives ending in -ese and -an remain unchanged in the noun.

Naming the function that performs this mapping as -man, we observe that the semantics is again regular, so that Spaniard may be represented in deep structure as $[[Spain_N]-ish_A]-man_N$. In general it is simpler to derive the -man nouns from the adjectives, rather than relating them directly to the country names, but note that Finn, Dane, Swede, Arab, and Jew appear to constitute a subclass where the "derivative" is shorter than the "source". Such problems frequently arise in the data presented in this work.

Related to the noun-forming function is the interesting elliptical operation evident in sentence (3):

(3) The English drink tea, while the French and the Portuguese prefer wine.

Here the noun people seems to have been deleted, but the operation must be lexical rather than syntactic, since it is morphologically constrained: no -an adjectives may occur in this construction:

(4) *The Russian drink tea.

(5) *The Italian eat spaghetti.

Connected with country names there is yet another function, evident in the verbs Germanize and Americanize. It is regularly -ize for all the national adjectives ending in -an, but it is Frenchify for French, Russify for Russian, Anglicize for English, Vietnamize for Vietnam (here the root seems to be the noun rather than the adjective), while for the rest no verbs exist: *Portuguize, *Chinafy. This lack of forms is not unusual in morphology. Some states and cities have derived names for RESIDENTS, while for many these are morphologically undefined:

(6) New York/New Yorker, London/Londoner, Ohio/Ohioan, Paris/Parisian, Liverpool/Liverpuddlian, San Francisco/San Franciscan, Boston/Bostonian, Washington /Washingtonian, Oxford/Oxonian, Cambridge/

Cantabrigian, Kentucky/Kentuckian, Massachusetts/*, Minneapolis/*,

Connecticut/*, New Haven/*, Amherst/*, Texas/Texan, Oregon/Oregonian,

Maine/Mainer, Indiana/Hoosier, Cincinnati/Cincinnatian, Arkansas/

Arkansawyer, Virginia/Virginian, Terre Haute/*, Los Angeles/

Angeleno.

1.2 REASONS FOR PAIRING

As we are beginning to discover, morphology depends upon shared
intuitions of likeness and difference, judgments of phonological and semantic
"closeness" and "distance". This work seeks to explicate the nature of these
notions, to explore criteria for pairing.

The words sane and sanity are paired by the morphology in much the same
way that Italy and Italian are paired, for example. There are essentially
two reasons for this decision. First, there is the phonological fact that
these formatives share distinctive features; they have in common the
struction /sVn/ and can be related by straightforward phonological rules.
Second, there is the semantic fact that these words participate in analogies.
There exists in English at least one semantically parallel match (e.g.,
pure/purity) which may occur in similar sentence slots:

(7a) Martha asked if Alice was sane.

(7b) Martha asked if Alice was pure.

(8a) Martha asked about Alice's sanity.

(8b) Martha asked about Alice's purity.

By relating these pairs, morphology expresses the fact that part of the
competence of English speakers is the ability to construct such analogical
patterns. Speakers know that sane and sanity are related, much as they know
that the finite verb is second in the syntax of WH-questions.

1.2.1 PSEUDO-PAIRS

This point becomes clearer if we consider some pairs that we do <u>not</u>
choose to relate morphologically. These are pairs which fail the phonological
and semantic criteria.

For example, we note that the deletion of initial /l/ frequently
produces a new English word:

> (9) ledge/edge, loan/own, learn/earn, lend/end, legal/eagle, lax/ax,
>
> leer/ear, lame/aim, lake/ache, lore/ore (oar), lyre/ire, lair/air,
>
> limp/imp, lamp/amp, lace/ace, love/of, load/ode, late/eight, loaf/
>
> oaf, label/able.

Some of these pairs seem at first semantically close (e.g., <u>ledge/edge</u>,
<u>loan/own</u> and <u>lamp/amp</u>), but observe that no two such pairs can be united
in an analogy. Each semantic relationship is different.

We are able to rule these out as morphological pairs because they fail
the second (semantic) criterion. The deletion of /l/ has no morphological
function. The similarity in sound of these formatives is a linguistic
accident; the pairs have no place in our morphology. Lack of analogy rules
out <u>hear/ear</u> and <u>truck/track</u> in a similar way.

A false pair of another kind fails the phonological criterion. A
sort of analogical relationship does exist in the case of <u>table/chair</u> and
<u>bar/stool</u>:

> (10a) John is sitting at the <u>table</u>.
>
> (10b) John is sitting at the <u>bar</u>.
>
> (11a) John is sitting on a <u>chair</u>.
>
> (11b) John is sitting on a <u>stool</u>.

However close the semantics, no natural phonological rule readily relates
these pairs. Here the semantic closeness is a fact about the real world,

not a fact of grammar. The ability to construct analogies of this kind is not linguistic.[1]

1.2.2 DEGREES OF RELATEDNESS

The phonological and semantic conditions on morphological pairs may be fulfilled to varying degrees. There may be exact sound correspondence with the affixation of a fixed element and no other operation, as in red/redness, where the only phonological change is the addition of the suffix -ness in the noun. Or there may be very little sound correspondence, as in swan/cygnet, where /s/ and /n/ are the only shared segments and where the required affix is a reduced form of -let, the diminutive suffix of drop/droplet and eye/eyelet (although eyelet is not semantically diminutive). The pair swan/ cygnet is semantically supported by analogy with pig/piglet, so the pair has some morphological plausibility, despite the low productivity of its phonological pattern.

On the semantic side there may be very many available analogies, as in the highly productive noun-forming suffix -ness. Or there may be only a small number of analogical pairs, as in the adjectives hourly, daily, nightly, weekly, monthly, quarterly, yearly (British fortnightly)[2] from the nouns hour, day, night, week, month, quarter, year, (fortnight). No other time expressions follow this pattern: *minutely (with lax vowels), *secondly, *noonly, *midnightly, *decadely, *centuryly.

We will find morphological pairs that show semantic analogy, but are phonologically unique. Examples are clean/cleanliness with analogy mean/ meanness, enormous/enormity with analogy monstrous/monstrosity, and grateful/ gratitude with analogy decrepit/decrepitude. Here various phonological elements appear or disappear idiosyncratically. Some pairs are unique, but

supported by the existence of others, as in the derivatic of $\underline{fortunate}_A$ from $\underline{fortune}_N$ paralleled by $\underline{lucky}_A$ from $\underline{luck}_N$.

Similarly, we encounter pairs that are phonologically analogical, but semantically unique. For example, we find that $\underline{steal/stealth}$ and $\underline{heal/health}$ follow similar sound patterns, although the semantic analogy is quite weak:

(12a)   Alice $\underline{steals}$ into the night.

(12b)   Alice $\underline{heals}$ quickly.

(13a)   Alice's $\underline{stealth}$ pleases the witches.

(13b)   Alice's $\underline{health}$ pleases the witches.

It is crucial to note that as language changes, certain historically motivated morphological pairs become unavailable to modern speakers. The derivational connections have been lost, for example, in $\underline{thrive/thrift}$, where the noun is no longer semantically close to the verb. One may exercise $\underline{thrift}$ without $\underline{thriving}$. Here the phonological pairs that exist ($\underline{give/gift}$ and $\underline{thieve/theft}$) do not support the pairing semantically.

Some other historical formative pairs that are probably unavailable to modern speakers of English are: $\underline{fiscal/confiscate}$, $\underline{temple/contemplate}$, $\underline{fable/fabulous}$, $\underline{grieve/grave}$, $\underline{require/requisition}$, $\underline{appoint/disappoint}$. Words may be connected historically, but not morphologically: $\underline{vine}$, $\underline{wine}$, $\underline{vintage}$, $\underline{vintner}$, $\underline{vineyard}$, $\underline{vinegar}$. $\underline{Vineyard}$ is related historically to $\underline{orchard}$ and $\underline{garden}$, but speakers cannot be counted on to know this.

1.3   DERIVATION AND INFLECTION IN THE LEXICON

We have seen that morphology is based upon the notion $\underline{morphological}$ $\underline{pair}$, which in turn is grounded in phonology and semantics. So far we have not distinguished between derivational and inflectional morphology. The distinction becomes important when we turn to the structure of the lexicon.

The lexicon, or dictionary, contains an exhaustive listing of formatives. There lexical items are recorded, assigned a syntactic class, a semantic representation, and a phonological shape. Some items will have alternative shapes; for example, the verb sing has variant verbal forms sings, singing, sang, and sung.[3] Some items will be related to other items, and such relations will also be noted; for example, the verb sing is related to the noun song.

Derivational morphology maps lexical items onto other lexical items, while inflectional morphology deals with lexical structure within items. Derivational morphology effects mappings external to the lexical item, while inflectional morphology brings about internal mappings.

This work will be primarily concerned with external mappings, or derivations, but as we will note, the two types of morphological relationship are not always mutually exclusive. In particular, there are cases where derivational forms appear to have inflectional status, and contrary cases where inflectional forms acquire derivational character.

1.3.1 THE TAXONOMY OF DERIVED NOMINALS

Before turning to some examples of this inflectional/derivational cross, it is necessary to define a syntactic class which is repeatedly referred to in the work which follows, the derived nominal. In our terminology, derived nominals are a special subset of the set of derived nouns. In particular, derived nominals are defined as those deverbal and de-adjectival noun derivatives which have S-interpretation. [This concept is developed more fully in Chapter Two.]

1.3.1.1 DEVERBAL NOMINALS

It is best to give some examples of nominals and their interpretation.
Dismissal is the derived nominal of the verb dismiss. In the sentence

(14) John's dismissal of the alternative explanations was reported

to Alice.

we find that the nominal can be interpreted as the verb in an embedded

sentence:

(15) That John dismissed alternative explanations was reported to

Alice.

Similarly, dismissal is interpreted passively in

(16) John's dismissal (from work) was reported to Alice.

where the sentence means:

(17) That John was dismissed (from work) was reported to Alice.

Like dismissal in either (14) or (16) are the following deverbal nouns

ending in -al:

(18) renewal, withdrawal, betrayal, approval, removal, survival,

revival, arrival, upheaval, acquittal, rental, recital, espousal,

denial, appraisal, trial, referral, portrayal

The list of such nouns is finite, in fact, small. The nominal, however, is

not restricted to forms ending in -al. There are several other possible

endings, and some of these are "productive". A complete taxonomy includes

the following:

(19) -tion: colonization, introduction, devastation, invasion

(20) -ance: disappearance, observance, issuance, acceptance,

entrance, utterance, tolerance (=toleration), admittance

(21) -ing: closing, opening, repairing, filing, obeying

(22) -ment: development, deployment, involvement, announcement

(23) zero: display, relay, delay, decay

(24) irregular: conquer/conquest, criticize/criticism, discover/

discovery, fail/failure, crown/coronation, store/storage, depart/

departure, compare/comparison, conspire/conspiracy, pursue/pursuit

Adhere has two nominals, adherence and adhesion, one abstract and the

other concrete in meaning. Example sentences containing these deverbal

nominals are:

(25) The troops' invasion of Cambodia angered Martha.

(26) John's closing of the store angered Martha.

(27) Bill's announcement of his divorce angered Martha.

(28) Arthur's delay in replying angered Martha.

(29) The troops' conquest of the capital angered Martha.

In each of the sentences (25)-(29) the nominal may be interpreted as the verb

in an embedded sentence.

1.3.1.2 DE-ADJECTIVAL NOMINALS

A de-adjectival nominal example is

(30) John's kindness surprised Martha.

where the sentence means:

(31) That John $\begin{cases} \text{is} \\ \text{was} \end{cases}$ kind surprised Martha.

Nominals in -ness from adjectives are quite common:

(32) -ness: hardness, redness, deadness, happiness, readiness

Other endings for de-adjectival nominals are the following:

(33) $\begin{cases} \text{-ance:} \\ \text{-ence} \end{cases}$ dominance, senescence, relevance, reticence,

magnificence, reluctance

(34) $\begin{cases} \text{-ancy:} \\ \text{-ency} \end{cases}$ consistency, decency, flagrancy, vibrancy, complacency

(35) -cy: bankruptcy, obstinacy, idiocy

(36) -ry: ribaldry, sophistry, bravery, savagery

(37) -ity: responsibility, sagacity, fidelity, felicity, duplicity

(38) -th: strength, wealth, length, width

(39) -itude: decrepitude, rectitude, certitude, fortitude, plentitude

Not all of these nominals have simple adjective sources; for example,

felicity has no underlying adjective *felis, although it clearly functions

syntactically as a nominal:

(40) John's felicity surprised Martha.

Example sentences containing these de-adjectival nominals are:

(41) John's dominance surprised Martha.

(42) Bill's consistency surprised Martha.

(43) Arthur's bankruptcy surprised Martha.

(44) Peter's ribaldry surprised Martha.

(45) Frederick's sagacity surprised Martha.

(46) Alice's fortitude surprised Martha.

In each of these cases, the de-adjectival nominal is interpreted according

to the pattern established in (30)-(31).

1.3.2. INFLECTIONAL/DERIVATIONAL CROSS

The preceding two sections make the claim, which will be repeated

throughout this work, that various derivational processes work across the

morphology to one purpose. There are a variety of endings involved in its

definition, but the notion derived nominal is defined for many verbs and

adjectives. Not for all. There is no noun *vanishment, although the pattern

banish/banishment exists, and although the synonym of vanish, the verb
disappear, exhibits the nominal disappearance. Similarly, subdue_v lacks
a derived nominal: *subdual, *subduement, *subdusion.

Returning to the claim presented in Section 1.3, we find that although
the class nominal is derivational in origin, it shows systematic syntactic
and semantic behavior—behavior that seems inflectional in character, except
for the fact that the morphology is so diverse. We observed earlier that in
the contrary case inflectional endings may yield forms that are essentially
derivational in nature. This is true for adjectives in -ed.

1.3.2.1 ADJECTIVES IN -ED

In traditional inflectional terms, -ed is the participial ending for
many verbs:

(47) John helps Bill.

(48) John has helped Bill.

The suffix, however, is found in many adjectival forms which do not seem so
closely connected with underlying verbs. For example, the forms

(49) abandoned, refined, deformed, offended, disappointed, wrinkled,

stunted, haunted, contented, limited, frosted, bloated,

depressed, inspired, dignified, advanced, congested, qualified,

amused

may occur prenominally and may take very or quite as adverbial modifier,
although the strictly verbal participles may not:

(50) *a very washed dress, *a very watched program, *a quite helped

person, *a quite painted room, *a very loved dog

Many adjectives in -ed do not appear to be derived at all:

(51) crooked, wicked, rugged, sacred, demented, wretched

A <u>secluded</u> wood is not a wood that someone has secluded, nor is a <u>devoted</u>
servant a servant that someone has devoted. Finally, some -<u>ed</u> derivatives
appear to be from noun, rather than verb, sources:

(52)   flowered, pointed, talented, conceited, cultured, feathered,

prejudiced, detailed, experienced, honeycombed, flatfooted,

broad-shouldered

All of these examples combine to suggest that the suffix -<u>ed</u>, although
inflectional and verbal, also yields on many occasions adjectives, some of
which have been relexicalized (entered in the lexicon as essentially
underived primitives).[4]

The nominal and -<u>ed</u> examples show that at least for English a rigorous
separation between inflection and derivation cannot be sustained.

Having made these observations, we now turn to the body of the work.

CHAPTER TWO - THE STRUCTURED LEXICON

2.1 BASIC CONCEPTS

The structured lexicon consists of two types of elements: items and rules.

The items constitute an exhaustive listing of all the formatives found in the language. They catalog the speaker's knowledge of what is and what is not a word. For any real speaker, of course, the lexicon will change with time as certain items gradually fall into disuse and other new items are adopted, but at any given moment the lexicon is fixed--the set of existent formatives, their possible shapes, uses, and meanings, being strictly delimited.

The rules express generalizations relating the items to one another. Some of these are redundancy rules specifying the nature of a theoretically possible formative in the language. Others capture what the speaker must know about existing formatives, in particular what the speaker knows about word-building processes. These rules presumably help the speaker remember the items in the file and acquire new items for storage. The rules simplify and order the rather idiosyncratic information found at this level.

2.1.1 LEXICAL ITEMS

We will assume that items are entered in the lexicon in a format that specifies phonological properties, syntactic properties, and semantic properties. Every lexical entry will be of the form:

(1)
$$\begin{bmatrix} /\text{phonological representation}/ \\ \text{syntactic representation} \\ \text{SEMANTIC REPRESENTATION} \end{bmatrix}$$

A sample lexical entry might be:

(2)
$$
\begin{bmatrix}
/l\Lambda v/ \\
\\
+V \\
+[NP^1\_\_\_NP^2] \text{ where } NP^1 \text{ must be } [+Animate] \\
\\
NP^1 \text{ LOVE } NP^2
\end{bmatrix}
$$

This entry claims that a lexical item phonologically represented as /lʌv/ is

a transitive verb requiring animate subject, and that it is interpreted as

LOVE. This entry permits use of the item in (3)-(5), but not in (6):

(3)   John loves Bill.

(4)   John loves his dog.

(5)   John loves democracy.

(6)   *Democracy loves cashews.

Another lexical item will be represented as:

(7)
$$
\begin{bmatrix}
/l\Lambda v/ \\
\\
+N \\
+Abstract \\
+[NP^{1}\text{'s} \_\_\_ \begin{Bmatrix} for \\ of \end{Bmatrix} NP^2] \text{ where } NP^1 \text{ must be } [+Animate] \\
\\
LOVE
\end{bmatrix}
$$

This entry asserts that there is another item phonologically represented as

/lʌv/, that this item is an abstract noun, and that it can occur in phrases

of types (8)-(10), but not (11):

(8)   John's love for Bill

(9;   John's love for his dog

(10)   John's love of democracy

(11)   *Democracy's love of cashews

We have again used the representation LOVE as the meaning, suggesting that

item (7) is somehow semantically related to item (2). Unfortunately, it is

not yet clear how to represent the semantics more satisfactorily.

Another lexical item for the English lexicon will be:

(12)
$$\left[\begin{array}{l} /l\Lambda v/ \\ +N \\ \text{SCORE OF ZERO IN TENNIS AND PINGPONG} \end{array} \right]$$

This entry states that the language contains another formative represented phonologically as /l∧v/, that this is a noun used in scoring tennis and ping-pong.

As we have said, the rules of the lexicon capture regularities manifest in the items. Intuition suggests that a rule might interrelate the first two /l∧v/ items, but that no rule relates either to the third.

If there is a rule, it must apply to more than one case, of course. Evidence for a rule must be sought in the body of the vocabulary. Supporting a rule relating the first two /l∧v/ entries, we find the following items:

(13)
$$\left[\begin{array}{l} /heyt/ \\ +V \\ +[NP^1 \_\_ NP^2] \text{ where } NP^1 \text{must be } [+Animate] \\ NP^1 HATE \, NP^2 \end{array} \right]$$

(14)
$$\left[\begin{array}{l} /heytrəd/ \\ +N \\ +Abstract \\ +NP^1 s \_\_ \left\{ \begin{array}{l} for \, NP^2] \text{ where } NP^1 \text{must be } [+Animate] \\ of \end{array} \right. \\ HATE \end{array} \right]$$

These entries permit (15)-(20), but prohibit (21) and (22):

(15)   John hates Bill.

(16)   John hates his dog.

(17)   John hates democracy.

(18)   John's hatred for Bill

(19)   John's hatred for his dog

(20)   John's hatred of democracy

(21)   *Democracy hates cashews.

(22)   *Democarcy's hatred of cashews

We note that noun entries (7) and (14) look similar, as do the verbs

(2) and (13). A lexical rule would explain the correspondences evident in

these items. No rule is forthcoming to account for (12), however. Its

phonological coincidence with (2) and (7) is structly fortuitous.

2.1.2 DERIVATIONAL FUNCTIONS

So far we have said little about the character of lexical rules. We will

make some strong claims about their nature. Our first observation is that

some of them are functions. These rules have a domain and range, and they

effect a one-to-one mapping of the former onto the latter. Lexical items are

the arguments of the domain and lexical derivatives are the values of the

range.

As the functions map lexical entries onto other lexical entries, they

assign phonological features, syntactic features, and semantic features.

A good example of this derivational process is the mapping of English cardinal

numbers onto ordinal numbers. The function that performs this mapping in

general assigns the suffix /θ/, makes the entry an adjective, and gives it

the meaning ORDERED AS NUMBER N. This function relates (23) to (24). We will

assume that the cardinals are nouns.

(23)
$$\begin{bmatrix} /fɔr/ \\ +N \\ 4 \end{bmatrix}$$

(24)
$$\begin{bmatrix} /fɔrθ/ \\ +Adj \\ 4TH \end{bmatrix}$$

This function works transparently for all numerals ending in <u>four</u>, <u>six</u>, <u>seven,</u> <u>eight</u>, <u>nine</u>, <u>ten</u>, <u>eleven</u>, <u>twelve</u>, the teens, <u>twenty</u> and the other multiples of ten, <u>hundred</u>, <u>thousand</u>, <u>million</u>, <u>billion</u>, <u>trillion</u>, <u>zillion</u>, and <u>zero.</u> Ordinals derived from cardinal numbers ending in <u>one</u>, <u>two</u>, <u>three</u>, and <u>five</u> are exceptional. The vowel of <u>fifth</u> is lax, rather than tense as in <u>five</u>, although both <u>nine</u> and <u>ninth</u> show tense vowels. Rather than the expected *<u>threeth</u>, the proper ordinal is <u>third</u>. Numbers ending in <u>one</u> and <u>two</u> are totally suppletive phonologically as <u>first</u> and <u>second</u>. None of these items is irregular syntactically or semantically, however, so the ordinal rule will apply freely in its domain, assigning suppletive phonology where necessary.

The values of one function may be the arguments of another. For example, there is another function that yields reciprocals, as in:

$$(25) \quad \begin{bmatrix} \text{/fɔrθ/} \\ \text{+N} \\ \text{+Count} \\ \text{1/4} \end{bmatrix}$$

This function turns ordinal adjectives into count nouns. In general, the phonology remains unaltered, but there are two exceptions. Rather than *<u>second</u>$_N$ we find <u>half</u>, and the noun <u>quarter</u> is in free variation with <u>fourth</u>$_N$, as in <u>a quarter of the pie</u>, (but not in <u>quarter moon</u>/*<u>fourth moon</u> or <u>quarter dollar</u>/*<u>fourth dollar.</u>)

This lexical process may be viewed as a composite function whose domain is the set of integers and whose range is the set of reciprocals. It is important to remember, however, that although this composite maps nouns onto other nouns, it proceeds via an adjectival stage.

2,1.2.1 FUNCTIONAL SUBREGULARITY AND IRREGULARITY

We have observed that functions show phonological suppletion. In fact, they also exhibit syntactic and semantic subregularities and irregularities of

various types.

It may be the case, for example, that although a function is semantically well-defined, not all lexical items with a particular semantic structure actually occur as members of the domain. A lexical process in English maps adjectives onto derivative verbs. Among the color adjectives we find such pairs as red/redden, white/whiten, black/blacken, yellow/yellow, gray/ gray. It happens, however, that there are no verbs derived from beige, green[5], orange, scarlet, purple, violet, or pink. These are perfectly arbitrary gaps, since there is no semantic or phonological obstacle to the formation of verbs in these cases. (In Russian, for example, we find rozovet', "to turn pink" as a regular derivative of rozovyj, "pink".)

The items of the lexicon record the fact that *pinken does not exist, just as they store the information that blacken does. Speakers do not create new words as freely as new sentences, even when a word-formation pattern clearly exists, as it does in this case.

Syntactic subregularity is evident in the color verbs which we have been discussing. We find, for example, that blacken is both transitive and in-transitive. As an intransitive verb it means TO BECOME BLACK. For example, we have the sentence:

(26)   The sky suddenly blackened.

As a transitive, however, it means TO CAUSE TO BECOME BLACK, as in:

(27)   John blackened his face for the minstrel show.

We note, however, that the analogous redden is strictly intransitive:

(28)   Mary's face reddened.

(29)   *Jim reddened his fireman's hat.

Some functions show semantic subregularities. For example, the function suffixing -er to verbs generally yields human agents, as in driver and ruler.

A set of derivatives such as <u>buzzer</u> and <u>freezer</u>, however, are generally [-Human].

Finally, there are phonological subregularities. Most nominals derived from verbs end in -tion, as in <u>the destruction of the city,</u> but many end in -ment, as in the deployment of troops. Similarly, most of the agent nouns derived from verbs end in <u>-er</u>, as we have observed, but some end in <u>-ent</u>: we have <u>adherent</u> and <u>resident</u> rather than *<u>adherer</u> or *<u>resider</u>.

2.1.2.2 ALLOFUNCTIONS

For cases where functions show subregularities we will use a special term: <u>allofunction.</u> We will say that the function adding -tion to form nominals from verbs has an allofunction in <u>-ment</u>. Similarly, we will claim that the function mapping adjectives onto verbs has an allofunction that is strictly intransitive, while in the general case both transitives and intransitives occur in the range. And we will say that the function yielding human agents like <u>ruler</u> has a semantic allofunction which gives nonhuman agents like <u>buzzer</u>. When functions partially share phonological, syntactic, or semantic features, they may be allofunctions.

Like allophones and allomorphs, allofunctions are used to capture subregularities. By allowing a rule to incorporate subrules, a function to include subfunctions, we permit more economical statement of certain generalizations than would otherwise be possible. In particular, the notion of allofunction allows us to capture phonological regularities that extend over heterogeneous semantic material and semantic regularities which apply across phonological diversity.

2.1.3 FORMALISM

In order to facilitate discussion of derivational functions, we will

develop a formalism that permits brief reference to their major features.

The symbolism $F = X[W_Y]_Z$ will be interpreted as claiming that the formative

F is of syntactic category Z, the result of applying function X to the under-

lying formative W of category Y.

The symbolism X_{YZ} will be interpreted as naming the derivational function

X whose domain is formatives of category Y and whose range is formatives of

category Z. The phonological and semantic aspects of function X may be referred

to by the ordered pair (a,b), where $\underline{a}$ is the phonological contribution, for

example a $\underline{suffix}$, and $\underline{b}$ is the semantic contribution, for example the meaning

AGENT. Thus, if we state chat $\underline{driver} = X[drive_V]_N$, then the function X may

be referred to with the ordered pair ($-\underline{er}$, AGENT). Similarly, for $\underline{untie}$ =

$X[tie_V]_V$, the function X is the ordered pair ($\underline{un}-$, REVERSAL). Where allo-

functions are involved, it may be useful to refer to only one member of the

sound-meaning pair. Thus, we may mention the function $NOMINAL_{VN}$ of $\underline{destruction=}$

$NOMINAL[destroy_V]_N$ and $\underline{deployment} = NOMINAL[deploy_V]_N$, ignoring temporarily

the phonological details. Similarly, we may choose to reference the function

yielding adjectives ending in the suffix $-\underline{able}$ (for example, $\underline{perishable}$, $\underline{profit-}$

$\underline{able}$, and $\underline{readable}$) by naming it simply as $-\underline{able}_{VA}$, ignoring the fact that the

meanings of its range are not uniform semantically. Since, as we will observe,

some derivational functions of natural language do not alter syntactic category

(in particular this seems to be the case for many prefixes), it will be

convenient to abbreviate X_{ZZ} as X_Z. By this convention, the derivational function

giving $\underline{untie}$ could be briefly referred to as ($\underline{un}-$, REVERSAL)$_V$.

We will call the phonological component of a function the $\underline{operator}$. Hyphens

will be used to indicate if the operator is a suffix, prefix, or infix. We

have already noticed, by mentioning stress-shift, that more complex phonological

processes than affixation may be involved. We will observe that zero operators

must also be admitted; that is, there are functions that have semantic and
syntactic effect, but leave no phonological trace.

Implicit in the notation is provision for derivations of unlimited complexity.
Since $X[W_Y]_Z$ is itself a formative, it can serve as input to another derivation-
al function whose domain includes items of category Z. The derivational function
A_{ZB} can apply to the formative $X[W_Y]_Z$, to yield the new formative $A[X[W_Y]_Z]_B$,
which is itself a potential argument of a derivational function.

2.1.3.1 TYPES OF ALLOFUNCTIONAL VARIATION

There are two basic types of allofunctional variation. First, we find phon-
ological allofunctions, functional variants which are identical in syntax and
semantics to a dominant function, but different in sound. For example, the
suffixes -ment and -tion both yield nominals from verbs. We find recruit$_V$/
recruitment$_N$ alongside complete$_V$/completion$_N$, the derived meanings being parallel.
The latter function seems to be the more productive, so we may say that (-ment,
NOMINAL)$_{VN}$ is a phonological allofunction of the function (-tion, NOMINAL)$_{VN}$.

Second, we find semantic allofunctions, functional variants which are
identical in syntax and phonology to a dominant function, but different in
meaning. An example of this type is the function suffixing -er to yield
agent nouns from verbs. The dominant pattern is for the derivative to be
[+Human]: drive$_V$/driver$_N$, play$_V$/player$_N$. There are derivatives in this
suffix which are [-Human], however, as in the driver used in golf or record
player. Other examples are buzz$_V$/buzzer$_N$ and freeze$_V$/freezer$_N$. Here, although
the [+Human] meaning is sometimes available (as in a factory where buzzing
or freezing is somebody's job), in general the inanimate reading pertains.
We may formally note this fact by claiming that (-er, INANIMATE AGENT)$_{VN}$ is a
semantic allofunction of the dominant function (-er, HUMAN AGENT)$_{VN}$.

A third type of allofunctional variation that we might expect to find is the syntactic. Although easily definable in our notation, syntactic allofunctions seem much more rare. It is hard to imagine syntactic variation that does not involve semantic variation to a significant degree.

If we were to incorporate syntactic allofunctions into our theory, possible examples might be: $-\underline{en}_{AV}$, which yields both transitive and intransitive verbs; -$\underline{able}$, which applies to both verbs and nouns (in $\underline{readable}$ and $\underline{objectionable}$); and $\underline{dis}$-, which applies to nouns, verbs, and adjectives in the basic meaning NEGATIVE ($\underline{disrepair}$, $\underline{disobey}$, $\underline{disproportionate}$).

Returning to the major types, we note that a given dominant function may have both phonological and semantic allofunctions. We observed earlier that the function (-$\underline{er}$, HUMAN AGENT)$_{VN}$ has a semantic allofunction. In fact, things are more complicated. Either of the agentive meanings may be realized by the suffix -$\underline{ent}$ (almost always in complementary distribution with -$\underline{er}$). Thus, we observe:

    (3C)   suffix -$\underline{er}$ in the meaning HUMAN AGENT ($\underline{driver}$)

    (31)   suffix -$\underline{ent}$ in the meaning HUMAN AGENT ($\underline{adherent}$)

    (32)   suffix -$\underline{er}$ in the meaning INANIMATE AGENT ($\underline{buzzer}$)

    (33)   suffix -$\underline{ent}$ in the meaning INANIMATE AGENT ($\underline{pollutant}$)

A survey of the lexicon discloses that (30) is the clearly dominant function. We expect its derivatives to be readily associated with one another and easily learned by speakers. Variants (31) and (32) are phonological and semantic allofunctions of (30), respectively. We anticipate that their derivatives will be less numerous and somewhat less readily comprehended and learned, since they involve deviations from the basic pattern. Type (33) derivatives are doubly removed from (30) and thus should be significantly more difficult

and less numerous. [See the end of section 4.2.3 for lists substantiating these assertions.] Since (33) is an allofunction of an allofunction (either (31) or (32),)it constitutes a very minor class.

It must be stressed that assertions about allofunctional variation follow from examination of the lexicon as a whole, not from the consideration of just a few examples. Suppose we find that:

(34)   suffix A has the meaning P in certain words

(35)   suffix A has the meaning Q in certain words

(36)   suffix B has the meaning Q in certain words.

We might conclude from this data that (34) and (35) are allofunctionally related, and that (35) and (36) are as well, if the words cited as evidence are of appropriate syntactic categories. We are not free to conclude which is an allofunction of which, however, until we establish dominance by looking at the entire lexicon. If $(A,Q)_{XY}$ is the dominant function, then $(A,P)_{XY}$ and $(B,Q)_{XY}$ are semantic and phonological allofunctions, respectively, of the dominant. We expect these to be less numerous in range, though greater in range than some function $(B,P)_{XY}$, if such exists, since the latter would be doubly variant from the dominant pattern. If either $(A,P)_{XY}$ or $(B,Q)_{XY}$ is dominant, however, the existence of $(A,Q)_{XY}$ does not suggest any necessary relationship (by transitivity) between the functions described by (34) and (36).

Not all arrays of the type (30)-(33) will be described as one function with allofunctions, For example, we find:

(37)   prefix de - in the meaning PRIVATIVE   (delouse, defrost)

(38)   prefix un - in the meaning PRIVATIVE   (unmask, unfrock)

(39)   prefix de - in the meaning REVERSATIVE   (detoxify, de-escalate)

(40)   prefix un - in the meaning REVERSATIVE (unglue, unwrap)

We note that the syntactic categories relevant in these functions are different. Here (37) and (38) map nouns onto verbs, while (39) and (40) map verbs onto verbs. A survey of the lexicon shows that $(\underline{de}\text{-}, \text{PRIVATIVE})_{NV}$ is dominant and the prefix $\underline{un}\text{-}$ is a phonological variant in the PRIVATIVE sense. In the REVERSATIVE case, however, $(\underline{un}\text{-}, \text{REVERSATIVE})_V$ is dominant, and here $\underline{de}\text{-}$ is a phonological allofunction.

We note in passing, however, that there is evidence that might be taken as arguing against this bifurcation. The prefix $\underline{dis}\text{-}$ appears in both PRIVATE and REVERSATIVE meanings, suggesting that there may be a unified NEGATIVE function at work here. The evidence is fairly substantial, but not overwhelming. The prefix $\underline{dis}\text{-}$ shows the PRIVATE meaning in $\underline{disillusion}$ and $\underline{disspirit}$, from the nouns $\underline{illusion}$ and $\underline{spirit}$. It is REVERSATIVE in $\underline{assemble}_V/\underline{disassemble}_V$, $\underline{associate}_V$ $/\underline{disassociate}_V$, $\underline{place}_V/\underline{displace}_V$, $\underline{embark}_V/\underline{disembark}_V$ (cf. $\underline{debark}$, $\underline{deplane}$), $\underline{connect}_V/\underline{disconnect}_V$, $\underline{engage}_V/\underline{disengage}_V$, and $\underline{charge}_V/\underline{discharge}_V$. The fact that one prefix unifies both cases seems to argue somewhat for one function.

$\underline{Dis}\text{-}$, however, is an extremely variable prefix, applying to all the major syntactic categories in the general NEGATIVE meaning. For adjectives it has the meaning NOT A, or OPPOSITE OF A: $\underline{similar}_A/\underline{dissimilar}_A$, $\underline{passionate}_A/\underline{dis\text{-}}$ $\underline{passionate}_A$, $\underline{honest}_A/\underline{dishonest}_A$, $\underline{consonant}_A/\underline{dissonant}_A$, $\underline{loyal}_A/\underline{disloyal}_A$, $\underline{proportionate}_A/\underline{disproportionate}_A$, $\underline{courteous}_A/\underline{discourteous}_A$, $\underline{continuous}_A/\underline{dis\text{-}}$ $\underline{continuous}_A$, $\underline{respectful}_A/\underline{disrespectful}_A$, $\underline{advantageous}_A/\underline{disadvantageous}_A$, $\underline{agreeable}_A/\underline{disagreeable}_A$ (Note that the latter does not come from $\underline{disagree}_V$). For nouns, the prefix has the basic meaning OPPOSITE OF N: $\underline{use}_N/\underline{disuse}_N$, $\underline{repair}_N/$ $\underline{disrepair}_N$, $\underline{concord}_N/\underline{discord}_N$, $\underline{harmony}_N/\underline{disharmony}_N$, $\underline{union}_N/\underline{disunion}_N$, $\underline{order}_N/$ $\underline{disorder}_N$, $\underline{affection}_N/\underline{disaffection}_N$, $\underline{repute}_N/\underline{disrepute}_N$. When applied to verbs, in addition to the REVERSATIVE meaning, $\underline{dis}\text{-}$ may have the meaning OPPOSITE OF V: $\underline{encourage}_V/\underline{discourage}_V$, $\underline{obey}_V/\underline{disobey}_V$, $\underline{qualify}_V/\underline{disqualify}_V$, $\underline{approve}_V/\underline{disapprove}_V$,

persuade$_V$/dissuade$_V$, prove$_V$/disprove$_V$. It may be that the notion of syntactic

allofunction should be extended to incorporate all these NEGATIVE cases. If

we consider this NEGATIVE meaning to be underlying, we might argue that

PRIVATIVE and REVERSATIVE are merely semantic allofunctions of an underlying

(dis-, NEGATIVE) function unspecified for syntactic category. There seem to

be fairly few PRIVATIVE and REVERSATIVE cases for dis-, however, so the evidence

does not seem to support its dominance.

In conclusion, we observe that not all semantic and phonological similarities

are allofunctional, just as not all similarities in syntax and phonology are

properly captured by braces. A clear case where we do not wish to set up

allofunctions is:

(41) prefix /ænti/ in the meaning BEFORE (antenuptial)

(42) prefix /ænti/ in the meaning AGAINST (anti-war).

Both prefixes appear to yield adjectives, but their derived meanings seem

quite unrelated and their distribution is not complementary (antechristian/

antichristian and antehistoric/antihistoric). There is the additional decisive

phonological evidence that a careful pronunciation may diphthongize the prefix

in (42) as /æentay/, while no such pronunciation can occur in (41).

Similarly, -en$_{AV}$ (dark$_A$/darken$_V$) is not a semantic allofunction of -en$_{NA}$

(wood$_N$/wooden$_A$), although suffixes are identical in sound. The fact that the

syntactic categories are different immediately argues against any allofunctional

unification. [See Section 5.3.1 for more discussion of problems in establishing

allofunctional relationships.]

2.1.4 ANALOGIES

An important tool which we will employ repeatedly in the investigation

which follows is analogy.[6] When formatives are parallel in structure,

particularly in semantics, we will often display them proportionally. We have

observed that the de-adjectival verbs <u>yellow</u> and <u>whiten</u> are semantically and and syntactically similar, although one is a zero-derivative and the other comes by affixation. We may express their affinity by the proportion:

(43) $yellow_A : yellow_V :: white_A : whiten_V$

As another example, observe that in the following sentences the suffix <u>-ing</u> added to verbs produces a noun with the meaning CAPACITY TO V:

(44)   John's <u>thinking</u> is confused.

(45)   John's <u>swimming</u> is good.

(46)   John's <u>painting</u> is creative.

(47)   John's <u>singing</u> is execrable.

(48)   John's <u>hearing</u> is bad.

But not all verbs follow this pattern:

(49)   *John's <u>speaking</u> is unclear.

(50)   *John's <u>remembering</u> is impaired.

(51)   *John's <u>pronouncing</u> is excellent.

(52)   *John's <u>seeing</u> is blurred.

Instead we find:

(53)   John's <u>speech</u> is unclear.

(54)   John's <u>memory</u> is impaired.

(55)   John's <u>pronunciation</u> is excellent.

(56)   John's <u>sight</u> is blurred.

Using proportions, we may say that in this context:

(57) $hear_V : hearing_N :: speak_V : speech_N :: see_V : sight_N$

We must be careful to use analogies in context, however, since they do not take account of homophony. Sentence (53) is actually ambiguous, since <u>speech</u> may be interpreted as either a mass noun, as in (44), or a count noun, disambiguated by the plural:

(58)   John's speeches are unclear.

For the latter speech we find other analogies. For example, we have:

(59)   John spoke well. I liked his speech.

(60)   John talked well. I liked his talk.

(61)   John sang well. I liked his song.

Song and talk do not belong in analogy (57), however, since sentence (47)

is not synonymous with:

(62)   John's song is execrable.

Still, song is morphologically related to sing just as much as singing is,

although by a different pattern.

Analogy provides insight into the structure of lexical items. We find,

for example, that the function (-able, ABLE TO BE V'ED)$_{VA}$ takes the verbs

understand and perceive as arguments, yielding the regular understandable and

perceivable, and the slightly exceptional variant perceptible. These formatives

can be set up in analogy (65), as demonstrated by sentences (63)-(64):

(63)   I understand your remark; it is understandable now.

(64)   I perceive the signal; it is $\begin{cases} \text{perceivable now.} \\ \text{perceptible} \end{cases}$

(65)   understand$_V$: understandable$_A$ :: perceive$_V$: perceptible$_A$

We note, however, that sentences (66)-(67) are strange:

(66)   *I hear the conversation; it is hearable now.

(67)   *I see the flag; it is seeable now.

Instead we find:

(68)   I hear the conversation; it is audible now.

(69)   I see the flag; it is visible now.

With sentences (63)-(64), and sentence (70), we can continue the analogy as

(71):

(70)   I can read the sentence; it is $\begin{cases} \text{readable} \\ \text{legible} \end{cases}$ now

(71) read_V : readable_A :: read_V : legible_A :: see_V : visible_A

  :: hear_V : audible_A

These analogies are evidence for the view that the stems leg-, vis-, and aud- mean READ, SEE, and HEAR.

2.1.4.1 SINGULAR RELATIONSHIPS

While positing analogies as a major source of lexical structure, we are forced to admit that there are many clearly derived formatives that participate in one-time, non-analogical relationships with their derivational sources. Among such recalcitrant examples are: culpable_A/culprit_N, bomb_N/bombard_V, medium_N/mediate_V, space_N/expatiate_V, grace_N/ingratiate_V/gratitude_N/gratify_V, official_N/officiate_V, instance_N/instantiate_V, instant_N/instantaneous_A, furnish_V/furniture_N, glass_N/glazier_N, joy_N/enjoy_V, prejudge_V/prejudice_N, judge_N/ajudicate_V/judicial_A, humble_A/humiliate_V, difference_N/differentiate_V, decant_V/decanter_N, luxury_N/luxuriate_V, terminate_V/terminal_A, inherit_V/heritage_N, sewer_N/sewage_N, bible_N/biblical_A, damn_V/condemn_V, preface_N/prefatory_A, paraphrase_N/paraphrastic_A, ample_A/amplitude_N, plenty_A/plenitude_N, enemy_N/inimical_A, parish_N/parishioner_N, conscience_N/conscionable_A. These are just a few of the problematical relationships which have arisen in this research.

Generalizations based upon singular relationships are certainly less well-founded than those for which analogies exist, but it ⁻ust be noted that any of these singular relationships may serve as the nucleus for future analogy. A good example is the formation of doubleton on the pattern single/singleton. words like orphan_N/orphanage_N look isolated until we pair them with vicar_N/vicarage_N and hermit_N/hermitage_N.

2.1.5 LEXICAL DEEP STRUCTURE

The final concept which we will explore here before turning to detailed examples arises naturally following a discussion of analogy: this is the notion of _lexical deep structure_. We observe that some words show evidence of the repeated application of derivational functions. Note, for example, the following sentence:

(72)   John commented on the indestructibility of Hoover Dam; he claims

         it is quite indestructible.

This sentence suggests the existence of a process suffixing -_ity_ to adjectives. Ignoring its meaning for the moment, we will claim that the following functional analysis holds:

(73)   indestructibility = -ity [indestructible$_A$]$_N$

The adjective argument is itself a derivative, however, as shown by:

(74)   The dam is indestructible -- or at least hardly destructible.

This sentence suggests that the following analysis holds:

(75)   indestructible = in-[destructible$_A$]$_A$

But _destructible_ itself can be morphologically atomized, since we find the sentence:

(76)   The dam might be destructible; it could be destroyed.

From this evidence we derive the analysis:

(77)   destructible = -able[destroy$_V$]$_A$

The analyses taken together assert that the full structure of (73) should be:

(78)   indestructibility = -ity[in-[-able[destroy$_V$]$_A$]$_A$]$_N$

We will call the analysis (78) the deep structure of the lexical derivative _indestructibility_. In Chapter Three we will develop argument patterns which

establish its validity, and in particular justify the ordering of functions which we have claimed.

2.2 EXAMPLES OF STRUCTURED LEXICAL ANALYSIS

The remainder of this chapter is devoted to analyses which employ the concepts that we developed in the first section. The examples are largely drawn from English noun morphology. We will discuss the so-called "derived nominal" and distinguish two major patterns of interpretation for it. Next we will examine zero-derivation and note that zero-derived nouns are similar in interpretation to derived nouns of the nominal type. Finally, we will explore the semantics of stress-shifted deverbal derivatives, observing further parallels with the preceding types of derivation.

2.2.1 DERIVED NOMINALS

We observed in section 2.1.4 that <u>song</u> is a derivative of the verb <u>sing</u> by semantic analogy with <u>speech</u> and <u>talk</u>. We note further that <u>dance</u> and <u>performance</u> also belong in this analogy:

(79)   John danced well. I liked his dance.

(80)   John performed well. I liked his performance.

These nouns are both [+count], as shown by the fact that the sentences are not substantially altered if we substitute plurals:

(81)   John danced well. I liked his dances.

(82)   John performed well. I liked his performances.

The nouns <u>dance</u> and <u>performance</u> differ syntactically, however. We may say (83), but not (84):

(83)   I liked his performance of the sonata.

(84)   *I liked his dance of the ballet.

The lexical item <u>performance</u> is marked syntactically as taking both <u>of</u>-phrases and preposed possessives, while the item <u>dance</u> takes only the latter.

What is most striking about (83), however, and of crucial interest here, is its semantic interpretation. The sentence is ambiguous as it stands, meaning either (85) or (86):

(85)   I liked the fact that he performed the sonata.

(86)   I liked the way that he performed the sonata.

If we delete <u>of the sonata</u>, to give (87),

(87)   I liked his performance.

interpretation (86) still pertains, but the factive interpretation does not survive.

When derived nouns receive factive interpretation, we will call them <u>derived nominals</u>, or <u>nominals</u> for short. <u>Performance</u> is a nominal, while <u>dance</u> and <u>song</u> are strictly derived nouns. It is significant that this definition is semantic, rather than phonological. As we will observe in the next section, phonology is only a partial indicator of the semantics underlying nominal morphology.

2.2.1.1 THE FEATURE [COUNT] AND INTERPRETATION

Consider the following sentences and their interpretations:

(88a)   Martha's decision surprised me.

(88b)   Martha's indecision surprised me.

(88c)   Martha's defection surprised me.

(88d)   Martha's dejection surprised me.

(88e)   Martha's rejection surprised me.

These five sentences are apparently identical in surface-structure syntax. Each is a simple transitive sentence of the obvious sort:

(89)

```
                            ─ S ──────
              NP ──────              ── VP
         ╱  ╲                      ╱      ╲
      Det    N                    V        NP
       │      ╲                   │         │
   Martha's  ⎧ decision       surprised    me
             ⎪ indecision
             ⎨ defection
             ⎪ dejection
             ⎩ rejection
```
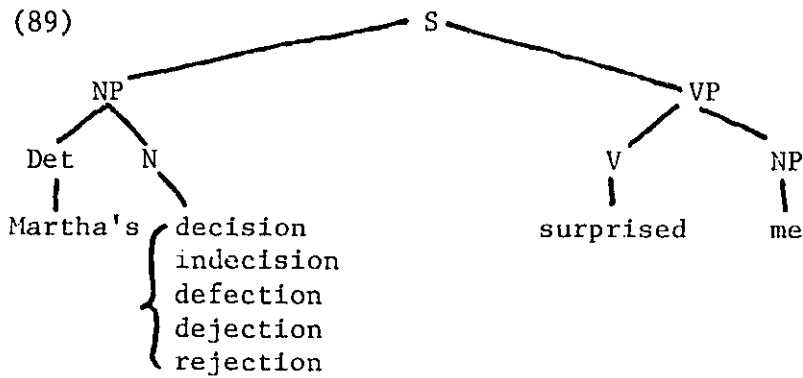
Despite the clear isomorphism at the surface, however, these sentences differ

radically in interpretation, as shown by the following paraphrases:

(90a)   What Martha decided (to do) surprised me.

(90b)   The fact that Martha was (so) indecisive surprised me.

(90c)   The fact that Martha defected surprised me.

(90d)   The fact that Martha was (so) dejected surprised me.

(90e)   The fact that Martha was rejected (by X) surprised me.

Some additional interpretations are possible, for example:

(91a)   The way that Martha defected surprised me.

(91b)   The fact that Martha rejected (our offer) surprised me.

The various interpretations of sentences (88) do not follow obviously from

the simple surface-structures of (89). We will seek to explain them derivation-

ally by attempting to isolate those features of the lexical items that condition

semantic interpretation.

We begin by observing that the nouns of (88) vary in the specification of

a lexical feature which is solidly established, namely the feature [count].

For example, (88a) is still grammatical if the subject is pluralized,

but (88b) is not:

(92a)   Martha's decisions surprised me.

(92b)   *Martha's indecisions surprised me.

Thus, the noun <u>decision</u> is [+count], while <u>indecision</u> is [-count]:

(93a)   Did Martha make any decisions?

        Some, but not many.

(93b)   Did Martha show any indecision?

        Some, but not much.

As a step toward explicating the differences in interpretation between (88a) and (88b), we may begin to catalogue these lexical facts. The following are partial lexical entries which summarize this information:

(94a) $decision_N$: [+count], $decide_V$

(94b) $indecision_N$: [-count], $indecisive_A$

Entry (94a) states that the lexical item decision is a count noun derivationally related to the verb <u>decide</u>. Entry (94b) claims that <u>indecision</u> is a mass noun derivationally related to the adjective <u>indecisive</u>. The latter claim is supported by the fact that <u>indecision</u> is synonymous with the more transparently derived <u>indecisiveness</u>:

(95)   Martha's indecisiveness surprised me.

With the formative <u>defection</u> of (88c) we find that either specification of of the feature [count] will produce a grammatical result:

(96a)   Was there any defection to the West last month?

        Some, but not much.

(96b)   Were there any defections to the West last month?

        Some, but not many.

These uses seem to be slightly different, where <u>defection</u> of (96a) refers to a continuing process, while that of (96b) denotes discrete events. We might propose two partial listings for <u>defection</u>, one count and the other mass:

(97a) $defection_N$: [-count], $defect_V$, PROCESS

(97b) $defection_N$: [+count], $defect_V$, EVENT

Continuing with this analysis, we find that the noun <u>dejection</u> in (88d)

is strictly [-count]:

(98)   *Martha's dejections surprised me.

Unlike the phonologically similar formative <u>defection</u>, the noun <u>dejection</u> comes

from an adjective, not a verb:

(99)   dejection$_N$: [-count], dejected$_A$

For most speakers the verb <u>deject</u> is either impossible or archaic.   Evidence

that entry (99) is correct is the fact that <u>dejection</u> is synonymous with the

transparently derived <u>dejectedness</u>:

(100)   Martha's dejectedness surprised me.

Finally we come to the ambiguous (88e) containing the noun <u>rejection</u>. We

observe first that (88e) has a variant form, especially with conjoint NP's:

(101a)   ?Martha and her sister's rejection surprised me.

(101b)   The rejection of Martha and her sister surprised me.

Observe that the latter sentence, in contrast to (88e), has no ambiguity; it

has no interpretation analogous to (91b), since it cannot mean:

(102)   The fact that Martha and her sister rejected (our offer)

        surprised me.

Note further that (88e) may be pluralized,but the variant form may

not:

(103a)   Martha's rejections surprised me.

(103b)   *The rejections of Martha surprised me.

The plural form (103) is unambiguous, with interpretation close to (102)

(104)   It surprised me that Martha (repeatedly) rejected (our offer.)

In fact, <u>rejection</u> of (103a) may be interpreted as "written notice of rejection,"

"verbal expression of rejection," etc., as in:

(105)   Jason received five rejections and two acceptances in the

mail this morning.

Here _rejection_ is not only [+count], but also [+concrete]. A similar type

of meaning-extension is found in:

(106)   The Supreme Court's decision is twenty pages long.

[Chomsky discusses examples of this type (e.g., _proof_) in fn 11, pp. 217-8

of "Nominalization"].

We may summarize these observations by establishing two partial lexical

entries, one count and the other mass. The count noun is also concrete,

meaning EXPRESSION OF V'ING, with _Martha_ read as the subject. The mass noun

is nominal; we will return to its interpretation in the following section.

(107a) $rejection_N$: [-count], $reject_V$, NOMINAL

(107b) $rejection_N$: [+count], [+concrete], $reject_V$, EXPRESSION

2.2.1.2   S-INTERPRETATION AND NP-INTERPRETATION

Comparing lexical entries with interpretations, we may begin to make

some general theoretical observations. We note that the feature[+count]

appears to be associated with interpretations of one type, [-count] with

another.

The count noun derivatives yield what we will call Noun-Phrase Interpretations.

We observe that sentence (88a), containing the count noun _decision_, has inter-

pretation (108):

(88a)   Martha's decision surprised me.

(108)   What Martha decided surprised me.

The _what_-clause comes from a dummy NP' modified by an S_1 containing _Martha_ as

subject and _decide_ as verb:

(109)

```
                              ,-S
         NP                                        VP
      ⟨NP'⟩    S₁                              V        NP
           NP      VP                          |        |
           |     V  ⟨NP'⟩                   surprised    me
        Martha   |    |
             decide   S
```
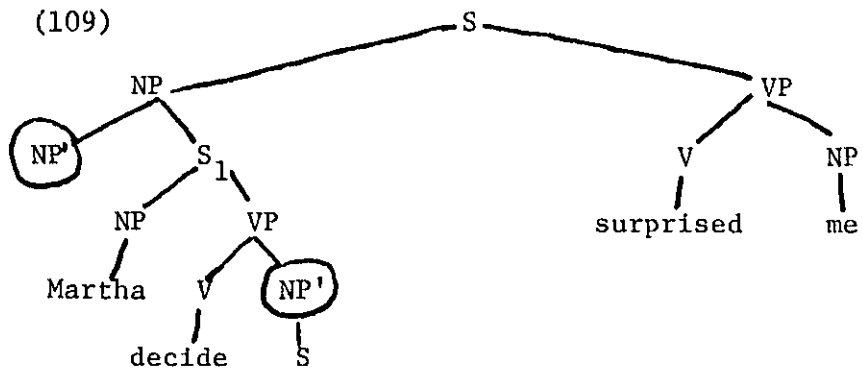
Thus, sentence (88a) may be followed logically by sentence (110a) or (110b) or (110c), depending upon the content of the embedded S:

(110a)   She decided to send George to boarding school.

(110b)   She decided that meat was too expensive.

(110c)   She decided that the President should be impeached.

If sentence (88a) is pluralized as:

(111)   Martha's decisions surprised me.

the interpretation is accordingly pluralized, although the morphology of interpretation (112) does not manifest the difference:

(112)   What (pl) Martha decided surprised me.

In this case, the dummy NP' is pluralized and multiple S's are embedded. Thus, (111) may be followed by:

(113)   She decided that George should go to boarding school and that

Alice should enter kindergarten.

Another example which we have seen where a derived count noun receives NP-interpretation is in the case of rejection in:

(114)   Jason received a rejection in the mail this morning.

Part of the interpretive tree will be:

(115)

```
                    S
         NP               VP
          |         V          NP
        Jason    received   (NP')  S
                              NP      VP
                               |    /    \
                          (Harvard) V   NP      PP
                                 reject (Jason)  P   (NP')
                                                 |
                                                 in
```
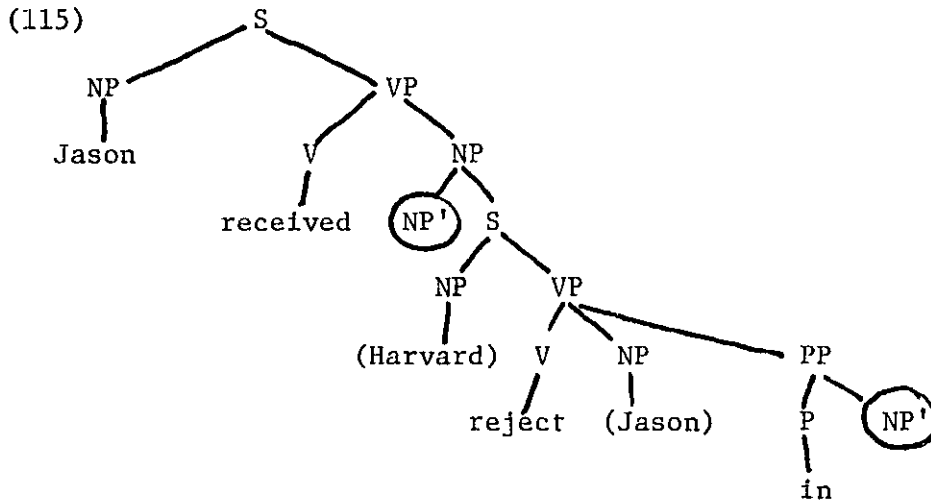
Here the NP in the higher VP means "that in which (Harvard) rejects (Jason)"
or "the letter of rejection." If, as in the case of (92), rejection is
pluralized, a plural marker is accordingly attached to the NP' in inter-
pretation.

Derived mass nouns which are nominal, on the other hand, induce Sentence-
Interpretation. Thus, for example, sentence (88c) receives interpretation as
(116):

(88c)   Martha's defection surprised me.

(116)   That Martha defected surprised me.

Here there is no NP', since NP directly dominates S_1 when defection is
[-count]:

(117)

```
                        S
      NP                         VP
       |                      V       NP
      S_1                  surprised   me
    NP      VP
     |    /    \
  Martha be    Adj
               |
            dejected
```
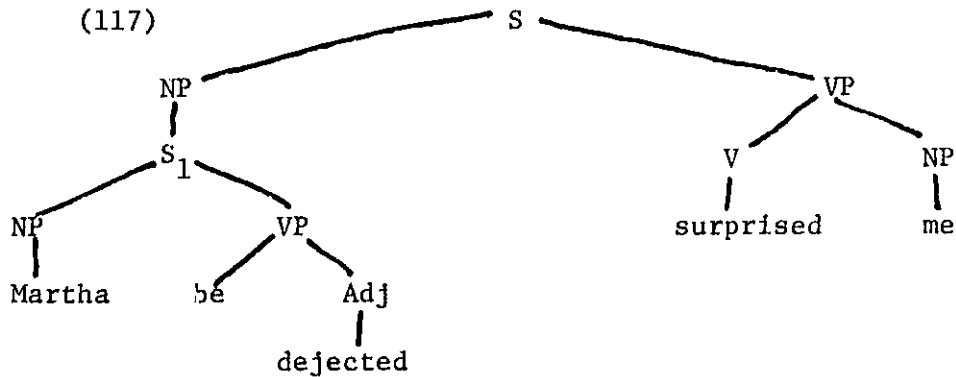
Note that this nominal comes from an adjective, not a verb. Case (88b) is similarly interpreted, with _indecisive_ replacing _dejected_ under the node _Adj_.

If we consider the entry _rejection_, we find a number of possible interpretations. We have already discussed the count option. If the noun is mass and nominal, two basic S-interpretations are possible, depending upon what is felt to have been deleted from the syntax of (88e). Thus, we may have the passive interpretation:

(119) Martha's rejection (by Radcliffe) surprised me.

Or we may find the active interpretation:

(120) Martha's rejection (of our offer) surprised me.

If context indicates that the deleted material is that of (119), then (88e) will be interpreted with Martha as the object of the embedded S_1:

(121)

```
                        S
            NP                    VP
              S₁              V       NP
       NP          VP      surprised   me
    (Radcliffe)  V    NP
               reject  Martha
```
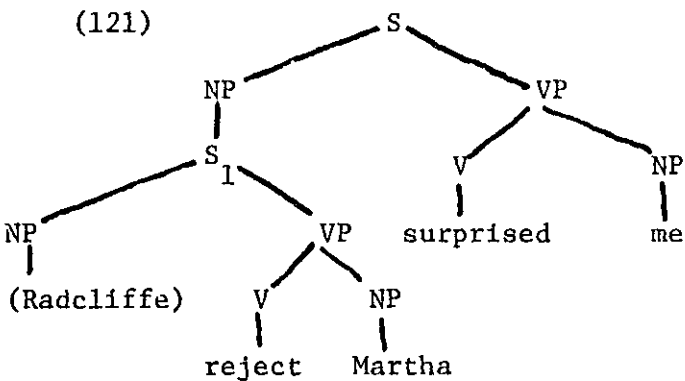
If, on the other hand, the deleted material provided by context is that of (120), Martha will be interpreted as the subject of the embedded S_1:

(122)

```
                            S
        NP                              VP
          S₁                      V         NP
     NP         VP            surprised      me
   Martha    V     NP
           reject  (our offer)
```
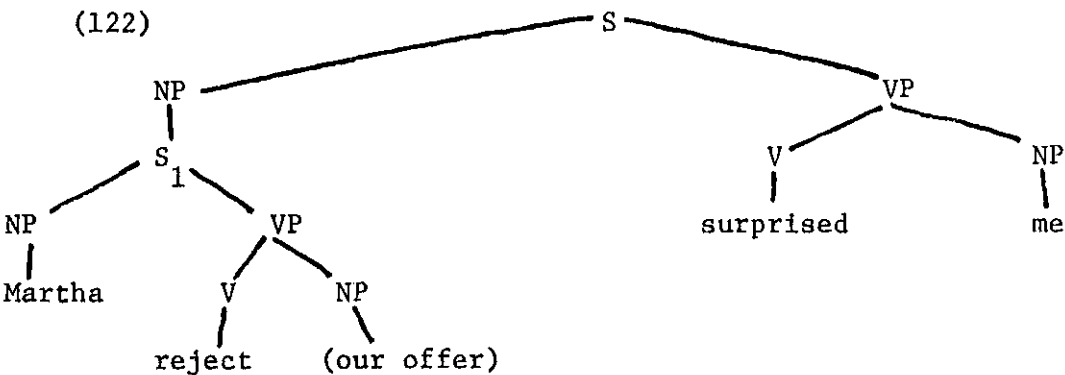
What is most important is that the feature [-count] is associated with

S-interpretation. This is characteristic of nominals, whether they come from

adjectives (indecision, dejection) or from verbs (defection, rejection).

The distinctions which we have developed allow us to explain some

morphologically ambiguous sentences. Consider, for example:

(123)   The committee's determination angered Bill.

This sentence may mean either (124) or (125):

(124)   That the committee determined what it did angered Bill.

(125)   That the committee was (so) determined angered Bill.

Note that if we pluralize (123) as (126), there is no interpretation of

type (125):

(126)   The committee's determinations angered Bill.

In interpretation (124), determination is read as a count derivative of the

verb determine. This meaning of determination is in semantic analogy with

the noun decision discussed above:

(127) $determine_V$: $determination_N$ :: $decide_V$: $decision_N$

The non-count interpretation of determination is a derivative of the adjective

determined, however, and is in semantic analogy with stubbornness:

(128) $determined_A$: $determination_N$ :: $stubborn_A$: $stubbornness_N$

Or consider the ambiguous sentence:

(129)   Nathan's selection pleased John.

This can mean either (130) or (131):

(130)   That Nathan selected what he did pleased John.

(131)   That Nathan was selected (by X) pleased John.

The first is the NP-interpretation, and it still pertains if selection is

pluralized. The second is the factive nominal interpretation for the non-

count reading of the noun.

A third ambiguous example is:

(132) The group's organization was remarkable.

One interpretation follows from the de-adjectival entry:

(133) organization$_N$: [-count], organized$_A$, NOMINAL

This nominal is in analogy with <u>disorganization</u>, from the adjective <u>dis-organized</u>. In this meaning, (132) is interpreted as:

(134) The fact that the group was (so efficiently)

organized was remarkable.

A second interpretation follows from the deverbal entry:

(135) organization$_N$: [-count], organize$_V$, NOMINAL

In this meaning, sentence (132) is read as:

(136) The fact the the group was organized (by X) was

remarkable.

A third interpretation follows from a count reading of <u>organization</u>, where

it is in analogy with <u>corporation:</u>

(137) organize$_V$: organization$_N$ :: incorporate$_V$: corporation$_N$

Only this reading survives, of course, under pluralization:

(138) The group's organizations were remarkable.

We will return later in this chapter to the semantics of NP-interpretation

for nouns like <u>organization</u> that are homophonous with derived nominals. We

will observe that semantic patterns are shared with stress-shifted nouns and

zero-derivatives, to which we now turn.

2.2.1.3 THE STRUCTURE OF NOMINAL INTERPRETATION

We have claimed that there exists a level of lexical deep structure.

One consequence of this view is that <u>attitude</u> and <u>resignation</u>, though both nouns with respect to the phrase structure rules of the base, are seen to have differing underlying lexical representations. <u>Attitude</u> is a lexical primitive--its lexical surface structure and deep structure are the same, since it has not undergone derivation. <u>Resignation</u>, on the other hand, has the deep structure $-\text{tion}[\text{resign}_V]_N$, showing its ultimately verbal source.

We observed in the previous section that the surface structure syntax of sentences containing derived and underived nouns may be the same. Thus, there is no phrase structure difference between the trees representing the sentences:

    (139)   John's attitude pleased Bill.

    (140)   John's resignation pleased Bill.

These two sentences have idential syntactic (and thus transformational) histories, except for lexical insertion.

When these sentences are interpreted by the semantic component, however, the interpretation must somehow account for the fact that sentence (140) has the interpretation (141):

    (141)   That John resigned pleased Bill.

while sentence (139) has no such reading.

In the theory which we have been elaborating, the explanation of (141) is not to be sought in some feature of syntactic deep structure, but rather in the lexical deep structure of the surface item <u>resignation</u>. The fact that this item is marked [+Nominal] in the lexicon (while <u>attitude</u> receives no such feature) is the distinction necessary to account for the interpretive facts.

It is premature to make any claims as to how the semantic interpretation of nominals actually proceeds, and it is not even totally clear whether the

interpretation occurs at a level of deep structure or at surface structure. The observations which follow would appear to fit into either system of interpretation.

We have related nominals to <u>sentences</u> of various types. For example, where V is intransitive, the nominal structure

(142)   B's V$_{Nom}$

is paired with a sentential reading

(143)   [B V]$_S$.

Thus, the sentences

(144)   John's resignation pleased Bill.
                 death
                 defection
                 departure
                 arrival
                 failure
                 return
                 retirement
                 enlistment

have the interpretations

(145)   That John resigned pleased Bill.
                 died
                 defected
                 departed
                 arrived
                 failed
                 returned
                 retired
                 enlisted

Exactly how these interpretations acquire tense (<u>died</u> = <u>die</u> + <u>Past</u>) is a problem which we will overlook. Note that the nominal in the sentence:

(146)   John's resignation will please Bill.

still receives S-interpretation, but the proper embedded sense is unclear:

(147)   That John {resigned / will resign} will please Bill.

The sentence:

(148)   John's resignation might please Bill.

is even more problematical.

If the nominal in question comes from a transitive verb, the proper

interpretation of

(149)   B's V$_{Nom}$

is generally of the type

(150)   [X V B]$_S$ where X is an unspecified subject.

Thus, the sentences:

(151)   John's extradition pleased Bill.
              redemption
              enslavement
              appointment
              election
              canonization
              conviction
              refutation

mean:

(152)   That X extradited John pleased Bill.
              redeemed
              enslaved
              appointed
              elected
              canonized
              convicted
              refuted

The nominal phrase

(153)   B's V$_{Nom}$ of C

to be interpretable must have V as transitive. The phrase is read with C as

the object of the sentential correspondent:

(154)   [B V C]$_S$

Thus, we find that the sentences:

(155)   John's invitation of Elizabeth pleased Bill.
              recognition
              endorsement
              abduction

```
             corruption
             detention
             admonition
```

are read as:

> (156)   That John invited Elizabeth pleased Bill.
>   recognized
>   endorsed
>   abducted
>   corrupted
>   detained
>   admonished

Finally, the deverbal nominal phrase:

> (157)   the V_{Nom} of B

where V is again transitive is interpreted with B as the object in the

sentential correspondent, with subject unspecified, like B's V_{Nom}:

> (158)   [X V B]$_S$

Examples are:

> (159)   The destruction of the city pleased Bill.
>   renovation
>   invasion
>   incorporation
>   naming
>   burning

which are interpreted as:

> (160)   That X destroyed the city pleased Bill.
>   renovated
>   invaded
>   incorporated
>   named
>   burned

Note that <u>naming</u> and <u>burning</u>, though gerundive in form, function like nominals.

Where the nominal to be interpreted is de-adjectival, a sentence interpretation again follows. The phrase:

> (161)   B's A_{Nom}

is interpreted as corresponding to the sentence:

(162)   [B be A]$_S$

Examples are:

(163)   John's derangement pleased Bill.
                exhaustion
                corruption
                devotion
                laziness
                stupidity
                tolerance
                restlessness

where the interpretation is:

(164)   That John was deranged pleased Bill.
                 exhausted
                 corrupt
                 devoted
                 lazy
                 stupid
                 tolerant
                 restless

To conclude, in general derived nominal phrases receive S-interpretation by

a semantic rule that is governed by lexical features. The sentence trees

of section 2.2.1.2 are all semantic interpretations induced by lexical deep

structure.

2.2.2   ZERO-DERIVATION

It is relatively easy to argue for derivational functions which leave

behind distinct morphological traces like un-, -able, -ment, and -tion. It

is more difficult to deal with functions which have zero operators.

One such function maps adjectives onto verbs, as in the verb dry from

the adjective dry. The following adjectives have associated homophonous

verbs: tame, clear, smooth, still, hollow, empty, dull, clean, obscure,

dirty, muddy, blind, numb, tidy, free, warm, ready, better, quiet. In all

these cases the verb is transitive, meaning TO CAUSE TO BECOME ADJ. Another

set of adjectives gives verbs which are strictly intransitive, meaning TO

BECOME ADJ: <u>faint</u>, <u>sour</u>, <u>mellow</u>, <u>sober</u>, <u>pale.</u> A third set of adjectives gives verbs which may be either transitive or intransitive, like <u>dry</u>: <u>open</u>, <u>dim</u>, <u>thin</u>, <u>tan</u>, <u>slow</u>, <u>cool</u>. In these cases, either meaning is possible, depending upon transitivity.

We might represent the derivational functions that yield these verbs as follows:

(165)   (∅, BECOME)$_{AV}$

(166)   (∅, CAUSE TO BECOME)$_{AV}$

We will examine in Chapter Three arguments about course derivation, but it is important to note at this point that support for derivation of the verb from the adjective, rather than the reverse, comes from the fact that these functions appear to be allofunctions of -en$_{AV}$, whose directionality is clear morphologically. Examining the verbs associated with the adjectives <u>thin</u>, <u>thick</u>, <u>tan</u>, <u>red</u>, <u>narrow</u>, <u>wide</u>, <u>better</u>, <u>worse</u>, we find the set <u>thin</u>, <u>thicken</u>, <u>tan</u>, <u>redden</u>, <u>narrow</u>, <u>widen</u>, <u>better</u>, <u>worsen</u>, all meaning TO BECOME ADJ or TO CAUSE TO BECOME ADJ. The analogy should be clear. Note also that by positing the adjectives as fundamental, we can naturally explain the appearance of comparative morphology in the verbs <u>better</u>, <u>worsen</u>, and <u>lessen</u>.

2.2.2.1 THE SEMANTICS OF ZERO-DERIVATIVE NOUNS

We have observed that the zero-derivation of verbs from adjectives is a semantically regular operation roughly expressed by the two functions (165) and (166). Other zero operations are the derivation of verbs from nouns, as in <u>fish</u>$_V$ or <u>water</u>$_V$, and the derivation of nouns from verbs, for example <u>exhibit</u>$_N$ and <u>guide</u>$_N$.

Concentrating on zero-derivative nouns, we note a variety of semantic

relations between derived nouns and their underlying verbs; there is no
single unified set of functions, although the set of patterns we find shows
some regularity. For example, in the sentences (167) and (168):

(167) Mary washed the laundry.

(168) Mary hung out the wash to dry.

we find that the noun wash is morphologically related to the verb wash.
In fact, sentence (168) is interpreted as:

(169) Mary hung out that which she had washed.

Thus, as a noun, wash means THAT WHICH IS V'ED. Similarly, we find that in
the sentence (170) and (171),

(170) John is catching fish.

(171) He has his catch on a string.

a parallel relationship holds between verb and noun. Sentence (171) is
interpreted as:

(172) He has that which he has caught on a string.

Here, catch as a noun means THAT WHICH IS V'ED. Like these two examples
are the nouns reply, answer, and retort from corresponding homophonous verbs.
In the sentences:

(173) John replied.

(174) His reply was brief.

we find that the noun of (174) may be interpreted to give:

(175) That which he replied was brief.

Again, we find deverbal zero-derived nouns meaning THAT WHICH IS V'ED. Brew,
roast, and stew also fall into this group.

There are other semantic patterns. The noun guide, for example, means
either THAT WHICH V'S or ONE WHO V'S, as in:

(176)   Elizabeth bought a guide to the museum.

(177)   Sally works as a guide for the park service.

Bore as a noun has both these meanings, as in:

(178)   John's latest novel is a bore.

(179)   Two bores came to my cocktail party.

Cheat has only the [+Human] interpretation:

(180)   I don't like playing cards with cheats.

Other meanings are not so concisely expressible. For example, the nouns love, hate, doubt, trust, regret, hope, desire, disgust, and dislike seem to share the common meaning of EMOTION. Disgust and dislike come from very different verbs syntactically, however:

(181)   John dislikes beer.

(182)   Beer disgusts John.

Further categories are needed to account for examples like dump and study, PLACE WHERE ONE V'S, and walk, THAT ON WHICH ONE V'S. Many zero-derivatives have multiple interpretations. Support, for example, has a [+Concrete] meaning as a [+Count] noun, but an abstract meaning as a mass noun:

(183)   The bridge soon fell, due to the weakness of its supports.

(184)   The proposal failed, due to lack of support from the faculty.

As we will observe when we return to zero-derivation in Chapter Three, many nouns are of the type hiss, scream, howl, laugh, grin, which may be semantically expressed as INSTANCE OF V'ING. Again, however, the facts are complicated, since we find the meaning of INSTANCE in (185), but not (186):

(185)   John made a funny smile.

(186)   John has a funny smile.

The following table summarizes some of the main meanings that we have

encountered:

> (187) THAT WHICH IS V'ED: wash, catch, take, haul, kill, brew,
>
> stew, roast, display, award, exhibit, request, reply, answer,
>
> retort
>
> THAT WHICH V'S: press, punch, stamp, pump, prop, support,
>
> brace, release, lock, alarm, appeal, attempt, call
>
> ONE WHO V'S: cook, judge, guide, tease, scold, cheat, bore,
>
> flirt, gossip, spy, shadow, guard

We will note that these patterns are repeated in the noun derivatives we

consider in the following sections.

2.2.3 SEMANTICS AND THE STRESSED SYLLABLE RULE

In The Sound Pattern of English Chomsky and Halle exhibit a phonological

mechanism for deriving nouns from verbs by shifting stress forward, as in

tránsfer, pérmit, and éxport from the verbs transfér, permít, and expórt.

It is natural to ask, given the framework which we have developed, whether

the stress-shift function has any consistent semantic content.

Consider the noun rétread, which means RETREADED TIRE. This word appears

to have been derived by the stressed syllable rule. Its source is the verb

retréad, and the meaning of RETREADED TIRE follows from the underlying sig-

nificance THAT WHICH IS V'ED. Similarly, a réject is THAT WHICH IS REJECTED

and an ímport is THAT WHICH IS IMPORTED.

The verbs convért (meaning TO CAUSE TO ADOPT A NEW RELIGION) and convíct

require [+Human] objects, so it is not surprising that their stress-shifted

derivatives cónvert and cónvict share the feature [+Human], meaning ONE WHO

IS V'ED rather than THAT WHICH IS V'ED.

On the other hand, we find agentive cases where the derivative is inter-
preted as ONE WHO V'S. Examples of this pattern are <u>rébel</u> which means ONE
WHO REBELS, and <u>éscort</u> which means ONE WHO ESCORTS.

We observed earlier that <u>disgust</u>$_N$ is a zero-derivative of the verb <u>disgust</u>,
meaning EMOTION. Like it is <u>tórment</u> from the verb <u>tormént</u>:

(188)   The pain tormented Alfred.

(189)   Alfred's torment was visible in his weary eyes.

As with zero-derivatives, we find several semantic patterns. Some of the
main meanings are shown in the following table:

(190)   THAT WHICH IS V'ED: réject, ímport, éxport, ínsert, réprint,

        récord, ábstract, aúgment, frágment, mísprint, éxtract, cóm-

        pound, rétread

        ONE WHO IS V'ED: cónvict, súspect, pérvert, cónvert, cón-

        script

        ONE WHO V'S: rébel, éscort, cónsort, déviate

There is also a group which refers to abstract results: <u>prógress</u>, <u>régress</u>,
<u>cónflict</u>, <u>íncrease</u>, <u>décrease</u>, <u>cóncert</u> ("harmony"), <u>prótest</u>. We find, finally,
<u>ínsult</u>, <u>tórment</u>, <u>cónstruct</u>, <u>tránsport</u>, and <u>férment</u> which are related to under-
lying verbs in still other ways.

Examination of stress-shift shows, then, that although it is a phonologic-
ally unified function syntactically mapping verbs onto nouns, it is semantically
heterogeneous in range. This is not to say that the semantic categories which
it yields are arbitrary, however. We observe many similarities with zero-
derivatives, in fact, enough to strongly suggest that stress-shift is basically
a phonological allofunction of zero-derivation. Note, for example, the
complementary distribution. Stress-shifted nouns are not contrasted with

unshifted nouns. All this suggests that disyllabic nouns derived from verbs

will be stress-shifted if this is phonologically possible. Semantically,

they will be treated like other zero-derivatives.

We now turn to parallels with derived nouns having nominal shape.

2.2.4 THE SEMANTICS OF DERIVATIVES HOMOPHONOUS WITH NOMINALS

Considering the phrases John's brief residence in California and John's

spacious residence in California, we find that the choice of adjectives

forces S-interpretation in the first case and NP-interpretation in the second.

The NP-interpretation, THAT IN WHICH ONE V'S, parallels the interpretations

of study and dump, which we discussed in section 2.2.2.1. Similarly, the NP-

interpretation of translation as THAT WHICH IS V'ED, parallels the reading

given the stress-shifted derivative récord.

Derived nouns homophonous with nominals fall into many of the same semantic

classes that characterize other derived nouns. The following table summarizes

the two major interpretations:

(191)   THAT WHICH V'S: obstruction, complication, limitation,

         affliction, punishment, entertainment, inspiration,

         irritation, nourishment, compensation, replacement,

         illustration, interference, solution, reinforcement

         THAT WHICH IS V'ED: assumption, donation, supposition,

         inheritance, acquisition, assignment, discovery, invention,

         prescription, creation, establishment, suggestion

There are other important categories. For example, the following are

characterized as EVENTS: celebration, burial, election, inauguration, execution,

consultation, and interrogation. Although these NP-interpretations are

generally [-Animate], they may sometimes be interpreted as [+Human]:

(192)   Haynsworth was Nixon's nomination to the Supreme Court.

(193)   The poet's inspiration was his beautiful wife.

(194)   The applicant listed two teachers as references.

(195)   Replacements were expected soon at the front.

As a final observation, we note that gerundive nominals often have derived

nouns as homonyms as well:

(196)   THAT WHICH V'S: wrapping, covering, trimming, flavoring,

        kindling, housing, roofing, padding, planking, coloring

        THAT WHICH IS V'ED: hanging, etching, engraving, building,

        painting, printing

Again, we find an EVENT group: crowning, christening, hearing, meeting,

hanging, training, teething. Parallel with the case of residence above is

that of dwelling. And as we noted in section 2.1.4, there are also many

gerundives meaning CAPACITY or ABSTRACT ACTIVITY, as for example, sailing,

gardening, teaching, smuggling, whaling, riding, skiing, cooking, housekeeping.

2.2.5   SUMMARY

The second part of this chapter has dealt with examples from English noun

morphology. We have shown that there are phonologically consistent functions

which have semantically heterogeneous ranges, and that there are semantically

unified functions, such as THAT WHICH V'S$_{VN}$, that show diverse phonology.

The facts which we have examined appear to support the notation and theoretical

base which we have presupposed. The reader is referred to the appendices for

further discussion.

CHAPTER THREE - COMPARISON OF THE STRUCTURED LEXICON WITH THE UNSTRUCTURED

LEXICON

3.1 THE ROLE OF THE LEXICON IN GRAMMAR

In a grammar which posits an unstructured lexicon, there is very little

to be said about the function of the lexicon. Within such a framework, the

lexicon is merely an alphabet of formatives: lists of nouns, verbs, adjectives,

etc. This formative alphabet presumably mediates between the syntax and the

phonology, and performs some vague semantic function, but it is not itself

an active component of grammar. [See Aspects of the Theory of Syntax, pp.

141-2]

In such a grammar, when sentences containing similar formatives are shown

to be related in meaning, it is ordinarily assumed that the sentences are to

be correlated syntactically by transformational derivation. The tacit

assumption is that all derivation is syntactic derivation. As Chomsky comments

in his paper on nominalization, "in the earliest work on transformational

grammar...the correctness of the transformationalist position was taken for

granted; and, in fact, there was really no alternative as the theory of grammar

was formulated at that time." [p.188]

The derived nominal raises grave difficulties for a grammar with a feature-

less, unstructured lexicon in which all derivation is syntactic. This is so

because, as Chomsky observes, the noun phrase (1) and the sentence (2) are

semantically related,

(1)   the enemy's destruction of the city

(2)   the enemy destroyed the city

but the derivation of (1) from (2) is not easily accounted for by syntactic

transformations. To deal with this problem, Chomsky formulated the lexicalist

position, involving "the extension of grammatical theory to incorporate
syntactic features." [p.188]

Chomsky's alternative analysis employs syntactic features like [+N] and
[+V] and an extension of the base to account for the correlation of (1) with
(2). A mechanism is provided which permits the insertion of destroy under a
node N, later rewriting [destroy, +N] as destruction.

It must be noted, however, that this lexicalist position does not entail
significant innovation in the lexicon, which remains basically amorphous.
Chomsky has proposed "as a tentative hypothesis, that a great many items appear
in the lexicon with fixed selectional and strict sub-categorization features,
but with a choice as to the features associated with the lexical categories
noun, verb, adjective." No hierarchy of syntactic features is available within
such a theory, since [destroy, +V] and [destroy, +N] are entirely equal in
lexical status. The hypothesis explicitly requires that destroy be neither
verb nor noun, but rather a de-categorized, floating formative, a "neutral"
lexical entry. [p.190] As we shall see, this proposal has some unfortunate
consequences.

3.2 LEXICAL HIERARCHY

If we assume a more sophisticated lexicon of the type briefly sketched in
Chapter Two, another hypothesis becomes available for explaining the correlation
of (1) and (2). The structured lexicon offers the concept of derivational
function, which may be used to explain the correspondence between (1) and (2).
In particular, such a theory leads us to posit a function $NOMINAL_{VN}$ which
maps verbs onto nouns. One such mapping is that of the argument $destroy_V$
onto its value $destruction_N$, which is subsequently assigned S-interpretation
in the manner described in Chapter Two. Here, it is the lexicon and its

lexical rules that account for the semantic correspondence between the verb
and its associated nominal.

Thus far, this may appear to be merely a notational variant of Chomsky's
lexicalist position, with the semantic value NOMINAL somehow replacing the
syntactic feature [+N]. It should be clear, however, that this new hypothesis
differs radically from the lexicalist in that the new system imposes a definite
hierarchy of syntactic categories, while the lexicalist position does not.

In the lexicalist system, "neutral" lexical items are permitted. In the
new system positing functions, however, no item is neutral. Derivatives come
from the ordered application of derivational functions, with noun coming
from verb and verb from adjective, and so on. Each derivative has a "history",
or lexical deep structure, which catalogs passage through an ordered series
of syntactic categories.

In the structured lexicon, destruction and destroy do not have equivalent
status. One (the former) is clearly derived from the other (the latter).
To help demonstrate that this is the case, we now turn to some arguments for
linear derivation. The argument pattern that we will develop supports the
hierarchy which we have claimed.

3.3 THE LINEARITY OF DERIVATION

We have observed that the derivational hypothesis imposes a hierarchy,
or linear order, on the application of lexical rules. Each function assigns
a syntactic category to output formatives, and thus the repeated application
of rules leads to successive layers of categories. This hierarchy was
observed by Bloomfield:

> In languages of complex morphology we can thus observe
> a ranking of constructions: a complex word can be

> described only as though the various compoundings,
> affixations, modifications, and so on, were added in
> a certain order to the basic form. Thus, in English,
> the word actresses consists, in the first place of
> actress and [-ez], just as lasses consists of lass
> and [-ez]; actress, in turn consists of actor and
> -ess, just as countess consists of count and -ess;
> actor finally, consists of act and [-r]. There would
> be no parallel for a division of actresses, say, into
> actor and -esses. In languages of this type, then, we
> can distinguish several ranks of morphologic structure. [p.222]

Implicit in the notation which we have developed are the assumptions that

derivation is a linear process, and an accretive process. We now explore

the first of these assumptions.

Consider the sentence:

(3)   The government's irresponsibility disturbed Dr. Spock.

Using an analysis of the type employed in Chapter Two, we may conclude that

this sentence is related to sentence (4):

(4)   The fact that the government was irresponsible disturbed

Dr. Spock.

This correlation suggests that irresponsibility is the nominal of the adjective

irresponsible, giving the partial lexical entry:

(5)   irresponsibility$_N$:   [-count], irresponsible$_A$, NOMINAL

It seems natural to relate the adjective irresponsible of (4) to an underlying

adjective responsible, as in sentence (6):

(6)   The fact that the government was not responsible disturbed

Dr. Spock.

This argues for the partial entry:

(7)   irresponsible$_A$:   responsible$_A$, NOT

Putting together (5) and (7), we find the lexical deep structure:

(8)   irresponsibility = -ity[in-[responsible$_A$]$_A$]$_N$

The structure of impossibility would be similar, with possible entered as the

adjective argument.

We note, however, the existence of the words responsibility and possibility which do not figure in the course of derivation which we have supposed. In the discussion of irresponsibility we somewhat arbitrarily assumed that the nominal is to be derived from the adjective. This is not the only assumption imaginable, however. We could have claimed that irresponsibility is derived, instead from responsibility.

At first glance, such a hypothesis seems quite plausible. We might relate (3) to sentence (9):

(9)   The government's lack of responsibility disturbed Dr. Spock.

We might posit, instead, the following deep structure:

(10)   irresponsibility = in- [ity [responsible$_A$] $_N$]$_N$

Why, after all, is structure (8) preferable to structure (10)? Structure (10) would assert that the prefix in- was attached last in the derivation, while (8) claims that the nominal formation, -ity$_{AN}$, was the last function to apply. Is there a principled means for choosing between these conflicting claims? Does it make a difference?

Our decision depends not so much upon the individual item as upon the structure of the total vocabulary of English. If we were to assume the lexical deep structure of (10) for irresponsibility, we would imply a partial lexical entry (11):

(11)   irresponsibility$_N$: responsibility$_N$, LACK OF

The function effecting the mapping of (11) and adding the meaning LACK OF, would be phonologically represented as in-$_N$ since it would map nouns onto nouns. Such a rule appears reasonable enough until we consider the fact that we must also account for the pairs possible$_A$/impossible$_A$ and responsible$_A$/

irresponsible$_A$. Here we would have a partial lexical entry (12):

(12)   irresponsible$_A$: responsible$_A$, NOT

This entry posits another function, which would be phonologically represented

as in-$_A$. Let us call in-$_N$ rule X and in-$_A$ rule Y.

It happens that if we examine the English vocabulary we find that

derived nominals apparently resulting from the application of rule X occur

only in cases where we find related derived adjec ives from rule Y. If there

is no in- adjective, there can be no in- nominal. Thus, we do not find

*inserenity because there is no *inserene, while we do have insincerity

because the adjective insincere exists. This fact strongly suggests that rule

X is not independent of rule Y.

In fact, an ordering of the rules as in (8) allows the total elimination

of rule X. We can derive impossible directly from possible by rule Y, and

then get their respective nominals impossibility and possibility by separate

applications of the nominalizing rule -ity$_{AN}$. Only two rules are required,

not three.

Rule X, in-$_N$, is thus shown to be a spurious generalization. If the

derivational functions are applied in the correct order, this function becomes

superfluous. A grammar which excludes in-$_N$ is more economical than a grammar

that includes it.

A striking example of deep structure linearity which is obscured at

the surface is the pair reusable/unusable, both of which come ultimately from

the verb use. They seem similar at the surface, but they can be shown to have

quite different deep lexical structures:

(13)   reusable = -able[re-[use$_V$]$_V$]$_A$

(14)   unusable $=$ un- [-able [use$_V$]$_A$]$_A$

The adjective <u>reusable</u> comes from the verb <u>reuse</u> by application of the

derivational function -<u>able</u>$_{VA}$, and the verb <u>reuse</u>, in turn, comes from the

underlying argument <u>use</u>$_V$ via the derivational function <u>re-</u>$_V$. The adjective

<u>unusable</u>, on the other hand, arises from <u>usable</u>$_A$ by application of the function

<u>un-</u>$_A$, and the adjective <u>usable</u> results from the argument <u>use</u>$_V$ after application

of the function -<u>able</u>$_{VA}$. Note that we could, in addition, apply the function

<u>un-</u>$_A$ to the structure (13), giving <u>unreusable</u>. <u>Unreusable</u> is represented as:

(15)   unreusable $=$ un- [able [re- [use$_V$]$_V$]$_A$]$_A$

Now if it were argued, for example, that (16) is the correct structure for

<u>reusable</u>,

(16)   reusable $=$ re- [-able [use]]
                                      V A A

We would have to posit the particular entry:

(17)   reusable$_A$: usable$_A$, AGAIN

This entry implies the existence of a function Z which derives <u>re-</u> adjectives

from other adjectives. The line of argument used against such a function is

entirely similar to that employed above. We are forced to assume a function

<u>re-</u>$_A$ applying to adjectives, but we note that all <u>re-</u> adjectives in the English

vocabulary are related causally to <u>re-</u> verbs. If we look carefully at the words

of English, we find no adjectives unrelated to verbs which might undergo such

a function. The adjectives *<u>repregnant</u>, *<u>rehopeful</u>, *<u>reuseless</u> do not exist,

although they would be semantically acceptable in the meanings PREGNANT AGAIN,

HOPEFUL AGAIN, and USELESS AGAIN. Since the function <u>re-</u>$_A$ would be able to

yield adjectival derivatives <u>only</u> in cases where the function <u>re-</u>$_V$ could apply

to a verb underlying the adjective, we find that the function <u>re-</u>$_A$ cannot be

independent of <u>re-</u>$_V$. By an argument of economy, then <u>re-</u>$_A$ does not exist.

By the right ordering in deep structure, only the function $\underline{re}\text{-}_V$ is required to account for the facts.

As a final example of this mode of argument, we consider the sentence:

(18)   The uncrated books are in my office.

This sentence is ambiguous, meaning either (19) or (20):

(19)   The books which have not (ever) been crated are in my office.

(20)   The books which have (just) been uncrated are in my office.

The ambiguity of (18) receives a very simple explanation under the derivational hypothesis. The adjective uncrated is derivationally ambiguous, having two alternative deep structures:

(21)   uncrated $= \text{un-}[\text{-ed}[\text{crate}_V]_A]_A$

(22)   uncrated $= \text{-ed}[\text{un-}[\text{crate}_V]_V]_A$

One of the adjectives has been derived through the categories V, A, A, while the other has passed through V,V,A. It may at first appear that there are only two derivational functions here, but there are actually three: $\underline{\text{un-}}_A$, $\underline{\text{un-}}_V$, and $\underline{\text{-ed}}_{VA}$. The function $\underline{\text{un-}}_A$ is an allofunction of the function $\underline{\text{in-}}_A$ which we have just encountered. It yields such adjectives as unhappy, unpopular, unperturbed, unloved, unavoidable (with its doublet inevitable). The homophonous function $\underline{\text{un-}}_V$ applies only to verbs, giving untie, unpack, unfasten, undo, unhook. In general, its semantic content is REVERSAL.

The ambiguity of sentence (18) is explained by the two deep structures (21) and (22). Uncrated is either the participle of the verb uncrate or it is the negative of the participle crated. This example shows that it clearly does matter in which order derivational affixes are applied. Interpretation (19) is correlated with lexical deep structure (21), and interpretation (20) with deep structure (22). We note in passing that our arguments imply the existence of a formative ununcrated, as in sentence (23), meaning (24):

(23)   The ununcrated books are in my office.

(24)   The books which have not been uncrated are in my office.

Sentence (23) implies that most of my books have been uncrated, but that

some have not.

In summary, the remarks of this section are intended to demonstrate that

lexical formatives have a linear deep structure, although it often does not

follow left-right surface structure. The formative is not simply a disordered

conglomeration of morphs. In fact, if it were, we should anticipate the

possibility of variations in morpheme order within formatives. Such is not

generally the case, and our theory explains this fact. What are traditionally

known as "bound morphemes" can be shown to be "bound" in a particularly

important way.

3.4   DERIVATION AS ACCRETION

These observations of linearity suggest that if the two lexical items

destroy and destruction are functionally related, one is probably derived from

the other (although logically there is also the possibility that both derive

from some third argument). An additional principle must be invoked to support

the assertion that destruction is derived from destroy. This is the principle

of accretion, which claims that if two formatives are related by a function,

that added-to is derivative. A corollary of this principle is the claim that

deletion is not an operator. In general, although not in all cases, if two

formatives are related, the "longer" phonologically is the derivative.

We will note in section 5.2.1 that in some cases truncation of phonological

segments does occur, as for example in medicine/medicate alongside vaccine/

vaccinate, where submorphemic elements have been deleted as an affix has been

applied. If a full-fledged morpheme is actually deleted, however, accretion

may have been violated. See section 5.2 for some problems.

By assuming that verbs serve as arguments and nominals as values of a function mapping one onto the other, we expect to encounter verbs with no nominals, but not the reverse. This is indeed the case. We note, for example, that the verb vanish has no derived nominal, although there is no phonological or semantic block, as shown by the existence of banishment from banish, and disappearance from disappear. It should be quite rare for a nominal t exist without an associated verb, however, since the only source of nominals is the function which we have posited. Similar observations hold for adjectives and their nominals. Again, our exr tations are justified when we look at the vocabulary as a whole. Note t t in an unstructured lexicon observations of this sort appear strictly fortuitous. The item [vanish, +V] is no more likely, in such a theory, than the item [vanish, +N].

There is a variant of the principle of accretion which can be cited in cases of zero-derivation to determine which item is underlying. The variant principle is: when the phonologies of two related formatives are equally complex, follow the evidence of analogical forms. We tacitly applied this principle in section 2.2.2 in arguing that the adjective thin underlies the verb thin, since the pair thick and thicken stand in analogy, and the adjective thick is shorter than the verb thicken. This principle argues against morpho-logical functions requiring phonological deletion to be an operator.

3.5 THE SEMANTICS OF ZERO-DERIVED DENOMINAL VERBS AND DEVERBAL NOUNS

Perhaps the most interesting derivations involve homophonous noun-verb pairs. It is not always easy in zero-derivation to establish whether the noun is underlying or the verb. The only clue is the semantic evidence.

For example, the following noun-verb pairs seem to be underlyingly verbs:

(25)   hit, knock, smile, move, pinch, sob, glide, grasp, hiss,

push, scowl, scratch, scream, shine, slur, soak, grin,

grumble, shudder, sip, moan, sneeze, snort, struggle,

yawn, growl, ride, saunter, spin, cough, shake

As nouns, none of these can name physical objects; all refer to actions or to

the results of actions. Many occur as the idiomatic objects of _give_ and _make_,

as in _give a push/shake/spin_ or _make a dash/run/smile_. Marchand has suggested

that a verb underlies if the noun denotes a "single instance illustrative of the

active process." [p.374].

When the noun in a homophonous pair names a physical object or substance,

on the other hand, the noun is usually underlying:

(26)   fish, water, ape, salt, box, slave, lecture, finger, picture,

            tree, mask, crate, shop, bone, robe, husk, milk, man, people,

            torpedo, truck, package, rivet, mother, father, police,

            chaperone, hand, button, book, blossom, knife, parachute, comb,

            hammer, saw, bus, paper, floor, roof.

In each of these cases it is impossible to define the verb without mentioning

the noun. Thus, $water_V$ and $salt_V$ mean TO APPLY N TO, while $bone_V$ and $husk_V$ mean

TO REMOVE N FROM. The verb _dust_ has both meanings, as in _dust a crop_ and _dust_

a table. The verbs _truck_ and _bus_ both mean TO TRANSPORT BY N. To _ape_ is TO

IMITATE AS AN N WOULD, while _slave_ means TO WORK AS AN N WOULD, and so on.

The various meanings of these denominal verbs are obviously highly idio-

syncratic, but they are not totally arbitrary.[9] The verbs fall into definite

groups, as the above remarks would indicate. Once the "missing" verb (_apply_,

put, _remove_, _transport_) is semantically recovered, the meaning of the derived

verb becomes transparent. Not just _any_ semantic relation is permitted between

noun and verb in zero-derivation. Despite their phonological coincidence, for

example, there is no direct derivational link in the lexicon between the noun

handle and the verb handle, because no analogy exists with any similar pair.

It should be evident from these semantic arguments that a lexicon which is not able to rank syntactic categories in derivation is less highly valued than one which anticipates hierarchy. It should be evident that it would be wrong to enter these items in the lexicon as unlabeled "neutral" roots which are only later specified [+N] or [+V], since this would lump together the two types of derivation which we have taken pains to isolate. A structured theory of the type that we have advocated here better explains the facts of morphological derivation.

CHAPTER FOUR - COMPARISON OF THE STRUCTURED LEXICON WITH GENERATIVE

SEMANTICS

4.1 INTRODUCTION

In Chapter Three we argued that the structured lexicon of Chapter Two is

theoretically preferable to the unstructured theory of early lexicalism.

This chapter will present empirical evidence showing that the structured

lexicon is also superior to generative semantics as put forward in the work of

George Lakoff, James McCawley, and others.

The facts presented in this section largely focus on problems of agentive

noun formation in English. The transformationalist treatment advocated by

generative semantics leads us to expect regularities that do not, in fact,

occur in the data, just as the unstructured lexicon fails to predict the

regularities that do. The lexicon structured by derivational functions makes

just the right claims, anticipating a degree of sound-meaning correspondence

in agentive nouns that falls midway between the extreme randomness inherent

in an unstructured lexicon and the extreme lawfulness implied by transformational

devices.

4.2 THE AGENTIVE TRANSFORMATION

In his dissertation Irregularity in Syntax George Lakoff develops the

theoretical position characteristic of generative semantics that morphological

derivation is to be handled transformationally rather than interpretively.

Lakoff's approach allows him to relate nouns to cognate verbs, as in the

derivation of sentence (1a) from (1b):

(1a)   Harry is the ruler of Liechtenstein.

(1b)   Harry rules Liechtenstein.

In Lakoff's system, the noun <u>ruler</u> is derived from the underlying sentential

source containing the verb <u>rule</u> by application of an agentive transformation.

McCawley (1968) further specifies this approach by proposing prelexical

transformations where the phrase the <u>inventor of the wheel</u> is to come from a

sentence structure as follows:

(2)
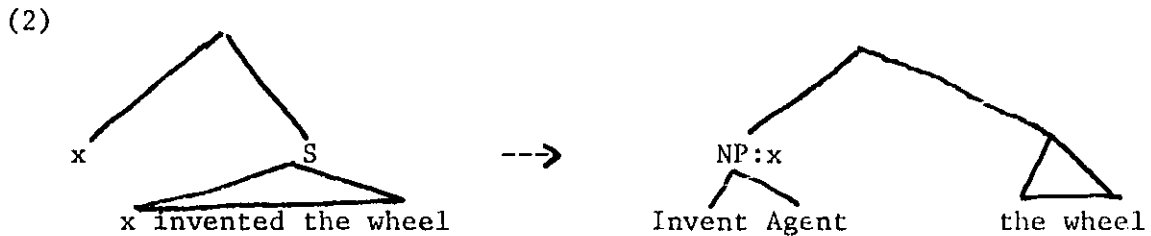
In the course of this derivation the lexical item <u>inventor</u> is to be substituted

for the structure:

(3)

In the generative semantic system put forward by Lakoff and McCawley,

<u>Agent</u> is realized not only in nouns ending in -<u>or</u> and -<u>er</u>, however. Alongside

(1a) and (1b), for example, Lakoff arrays:

(4a)   Harry is the king of Liechtenstein.

(4b)   *Harry kings Liechtenstein.

Lakoff makes it clear that (4a) is to be derived from (4b) in the same way that

(1a) is to come from (1b), although a hypothetical verb <u>king</u> is required to

account for this derivation. Another set of examples to be handled by Lakoff's

agentive transformation is:

(5a)   John is a robber.

(5b)   John is a thief.

(6a)   John robs things.

(6b)   *John thieves things. (compare <u>thievery</u>)

Here sentences (6a) and (6b) are the putative sources of (5a) and (5b).

4.2.1 PROBLEMS WITH LAKOFF'S ANALYSIS

A number of problems immediately arise with these examples. Factually,
I disagree with Lakoff's grammaticality judgments connected witl. rob and
thieve in (6a) and (6b). In my dialect, rob takes as objects those persons
or institutions which are robbed, but not that which is taken in the robbery:

(7)   John robs banks.

(8)   John robs little old ladies.

(9)   *John robs banknotes and securities.

Thus, for my speech, (6a) is ungrammatical. So, incidentally, is

(10)   *John is a robber of things.

which should be the agentive transformation of (6a) if the rule employed in
(1a) and (4a) is adhered to.[10] Interestingly, the verb steal may be sub-
stituted in (6a) and (9) to give:

(11)   John steals things.

(12)   John steals banknotes and securities.

There is no agentive stealer in my speech, however:

(13)   *John is a stealer.

Thieve, on the other hand, is not a hypothetical verb in my dialect. It exists,
but is intransitive:

(14)   John thieves.

(15)   John does a lot of thieving.

The theoretical problems with Lakoff's analysis are much more serious, however.
He proposes that both thief and king be derived from underlying verbs by the
agentive transformation, although neither noun manifests the characteristic
agentive endings. This approach manages to capture the semantic generalization
implicit in identical roots (correctly asserting, for example. that rob and robber
are related), but it totally disregards morphological evidence and often requires

the postulation of unattested underlying formatives which have no independent justification.

In particular, Lakoff is quite unable to explain why the agent noun coming from the allegedly underlying thieve should not be *thiever rather than thief. Other verbs rhyming with thieve show that there is no phonological block to formatives with this shape: we find receiver and deceiver coming from verbs ending in [iv]. If a transformation exists, why should thief not follow it fully, including morphological detail?[11] Lakoff attempts no explanation for this fact.

Similarly, he does not explain why the noun coming from the underlying hypothetical verb king should be a zero-derivative, rather than *kinger by anology with singer and ringer. Apparently, in Lakoff's system we must record with the underlying hypothetical verb king not only the fact that it cannot be realized at the surface, but also the fact that its agent derivative is irregular. This is a peculiar state of affairs. It would seem that the whole point of positing a hypothetical element should be a regularization of the facts, rather than the reverse.

4.2.1.1 BACK-FORMATION AND ANALOGY

In a chapter on lexical representation Lakoff remarks that, for the section now under consideration, "a number of verbs had to be listed as hypothetical items in order to account for certain derived forms of those verbs and for our intuitions about them. Many of these have actually appeared as back-formations at various times in the history of the language. A number of them were common verbs for a long period of time. Among these are to benefact, to plumb, to poetize, to purpose, to consternate, to constern, to thieve, to critique, and to king." [pp. 89-90]

Here Lakoff lists under the traditional rubric of "back-formation" a
number of disparate derivational processes. In discussing analogic change
Bloomfield (1933) defined this term as follows: the "creation of shorter
or underlying forms is called back-formation." [p.412] Lakoff's verb plumb
is an example of back-formation in the sense Bloomfield intended, since
plumb participates fully in the semantic and phonological analogy (16):

(16) $paint_V$: $painter_N$ :: $bake_V$: $baker_N$ :: x_V : $plumber_N$

The verbs poetize, thieve, and king are clearly not back-formations in
this sense, however. Although they are held by Lakoff to be "underlying
forms," they do not belong in analogy (16). Poetize, for example, is longer
than its putative derivative poet, and thus would violate the principle of
accretion developed in Chapter Three. This is of no interest to Lakoff,
however, who comments; "Let us put aside the interesting question of the
relationship of the phonological forms of the words to one another and con-
centrate on the syntactic issues involved." [p.91] Unfortunately, to put aside
this question is to ignore the central evidence.

Lakoff's method is to use whole sentences as analogical evidence, taking,
for example, the existence of (5)-(6) together as proof that the noun thief
must be the derivative of a verb thieve, since thief has the "agentive" meaning
required. Using entire sentences as analogies, however, one must be careful
to see that the proper variable has truly been isolated. Is it the case, for
example, that a transformation is the only possible source for the "agentive"
properties of the noun thief? Are we certain that thief is a derivative at
all?

In fact, there is another distinctly plausible possibility, namely the
reverse, that the noun thief is underlying and that the verb thieve is derived
from it. This alternative course of derivation is supported by phonological,

semantic, and historical evidence. First, we find the semantic analogy:

(17) slave_N : slave_V :: thief_N : thieve_V

Here the verbs both mean TO ACT LIKE N. Historically, these meanings are

attested centuries later than the nouns. In its present sense, the OED cites

the verb <u>slave</u> first in 1719, "There's many more who slave and toil, Their

living to get," while the first use of the noun is recorded for 1290. Similarly,

<u>thief</u> occurs in 688-95, with some attestations of <u>thieve</u> in the 900's, but most

only after the 1600's, as in 1627, "And there this monster sat him down to

thieve." The late attestation of the verbs argues that the nouns are under-

lying, contrary to Lakoff's hypothesis. Second, we find the phonological

analogy:

(18) house_N : house_V :: thief_N : thieve_V

The phonological pattern evident here is that when verbs come from nouns ending

in a voiceless fricative, the consonant often becomes voiced. Thus, we may

suspect the existence of a derivational function mapping the noun <u>thief</u> onto

the verb <u>thieve</u>, voicing the final consonant and assigning the meaning TO ACT

AS N.[12] We no longer need to explain the fact that there is no agentive <u>-er</u>

ending on the noun, since the verb is not taken as underlying.

4.2.1.2 THE <u>KING</u> CASE

Having made these observations about <u>thief</u>, we now reconsider the alleged

derivation of king_N from an underlying hypothetical verb *king. There is an

analogy that at first appears to support this path of derivation, namely the

zero-derivative pattern (19):

(19) cook_V ; cook_N :: x_V : king_N

where the noun means ONE WHO V'S. The other nouns which are also [+Human]

zero-derivatives of verbs are generally derogatory, however, as Marchand observes:

cheat, bore, flirt, gossip, sneak, snoop, spy, tease, tramp; the few which
are non-derogatory are listed by Marchand as: coach, cook, guide, and judge.
[p.376] King does not appear to belong in this group.

Much more significant, however, is the question as to what it means to
king. If the verb merely means TO BE KING, and nothing else, what does the
postulation of the hypothetical verb accomplish? In particular, what are the
limits to this process? Do all human nouns come from underlying verbs? Are
sentences (20) derived from the underlying (21)?

(20a)   Elizabeth is the queen of England.

(20b)   Charles in the prince of Wales.

(20c)   Elmo is the arch-duke of Lower Slobovia.

(20d)   John is the black sheep of the class.

(20e)   Alice is the secretary of the department.

(20f)   Arthur is the villain of the play.

(21a)   *Elizabeth queens England.

(21b)   *Charles princes Wales.

(21c)   *Elmo arch-dukes Lower Slobovia.

(21d)   *John black sheeps the class.

(21e)   *Alice secretaries the department.

(21f)   *Arthur villains the play.

There seems to be no end to the improbable examples that come to mind.

Another problem is that when verbs are attested which are homophonous with
[+Human] nouns, they frequently have other meanings than TO BE N. For example,
queen$_v$ exists, but it is used only with reference to the promotion of a pawn
to queen status in the game of chess, as in:

(22)   John queened two pawns.

Here the verb means TO MAKE INTO N.   The analogy is:

(23) $knight_N$: $knight_V$ :: $queen_N$: $queen_V$

No ready explanation is forthcoming within the framework of generative

semantics for the fact that when these verbs do exist their semantic content

often differs from what the agentive transformation requires.

4.2.2 ADJECTIVE CASES

Lakoff also claims that adjectives may be transformed into agent nouns.

[p.127]. His first examples of such "agent nominals" are:

(24a)   She is beautiful.

(24b)   He is idiotic.

(24c)   John is foolish.

(25a)   She is a beauty.

(25b)   He is an idiot.

(25c)   John is a fool.

Here examples (25) are allegedly derived from the adjectival sources in (24).

We now turn to each of these cases in detail. In each instance we will argue

that nouns underlie the adjectives, rather than the reverse.

To some extent Lakoff already concedes this point by remarking in parentheses:

"I assume that the adjective endings -ful, -ic, -ish, are added by late spelling

rules onto adjectives that have not been transformed into nouns." [p.128] The

alleged lateness of spelling rules notwithstanding, it should be quite clear

that Lakoff's proposal amounts functionally to the deletion of adjective

suffixes to form nouns. For the grammar to know how to spell the adjectives

"later", it must already store full information about actually realized endings:

which adjectives take -ful, which -ic, etc. Lakoff's theory amounts to the

postulation of double adjective entries, since somewhere the grammar must store

both stages of every adjective, e.g., both *$fool_A$ and $foolish_A$. To say that

the adjectives are both underlying and spelled later is a highly misleading

way to represent morphological facts.

4.2.2.1 BEAUTIFUL/BEAUTY

Lakoff has asserted that beauty of (25a) is the "agent noun" of the adjective

beautiful of (24a). But what is an "agent noun"? The great majority of

adjectives do not undergo this alleged transformation. For example, there are

no "agent noun" morphologically associated with the adjectives of (26):

(26)   She is   ugly
                   nice
                   lazy
                   smart
                   good
                   happy
                   strong
                   rich
                   interesting

The productivity of the beauty pattern, to which Lakoff devotes only one

example, is in fact quite limited. A thorough search yields only the following

potential pairings:

(27a)   She is helpful.

(27b)   She is a help.

(28a)   She is delightful.

(28b)   She is a delight.

(29a)   She is wonderful.

(29b)   She is a wonder.

(30a)   She is disgraceful.

(30b)   She is a disgrace.

(31a)   She is frightful.

(31b)   She is a fright.

(32a)   She is successful.

(32b)   She is a success.

There are many more adjectives in -ful that do not follow this pattern:

(33a)   She is merciful.

(33b)   *She is a mercy.

(34a)   She is hopeful.

(34b)   *She is a hope.

(35a)   She is powerful.

(35b)   *She is a power.

(36a)   She is deceitful.

(36b)   *She is a deceit.

(37a)   She is truthful.

(37b)   *She is a truth.

(38a)   She is faithful.

(38b)   *She is a faith.

(39a)   She is dutiful.

(39b)   *She is a duty.

(40a)   She is skilful.

(40b)   *She is a skill.

(41a)   She is wrathful.

(41b)   *She is a wrath.

(42a)   She is wasteful.

(42b)   *She is a waste.

(43a)   She is hateful.

(43b)   *She is a hate.

(44a)   She is useful.

(44b)   *She is a use.

(45a)   She is graceful.

(45b)   *She is a grace.

Many more unsuccessful examples could be given where the (b) cases clearly are not derived from the (a) cases. In general, -ful adjectives are derived, historically and synchronically, from nouns, rather than the reverse. They tend to mean, concretely, FULL OF N, or abstractly, CHARACTERIZED BY N.

The apparently "agentive" quality of the nouns of (27b)-(32b) is not the result of a transformation, but rather the consequence of a change of feature on underlying abstract nouns. The [+Human] use of the noun beauty appears to come from a concretization of the abstract noun, and this may be the case when the noun is not related to an adjective, as for example in:

(46)   She is a disappointment.

(47)   She is a blessing.

(48)   She is an abomination.

(49)   She is a curse.

Many abstract nouns fail to undergo this feature change, however:

(50)   *She is a ⎰passion
                 ⎪fear
                 ⎪despair
                 ⎪resentment
                 ⎨neglect
                 ⎪doubt
                 ⎪indiscretion
                 ⎪regret
                 ⎱potential

The pattern is not very productive, then, and it does not apply to strictly "agentive" [+Human] cases:

(51)   Your black eye⎫ is a beauty.
        John's new car ⎪
        That theorem   ⎬
        This rose   ⎪
        Our situation ⎭

From the morphological evidence it appears, then, that the most plausible account for Lakoff's example is that a small set of evaluative abstract nouns

undergoes a zero-derivation that allows them to be used in semantic contexts which are [+Concrete] and sometimes [+Human].

Lakoff observes that these nouns take _real_ as a modifier:

(52)   She is a real beauty.

He claims "that adverbs that modify verbs and adjectives are transformed into adjectives when the agent rule applies." As an instance he notes (52) and claims that it comes from (53):

(53)   She is really beautiful.

This proposal raises further problems, which we cannot explore here; in general it is questionable that adverbs are the source of adjectives, rather than the reverse. Actually, Lakoff's observation is not at all the consequence of the "agent rule," but a semantic consequence of the fact that the modified nouns are evaluative. If the agent rule were the only source, we would have no explanation for the non-agentive cases:

(54)   Your black eye is a real beauty.

(55)   John's painting is a real disappointment.

(56)   Bill's house is a real dump.

(57)   Caviar is a real luxury.

In summary, then, the derivational facts are consistent with both a functional lexicalist position and a strong stand on accretion. We may continue to assume that the noun formatives (which are shorter) are underlying, and the adjectives are morphologically derived from them by functions such as $(-\underline{ful}, \text{CHARACTERIZED BY N})_{NA}$. Concrete uses of abstract nouns, such as Lakoff's _beauty_ example, may be accounted for by a feature change on abstract nouns in concrete contexts. No adjectival stage is implied, as shown by sentences (46)-(49). In the revised lexicalist framework, the morphological facts receive a natural explanation without the postulation of an unproductive

agent transformation.

4.2.2.2 IDIOTIC/IDIOT

We now turn to Lakoff's second example of agent noun transformation from an allegedly adjectival source:

(58a)   He is idiotic.

(58b)   He is an idiot.

Here the noun idiot of (58b) is to come from the adjective idiotic of (58a). Additional evidence for this view presented by Lakoff is the behavior of the adverb utterly under transformation, so that we find:

(59a)   He is utterly idiotic.

(59b)   He is an utter idiot.

To evaluate Lakoff's claims, we turn to a close examination of the adjectives in -ic. There appear to be three major derivational types. First there are the adjectives like idiotic with related shorter nouns:

(60a)   He is utterly vampiric.

(60b)   He is an utter vampire.

(61a)   He is utterly misanthropic.

(61b)   He is an utter misanthrope.

(62a)   He is utterly psychopathic.

(62b)   He is an utter psychopath.

(63a)   He is utterly fatalistic.

(63b)   He is an utter fatalist.

(64a)   He is utterly materialistic.

(64b)   He is an utter materialist.

(65a)   He is utterly idealistic.

(65b)   He is an utter idealist.

(66a)   He is utterly nomadic.

(66b)   He is an utter nomad.

(67a)   He is utterly parasitic.

(67b)   He is an utter parasite.

(68a)   He is utterly optimistic.

(68b)   He is an utter optimist.

(69a)   He is utterly pessimistic.

(69b)   He is an utter pessimist.

(70a)   He is utterly enthusiastic.

(70b)   He is an utter enthusiast.

(71a)   He is utterly diplomatic (polite).

(71b)   He is an utter diplomat.

(72a)   He is utterly prophetic (psychic).

(72b)   He is an utter prophet.

(73a)   He is utterly acrobatic (agile).

(73b)   He is an utter acrobat.

Some of these adjectives and nouns sound strange with <u>utter</u> and <u>utterly</u>,

however;

(74a)   ?He is utterly artistic.

(74b)   ?He is an utter artist.

(75a)   ?He is utterly atheistic.

(75b)   ?He is an utter atheist.

(76a)   ?He is utterly monopolistic.

(76b)   ?He is an utter monopolist.

(77a)   ?He is utterly capitalistic.

(77b)   ?He is an utter capitalist.

The nouns communist and journalist definitely cannot come from adjective sources:

    (78a)   *He is journalistic.

    (78b)   He is a journalist.

    (79a)   *He is communistic.

    (79b)   He is a communist.

If the agent transformation is to delete -ic, it must also delete -al from the ending -ical, since we find:

    (80a)   He is utterly heretical.

    (80b)   He is an utter heretic.

    (81a)   He is utterly fanatical.

    (81b)   He is an utter fanatic.

    (82a)   He is utterly piratical.

    (82b)   He is an utter pirate.

The noun critic cannot be gotten in this way:

    (83a)   ?He is utterly critical.

    (83b)   *He is an utter critic.

Cynical appears to work, however:

    (84a)   He is utterly cynical.

    (84b)   He is an utter cynic.

The second type of -ic adjective shows a zero-derived "agent noun." Some take utter and utterly; others do not:

    (85a)   He is rustic.

    (85b)   He is a rustic.

    (86a)   He is agnostic.

    (86b)   He is an agnostic.

    (87a)   He is utterly eccentric.

(87b)   He is an utter eccentric.

(88a)   He is utterly psychic.

(88b)   He is an utter psychic.

(89a)   He is ascetic.

(89b)   He is an ascetic.

Other adjectives of this type are: diabetic, eclectic, peripatetic, psychotic, neurotic, romantic, dyspeptic, spastic.

The third set of adjectives in -ic show no "agent noun" formation at all:

(90a)   He is energetic.

(90b)   *He is an energet.

(91a)   He is pathetic.

(91b)   *He is a pathet.

Those derived from proper nouns invariably lack such derivatives:

(92a)   He is platonic.

(92b)   *He is a platon.

(93a)   He is socratic.

(93b)   *He is a socrat.

Other examples showing no "agent noun" are: sympathetic, manic, sarcastic, terrific, messianic, miltonic, byronic. The "agent noun" of philanthropic would have to be the longer philanthropist.

For Lakoff's transformation to work, it will have to delete -ic or -al in the first cases, retain the ending in the second cases, and fail to apply in the third cases. The allegedly underlying adjectives will have to be marked appropriately.

The functional lexicalist treatment of these facts is quite natural, retaining the principle of accretion. The nouns are underlying in the first

cases, and the derived adjectives mean LIKE N, so that idiotic means LIKE AN

IDIOT. In the second cases, the nouns are derived by a zero process from the

adjectives, and they mean ONE WHO IS ADJ. The third cases simply have no noun

realizations, or are derived from proper nouns by the first method, socratic

meaning LIKE SOCRATES. These examples are not stunning. but it is clear that

the revised lexicalist hypothesis is in no way inferior to generative semantics

in treating them.

4.2.2.3 FOOLISH/FOOL

Lakoff's third example of the agent noun formation is weaker than the

preceding. He claims that sentence (94)

(94)   John is foolish.

is the sentential source for the noun of sentence (95)

(95)   John is a fool.

When one carefully examines the morphological evidence, however, support for

Lakoff's alleged transformation quickly vanishes. Again we find several sets

of data.

First, we find the cases like foolish:

(97a)   John is completely prudish.

(97b)   John is a complete prude.

(98a)   John is completely boorish.

(98b)   John is a complete boor.

(99a)   John is completely brutish.

(99b)   John is a complete brute.

(100a)   John is completely amateurish.

(100b)   John is a complete amateur.

Some of the above sound peculiar with <u>complete</u>. In the following, the paired
sentences are not synonymous:

(101a)   John is childish.

(101b)   John is a child.

(102a)   John is boyish.

(102b)   John is a boy.

The adjectives <u>childish</u> and <u>boyish</u> are often attributed to those who are not
children or boys. This is the whole force of the suffix -<u>ish</u>,which means
CHARACTERISTIC OF N. If sentences (101)-(102) were synonymous, it would be
illogical to say:

(103)   Grandpa is childish.

(104)   John's father is boyish.

But these sentences are perfectly acceptable.

A second set of -<u>ish</u> nouns show that CHARACTERISTIC OF N is the derived
meaning, and that the noun comes from the adjective:

(105a)   John is elfish.

(105b)   John is an elf.

(106a)   Sarah is dwarfish.

(106b)   Sarah is a dwarf.

(107a)   Sarah is nymphish.

(107b)   Sarah is a nymph.

(108a)   John is spookish.

(108b)   John is a spook.

(109a)   John is oafish.

(109b)   John is an oaf.

(110a)   John is puckish.

(110b)   ?John is a puck.

Where these are evaluative, they make take <u>complete</u> as a modifier:

(111)   John is a complete oaf.

This is generally true of evaluative nouns, however, as we observed in the previous sections concerning <u>utter</u> and <u>real</u>; nouns do not have to have related adjectives for these modifiers to occur:

(112)   John is a complete ass.

(113)   John is an utter crook.

(114)   John is a real yes-man.

(115)   John is a total nincompoop.

A third set of -<u>ish</u> nouns are based on the names of animals:

(116a) John is piggish.

(116b) John is a pig.

We also find <u>swinish</u>, <u>bearish</u>, <u>mulish</u>, <u>owlish</u>, <u>goatish</u>, and <u>puppyish.</u> Note, however, that sentences (117) are not necessarily synonymous:

(117a) John is sheepish.

(117b) John is a sheep.

The adjective <u>sheepish</u> refers to only one characteristic generally attributed to sheep, namely their meekness.

A fourth subset of -<u>ish</u> adjectives are those of nationality. These do not take <u>complete</u>:

(118a) John is Finnish.

(118b) John is a Finn.

Like <u>Finnish</u> are: <u>Jewish</u>, <u>Danish</u>, <u>Swedish</u>, <u>Polish</u>, and <u>Turkish</u>. We note, however, that <u>Flemish, Irish</u>, and <u>English</u> do not have shorter "agent nouns":

(119a) John is English.

(119b) *John is an Engle.

A fifth set of -<u>ish</u> adjectives definitely cannot undergo Lakoff's

transformations:

    (120a)   John is feverish.

    (120b) *John is a fever.

    (121a)   John is stylish.

    (121b) *John is a style.

    (122a)   John is ticklish.

    (122b) *John is a tickle.

    (123a)   John is peevish.

    (123b) *John is a peeve.

Finally, we encounter -ish adjectives derived from numerals and other

adjectives with the meaning SOMEWHAT: reddish, pinkish, dullish, purplish,

sixtyish, etc. These also fail to undergo Lakoff's alleged transformation.

Unlike the situation characteristic of research in syntax, where an

enumeration of all the sentences in which a given transformation applies is

not only difficult but theoretically impossible, in derivational morphology

we can make a nearly complete list of the occurrence of a given suffix, using

a rhyming dictionary. Upon examination of the data in this case, we find that

"agent noun" formation by deletion of -ish from adjectives is simply not supported

by the facts.

Rather, we find a state of affairs typical of the lexicon, where a set

of -ish adjectives is derived from a variety of sources, some from [+Human] nouns,

some from [+Animate] nouns, and some from nouns of other types (feverish) or from

adjectives and numerals. All have the semantic flavor of SOMEWHAT. One can

act foolish or piggish without literally being a fool or a pig.

This -ish example, like the two preceding examples, does not prove even

partially productive. Lakoff's facts do not threaten the principle of accretion.

No clear evidence for a transformation has been provided.

4.2.3   AGENT NOUNS IN [-ər]

Lakoff's final examples of agent noun formation are:

(124a)   John kills men.

(124b)   John is a   killer of men.

(125a)   John destroys houses.

(125b)   John is a destroyer of houses.

As further evidence he cites the behavior of adverbs under the agent trans-
formation, where the (b) examples come from (a) sources, again:

(126a)   John kills men mercilessly.

(126b)   John is a merciless killer of men.

(127a)   John destroys houses professionally.

(127b)   John is a professional destroyer of houses.

These examples of transformational derivation of agent nouns are considerably
more plausible than the adjective cases which we have examined.   In instances
(124)-(125), Lakoff derives the longer noun from the shorter verb, allowing
for the principle of accretion as we would in a functional lexicalist treatment.

The suffix [-ər], in contrast to the other suffixes which we have con-
sidered in this chapter, is generally productive.   A new verb glick could
readily be assigned an agent noun with the meaning(s): PERSON OR THING THAT
GLICKS.   Whether this agent noun is actually instantiated depends basically
upon non-linguistic factors, but the morphology is clearly productive.   This
fact renders plausible an agent transformation, but it in no way argues against
the functional lexicalist theory, which is also supported by it·

Lakoff's claim about the adverbs violates the principle of accretion and
there are some syntactic exceptions to the pattern he cites:

(128a)   John kills men immediately.

(128b)   *John is an immediate killer of men.

(129a)   John kills men electrically.

(129b) *John is an electric killer of men.

(130a)   John kills men artificially.

(130b) *John is an artificial killer of men.

Other adverbs, when transformed, receive different interpretations:

(131a)   John kills men curiously.

(131b)   John is a curious killer of men.

(132a)   John kills men separately.

(132b)   John is a separate killer of men.

An interpretivist theory of adverbs along the lines of Jackendoff (1972) seems
to be a better account of the facts in this case.

Here, the problems with Lakoff's analysis are not with the morphological
path proposed, which coincides with that chosen in the functional treatment,
but with the transformation itself. We note that many verbs which require
objects must also have them in of-phrases when in the agentive form. The
following agent nouns must have accompanying prepositional phrases:

(133)   John is   an instigator of rebellion
                    an inhibitor of conversation
                    an orginator of the ice cream cone
                    a disseminator of pornographic literature
                    a portrayer of violence
                    a thrower of parties
                    a giver of gifts
                    a respecter of persons
                    a disturber of the peace
                    a defacer of public monuments
                    a bearer of good news

These facts are consistent with transformation, since the selectional restrictions
requiring objects appears to be inherited by the noun in the process of trans-
formation. (The lexicalist position is not in peril, since the lexical entries
for (133) are simply marked as +[___ of NP]obligatorily.) Inconsistent with

transformation, however, is the contrary case, where many [-ər] nouns do in fact occur without of-phrases, although underlying verbs are strictly transitive:

(134a) *John investigates.

(134b) John is an investigator.

(135a) *John employs.

(135b) John is an employer.

(136a) *John illustrates.

(136b) John is an illustrator.

Some other examples of this type are collector, inspector, commander, grower, brewer, publisher. The transformationalist must find a way to delete the unnecessary objects before agent noun formation. The mechanism for this operation remains unclear. Lexicalism has no trouble with these cases, since they are treated as ordinary nouns.

A much more serious argument against the transformationalist is the non-existence of many -er nouns: *discusser, *forgetter, *assumer, *understander, *rememberer, *knower, *recognizer, *needer, *wanter, *hoper. Marchand comments that "it seems safe to state that only such verbs derive an agent substantive in -er as denote an activity which is observable either visibly or audibly... Generally, verbs that do not allow of the transformation of an active statement into a passive sentence do not derive -er substantives either. Derivatives from such verbs as belong, cost, weigh, for instance, do not exist.... There are no derivatives either from quasi copulas such as appear, become, grow, seem, turn or from the copula verb be." [pp.273-4] Marchand may be partially wrong about the visibility and audibility requirements (cf. thinker), but in general he is quite right in observing gaps in productivity.

Even when [-ər] derivatives exist, they may not be transformationally available even in very simple cases. For example, taker exists, as in the

compound census-taker, but we do not derive (137):

    (137a)   John takes his briefcase to work.

    (137b)   *John is a taker of his briefcase to work.

We find theater-goer and street-walker, but note the following:

    (138a)   Billy goes to school.

    (138b)   *Billy is a goer to school.

    (139a)   John walks to the grocery.

    (139b)   *John is a walker to the grocery.

Similarly, we find:

    (140a)   Martha talks on the telephone.

    (140b)   *Martha is a talker on the telephone.

    (141a)   Elizabeth speaks to her neighbors.

    (141b)   *Elizabeth is a speaker to her neighbors.

    (142a)   Mary does her laundry.

    (142b)   *Mary is a doer of her laundry.

    (143a)   Bill swears in French.

    (143b)   *Bill is a swearer in French.

    (144a)   Sam picks up the newspaper.

    (144b)   *Sam is a picker up of the newspaper.

    (145a)   George makes his bed.

    (145b)   *George is a maker of his bed.

    (146a)   Alan parts his hair.

    (146b)   *Alan is a parter of his hair.

    (147a)   John fills his gas tank.

    (147b)   *John is a filler of his gas tank.

    (148a)   The baby throws up all day.

(148b) *The baby is a thrower up all day.

(149a) John watches his children.

(149b) *John is a watcher of his children.

(150a) Bill says his prayers.

(150b) *Bill is a sayer of his prayers.

(151a) John asks for more money.

(151b) *John is an asker for more money.

(152a) Arthur carries the cat.

(152b) *Arthur is a carrier of the cat.

(153a) John builds up his collection of cars.

(153b) *John is a builder up of his collection of cars.

(154a) Martha holds her baby.

(154b) *Martha is a holder of her baby.

(155a) John knocks at Martha's door.

(155b) *John is a knocker at Martha's door.

(156a) Bill moves to California.

(156b) *Bill is a mover to California.

(157a) Alice thinks that John is obnoxious.

(157b) *Alice is a thinker that John is obnoxious.

(158a) Paul believes that the moon is made of green cheese.

(158b) *Paul is a believer that the moon is made of green cheese.

(159a) John doubts that Bill is coming.

(159b) *John is a doubter that Bill is coming.

(160a) Elizabeth sees that her plan is futile.

(160b) *Elizabeth is a seer that her plan is futile.

(161a) John tells his wife the news.

(161b) *John is a teller to his wife of the news.

(162a) Bill hurt his dog.

(162b) *Bill is a hurter of his dog.

(163a) John hunts for deer.

(163b) *John is a hunter for deer.

Apparently, the agent transformation must be restricted in order to
block the unacceptable sentences of (137)-(163). In general it seems that
the transformation cannot work in sentences with indirect objects, verbs with
particles, subject-referential pronouns in the object, or complement sentence
objects. It is important to note, however, that even if all these conditions
are met (and there may well be others), there is still the lexical requirement:
the agent noun must exist. For example, although the dictionary lists hurter,
in my dialect the word does not exist, so no sentence with hurt as main verb
could be agent-transformed. This is evidence for the lexicalist view.

The revised lexicalist position is undisturbed by the ungrammaticality
of the transforms (137)-(163). As we have observed, according to the lexicalist
hypothesis each agent noun must be entered separately in the lexicon. Some
nouns, like McCawley's inventor are fully lexicalized derivatives of underlying
verbs. By "fully lexicalized" we mean that inventor may occur in those environ-
ments where invent would generally be found. The selectional restrictions are
essentially the same:[13]

(164a) John invents gizmos.

(164b) John is an inventor of gizmos.

(165a) *Prosperity invents gizmos.

(165b) *Prosperity is an inventor of gizmos.

(166a) *John invents prosperity.

(166b) *John is an inventor of prosperity.

(167a)   John invents fairy stories.

(167b)   John is an inventor of fairy stories.

(168a)   *John invents Richard Nixon.

(168b)   *John is an inventor of Richard Nixon.

In addition to the fully lexicalized derivation, there is an entry in

the lexicon:

(169)   inventor$_N$:   invent$_V$, PROFESSION

This entry, with its additional semantic information, allows <u>inventor</u> to occur

without object in a sentence like (170):

(170)   Bill is a carpenter and Tom is a blacksmith and John is an

inventor.

Other nouns may be only partially lexicalized.   In particular, the

PROFESSION entry may not exist.   For example, <u>holder</u> is not fully lexicalized.

It may occur as the agent derivative of <u>hold</u> in the sense TO OWN OR POSSESS.

We will call this verb <u>hold</u>$_X$.   Thus, we find the entry:

(171)   holder$_N$:   hold$_X$

From this entry we find derivatives like:[14]

(172a)   Tom holds a box at the opera.

(172b)   Tom is the holder of a box at the opera.

(172c)   Tom is an opera box holder.

(173a)   Tom holds a winning lottery ticket.

(173b)   Tom is the holder of a winning lottery ticket.

(173c)   Tom is a winning lottery ticket holder.

The agent noun <u>holder</u> is also lexicalized for <u>hold</u> in the sense TO SERVE

AS A RECEPTACLE FOR.   We will call this verb <u>hold</u>$_Y$. We will find the lexical

entry:

(174) holder_N : hold_Y

And we encounter derivatives like:

(175a)   This bracket holds the garbage can.

(175b)   This bracket is the holder of the garbage can.

(175c)   This bracket is the garbage can holder.

(176)   Please put the candle holder on the table.

(177)   Martha made me a new pot holder.

In the meaning hold_Y, [+Human] nouns may not be subjects, so this use of holder

is naturally [-Animate]. A third meaning of hold, hold_Z, is required to account

for its occurrence in (178):

(178)   Martha holds her baby.

The verb hold is not lexicalized for holder, so we do not find the sentence:

(179)   *Martha is a holder of her baby.

Similarly, the noun speaker is lexicalized only for the verb speak meaning

TO KNOW A LANGUAGE, so that we find:

(180a)   Elizabeth speaks Spanish.

(180b)   Elizabeth is a speaker of Spanish.

(180c)   Elizabeth is a Spanish speaker.

We do not find speaker lexicalized for the verb speak meaning TO CONVERSE WITH,

however, so the sentence

(181)   *Elizabeth is a speaker to her neighbors.

is not interpretable. Note, however, that speaker is lexicalized for PROFESSION,

so that we find:

(182)   Emma Goldman was a popular speaker.

A problem arises with walker and talker. These are not fully lexicalized

either, since we ordinarily do not find:

(183)   *John is a walker.

(184)   *John is a talker.

although for some speakers these are variants of:

(185)   John is quite a walker.

(186)   John is quite a talker.

Adverbs make (183) and (184) acceptable, since we do find:

(187)   John is a fast walker.

(188)   John is a slow talker.

The only explanation available appears to be that agent nouns applied to humans

generally denote quantities, propensities, and professions. Walker and talker

are too obviously human to be helpful information. All people walk and talk.

In fact, (183) and (184) become imaginable in the case where John is a baby

whose development is being discussed.

The lexicalist is able to explain the fact that embedded sentence comple-

ments are blocked in the alleged agent transformation. The sentence (189)

(189)   *Alice is a thinker that John is obnoxious.

is ungrammatical for the same reason that the following is:

(190)   *Alice is a person that John is obnoxious.

Human nouns cannot be followed by unreduced that-clauses in surface structure.

Thinker is inserted at the same level as person and it behaves similarly.

Another observation favoring the lexicalist position is the fact that

verbs which are zero-derivatives of nouns do not show agent nouns in [-ər]:

(191a)   John captains the ship.

(191b)   *John is the captainer of the ship.

(192a)   John pilots the airplane.

(192b)   *John is the piloter of the airplane.

(193a)   John hosts the party.

(193b)   *John is the hoster of the party.

The -er nouns do not occur becuase captain, pilot, and host already incorporate

the semantic material of AGENT.   The transformationalist has no explanation

for their non-occurrence.

We note that when a verb is derived from a non-human noun such as milk,

the agentive noun in [-ər] does exist, namely milker.   This derivative has

three meanings, referring (1) to the person who milks, (2) to the machine used

in milking, and (3) to the cow which is milkable.

These observations bring us to the most complicated argument in favor of

the lexicalist position.   Lakoff and McCawley do not mention the fact, which

we have just observed, that many non-human agent nouns are derived by [-ər].

We find the following objects and devices:

(194)   buzzer, vaporizer, dryer, mixer, freezer, tranquillizer,

(orange) squeezer, computer, transformer, transmitter,

harvester, scooter, heater, bomber, racer, tracer, tracker,

extinguisher, pacifier, skimmer, scraper, fastener,

moistener, steamer, stroller, bumper, incubator, dessicator,

indicator, oscillator, escalator, ventilator, recorder,

calculator, regulator, insulator, detonator, alternator,

separator, vibrator, refrigerator, accelerator, generator,

incinerator, perforator, demonstrator, commutator, elevator,

refractor, extractor, deflector, reflector, carburetor,

connector, erector, detector, conductor, monitor, fertilizer.

The generative semanticists must explain the fact that these nouns will have

to be attached to trees somehow different from structure (195)

(195)

```
        /\
       /  \
      /    \
  Invent   Agent
```

in order to handle words like <u>generator</u>. Somehow the semantic material DEVICE

or OBJECT must occur in the tree.

But we now observe the important fact that there is an allofuction of

[-ər], namely [-ənt]. It occurs in the following [+Human] agent nouns:

(196)   claimant, applicant, assistant, supplicant, informant,

         participant, occupant, migrant, entrant, inhabitant,

         consultant, adherent, aspirant, combatant, resident,

         registrant, celebrant, complainant.

What is striking, however, is that this allofunction also produces a set of

non-human agents (largely liquid or gaseous):

(197)   irritant, precipitant, stimulant, solvent, lubricant,

         deodorant, pollutant, repellant, coolant, intoxicant,

         refrigerant, propellant

The revised lexicalist view explains the similar behaviors of the suffixes

[-ər] and [-ənt] by noting that both functions realize the same underlying

semantic material, AGENT, which is in turn split into [+Human] and [-Animate].

In some cases, both meanings occur: <u>racer</u>, <u>bomber</u>, <u>stroller</u>, <u>destroyer</u>,

<u>calculator</u>, <u>demonstrator</u>, <u>conductor</u>, <u>monitor</u>.[15]

The transformationalist cannot explain why two different types of tree

structure should regularly show the same morphological shapes upon lexical

insertion. The transformationalist does not lead us to anticipate two endings

used in both ways; it might just as well be four endings, or three, or five.

For the lexicalist, the actually occurring case is quite naturally a consequence

of the theory of allofunction, put forward in section 2.1.3.1.

Observe finally that the lexicalist is able to explain fairly naturally

the existence of many underived [+Human] nouns that do not undergo the alleged

transformation:

(193)   penitent, belligerent, exponent, insurgent, savant,

          adjutant, militant, vagrant, lieutenant, mendicant,

          merchant, descendent, tenant, constituent, coroner,

          foreigner, southerner, northerner, easterner, westerner,

          Vermonter, New Yorker, tutor, bachelor, tailor, debtor,

          creditor, ancestor, proprietor, victor, warrior, teamster,

          spinster, punster, chorister, treasurer, seafarer, sorcerer,

          forester, docker, author, voyager, lowlander, islander, in-

          lander, outfielder

Here the operators [-ər] and [-ənt] do not effect actual derivations from

verbs, but they still express the [+Human] element of AGENT. The trans-

formationalist has no explanation for the common meanings of (198), without

positing underlying verbs that have little plausibility.

4.3 SUMMARY

This chapter has argued that the functional lexicalist theory developed

in Chapter Two is superior to generative semantics in accounting for the facts

of agent noun derivation. The first sections were devoted to dismissing three

of Lakoff's examples as unsupported by morphological evidence when the vocab-

ulary as a whole is examined. The last section details the syntactic and

semantic problems inherent in a transformational treatment of [-ər] derivatives

and presents evidence supporting a functional solution.

The reader is referred to Appendix D, $-ED_{NA}$ AND $-LESS_{NA}$, for more arguments

of this type favoring revised lexicalism over generative semantics.

CHAPTER FIVE - QUESTIONS RAISED BY THE STRUCTURED LEXICON

5.1 INTRODUCTION

A number of questions arise within the theoretical framework of the structured lexicon. This chapter deals with some of these questions, proposing tentative answers in some cases and indicating possibilities for future research in others.

First, we consider the principle of accretion and the problems it raises for a consistent morphological description. Next, we turn to a discussion of the bearing of semantic evidence upon morphology. In particular, we examine the evidence required to establish phonological representations with a structured lexical theory. This question leads to a distinction between major and minor categories in derivation and an overall look at derivational patterns. The chapter closes with some speculations about adjective types and the interpretation of nominal phrases.

With its emphasis upon functional correlation of sound pattern with meaning, the structured lexicon implies a theoretical approach that tends to solve individual morphological problems on a maximally general basis. The structured lexicon itself is based on the assumption that the whole of a vocabulary is affected by the functioning of a part. This chapter works out in detail a few problems requiring this integral view.

5.2 PROBLEMS WITH ACCRETION

Inherent in the notation which we have developed is the assumption that morphological derivation is an essentially accretive process, the successive

incorporation of element after element into formative structure. In Chapter
Three we briefly discussed the principle of accretion, which claims that if
two formatives are related by a function, the one added-to phonologically
is derived. This principle basically excludes deletion as a functional
operator. The exclusion of deletion implies that, with the exception of
zero-derivation, every derivational function leaves a phonological trace
behind. Derivation is almost, but not quite, recoverable from surface
evidence, except in cases of total suppletion.

There are cases, however, where it is difficult to maintain this principle.
In German, for example, we find the abstract nouns Ruhe/Unruhe and Geduld/
Ungeduld alongside the adjectives ruhig, "quiet"/unruhig, "unquiet" and
geduldig, "patient"/ungeduldig, "impatient". On the one hand it seems best
to consider the abstract nouns underlying, the adjectives being derived from
them by the derivational function $-ig_{NA}$. Such a step, however, requires that
a negative prefix be available to apply directly to nouns, a derivational
$un-_N$ which, in German as in English, fails to be independent of the derivational
function $un-_A$, since the former cannot apply to a noun unless the noun yields
a derivative adjective to which $un-_A$ could apply.[16] We must have the function
$un-_A$ for those adjectives which do not come from abstract nouns, e.g., denkbar
"imaginable"/undenkbar "unimaginable".

If we assume, however, that Geduld/Ungeduld are derived from underlying
adjectives, we must posit a function which deletes the adjective suffix $-ig$,
abandoning the principle of accretion. In English we find a similar problem.
The adjective happy has the derivative nominal happiness, suggesting that
abstract nouns should come from underlying adjectives; unhappy/unhappiness
supports this hypothesis. We find other cases, however, where the abstract

noun is shorter than the adjective which should be its source, e.g., joyful/ joy, beautiful/beauty, angry/anger, hungry/hunger. In some cases the abstract noun has a longer doublet: joyfulness, angriness. Entirely equivalent problems arise in Swedish where we have the abstract nouns behag/obehag alongside the longer adjectives behaglig "pleasant" and obehaglig "unpleasant", where $o-_A$ is the Swedish function equivalent to the function $un-_A$ of English and German, and -lig is the adjectival ending. Perhaps it is wrong to suppose that derivation will go in only one direction. Alongside the adjective/ abstract N cases represented by happy/happiness with adjective underlying and joy/joyful with noun underlying, we find agent/verb cases, such as assassin/ assassinate where the noun is clearly historically and synchronically under- lying and kill/killer, where the verb is underlying. Thief/thieve could follow either pattern (but see section 4.2.1.1.)

It may be that deletion is allowed as an operator when a function is terminal. A terminal function is one the members of whose range may not serve as the arguments of another function. The Ungeduld and obehag cases seem to follow this pattern if derived from adjectives by deletion, but we have argued elsewhere (4.2.2.1) that beauty undergoes a zero-function to become [+Human], thus violating the suggestion that deletion is terminal if beautiful is taken as underlying. This question needs more research.

We have argued, primarily in Chapter Three, that syntactic category should not be viewed simply as a "feature" which is independently specified for lexical items. We have claimed for example, that although the formative quiet is a verb, a noun, and an adjective, it is only the adjective which is underlying. Zero-derivations are also accretive in structure.

For the sake of argument, let us temporarily assume the free-floating feature specification of unstructured lexicalism. We will have [quiet, +A], [quiet, +V] and [quiet, +N]. Similarly, we will find [tame, +A] and [tame, +V], [dry, +A], [dry, +V],[blind, +A] and [blind, +V]. We observe that the verbal entries have participles which are used adjectivally: quieted horses, tamed lions, dried beans, blinded rats. None of these is synonymous with the underlying adjectives: quiet horses, tame lions, dry beans, blind rats.

We find that the unstructured feature system has no way to distinguish dry_A from dried_A, since both are presumably represented as [dry, +A]. In particular, the unstructured feature system cannot express the fact that dried has both verbal and adjectival character. It is verbal, for example, in that it cannot be modified by very or extremely,although ordinary adjectives can: very dry beans, *very dried beans. We might seek to account for these facts by representing dried as [dry, +A, +V], with two features. To do this is almost tantamount to admitting that we need a hierarchical feature-specification, however. Note further that dryness would be specified as [dry, +N]. But dryness has the adjectival feature that it can be modified by extreme, suggesting the representation [dry, +A, +N]. Within the unstructured system, there is now no reason to exclude *driedness, which would be [dry, +A, +V, +N]; its non-occurrence is simply an arbitrary fact.

In the hierarchical system imposed by derivational functions, on the other hand, we can venture an explanation for the non-existence of *driedness. The deep structure of dried is $-ed[\emptyset[dry_A]_V]_A$. We observe that the function which yields participial adjectives is a terminal function. Once it has applied, no further derivations can be undergone. Thus, *driedness is out because dried is a terminal derivative. A few similarly prohibited nouns are

*woundedness, *fixedness (in the meaning STATE OF BEING REPAIRED),

*destroyedness, *killedness.

There are some apparent counter-examples to the generalization that $-ed_{VA}$

is a terminal function. We find: preparedness, ruggedness, fixedness

(meaning STEADINESS), jaggedness, raggedness, wretchedness, wickedness,

learnedness, blessedness, indebtedness, affectedness, conceitedness,

disinterestedness, worriedness, pigheadedness. Examining these examples

more closely, however, we find that underlying the -ness forms are "true"

adjectives that can be modified by very and extremely, not verbs. The

function $-ed_{VA}$ has not been applied to them, so they are not terminal.

Other terminal functions appear to be $-ly_{AAdv}$ and the various forms of

$NOMINAL_{VN}$ and $NOMINAL_{AN}$. The function $-ing_{VA}$ appears to be partially

terminal; it feeds only into the adverb-forming function in -ly: frighten-

ingly, disturbingly. There are no -ness nominals for deverbal -ing

adjectives, although the latter do take very and extremely: very frightening/

*frighteningness, extremely surprising/*surprisingness. Willingness is not

a counter-example, because the adjective willing is not synchronically

derived from the verb will.

The suffix -ity generally yields de-adjectival nominals, as in superior/

superiority, rare/rarity, sane/sanity, peculiar/peculiarity. How are we

to account for the apparently deverbal derivations of depravity (from deprave?)

and deformity (from deform?)? Is there also a homophonous function $-ity_{VN}$?

An investigation into semantics discloses the correct solution. Depravity

is the state of being depraved and deformity is the state of being deformed.

Semantically, there is an adjectival stage between the verb and the nominals.

It appears that the correct deep-structure representing depravity is thus

thus -ity $[\emptyset[\text{deprave}_V]_A]_N$ and <u>deformity</u> is represented as the structure

-ity $[\emptyset[\text{deform}_V]_A]_N$. But note that the inner adjectives cannot be realized

similarly at the surface, where they are <u>depraved</u> and <u>deformed</u>. The verbs

seem to be causatives of these underlying adjectives, but such treatment

would violate the principle of accretion. The optimal solution is unclear.

It is interesting to consider in this connection the phonologically

similar verbs <u>deprive</u> and <u>deprave</u>. The former has the nominal <u>deprivation</u>,

while the latter has the associated nominal <u>depravity</u>, as we have just ob-

served. <u>Depravity</u> is a de-adjectival nominal, as shown by the following

sentences and its paraphrase:

(1)   The children's depravity was evident.

(2)   The fact that the children were depraved was evident.

Similarly, we have:

(3)   The children's deprivation was evident.

(4)   The fact that the children were deprived was evident.

Now as the foregoing paragraph has argued, <u>depravity</u> comes from a very only

indirectly, if at all. Thus, it is not surprising that it cannot serve

as a deverbal nominal, while <u>deprivation</u> can:

(5)   *John's depravity of the children was despicable.

(6)   John's deprivation of the children was despicable.

(Webster's Third International lists <u>depravation</u>,which would probably occur

in (5) for those who have it.)

Nominals in -<u>tion</u> are sometimes ambiguous between deverbal and de-

adjectival interpretation, but nominals in -<u>ity</u> are strictly de-adjectival.

Further evidence for this generalization is provided by <u>deform/deformity/</u>

<u>deformation</u>, where the second formative may not be a deverbal nominal:

(7)   Mark's deformation of the plastic fascinated Mary.

(8)   *Mark's deformity of the plastic fascinated Mary.

It may be de-adjectival, however:

(9)   Mark's deformity saddened his mother.

(10)   The fact that Mark was deformed saddened his mother.

These observations argue once again that the unstructured lexicon is

inadequate observationally. If lexical items are unspecified in the lexicon

as to syntactic category, acquiring features in a non-hierarchical manner,

both deformity and deformation would presumably correspond to the underlying

lexical item [deform, +N]. A syntactic feature theory that makes no

provision for course of derivation is unable to state that deformity comes

from a verb via an adjective, while deformation is derived directly.

Accordingly, there is no way within such a feature system to explain the

syntactic difference between the two nominals. By positing an adjectival

stage in the linear derivation of deformity we explain these facts, although

the problems with accretion remain.

Further research may show that deletion operations are required in

morphology. [See the next section.] For the moment, however, it seems

essential to adhere as closely as possible to the principle of accretion,

since it leads us to respect the phonological evidence, often the only

sure evidence available.

It is important to note, finally, that if a fuller theory of semantic

representation were available, a semantic correlate of the principle of

accretion could also be applied: if two formatives are related by a function,

the simpler semantically is underlying. We used this principle tacitly in

arguing for certain patterns of zero-derivation in section 3.5, in fact. It

is relatively easy to define the verb <u>water</u> in terms of the noun <u>water</u>,

as TO APPLY WATER TO, for example, but it is quite impossible to define

the noun in terms of the verb. The semantic principle of accretion would

claim that when the two items are fully represented semantically, <u>water</u>$_N$

must be taken as underlying <u>water</u>$_V$, since the representation of the noun

is simpler.[17]

5.2.1 TRUNCATION RULES AND THE PRINCIPLE OF ACCRETION

In his thesis, <u>Word Structure</u>, Mark Aronoff posits truncation rules

to delete a "designated stem-final morpheme before a designated suffix."

[p.188]. According to Aronoff [p.189], "a truncation rule deletes a morpheme

which is internal to an affix in the following manner:"

$$(11) \quad [[root+A]_X +B]_Y \qquad \text{Where X and Y are Major Lexical}$$
$$\text{Categories}$$

$$1 \quad 2 \quad 3$$

$$\longrightarrow$$

$$1 \quad 0 \quad 3$$

Aronoff goes on to say that "truncation rules are necessary within our

theory simply because without them we often find cases of regularly

derived words, semantically transparent, formed with affixes which we know

to be alive and regular in their operation, which on the surface, do not

appear to have been derived from words." [p.189]

Aronoff's first example is the suffix <u>-ee</u> of <u>employ/employee</u> and <u>pay/</u>

<u>payee.</u> He observes that verbs of the form <u>nominate</u> and <u>evacuate</u> have

derivatives <u>nominee</u> and <u>evacuee.</u> "Here the suffix <u>ee</u> does not appear

attached to any verb, but rather to the root of that verb, which can be

obtained by deleting its last morpheme." [p.190]

The question arises, however, whether -ate in this case really is a morpheme. The ending -ate appears on many verbs which are not synchronically derived: exaggerate, agglutinate, deteriorate, delicate, confiscate. There seems to be no reason to separate suffix and root in these instances; the words should be entered whole in the lexicon. The ending -ate conveys the information that these formatives are verbs, but it has no other significance, and the items must be marked [+V] in any case. Under the circumstances, are we justified in calling -ate a morpheme?

There are instances where -ate clearly is a morpheme--where it serves, in fact, as the operator of a function. The function $-ate_{NV}$ has the meanings TO ADD N TO, TO SUPPLY WITH N: air_N/$aerate_V$, $chlorine_N$/$chlorinate_V$, $fluoride_N$/$fluoridate_V$, $medicine_N$/$medicate_V$, $hyphen_N$/$hyphenate_V$, $orchestra_N$/ $orchestrate_V$, $vaccine_N$/$vaccinate_V$. Some other instances are allied with these, though not so obviously. Hydrate and dehydrate come by $-ate_{NV}$ if we posit the variant hydr for water. Populate is related to the noun people, though its meaning is broader than its derivational source would indicate: a tenement may be populated with rats. Paginate means TO SUPPLY WITH PAGE NUMBERS, not simply with pages. These idiosyncratic shades of meaning must be recorded with the verbs in the lexicon, since the function $-ate_{NV}$ does not provide them.

Another case where -ate is a morpheme, and a function, is its use to derive verbs from adjectives, often in the meaning TO MAKE A, TO RENDER A. Thus, we find $valid_A$/$validate_V$, $authentic_A$/$authenticate_V$, $liquid_A$/$liquidate_V$, $granular_A$ ($grain$)/$granulate_V$. $Vacate_V$ seems to be functionally derived from

$\underline{vacant}_A$; here the $\underline{-nt}$ would have to be truncated. $\underline{Similar}_A$ appears to

yield both $\underline{assimilate}_V$ and $\underline{simulate}_V$, each formed with specific semantic

material. $\underline{Emasculate}_V$ is derived from $\underline{masculine}_A$, with the prefix $\underline{e-}$

in this case providing the negative semantic reading.

The existence of functions with operator $\underline{-ate}$ does not make $\underline{-ate}$ a

morpheme in all of its occurrences, however. Aronoff has observed some

cases where the sequence $\underline{-ate}$ must not appear. There are other cases

where, just as arbitrarily, $\underline{-ate}$ must be inserted. Consider, for example,

adjectives in $\underline{-ive}$. We find $\underline{quality}_N/\underline{qualitative}_A$, $\underline{quantity}_N/\underline{quantitative}_A$,

$\underline{faculty}_N/\underline{facultative}_A$, $\underline{frequency}_N$ $\underline{(frequent)/frequentative}_A$, $\underline{lucre}_N/\underline{lucrative}_A$.

Some people say $\underline{orientate}$ for $\underline{orient}_V$. In these cases, the inserted $\underline{-ate}$

has no semantic content. Other forms showing the inserted affix, not coming

from verbs in $\underline{-ate}$ or related nominals in $\underline{-ation}$ are: $\underline{sign/signatory}$,

$\underline{command/mandatory}$, $\underline{piliferous/depilatory}$, $\underline{compare/comparative}$, $\underline{vocal/}$
$\underline{vocative}$, $\underline{conspire/conspirator}$.

We see, then that $\underline{-ate}$ Truncation and $\underline{-ate}$ Insertion are both required

in the morphology. This fact alone has no bearing on the principle of

accretion, however, which states that deletion is not a functional operator.

If $\underline{nomin}$ or $\underline{evacu}$ functioned differently as roots after $\underline{-ate}$ Truncation,

we might have a counterexample to accretion. This is not the case with

Aronoff's examples, however. What we would need to show a violation of the

principle would be two parallel derivatives: $\underline{evacuee}$ and $\underline{evacuatee}$ with

different meanings, but both coming from $\underline{evacuate}$; this would show that

deletion in the first case had produced a functional change, a semantic

as well as phonological alternation.

Other instances of truncation given by Aronoff do not violate the principle

of accretion, for the same reason. He cites <u>penetrate/penetrable</u> to show the deletion of -<u>ate</u> before -<u>able</u>. <u>Navigate/navigable</u> is a similar case. But here again, -<u>ate</u> is not functional, so its deletion does not bear on the principle.

Aronoff's "last and most striking case [of Truncation in English]... has to do with the adverbial suffix <u>ly</u> and the comparative suffix +<u>er</u>." [p.195] There are many serious problems with Aronoff's analysis.

First, he claims that the comparative of adjectives is formed in two distinct ways:

"a)   The suffix +<u>er</u> is attached to the adjective, as in <u>big/bigger</u>, <u>small/smaller</u>.

"b)   The independent word <u>more</u> is placed in front of the adjective, as in <u>more interesting</u>."

He claims that "the choice between (a) or (b) is determined phonologically. Monosyllables and disyllables ending in <u>y</u> take (a) (<u>stupider</u> and *<u>apter</u> are exceptions) all other take (b). Some disyllables in <u>y</u>, namely those which can be analyzed as <u>X+ly</u>, take either (a) or (b)." He gives the following table to illustrate the various restrictions:

(12)   <u>adj</u>   <u>more adj</u>   <u>adjer</u>

big	*more big	bigger
fast	*more fast	faster
happy	?more happy	happier
silly	more silly	sillier
lovely	more lovely	lovelier
sprightly	more sprightly	sprightlier
comely	more comely	comelier
perverse	more perverse	??perverser
flagrant	more flagrant	*flagranter
pompous	more pompous	*pompouser

The conditioning environment for the comparative is not, in fact, so unique as Aronoff asserts. Quirk and Greenbaum observe that "common disyllabic adjectives that can take inflected forms are those ending in an unstressed vowel, syllabic /l/ or /ə(r)/:

(1)   -y: funny, noisy, wealthy, friendly

(2)   -ow: hollow, narrow, shallow

(3)   -le: gentle, feeble, noble

(4)   -er, -ure: clever, mature, obscure

Common adjectives outside these four categories that can take inflectional forms include common, handsome, polite, quiet, wicked." [p.134] Aronoff's exception, stupid, calls to mind other adjectives ending in /əd/ that inflectionally compare in my dialect: rugged, ragged, sacred, naked, rapid, solid. Thus, we see that the disyllabic adjectives which take inflectional -er are by no means restricted to -y or -ly endings, although these are well represented: homely, early, curly, courtly, beastly, costly, lovely, comely.

The data on which Aronoff bases his truncation claim for adverbs are not very solid. For my dialect, quick and soft are acceptable adverbs, as in:

(13)   Come quick!

(14)   He spoke so soft I could hardly hear him.

Stronger, on the other hand, is not a comparative adverb in my speech:

(15)   *I am stronger inclined to believe it.

Whatever its basis, Aronoff's claim is that "if +er was attached to disyllabic adverbs ending in y, as it is to such adjectives..., then we would expect the forms *stronglier, *quicklier, *softlier, which are not only non-current, but impossible. The simplest and most elegant solution to the problem

is to have a rule of truncation which operates only on the class of adverbs in question.

(16)   Adverb +er truncation:

$$C_0VC_0+ly+er_{Adv}$$

1   2   3
          $-\rightarrow$
1   0   3

By using the truncation rule (16),...we allow ourselves to state exactly the same conditions on the distribution of +er and more for adverbs and adjectives. The only difference between the two classes is the operation of rule (16) in the former, though not in the latter." [pp.196-7]

But what is the evidence that -er was ever applied to adverbs ending in -ly? The Adverb +er Truncation Rule seems to amount to a statement that -er never occurs with -ly in adverbs. Aronoff notes in passing that "truncated" comparative adverbs may not occur before adjectives: more deeply philosophical, *deeper philosophical. This is so, despite the fact that these forms occur in other contexts:

(17)   John dived deeper.

(18)   John dived more deeply.

It appears that -er forms of the adverb occur only in those places where an adverb not ending in -ly occurs:

(19)   John dived deep.

Aronoff's grammatical judgments, excluding(20) and (21),

(20)   He ran quick.

(21)   He spoke soft.

prevent him from recognizing this fundamental fact, since he cannot relate these to:

(22)   He ran quicker.

(23)   He spoke softer.

Aronoff rejects what seems to be the more promising solution: "If we

delete before we do the comparative rule [i.e., take the simple adjective

form as underlying], what is the category of the item we form the comparative

from? If from _softly_ we go through _soft_ to _softer_, is this _soft_ an adjective

as it should be if the _ly_ rule is to have any validity? But if it is an

adjective, then do we form the comparative of an adverb in these cases from

an adjective?" [p.197]

This suggestion, that the comparative of the inflected adverb is

related to the comparative of an adjective, is not contradicted by the data.

Quirk and Greenbaum, for example, point out that "for a small number of

adverbs the inflected forms used for comparison are the same as those for

adjectives: _well/better/best_, _badly/worse/worst_.... Adverbs that are

identical in form with adjectives take inflections, following the same

spelling and phonetic rules as for adjectives, eg: _early_, _late_, _hard_, _slow_,

fast, _quick_, _long_. _Soon_, which has no corresponding adjective, is frequently

used in the comparative (_sooner_), but is not common in the superlative

(_soonest_)." [p.135]

And so we have the generalization that if an adverb not ending in -_ly_

may occur in a given context, then a comparative in -_er_ may also occur. We

also find the converse generalization: No -_er_ comparative adverb may occur

if the simple adverb without -_ly_ does not occur. Note that for these purposes,

early is not analyzed as ending in adverbial -_ly_:

(24)   John came early.

(25)   John came earlier than Bill.

(26)   *John returned rapid.

(27)   *John returned rapider than Bill.

(28)   This trolley car is rapider than that one.

(29)   *Alice answered stupid.

(30)   *Alice answered stupider than Sarah.

(31)   Alice's answer was stupider than Sarah's.

The nonoccurrence of -er forms before adjectives receives a natural

explanation within this framework, since the simple forms do not occur

because they would be confused with adjectives. Phrase (32) is not ambiguous,

since deep must be an adjective:

(32)   deep philosophical considerations.

It contrasts with the -ly form in (33):

(33)   deeply philosophical considerations.

Accordingly, the inflected comparative adverb may not occur in preadjectival

position, by the generalization cited in the preceding paragraph. Phrase

(34) does occur,

(34)   deeper philosophical considerations

but it is read with deeper as an adjective parallel with philosophical,

rather than as an adverb on the adjective. The adverbial case can only be

gotten periphrastically:

(35)   more deeply philosophical considerations.

With participial idioms we get comparative inflected forms of the

adverb:

(36)   the softer-spoken individual

(37)   the harder-pressed family

(38)   the deeper-seated objections

(39)   the harder-hit nation

(40)   the earlier-organized committee

(41)   the better-financed group

(42)   the farther-sighted corporation

These follow from the use of non-ly forms in the uncompared cases:

(43)   the soft-spoken individual

(44)   ?the softly-spoken individual

(45)   the hard-hit nation

(46)   *the hardly hit nation

In general, we may say that most adverbs are compared periphrastically

with more and most. Exceptions are those adverbs which are not derived from

adjectives by $-ly_{AAdv}$. These are zero-derived adverbs like soft and hard and

underived adverbs like soon. The latter are compared like short adjectives,

using -er and -est.[18]

We find no evidence supporting the application of -er to -ly adverbs.

This fact supports the claim, in the previous section, that $-ly_{AAdv}$ is a

terminal function. So far the cases cited by Aronoff do not threaten the

principle of accretion.

Note that we have not argued that no deletion occurs in the morphology.

Truncation, so long as it occurs at a submorphemic level, does not contradict

the accretive principle. Aronoff gives a very interesting example of the

need for truncation in Russian. He observes that verbs derived from bez

("without") + N via an intermediate adjectival stage lose the adjectival

suffix n. The verb obezúmet' ("to make crazy or mindless") is derived from

bez umá ("without mind") by an adjective step, bezúmnyj. The adjectival

suffix does not appear in the verb, hence, according to Aronoff, truncation

applies. But note that the stress pattern of the adjectival stage is re-

tained. There are still phonological traces of the adjectival function. If

all evidence of the adjectival stage had been erased, we might indeed have

a counter-example in this Russian case; but we can posit a Truncation rule

for n and still retain the notion of accretion, since the deleted suffix

is only one of the phonological effects of adjective formation. It is

difficult to say for sure what is going on here, but the principle of

accretion does not seem challenged by the data.

5.3 PROBLEMS WITH UNDERLYING REPRESENTATIONS

The morphological approach implicit in the structured lexicon bears

upon the practice of phonology. The overall goal of grammar is the systematic

correlation of sound with meaning. Clearly, a phonology which generates

the entire set of formatives, but fails to make the syntactic and semantic

connections that we have observed, serves little purpose. An optimal

phonology will have a solid semantic basis.

To make this statement is not to solve individual problems, however.

In his work on contemporary French, Schane (1968) has asserted, for example,

that soir/serein/sérénade form a related set with the same underlying first

syllable. [pp.25,45] No semantic argument is presented to defend this

selection. It is not at all obvious, however, that speakers will relate

"evening," "serene," and "serenade" to one another. Elsewhere, Schane

claims that pastel and pâte, "pastel" and "paste, dough" are related, in

order to argue for past as underlying the latter. [p.55] But what is the

evidence that speakers actually relate these formatives?

One way to argue against the pairs paste/pastel and serene/serenade
in English is to observe that there are no analogical patterns, either
phonological or semantic, to defend these pairings although both have
historical basis. If another pair, regardless of meaning, showed the phono-
logical pattern of [peyst]/[pæstɛl], or if another pair, regardless of
shape, showed the semantic pattern of MOOD/TYPE OR MUSIC, our decision
might be different, since a derivational function, however limited, would
exist in each case.

A footnote from Sapir is pertinent:

> One must be careful not to be misled by structural features
> which are mere survivals of an older stage, which have no
> productive life and do not enter into the unconscious pat-
> terning of the language. All languages are littered with
> such petrified bodies. The English -ster of spinster and
> Webster is an old agentive suffix, but as far as the feeling
> of the present English-speaking generation is concerned, it
> cannot be said to really exist at all; spinster and Webster
> have been completely disconnected from the etymological group
> of spin and weave (web). Similarly, there are hosts of rela-
> ted words in Chinese which differ in the initial consonant,
> the vowel, the tone, or in the presence or absence of a final
> consonant. Even where the Chinaman feels the etymological
> relationship, as in certain cases he can hardly help doing,
> he can assign no particular function to the phonetic vari-
> ation as such. Hence it forms no live feature of the language-
> mechanism and must be ignored in defining the general form of
> the language. The caution is all the more necessary, as it
> is precisely the foreigner [or linguist -- RR], who approaches
> a new language with a certain prying inquisitiveness, that
> is most apt to see life in vestigial features which the native
> is either completely unaware of or feels merely as dead form.

[Language, fn 22, p.140]

An etymological relationship dies when the speaker "can assign no particular
function to the phonetic variation as such," at the moment when meaning and
form cease to be correlated. If the phonology is not semantically constrained

we quickly lose the distinction between synchrony and diachrony. Without

semantic constraints, any two vaguely related formatives left by history

become evidence for derivation. In fact, any formative set that strikes

the fancy of the investigator can be introduced as evidence.

As such an example, consider the pairs thumb/thimble and crumb/crumble.[19]
If these pairs are accepted as formative sets, we have unimpeachable evidence

for underlying final /mb/ in English. Once the validity of the formative

set is acknowledged, the conclusion is inevitable. The criterion of

semantic relatedness allows rejection of these pairs as formative sets,

however. Thimble$_N$ and crumble$_V$ are of different syntactic categories, which

suggests that there is no evidence for a derivational function with operator

[-⊙l]. The semantic relation thumb$_N$: thimble$_N$ cannot be projected onto any

other nouns; the connection between thumb and thimble is no longer evident

to speakers (since the thimble is not worn on the thumb). Similarly, with

crumb$_N$: crumble$_V$ we find no analogical pair. The spelling crumb is deceptive,

since historically /b/ was never found in the noun at all, its origin being

OE cruma via ME crumme. (A good argument for underlying /mb/ could be made

from bomb and the nominal bombardment, however.)

Chomsky and Halle discuss a more interesting example that raises the

issues we have been examining: "Consider the word righteous, which is

clearly derived from right." [Chomsky and Halle (1968, p.233] The consequence

of the alleged derivation is the claim that English requires an underlying

velar spirant, a claim of some substance.

In evaluating the claim and the phonology that follows from it, we

must first observe that it is not clear whether Chomsky and Halle intend

right$_A$ or right$_N$ as the putative source for righteous. From a functional

point of view it clearly matters. A look at the historical facts is instructive.

As it happens, righteous is by no means optimally spelled. As Marchand

remarks, there seems to have been a confusion in the sixteenth century

between the French suffix -ous and the Germanic suffix -wise. For example,

the spelling pytewys is attested for the French loan piteous. [Marchand,

p.340] The true progenitor of righteous appears to have been the OE rihtwīs

(cf. modern Swedish rättvis). Given the pairs courage/courageous and virtue/

virtuous, it appears that in modern English the function $-ous_{NA}$ applies to

abstract nouns and yields adjectives meaning EXHIBITING N. Since righteous

means UPRIGHT, JUST, it should be derived from a noun right meaning UPRIGHT-

NESS, JUSTICE. This would then fit the paradigm of $courage_N$: $courageous_A$

:: $right_N$: $righteous_A$.

Unfortunately, however, in modern English the noun right has ceased to

have this interpretation. Hall's dictionary lists "equity, justice, law,

canon, rule" as definitions for OE riht; clearly the meaning is changed,

since the noun now means PRIVILEGE. Of course we might choose to posit an

unrealized abstract noun *right (cf. Swedish rätt) with the appropriate

meaning, but it would be misleading to claim that the adjective righteous

is derivable from any actually existent formative right. The semantic facts

do not support this step in the phonology, and the argument for underlying

velar spirants is correspondingly weakened.

These remarks should not be taken as suggesting that the problem of

semantics in phonology has somehow been, in principle, solved. In many cases,

it is still not obvious how to value the morphological evidence. For

example, in a footnote Chomsky and Halle suggest that "we might account for

the position of primary stress [in $perfect_A$] by deriving the adjective from

the underlying verb perféct in the familiar way, but this would still

leave unexplained the vowel reduction in the final syllable." [p.162]

Also unexplained, however, is the semantic pattern. It appears that the
adjective and verb pérfect_A/perféct_V are in paradigm with the zero-derivative
pair complete_A/complete_V and we have argued in section 2.2.2 that the
adjective is underlying, the zero-function being an allofunction of the
causative $-\text{en}_{AV}$. Here the phonological pattern and the semantic pattern
appear to run in contradictory directions. The optimal solution remains
unclear.

Chomsky and Halle frequently acknowledge difficulties of this sort.
Discussing the examples aristocracy, telegraphy, synonymy, economy, galaxy,
industry, and melody, they remark "that many of these examples do not
justify the assignment of any special status to -y." [p.130] It seems
probable that galaxy and melody are morphologically underived forms, in some
suitable representation underlying other derivatives such as galactic,
melodic, and melodious. Telegraphy is related to telegraph, but no clear
analogies present themselves, although photography:photograph is close.
Aristocracy, synonymy, economy, and industry can be nominals, however; they
are plausible candidates for derivation on the model orthodox_A/orthodoxy_N,
with the function $(-y, \text{NOMINAL})_{AN}$:

(11a)   Mary disapproves of the orthodoxy of Bill's views.

(11b)   Mary disapproves of the fact that Bill's views are orthodox.

(12a)   The count questioned the aristocracy of his new neighbor.

(12b)   The count questioned that his new neighbor was aristocratic.

(13a)   The synonymy of the sentences surprised the linguists.

(13b)   It surprised the linguists that the sentences were synonymous.

(14a)   Elizabeth questions the economy of a European car.

(14b)   Elizabeth questions that a European car would be economical.

(15a)   The old man commented favorably on his nephew's industry.

(15b)   The old man commented favorably on the fact that his

nephew was industrious.

If we choose to posit artificial adjectival roots for the nominal derivatives,

we are able to assert that $-y_{AN}$ is a nominalizing function serving as an

allofunction of the more regular $(-ity, NOMINAL)_{AN}$ manifest in prolix/

prolixity and complex/complexity. The nominal industry would require an

underlying adjectival source $*industr_A$ which could be realized at the surface

only as the longer industrious. It is important to remember that we argued

in section 4.2.2 against such late spelling rules, however. Artificial

roots are not a generally desirable solution, since they require double

listing of entries in the lexicon.

Our analysis has justified the underlying plus-boundaries assumed by

Chomsky and Halle for the words economy and industry in their use as nominals.

The practice of morphological division followed in Sound Patterns cannot

always be supported, however. For example, if one carefully examines

formatives ending in -ary and -ory it becomes clear that these suffixes

consistently yield adjectives, the first applying to nouns, as in fragment/

fragmentary and development/developmentary, and the second applying to

verbs, as in inflame/inflammatory and ejaculate/ejaculatory. [Marchand,

pp. -254, 337]

Obviously, then the nouns allegory, territory, category, memory,

armory, and history are not derived by $-ory_{VA}$, since they are not adjectives,

nor are the nouns apothecary, anniversary, infirmary, and secretary

derivatives of $-ary_{NA}$, for the same reason. In none of these noun cases can

an artificial root of the type *apothec be semantically defended. The full

nouns should be entered in the lexicon as underived primitives. Similarly,

certain adjectives in -ary should also be entered as primitives. Although

$\underset{N}{\underline{station}}$ /$\underset{A}{\underline{stationary}}$ phonologically parallels $\underset{N}{\underline{probation}}$ /$\underset{A}{\underline{probationary}}$,

the first set is morphologically specious, since the meaning of the adjective

cannot be derived from the noun. And there is no evidence that $\underline{ordinary}$ is

derived by the function $-\underline{ary}_{NA}$, since no grounds exist for assuming an

underlying noun *$\underline{ordin}$. In general, the structured lexicon leads to the

postulation of boundaries only in cases where derivational functions apply.

In cases where no such derivation occurs, no division is generally assumed.

It is not necessarily the case, however, that suffixes are treated

independently in all cases of semantic or syntactic variation. The suffix

$-\underline{ive}$, for example, is actually two derivational functions, one forming

adjectives from verbs and the other forming adjectives from nouns.

Phonologically the functions may well be united. Examples of $-\underline{ive}_{VA}$ are:

$\underline{express}$/$\underline{expressive}$, $\underline{destroy}$/$\underline{destructive}$, $\underline{construct}$/$\underline{constructive}$, $\underline{produce}$/

$\underline{productive}$, $\underline{elect}$/$\underline{elective}$. Examples of $-\underline{ive}_{NA}$ are: $\underline{instinct}$/$\underline{instinctive}$,

$\underline{quantity}$/$\underline{quantitative}$, $\underline{defect}$/$\underline{defective}$, $\underline{authority}$/$\underline{authoritative}$. The

existence of two functions allows us to explain the difference between $\underline{an}$

$\underline{óffensive\ quarterback}$ and an $\underline{offénsive\ quarterback}$. The first, meaning "on

offense" comes from the noun $\underline{óffense}$ by $-\underline{ive}_{NA}$, while the second, meaning

"repulsive", comes from the verb $\underline{offénd}$ by $-\underline{ive}_{VA}$. Using $-\underline{ive}_{NA}$ we are able

to relate $\underline{expensive}$ to $\underline{expense}$ rather than to the verb $\underline{expend}$. This is a

desirable result, since $\underline{expensive}$ and $\underline{expense}$ surely appear in vocabularies

where $\underline{expend}$ does not occur.

Marchand observes in this connection that "from a structural point of

view, most of the . . . Latin-coined words in $-\underline{ive}$ are matched by Latin-

coined substantives in $-\underline{ion}$." [p.316] An example of this is $\underline{cognitive}$/

$\underline{cognition}$, where there is no underlying verb at the surface. Similarly,

for many speakers there is no verbal source for $\underline{abrasive}$/$\underline{abrasion}$, *$\underline{abrade}$,

and percussive/percussion, *percuss. It may desirable in these cases to posit the abstract verbs to link the noun and adjective morphologically.

Whatever the decisions about underlying forms in individual cases, it should be remembered that the structured lexicon lists each formative derived. This theoretical procedure implies, in psycholinguistic terms, that although phonological and semantic generalizations may assist, rote memory plays a major role in the storage of formatives. The words pertain, sustain, obtain, attain, abstain, detain, and retain are all stressed by Chomsky and Halle using the equals ("=") boundary as "complex verbs." We observe, however, that this unification of stress patterns in no way prepares us for the disarray exhibited in the nominals: pertinence (via pertinent), sustenance, obtainment, attainment, abstinence (from drink),
A
abstention (from voting), detention, retention. There seems to be little alternative to virtual memorization of these items.

This problem is actually quite widespread. The verbs impose and compose have "regular" nominals imposition and composition, but propose has proposal, expose has exposure, and dispose has disposal. The formatives proposition, exposition, and disposition, the apparently "regular" forms, are not deverbal nominals.

In this connection Chomsky and Halle make the following observation:

When children learn their mother tongue, they are exposed
not to its grammar directly but rather to the output of
this grammar as it is actualized in the utterances of the
parents, and it is on the basis of these utterances that
children construct the grammar of a given language. The
children's grammar will contain a given phonological rule
which corresponds to a historically attested change and is
present in the grammar of their parents only if the grammar
containing this rule is the most highly valued grammar in
terms of the evaluation measure.

[Chomsky and Halle, (1968), p.251]

This remark raises a fascinating question: how does the evaluation measure determine that a rule should be discarded (not acquired)? When does it become preferable to handle cases as suppletions, rather than as phonological derivatives? When does the child know that he is confronted with Sapir's "petrified bodies"? When does he memorize rather than regularize?

It seems that one clear instance when the child will choose suppletion is when the phonological rules make false predictions by regularizing the wrong formatives as a set. Such a case might be the palatalization of underlying dentals in nominals. We find the pair contend/contention, where the noun is the derived nominal of the verb:

(16a) Mary contends that her pocket book was stolen.

(16b) Mary's contention that her pocket book was stolen disturbed Sarah.

The palatalization rule may lead the child to expect that attention and pretension will be similarly derived from the verbs attend and pretend, manifestly an incorrect conclusion:

(17a) John attended the conference.

(17b) *John's attention of the conference pleased Bill.

(18a) Sam pretended to be Santa Claus.

(18b) *Sam's pretension to be Santa Claus amused the children.

The problem is, of course, that attention and pretension were originally derived from the verbs attend and pretend at a time when they had the meanings TO FIX THE MIND UPON and TO CLAIM, ASSERT. (Compare with the French attendre/attention and prétendre/prétention.) But perhaps, as semantic exceptions, the formatives attention and pretension are no more inherently misleading than idioms like run of the mill and earmark, which now have nothing to do with mills or ears.

The problem of acquisition remains, however. Do children ever make

the mistakes <u>defend</u>_V/*<u>defention</u>_N , <u>depend</u>_V/*<u>depention</u>_N, <u>recommend</u>_V/*<u>recommention</u>_N

on the pattern <u>ascend/ascension</u>, <u>apprehend/apprehension</u>, <u>extend/extension</u>?

If children do make such mistakes, this would argue for stronger phonological

rules. If they do not, the role of rote memory is increased and the fully-

specified entries of the structured lexicon are correspondingly supported.

5.3.1 CONSTRAINTS ON LEXICAL RULES

An important subject for future research in derivational morphology is

the general nature of lexical rules. The use of functions to cross-

reference lexical items is a very powerful device; arbitrary cross-reference

can relate any two entries, even <u>dog</u> and <u>cat</u> (or, more plausibly, <u>pen</u>

and <u>pencil</u>).

If there are no constraints on lexical rules, we might cross-reference

<u>invent</u> with <u>inventory</u> and <u>require</u> with <u>requisition</u>. (These historically

cognate words no longer have any intuitive connection for speakers.) What

is to constrain such pairing? What are the boundaries of possible lexical

relationships?

We know that a phonological rule which changes a velar stop to a front

vowel should be exeedingly expensive in the description of a natural language.

Similarly, we know that a syntactic rule interchanging the third and fifth

words in seven-word sentences is quite improbable. But what constitutes a

"natural" rule in morphology, and what characterizes an impossible rule?

What types of lexical items may be cross-referenced?

A related question is: when can two functions be considered allo-

functional, and when can such a tie be ruled out? In section 2.1.3.1 we

argued against relating <u>anti-</u> and <u>ante-</u>, and against a connection between

-en$_{AV}$ of the causative and adjective forming -en$_{NA}$. In our arguments we noted the non-complementary distribution of the former two, and the differences in syntactic class of the domain and range of the latter two. Unfortunately, not all cases are so readily decided.

A problematical case of this type is presented by the more than two hundred nouns (as listed by Walker) ending in the suffix -age. Are the various derivatives allofunctionally related?

One set of -age derivatives come from units of measure:

(46)   foot/footage, yard/yardage, ton/tonnage, acre/acreage,

        mile/mileage, volt/voltage, watt/wattage.

Another set characteristically comes from verbs, the derivative having nominal interpretation:

(47)   store/storage, coin/coinage, stop/stoppage, pass/passage,

        pilfer/pilferage.

A third set comes from nouns with the meaning PLACE WHERE N LIVES:

(48)   orphan/orphanage, hermit/hermitage, vicar/vicarage, parson/

        parsonage.

Also meaning PLACE, but derived from verbs are:

(49)   steer/steerage, moor/moorage, anchor/anchorage.

A few of these nouns mean RESULT:

(50)   wreck/wreckage, leak/leakage, break/breakage.

The following seem to show other relationships:

(51)   percent/percentage, link/linkage, drain/drainage, marry/marriage,

        use/usage, short/shortage, rough/roughage, post/postage,

        cover/coverage, bag/baggage, pack/package.

Like footage in the meaning AMOUNT, are dose/dosage and lever/leverage.

Thus, we find that -age forms nouns from nouns (foot), verbs (store),

and adjectives (<u>rough</u>). Some subgrouping of derivative meanings is possible, but in general it is impossible to say which of the semantic allofunctions, if any, is dominant. [See 2.1.3.1]. The range of meanings possible for derivatives in this suffix seems extremely varied, if not unconstrained.

A similar example is the set of nouns ending in -ry. Both denominal and deverbal derivatives exist, and there are some de-adjectival cases.

Basically meaning PLACE (and thus apparently allofunctional with the -<u>age</u> of <u>orphanage</u>) are:

(52)   nun/nunnery, cream/creamery, brew/brewery, nurse/nursery,
       fish/fishery, bind/bindery, dean/deanery, bake/bakery, found/
       foundry, launder/laundry, hatch/hatchery, tan/tannery,
       grocer/grocery, can/cannery, wine/winery.

In many cases the underlying meaning is PLACE OF BUSINESS, although this is not the case for <u>nunnery</u>.

Another set of derivatives in -<u>ry</u> are concrete objects:

(53)   shrub/shrubbery, green/greenery, scene/scenery, fine/finery,
       jewel/jewelry, machine/machinery, stitch/stitchery, pot/pottery,
       circuit/circuitry.

Arts are represented by:

(54)   archer/archery, husband/husbandry, carpenter/carpentry, chemist/
       chemistry, dentist/dentistry, wizard/wizardry

There are also nominals in -<u>ry</u>:

(55)   savage/savagery, brave/bravery, ribald/ribaldry

Falling into the ARTS category are the recent coinages:

(56)   weapon/weaponry, gadget/gadgetry, summit/summitry, rocket/rocketry.

Abstract states are:

(57)   snob/snobbery, trick/trickery/treachery, bandit/banditry,

pedant/pedantry, slave/slavery, drudge/drudgery.

Mason/masonry and peasant/peasantry are like derivatives in -age: baron/
baronage and r er/peerage.

Here again, places, objects, and abstractions are all yielded by the
same noun-forming suffix, applying to nouns, verbs, and adjectives. Would it
be proper to unify all these derivational processes allofunctionally? It
seems that these functions are united only in that their range is the set
of nouns. Allofunctional unification allows the statement of certain
phonological and syntactic properties of the suffix, but it suggests a
unity of meaning that simply does not exist.

Organization of the data semantically rather than phonologically would
reveal even more diversity as various affixes are realized: baron/baronage,
peasant/peasantry, noble/nobility, aristocrat/aristocracy, monarch/monarchy.

The theory needs to be refined further to clarify whether allofunctional
relations should always involve minor variations on a major, dominant
pattern, or whether the diversity of the -age and -ry cases should be
accommodated in the notion of allofunction. If the latter, then further
criteria will be needed to distinguish between allofunctional relations and
accidental similarity.

The proper solution at this point is unclear. It is certain only that
the range of possible morphological relationships is quite extensive.
Universal constraints are yet to be uncovered.

5.4. MAJOR, MINOR, AND NONPARTICIPANT CATEGORIES IN DERIVATION

An overall view of English morphology suggests a distinction between
participant and nonparticipant, major and minor, syntactic categories. Nouns,
verbs, and adjectives are major participants, since they serve in derivational

functions both as arguments and as values. (In fact, as we shall observe, functions exist mapping each of these categories onto each of the others.) Adverbs and nominals (taking the latter as a syntactic category distinct from nouns) are minor participants in derivation, serving as values for productive functions, but not in general serving as arguments. Finally, pronouns, determiners, prepositions, conjunctions, and interjections are basically nonparticipant in derivation, constituting a rather fixed and unproductive lexical group.

The derivational functions of English assume an interesting, and perhaps universal configuration. We find functions mapping each of the major syntactic categories onto each of the others. For example:

V → A	-ing_{VA}	sing/a singing teapot
		swing/a swinging party
	-ive_{VA}	offend/an offensive person
		produce/a productive factory
V → N	-er_{VN}	talk/a fast talker
		swim/a good swimmer
	-tion_{VN}	obstruct/an inconvenient obstruction
		invent/a brilliant invention
N → A	-ish_{NA}	pig/a piggish remark
		child/a childish response
	-y_{NA}	health/a healthy woman
		mud/a muddy path
	-ive_{NA}	offense/an offensive move
		defect/a defective toy
N → V	∅_{NV}	salt/salt your food
		truck/John trucked the vegetables to town

| | | $\underline{-ize}_{NV}$ | category/categorize the nouns |
			stigma/Martha was stigmatized
A $\rightarrow$ V		$\underline{-en}_{AV}$	fat/the peasant fattened his calf
			thick/Sally thickened the broth
		$\underset{AV}{\emptyset}$	dry/dry your hair
			thin/thin the carrots
		$\underline{-ize}_{NV}$	equal/equalize the pressure
			popular/popularize the work
A $\rightarrow$ N		$\underset{AN}{\emptyset}$	red/John is a red (communist)
			special/there is a special on TV
			elderly/the nurse cares for the elderly
			aging/the aging appreciate attention

It is important to note that, in contrast to these basically suffixal operators, prefixes often leave underlying categories unchanged. Examples are:

		$\underline{re-}_{V}$	do/redo the problems
V $\rightarrow$ V			paint/repaint the house
A $\rightarrow$ A		$\underline{un-}_{A}$	characteristic/an uncharacteristic remark
			pleasant/an unpleasant smell
N $\rightarrow$ N		$\underline{ex-}_{N}$	wife/Jane is my ex-wife
			president/the ex-president gave a speech

In general, we may represent the functional configuration of the major categories as:

(58)
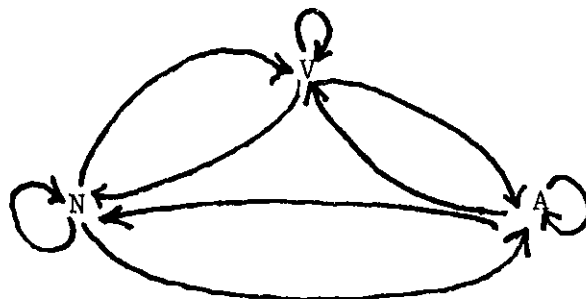
It is natural to ask whether this general functional configuration is unique to English, or whether it may be a universal feature of morphological derivation. (Appendix F presents some evidence for the latter view.)

In addition, English has two terminal categories: the adverb, which in many ways is a special type of adjective, and the nominal, which is a special type of noun.[20] Examples are

A → Adv	$-\underline{ly}_{AAdv}$	elegant/to swim elegantly	
		enthusiastic/to sing enthusiastically	
		horrible/a horribly complicated example	
		extreme/an extremely simple recipe	
V → Nom	$-\underline{tion}_{VNom}$	destroy/the enemy's destruction of the city	
		invade/the American invasion of Laos	
	$-\underline{ment}_{VNom}$	deploy/the deployment of troops	
		attain/the attainment of an objective	
A → Nom	$-\underline{ness}_{ANom}$	wild/the wildness of her gestures	
		sad/th: sadness of her smile	
	$-\underline{y}_{ANom}$	immediate/the immediacy of the problem	
		orthodox/the orthodoxy of his solution	

It seems likely that adverb and nominal are not universal derivational categories. This question deserves further attention.

The claim that English nominals constitute a minor category is not crucial, but it reflects the fact that nominals receive special interpretation and behave uniquely with respect to syntax (they are never plural, they generally require definite determiners and often require objects in possessive phrases).

The assertion about adverbs is more controversial. There are several

arguments favoring minor status for adverbs. First, with relatively few

exceptions (such as very, quite, tomorrow, yesterday) adverbs can be

systematically paired with shorter adjectives. If the adverbs are derived

from the adjectives, the principle of accretion can be preserved phonologically,

and also semantically, in that the adverb can generally be defined in terms

of the adjective, but not the reverse. Lakoff has claimed that the reverse

derivation of adjectives from adverbs holds, but note that no evidence is

available that adverbs generally serve as the arguments for any other function.

We do not find nouns or verbs systematically coming from adverbs. The

overall schema (58) is simplified by assuming that adverbs are a special type

of adjective. Morphological evidence for this view is the fact that

cognate languages such as Swedish, German, and Russian treat the adverb as

a simple neuter adjective.

A few counter-examples should be mentioned, some of which can easily be

dismissed. Illness and sickness may be pluralized, but in this use they are

simply synonyms for the noun disease, not nominals. Weakness has a plural,

but so does its opposite, strength, which does not exhibit nominal morphology.

In French we find verbs from pronouns: tu "thou"/tutoyer "to say thou" and

vous "you, pl"/vouvoyer "to say you". Similarly, we find the Finnish verb

sinutella "to use the familiar form of address", from the pronoun sinä. In

addition, we find minuus, "ego, personality" derived by -uus, an abstract

noun forming suffix, from minä, "I". In English we find verbs from a few

prepositions: to up the ante, to down a beer, to off a cop. Similarly, in

German we find the verb äussern, "to utter, manifest" ultimately coming from

the preposition aus, "out". In English we have the verb of forward a letter

and the noun of a forward in soccer from the adverb forward. Russian

has the adjective <u>peredovoj</u>, "foremost, advanced" from the preposition <u>pered</u>,

"before, in front of." Russian also shows adjectives from the adverbs

<u>today</u>, <u>yesterday</u>, and <u>tomorrow</u>: <u>s'evodnja/s'evodnjašnij</u>, <u>včera/včerašnij</u>,

<u>zavtra/zavtrašnij</u>, and Finnish similarly shows the latter two: <u>eilen/eilinen</u>,

<u>huomenna/huominen</u>. These are not major patterns of derivation, however, and

do not seriously threaten our analysis.

5.5 THE INTERPRETATION OF ADJECTIVES IN NOMINAL PHRASES

In "Remarks on Nominalization" Chomsky very briefly discusses the

adjectives which appear with derived nominals, primarily in order to dispose

of the suggestion that they are derived from adverbs: "adjectives that

appear with derived nominals often cannot appear (as adverbs) with the

associated verbs: for example, we have <u>John's uncanny (amazing, curious,</u>

<u>striking) resemblance to Bill</u> but not *<u>John resembled Bill uncannily</u>

<u>(amazingly, curiously, strikingly)</u>." [p.195] If adjectives are assigned in

the base to nominal phrases, we account for the fact that <u>Bill's outrageous</u>

<u>refusal to see John</u> is acceptable, whi'e <u>Bill refused to see John outrageously</u>

is deviant. The lexicalist hypothesis permits such phrases, but at least

as Chomsky formulates it, there seems to be no way to constrain their

formulation.

It is obvious that not all adjectives can occur in nominal phrases, but

it is not yet clear how a lexicalist hypothesis might seek to exclude them.

Clearly, some selectional restrictions or output constraints must be

applicable, since we find the following ungrammatical and uninterpretable:

*<u>Bill's big orange refusal to see John</u>, *<u>Martha's envious departure</u>, *<u>the</u>

<u>bigamous bombardment of civilian targets</u>.

Its apparent shortcomings aside, one of the most valuable insights of the transformationalist position has been that nominals are shown to receive sentence interpretation. Chomsky has sought to incorporate this insight into the lexicalist position by introducing elaborate base rules which guarantee that the nominal phrase will have sentence structure. "The internal structure of the nominal . . . mirrors that of the sentence." [p.211] Within the lexicalist framework, then, the nominal phrase becomes, like S, a recursive element of the base. We find, for example, embeddings of nominals within nominals: Bill's condemnation of Martha's hasty departure . . ., George's recognition of Elizabeth's unwillingness to . . .

The problem with this explanation, however, is that adjectives which are necessarily part of "the internal structure of the nominal" would have several different interpretations. For example, the nominals:

(59)   Martha's unfortunate departure

(60)   Martha's angry departure

(61)   Martha's hasty departure

are variously interpreted. Nominal (59) would be associated with a sentence with a sentential adverb:

(62a)   Unfortunately, Martha departed.

(62b)   It is unfortunate that Martha departed.

The nominal of (60) would be associated with a sentence whose subject is modified:

(63a)   Martha angrily departed.

(63b)   Martha was angry when she departed.

And the nominal (61) would be associated with a sentence incorporating an adverb on the verb.

(64)   Martha departed hastily.

Similarly, we find that de-adjectival nominals are variously interpreted according to the type of adjective in the nominal phrase:

(65)   Martha's predictable optimism

(66)   Martha's cautious optimism

(67)   Martha's extreme optimism

Nominal (65) would be associated with a sentence containing a sentential adverb:

(68a)   Predictably, Martha is (was, will be, etc.) optimistic.

(68b)   It is (was, etc.) predictable that Martha is (was, etc.) optimistic.

Nominal (66) recalls a sentence whose subject is modified:

(69)   Martha was cautious in her optimism.

And nominal (67) would be associated with a sentence with adverb on an adjective:

(70)   Martha was extremely optimistic.

Neither the transformationalist nor the early lexicalist hypothesis furnishes a totally satisfying account of these adjectives in nominal phrases. Early lexicalism has no mechanism for explaining the varieties of interpretation. For the transformationalist, the sentential sources for adjectives are so disparate as to greatly complicate the structural description of any rule which seeks to refer to them. Besides, even if we could formally relate these adjectives in nominal phrases to the adverbs in sentences, this would not really help, given the fact that the adverb itself is so poorly understood. (To "explain" adjectives in nominal phrases by such reduction is only to defer genuine explanation.)

The structured lexicon offers an alternative, however. If the lexicon provides nominals derived by lexical rule, as we have tried to

argue, we may posit an essentially free application of the base rules to generate nominal phrases, and introduce a semantic rule to interpret these phrases, throwing out those which are meaningless. Such a solution demands that we motivate for adjectives certain semantic features that will allow, for example, the exclusion of *John's hasty ignorance and *Martha's extreme departure, while permitting John's extreme ignorance and Martha's hasty departure.

Adjectives may be categorized semantically according to the types of noun that they modify. For example, certain adjectives characteristically apply to humans: angry, sad, cheerful, proud, calm, frantic, stubborn, ambitious, impatient, furious. Thus, in the nominal phrase Ethel's stubborn optimism, it is Ethel, not optimism that is stubborn. We find that the adverb stubbornly in the sentence:

(71)   Ethel is stubbornly optimistic.

is accordingly "subject-oriented" [Jackendoff, 1972]. Stubbornly may not occur in a sentence that lacks a human subject in deep structure:

(72)   *The boulder rolled stubbornly down the hill.

We must enter the adjective stubborn in the lexicon as semantically HUMAN, and stubbornly will inherit the subject-oriented feature accordingly.

Chapin, Stern, and Sturtevant have all remarked upon peculiarities in the interpretation of adjectives. Chapin observes:

> A very general and interesting phenomenon is the use of
> self-ing adjectives to modify nouns which are not themselves
> the antecedents of the reflexive pronoun but are connected
> in some way with the antecedent. Thus
>   (95) The witness' testimony was self-incriminating.
> In (95) it is not the testimony which incriminates itself, but the
> witness who incriminates himself with the testimony. [p.42]

Stern remarks similarly that

it is very common for an adjective to be attributed to a noun
with which it is not logically compatible. We speak of the
highest bidder, although, strictly the bidder is not high,
only his bid is. It is especially common with nomina agentis
derived from verbs, the action of which is qualified by the
attribute: an early riser, late comers, first offenders,
he is a hard student, a long resident, a slow walker, we
were both fair runners, a probable winner of the Derby, a
close observer, a wide traveller, a habitual liar. Nouns
which denote a person having a certain quality receive an
attribute pertaining to the quality, not to the person:
a perfect stranger, a total stranger, you are a positive fool,
her particular friend. Adjectives of size are similarly used:
a great admirer of Tennyson, he was an enormous eater...[p.349]

And Sturtevant notes in the same vein that

in using the phrase "wicked ways," we do not blame the "ways"
but the people who walk in them; and the result is a new
relationship between the adjective and its noun. A trans-
ferred epithet usually ascribes an attribute of personality
to an inanimate object, but still without any thought of per-
sonification. Carlyle speaks of "ambitious Latin" without
implying that language can feel ambition. No one imagines
that a "happy event" enjoys itself, or that a "learned treatise"
has studied much. [p.145]

As a step toward explanation of these interpretive phenomena, we will

develop a classification system for adjectives based on the observations

(rather randomly represented in the quotations above) that some adjectives

pertain primarily to people, some to actions and qualities, others to physical

features (e.g., size) and so on.

Adjectives which pertain essentially to human beings will be assigned

the feature [+psychological]. These can then be subcategorized with respect

to the feature [evaluative], which will be clarified below. The following

adjectives appear to be [+psych, -eval]: careful, eager, angry, sad, cheerful,

curious, inquisitive, happy, proud, humble, optimistic, pessimistic, suspicious,

skeptical, enthusiastic, grateful, ignorant, calm, frantic, uneasy, impatient,

mad ("angry"), wild, fearful, neurotic, reluctant, hesitant, violent, bored,

busy, forgetful, confused, stubborn. These adjectives fit into the frame:

(73) John is quite _____$_A$.

Many also fit the frame:

(74) John is _____$_A$ to V.

as in:

(75) John is eager to go.
           hesitant
           happy
           proud
           impatient

Examples of adjectives which are [+psych, +eval] are:

careless, reckless, lazy, intelligent, clever, unwise, wise, nasty, thought-
less, maudlin, sentimental, naive, pompous, irreverent, superstitious, kind,
thoughtful, considerate, modest, impudent, ridiculous, cruel, polite, impolite,
stupid, selfish, insolent, smug, stingy, rebellious, mad ("crazy"), irrespon-
sible, brave, pretentious. These adjectives fit frame (73) and many fit frame
(74):

(76) John is clever to go
           thoughtful
           considerate
           stupid
           mad
           brave

All of these adjectives fit frame (77):

(77) It was _____$_A$ of John to V

as in:

(78) It was careless of John to tell Martha about Alice.
           nasty
           clever
           thoughtless
           thoughtful
           brave

The [+psych] adjectives are generally permitted as the modifiers of

derived nouns and nominals: a modest proposal, a stupid remark, a clever

statement, John's angry refusal to leave, Martha's careful investigation of

the facts, Alice's stubborn determination, selfish ambition, cautious

optimism, a cheerful reply, polite skepticism, ignorant gossip, vicious

attacks, smug complacency, puritanical intolerance. Even when they clearly

denote physical objects, the derived nouns may have [+psych] adjectives as

modifiers. Thus we have a thoughtful gift, cheerful donations, and a

reluctant refund, but not *a thoughtful pair of cuff links, *cheerful money,

or *a reluctant ten dollars.

The [+psych] adjectives modify the derived nouns and nominals, however,

only when these come from verbs which have deep-structure [+human] subjects

or from adjectives which are themselves [+psych]. Thus, we do not have *a

thoughtful result, *an angry development, *polite fatness, *careful redness,

*the Ohio River's selfish flooding of the town, *the hurricane's neurotic

destruction of homes, *modest inevitability, *proud irrelevance.

Adjectives that characteristically modify actions or qualities will be

assigned the feature [+nominal]. (It may be desirable to subcategorize

further, particularly with respect to deverbal and de-adjectival nominals).

The following are [+nom]: easy, quick, slow, fast, difficult, terrible,

extreme (strictly with de-adjectival nominals), tragic, provocative, immediate,

timely, correct, incorrect, frequent, evident, obvious, probable, certain,

justifiable, regrettable, crucial, complete, utter, total, prompt, undeniable,

apparent, arbitrary, late, habitual, regular. These adjectives do not fit

frames (73), (74), or (77). They appear as the modifiers of nominals:

John's easy dismissal of Martha's objections, Sarah's extreme intolerance,

the tragic destruction of Vietnam, the undeniable efficacy of our methods,

the students' habitual tardiness, Bill's probable departure on Friday, Martha's total negligence, George's utter indifference.

Adjectives that characteristically describe physical objects receive the feature [+physical]. Examples are: solid, flimsy, thin, thick, fat, tall, high, red, old, big, sour, sweet, wide, colorless, heavy, empty, soft, quiet, harsh, loud, rough, crude, smooth, beautiful, ugly, broad, deep, long, light, bright, dark, enormous, huge, tiny, rotten. Another group of adjectives applies to animates, but not necessarily humans. These are specified [+animate]: hungry, sleepy, pregnant, helpless, healthy, clumsy, young.

The last major grouping is the set of [+open] adjectives which apply to all of the types of noun enumerated. These open adjectives can co-occur with any of the features [+phys], [+animate], [+psych] or [+nom]: unusual, good, bad, admirable, ridiculous, interesting, strange, foolish, harmful, dangerous, rare, helpful, common, useful, peculiar, useless, suspicious ("strange"), doubtful, ordinary, boring, confusing, wonderful, incredible, repulsive, disgusting, unpleasant, deceptive, hopeless, pathetic, perfect, nice, charming, pleasant, outrageous, commonplace, unique, special. Peculiar, for example, modifies nouns of all types: a peculiar table, a peculiar dog, a peculiar person, a peculiar remark, John's peculiar indifference to pain, Martha's peculiar refusal to examine the facts, the barn's peculiar redness, Bill's peculiar impatience. Similarly, with the adjective disgusting: a disgusting picture, a disgusting cat, a disgusting person, a disgusting announcement, John's disgusting apathy, Elizabeth's disgusting rejection of all moral arguments, Arthur's disgusting departure at a crucial moment, the dean's disgusting liberalism.

It seems obvious that since most concrete physical objects have no
psychology, [+psych] adjectives will not modify them. Thus, we do not find
*a thoughtful rock, *a cheerful turnip, or *lecherous fireplugs. There are
many apparent counterexamples to this generalization, however: a clever house,
a thoughtful book, irreverent clothes, a careful portrait, a modest workshirt,
militant posters, an impudent mustache, puritanical hemlines, affluent suburbs,
enthusiastic telegrams, barbaric fragmentation bombs, cruel weapons, an
ambitious new railroad, grateful letters, a sentimental birthday card.

In these cases, the [+psych] adjectives can often be conjoined with
ordinary [+phys] adjectives: a big thoughtful book, a modest blue workshirt,
huge militant posters. This phenomenon is related to a problem discussed by
Chomsky in "Remarks on Nominalization," where "two senses of [a] word can
be combined in apposition," [fn 12, p.218] as in this book, which weighs
five pounds, was written in a hurry. Modifiers impose upon a noun a par-
ticular type of interpretation: it is obvious, for example, that a person
sent to find a maudlin book will search in a very different way from a person
seeking a mauve book: one of them examines only the covers, while the other
must read the contents.

Observe further that maudlin cannot be identically interpreted as the
modifier of book and person. If we say that a book is maudlin, we imply that
it is full of sentimental characters, mawkish writing, affected emotion,
and so on. If we say that a person is maudlin, however, we mean that he
behaves in a particular way.

Why, if the mode of interpretation is so different, is the same adjective
used to describe the person and the object? What do a maudlin book and a
maudlin person have in common? Apparently, the book is considered to be the

expression of a maudlin person; it is expressive of human psychology, in other words.

The set of physical objects which can be viewed as the expression of human personality is culturally determined, not linguistically determined. Objects which are not man-made may not be so viewed: *impudent trees, *a careful lake, *cautious aluminum, *enthusiastic snow, *thoughtless air, *superstitious carrots. Most aesthetic creations, many articles of clothing, and certain other human artifacts (e.g. houses, automobiles, furniture) may acquire this expressive feature--although the full range of psychology is obviously not expressible in each case: clever house, but not *apathetic house.

One can imagine the following interpretive process. When a [+psych] adjective is found modifying a [-human] noun, the semantic component first seeks the feature [+nom]; if it is present, the adjective is taken as modifying the subject (even if unexpressed) of the nominal: a careful investigation (undertaken by someone who is careful), a wise alteration in our plans, an intelligent solution to the problem, John's passive resistance, Martha's stubborn refusal to talk. If the noun is not nominal, the semantic component assigns the semantic feature [+expressive] and reinterprets. Thus, a thoughtful book is a book whose author was presumably thoughtful, to some extent; grateful telegrams are composed by grateful people; clever frag-mentation bombs reveal the cleverness of the manufacturer, and so on. If the semantic component cannot, due to cultural fact, assign the feature [+expressive], the NP receives no intelligible interpretation and the utterance containing it is classified as deviant: *grateful tomatoes, *impertinent thumbtacks, *optimistic stop signs, *thoughtless carpet.

It is apparent that some NP's will remain uninterpreted, although they meet these feature specifications. We will probably want to exclude *optimistic pessimism, for example, although optimistic is [+psych] and pessimism is the nominal of a [+psych] adjective. Since the two adjectives are semantically contrary, interpretation becomes strained. In some cases, speakers may force an interpretation despite contradiction in order to obtain stylistic effect: cruel charity or stingy liberalism.

We are in a position to predict, however that dangerous cynicism is interpretable, while *cynical danger is not. As we indicated above, dangerous is a [+open] adjective. It is thus entirely acceptable as the modifier of a [+nom] noun like cynicism. John's dangerous cynicism is thus interpretable as: it is dangerous (John is cynical), or it is dangerous for John to be cynical.

The adjective cynical is inherently [+psych], however, and thus can evaluate nominals only if they have deep-structure human subjects. Danger is the abstract noun related to dangerous, but it is not inherently [+psych] (the danger of falling rocks), so cynical is excluded as a potential modifier. Thus, *cynical danger is not interpretable.

The nominal phrase John's angry suppression of the facts is interpretable, because angry is [+psych] and the nominal suppression is derived from the verb suppress, which takes [+human] subjects. Thus, the phrase is associated with the sentence: John is angry and John suppresses the facts. John's dangerous suppression of the facts is associated with it is dangerous (John suppresses the facts), or it is dangerous for John to suppress the facts, by arguments similar to those noted above.

We have seen, then, that adjectives normally attributed to human beings may be applied to nominals and to physical objects (which have acquired the feature [+expressive]), and we have observed the interpretive principle used to understand such combinations. It happens also that [+phys] adjectives are often atrributed to nominals and to humans, but with a radical alternation in meaning.

Examples of [+phys] adjectives which can become [+psych] are: sharp, sour, warm, cold, cool, smooth, dull, rough, flexible, sweet, crude, plastic, transparent, square, colorful, tense, bland, narrow, simple, crooked, fiery, tight, loose, plain, vacuous, brilliant, bright, broad, wooden, straight, dense, depressed, high, flat, well-rounded, heavy. These are used in NP's like: a heavy chick, a sharp dude, a dull student, a straight friend, a cool reception, colorful eccentricity, a bright child, square parents, a warm acquaintance.

The meanings of these adjectives as [+psych] modifiers cannot be productively derived from the physical meaning; many physical adjectives fail to receive such interpretation: cylindrical, tall, circular. Although these facts are not, in general, predictable—and thus require individual listing in the lexicon—it should be apparent that there is a tendency in English (and probably in many other languages) to regard the human personality as an object, a "thing" that can be described in physical terms. The physical vocabulary serves as a source for innovation in the psychological vocabulary. This fact is probably best expressed as a diachronic semantic universal: over time, [+phys] adjectives tend to acquire the feature [+psych].

It is also possible for [+phys] adjectives to participate in the nominal

dimension, again with an extension of meaning: slight recognition, deep
conviction, extensive investigation, small promise, massive neglect, broad
reform, thin support, shaky optimism, great confusion, flimsy justification,
high hopes, wide travel, thick settlement, gross overpopulation, shallow
commitment, loose construction, stiff resistance.

Like extensions into the psychological sphere, this use of adjectives
is idiosyncratic, and thus must be noted in the lexicon for each entry.
Obviously, optimism cannot be said to be shaky in the same sense that a table
is. Still, however, arbitrary the individual case, there is a general ten-
dency to extend physical adjectives in this manner. We expect historical
semantic change to occur in this direction. Two good examples of such
semantic shift are profound and great which are now almost strictly [+nom],
although they were once physical. (Cf., French profond and grand, which
still retain the physical meanings as well: un enfant grand pour son âge
"a child big for his age" and puits profond "deep well.")

The feature [evaluate] introduced above to subcategorize the feature
[psych] has not yet been adequately motivated. It serves to distinguish
proud from pompous and forgetful from inconsiderate. Proud and forgetful
are strictly descriptive, while pompous and inconsiderate introduce value
judgements. We have noted that [+eval] adjectives regularly occur in frames
like the following:

(79) It was pompous of John to insist on being picked up in

a limousine.

(80) It was inconsiderate of Martha to ignore her guests.

In general, the purely descriptive [-eval] adjectives do not occur in such
contexts:

(81) *It was proud of John to wear a tuxedo.

(82) *It was angry of George to swear at Jane.

As we turn to the derivation of adverbs, it is interesting to note a
set of sentences noted by Jackendoff [1972, p.57]. He observes that sentences
(83) have paraphrases (84) and (85):

(83) Carefully
      Cleverly   (,) John spilled the beans.
      Clumsily

(84) John was ? clumsy to spill the beans.
              careful
              clever

(85) It was clever of John to spill the beans.
              clumsy
              *careful

There is more to say about these examples. First, John was careful to spill
the beans means John made certain that he spilled the beans; he may have
spilled them in either a careful or a sloppy manner—the point is that he
sought to do it. (It is probably best to consider be careful to$_V$ as an
idiom that functions as a unitary verb, just as be happy to$_V$ means agree to$_V$.)
Second, it is not always the case that sentences like (83) have such para-
phrases. Observe in particular that sentences (86) do not mean (87):

(86) Eagerly   (,) John spilled the beans.
      Proudly
      Reluctantly
      Impatiently
      Hesitantly

(87) John was eager to spill the beans.
              proud
              reluctant
              impatient
              hesitant

while sentences (88) do mean (89):

(88)   Wisely   (,) John spilled the beans.
        Impudently
        Cruelly
        Stupidly
        Politely

(89)   John was wise to spill the beans.
             impudent
             cruel
             stupid
             polite

In sentences (87), the judgment about John temporally precedes the spilling of the beans; indeed, the beans may never have been spilled. In the sentences (89), however, the judgment of John is subsequent to the deed. Observe that only the adjectives of (53) appear in the frame:

(90)   Spilling the beans was a _____$_A$thing to do.
                  wise
                  cruel
                  *eager
                  *hesitant

The adjectives of (89) are all [+eval], while those of (87) are descriptive, or [-eval]. In sentences (87) the adjectives are directly descriptive of John, while in (89) they describe the speaker's feeling abʊt John's behavior. This recalls Jackendoff's dichotomy between <u>subject-oriented</u> and <u>speaker-oriented</u> adverbs, probably the key to many of the problems we have raised here.

The adjective categories which we have developed in this section help to explain the semantics of adjectives in agent phrases as well. Lakoff's sentence:

(91)   John is a merciless killer of men.

is interpreted as:

(92)   John kills men and John is merciless in his killing.

(93) John is a cheerful killer of men.

is read as:

(94) John kills men and John is cheerful in his killing.

Both of these adjectives are [+psych], and the first is also [+eval],

as shown by the sentence:

(95) It was merciless of John to kill the men.

We do not find interpretations of this type for the sentences:

(96) John is a habitual killer of men.

(97) John is a gradual killer of men.

Here the adjectives modify the action, rather than the person, so in our

system they are [+nom]. The interpretations are:

(98) John kills men and the killing is habitual.

(99) John kills men and the killing is gradual.

Note that we do not find, as part of the interpretation:

(100) *John is habitual.

(101) *John is gradual.

If we were to derive the adjectives from adverbs in sentences by an agent

transformation, we would no longer have any basis for these insights, since

the adverbial cases are syntactically invariant, despite semantic differences:

(102) John kills men mercilessly.
                      cheerfully
                      habitually
                      gradually

The superiority of the functional lexicalist derivation should be evident.

Note finally that we have found a way to explain the fact that examples

like endorse sloppily and sloppy endorsement share common elements of meaning

without deriving one phrase from the other, which would violate the principle

of accretion no matter which way we chose to do the derivation. In the functional lexicalist treatment we encounter no such contradiction, since words can be related in other than transformational ways. Morphologically, we are able to go both ways at once, to derive sloppily from sloppy and still get endorsement from endorse.

The analysis of this section is in many ways incomplete, but hopefully enough evidence has been offered here to support the view that an interpretive theory based on semantic features is, in principle, possible. Such an interpretive theory is indispensable to the overall development of structured lexicalist theory.

APPENDIX A - THE CLASSIFICATION OF DEVERBAL N'S

A.1 NOMINALS AND NOUNS

We have observed that noun-like formatives derived from adjectives and verbs fall into two distinct classes based upon their semantic interpretation. One set of derivatives, which we have chosen to call the nominals, receive S-interpretation, while members of the other set, the deverbal nouns, typically receive NP-interpretation.

For example, destruction, the derivative of destroy$_V$ in

(1)   The destruction of the monument occurred at five o'clock.

is clearly being used as a nominal. The formative can take a by-phrase, as in

(2)   The destruction of the monument by terrorists occurred at

        five o'clock.

and it receives S-interpretation:

(3)   Terrorists destroyed the monument at five o'clock.

The sentence

(4)   John saw the destruction.

is ambiguous, however, since both nominal and noun readings of destruction are available. Under nominal reading, sentence (4) means

(5)   John saw something being destroyed.

Here the interpretation is one of PROCESS or ACT. With a noun reading, however, sentence (4) may have the meaning

(6)   John saw what was left after something was destroyed.

With this interpretation, sentence (4) is synonymous with the unambiguous

(7)   John saw the wreckage.

where only the RESULT or CONSEQUENCE interpretation is permitted.

Similar to <u>destruction</u> is the derivative <u>installation</u>, from <u>install</u>$_V$, where

the sentence

    (8)   John saw the installation.

may have either the nominal reading

    (9)   John saw something being installed.

or the noun reading

    (10)   John saw what had been installed.

A.2 FEATURES ON DEVERBAL NOUNS

Deverbal nouns may be categorized by the features [Concrete] and [Count],

minus values being [Abstract] and [Mass]. In many cases deverbal nouns turn

out to be homophonous with related derived nominals. For example, the noun

<u>destruction</u> of sentence (4) is [-Concrete, -Count]. The fact that <u>destruction</u>

is [-Count] may be observed in the following question and answer:

    (11)   Was there any destruction today?

    (12)   Yes, there was $\begin{cases} \text{some.} \\ \text{*one} \end{cases}$

No plurals are permitted: *<u>five destructions</u>, *<u>few destructions</u>. That the

noun is [-Concrete] is shown by its use with the modifiers <u>great</u> and <u>slight,</u>

which cannot be used with concrete nouns: *<u>great sugar</u>, *<u>slight sand</u>.

Not all nominals have homophonous abstract mass nouns of this type

however. For example, <u>departure</u> is the nominal of <u>depart</u>$_V$ in

    (13)   The plane's departure is occurred at five o'clock.

This sentence shows S-interpretation of the nominal, with paraphrase

    (14)   The plane departed at five o'clock.

We note, however, that the response to question (15)

    (15)   Was there any departure today?

differs from (12):

> (16) Yes, there was one   .
>   *some

In the noun, plurals occur: five departures, few departures,*much departure.

Clearly, departure is [+Count]. Like destruction it is [-Concrete], however,

since [+Physical] adjectives tend not to apply: *a red departure, *a thick

departure, *a sticky departure. As a noun, then, departure is [-Concrete,

+Count].

The noun installation is [-Concrete, +Count]. The fact that it is concrete

is indicated by the occurrence of [+Physical] modifiers: a big installation, a

hidden installation. The count feature is supported by the plurals: multiple

installations.

The noun surveillance, which has no underlying verb at the surface in mod-

ern English, functions as a derived noun nonetheless. Its feature specification

is [-Concrete, -Count]. The mass feature is supported by the absence of plurals

and the occurrence of forms with much and little: *many surveillances, much sur-

veillance, *few surveillances, little surveillance. The abstract feature is

evident from the non-occurrence of [+Physical] adjectives: *sticky surveillance.

Rather, we find such abstract modifiers as effective, careful, elaborate.

Thus, we find that all four of the feature combinations of [Concrete] and

[Count] are exhibited in nouns with nominal morphology. Another example of a

[+Concrete, +Count] derivative is the word obstruction. As a noun it has the

non-human agentive meaning THAT WHICH V'S. We find the noun is regularly mod-

ified by [+Physical] adjectives: a huge obstruction, a small obstruction, sharp

obstructions, immovable obstructions. We find plural desinences: many

obstructions, few obstructions. Occasionally the noun is used as mass, however,

as shown by the sentence:

> (17) Was there much obstruction of traffic?

Condensation, like destruction, exemplifies the concrete mass noun,
a RESULT noun meaning THAT WHICH IS V'D. The noun falls into an analogy
with frost, as the following proportion suggests:

(18)   freeze$_V$: condense$_V$ :: frozen$_A$: condensed$_A$ :: frost$_N$:

condensation$_N$

As with frost, we find [+Physical] modifiers: thick condensation,
hard condensation, visible condensation. The noun is mass, as shown by
much condensation, little condensation, *many condensations, *few conden-
sations. Again, however, we find exceptional use, as in

(19)   Repeated condensations are required to effect the

process.

This is not surprising, since even with ordinary mass nouns like sugar we
sometimes find count morphology manifest:

(20)   Glucose is one of many sugars used by the body.

Distillation works exactly the same way:

(21)   Repeated distillations are required to effect the

process.

Another example of a derived concrete mass noun is population, pre-
sumably from the verb populate. In general the word is modified by
[+Physical] adjectives; sparse population, dense population, large
population, extensive population, varied population. Some [+Animate]
adjectives also occur, as in a healthy population. When the word borders
on the derived noun populace in meaning, we also find [+Psychological]
adjectives as modifiers, as in a cheerful population, an enlightened
population, an aware population. In general, the noun population is mass:
little population, some population, no population, much population. Again,
however, we find count morphology, as in:

(22) Can you cite the populations of the major American

Indian tribes?

(23) We have isolated three populations from our experiment.

In these meanings, the word means either NUMBER or GROUP.

It may be objected that population is semantically abstract, that it

cannot be a concrete entity. From a semantic point of view, this is

partially true, of course, but the use of such concrete modifiers as big

and dense clearly distinguishes it from other derived nouns which are truly

[-Concrete], like confusion. We do not find *large confusion, *thick

confusion, *homogeneous confusion, or *sparse confusion.

The features [-Concrete, +Count] are evident in deverbal nouns like

reorganization, a form which is also homophonous with an associated nominal.

We do not, in general, encounter [+Physical] adjectives as modifiers: *dense

reorganization, *sparse reorganization. We do find more abstract modifiers,

as in thorough reorganization, complete reorganization, democratic re-

organization. The noun reorganization denotes a countable EVENT, and so we

find the phrases periodic reorganizations, monthly reorganizations, un-

expected reorganizations, subtle reorganizations.

Again, we observe, however, that not all nominals have homophonous count

nouns of this type associated with them. For example, we find nominal

phrases like the periodic relegation of radicals to insignificant offices or

the annual institution of new regulations where the nominals receive S-

interpretation, but we cannot refer simply to the plural forms *the periodic

relegations or *the annual institutions. 'There are no count EVENT nouns

derivable from the verbs relegate and institute. In fact, even organization

differs from reorganization in this respect. We may speak of the periodic

organization of new anarchist collectives, where organization appears as a nominal, but we cannot use this word as an EVENT noun: *the periodic organizations of last year. As a noun, organization is strictly concrete and count, meaning GROUP: large organizations, intimate organizations, coherent organizations.

Knowledge is an abstract mass noun, idiosyncratically derived from the verb know. Like its antonym ignorance (which has no verbal source at the surface, since ignore is not appropriate in meaning), this word may not be a nominal. It is not the nominal of know in the meaning TO BE ACQUAINTED WITH A PERSON. We may not refer to *John's lifelong knowledge of Bill. Nor is knowledge the nominal of the verb know in its meaning TO BE COGNIZANT OF. We can say

(24) John knows the answer.

But the nominal *John's knowledge of the answer is peculiar, as is *John's ignorance of the answer. These restrictions on the use of knowledge and ignorance arise at the lexical, not the semantic level, as shown by the grammaticality of John's lifelong acquaintance with Bill and John's aware-ness of the answer. Knowledge must be entered in the lexicon as [-Nominal].

Its derived noun use is quite consistent with the features [-Count, -Concrete]. The mass character of the word is evident in the phrases much knowledge, little knowledge, more and more knowledge, *many knowledges, *few knowledges. (It is interesting that the Russian word znanije does have a plural, although it translates knowledge perfectly as the derivative of znat', "to know".) This is again a lexical fact, not a deep semantic one, as shown by the English plural abilities, which is close in meaning.

To some extent [+Physical] modifiers are allowed, as in deep knowledge,

superficial knowledge, shallow knowledge, extensive knowledge, but in general

this use is metaphorical and the noun is to be considered basically abstract.

An indicator of this abstractness is the use of the adjective great (opposite

slight) as a modifier in, for example, John's great (slight) knowledge of

cooking. As we noted above, these modifiers do not apply to concrete mass

nouns. In this respect knowledge parallels other abstract mass nouns, in

particular parameters like depth and length: great depth, great length. In

the sentence

(25) John's knowledge of nonverbal communication surprised

Martha.

the adjective great is understood to be the implicit modifier of knowledge.

This again parallels the behavior of parameters:

(26) Martha was anxious about the (great) depth of the river.

The [-Concrete, -Count] noun knowledge is closely related semantically

to wisdom and experience, the first a morphologically irregular derivative

of the adjective wise and the second apparently an abstract zero-derivative

of the verb experience. (Perhaps the latter is to be accommodated somehow

as the de-adjectival derivative of the longer participle experienced,

however.) All are [-Concrete], as shown by the modifiers great and slight,

and all are mass: much knowledge, little wisdom, some experience.

Homophonous with the abstract mass noun experience is the abstract

count noun experience meaning EVENT. Experience, like wisdom and knowledge,

is regarded by the grammar as an abstract substance which is to be accum-

ulated or piled up, while experiences are events which are separable and

countable.

APPENDIX B - SEMANTIC REGULARITIES IN DERIVED NOUNS WITH NOMINAL

MORPHOLOGY

B.1 ALLOFUNCTIONS OF $-\underline{TION}_{VNom}$

The hypothesis which we have been pursuing, that of a lexicon structured

by derivational functions, suggests a level of regularity that falls some-

where between the essentially total predictability that we expect from

transformational analysis and the virtually total idiosyncracy which is

implicit in extreme lexicalism. The notion of derivational function permits

us to capture semantic, syntactic, and phonological regularities, while

allowing for sub-regularities and exceptions.

We have already noticed that derived nominals (which receive S-inter-

pretation) must be distinguished from derived nouns (which receive NP-

interpretation). In a great number of cases the morphology has assigned a

particular phonological representation to multiple syntactic/semantic slots.

In particular, nominals and derived nouns often share a single phonological

shape.

Stated more specifically, the basic function $-\underline{tion}_{VNom}$ has a primary

allofunction $-\underline{ment}_{VNom}$ and several other minor phonological allofunctions.

These functions yield nominals, but they also regularly provide shapes which

are assigned the same types of semantic representation as deverbal nouns

derived by other means, for example by zero-derivation and stress-shift,

processes which never yield nominals.

B.2 SEMANTIC REGULARITIES

Examining count nouns derived from verbs by the suffix $-\underline{tion}$ and its

allofunctions, we observe semantic regularities. We find, for example, that

the verbs

(1)   impede, hinder, obstruct, block, annoy, bother, limit

        restrict, distract, inhibit

share a common core of meaning. All are transitive and imply, concretely

or abstractly, the notions of OBSTACLE TO INTENTION. Nouns derived from

these verbs, whether by nominal morphology, zero-derivation, or other means

(2)   impediment, hindrance, obstruction, block, annoyance, bother

        limitation, restriction distraction, inhibition

generally have the meaning OBSTACLE. Syntactically, several of these nouns

may take to NP as complement:

(3)   John's blindness is an impediment to his advancement.

(4)   The constant noise is a hindrance to my work.

(5)   The parked van is an obstruction to traffic.

(6)   Martha's dog is an annoyance to the neighbors.

There is no transformation operative here, however, since although prevent,

retard, and thwart belong semantically in group (1), and we have

(7)   The wall prevents people from falling off the cliff.

(8)   The chemical retards decomposition.

(9)   The discovery thwarts bureaucratization.

we find no derivative nouns in these cases:

(10)   *The wall is a prevention....

(11)   *The chemical is a retardation....

(12)   *The discovery is a thwart....

Derivational functions capture the subregularity of these examples without

recourse to transformations. We need only assume that the morphological

operators -tion, -ment etc., assign various meanings to derived deverbal

nouns. Among those meanings we find, fairly regularly, "that which V's".

Each such derivative must be listed separately in the lexicon, since not all

verbs show derivatives with this meaning. The theory that we have developed

leads us to expect a lexicon that is both structured and idiosyncratic. The

evidence which follows is empirical justification of this view.

Another group of verbs

(13)   extend, prolong, enlarge, expand, project, add, supplement,

        insert

share the underlying idea of GROWING. The nouns derived from these verbs,

when count, refer to GROWTH:

(14)   extension, prolongation, enlargement, expansion, projection,

        addition, supplement, insertion.

Thus we have the sentences:

(15)   Sharp projections on automobiles are now prohibited by law.

(16)   Meetings may be held in the addition to the student union.

(17)   We analyzed the story in the supplement to today's paper.

(18)   Did you receive the insertion (or insert) in yesterday's

        bulletin?

Similarly, the verbs

(19)   adapt, modify, improve, enhance, refine, simplify, complicate,

        enrich

all imply QUALITATIVE CHANGE. These derived nouns, whether from -tion or

-ment, share the meaning "that which V's". This parallels the zero-derivation

of the verb change itself, where the derived noun change has an analogous

meaning. Thus, we find alongside the sentences

(20)   John changed the arrangement of his room.

(21)   Arthur improved the gizmo.

(22)   Engineers enhanced the stereo's audible range.

the derived nouns of the sentences:

(23)   The change in John's room was the addition of a new rug and

two new paintings.

(24)   The improvement was a longer whatsit.

(25)   The enhancement was a broadening of higher frequency response.

Like the CHANGE verbs we encounter

(26)   cancel, ornament, decorate, embellish, garnish, endorse, sign,

note

which have derived nouns meaning CONCRETE CHANGE, "that which V's":

(27)   cancellation (of a stamp), ornamentation, decoration, embel-

ishment, garnishment, endorsement, signature, notation.

And so the verbs of the sentences

(28)   The stamp was cancelled in blue ink.

(29)   The chamber pot was gaily decorated.

(30)   John endorsed the check sloppily.

are related morphologically to the nouns of

(31)   The cancellation was blue.

(32)   The decorations were gay.

(33)   John's endorsement was sloppy.

Another set of related verbs is

(34)   create, compute, formulate, translate, render, compose,

publish, revise, contribute, accomplish, attain, achieve,

acquire

which have associated derived nouns with the meaning "that which is V'd"

(35)   creation, computation, formulation, translation, rendition,

composition, publication, revision, contribution, accomplishment,

attainment, achievement, acquisition.

Some examples relating the nouns and verbs are:

(36)   John translated the article.

(37)   A foundation contributed a million dollars for research.

(38)   The museum acquired a new painting.

whose verbs are morphologically related to the nouns of

(39)   John's translation is on page twenty.

(40)   The foundation's contribution was smaller than expected.

(41)   The new acquisition will be exhibited next month.

Another set of verbs describing actions

(42)   receive, inspect, transact, exhibit, interrogate, confront,

dedicate, initiate, consecrate, bury, baptise, celebrate,

elect, inter

have associated nouns referring to events:

(43)   reception, inspection, transaction, exhibition, interrogation,

confrontation, dedication, initiation, consecration, burial,

baptism, celebration, election, interment

Semantically, these nouns are parallel to the zero-derivative harvest from

the verb harvest:

(44)   Farmers harvest corn at the end of the summer.

(45)   The harvest is late this year.

The nouns of (43) mean "that during which one V's":

(46)   The queen received the American ambassador.

(47)   The reception was very formal.

Similar to (43) in semantics are commencement, exposition, and coronation.

The first two are derived from verbs which are not quite appropriate in

meaning, commence and expose, while the third is an irregular derivative

of the verb crown. Depression and recession also seem to be derived event

nouns, but again the underlying verbs, depress and recede, are not directly related.

From the "action" verbs

(48) invade, intervene, violate, transgress, detonate, provoke, erupt, explode, retaliate, disturb, agitate

we find the "event" nouns

(49) invasion, intervention, violation, transgression, detonation, provocation, eruption, explosion, retaliation, disturbance, agitation.

The nouns incursion and reprisal belong with this group. although they have no underlying verbs. In general, the nouns of (49) are parallel in meaning to the zero-derivative attack from the verb attack.

Yet another set of verbs

(50) excavate, settle, fortify, connect, terminate, reside, dwell

yield derived nouns referring to places. The nouns of (51) mean "that in which one V's" or "That where there is V'ing":

(51) excavation, settlement, fortification, connection, termination, residence, dwelling

Less regularly, we find junction and juncture, both presumably from join. Alongside residence and dwelling we find the archaic abode from abide. The noun plantation seems to belong in this group, although the connection with the verb plant is not direct. All these nouns are parallel in meaning to the zero-derivative of dump:

(52) We need to dump our garbage.

(53) Take it to the dump.

The following verbs involving verbal expression, whether written or spoken also show count noun derivatives, many via -tion:

(54) salute, accuse, indict, state, resolve, condemn, declare, proclaim, exclaim, observe, explicate, ejaculate, notify, interpret, regulate, recommend, define, command, correct, contradict, communicate, introduce, describe, prescribe, predict, justify, object, suggest, stipulate, require.

The nouns of (55) mean "that in which one V's":

(55) salutation, accusation, indictment, statement, resolution, condemnation, declaration, proclamation, exclamation, observation, explication, ejaculation, notification, interpretation, regulation, recommendation, definition, commandment, correction, contradiction, communication, introduction, description, prescription, prediction, justification, objection, suggestion, stipulation, requirement.

They are parallel in meaning to the zero-derived nouns of the verbs charge, claim, guess, and order:

(56) The policemen charged John with larceny.

(57) Martha claimed that Bill had insulted her.

(58) Elizabeth guessed the combination of the safe.

(59) The company ordered that the plant be closed.

(60) The charge was unfounded.

(61) Martha's claim angered Bill.

(62) Elizabeth made a good guess.

(63) The order surprised the workers.

We observe that nouns of this sort take that-clause complements if the underlying verbs do:

(64) The governor proclaimed that Tuesday is Gopher Day.

(65) John predicted that the world would end next week.

(66) The governor's repeated proclamations that Tuesday is Gopher Day

amused the press.

(67) The prediction that the world would end so soon worried John's

wife.

The nouns reinforcement (count), replacement (count), opposition (mass),

and congregation (usually mass) derive from underlying reinforce, replace,

oppose, and congregate and generally mean "that which V's", although they

may also mean "the one(s) who V":

(68) Reinforcements replaced the fallen soldiers.

(69) Replacements for faculty on leave will be recruited by the Dean.

(70) The rightist opposition angrily fought against the leftist program.

(71) The congregation disliked their new minister.

The feature [+Human] is optionally assigned to the first three derivatives

and obligatorily assigned to the last. The assignment of this feature is

consistent with selectional restrictions on the subjects of their under-

lying verbs. Refreshment and nourishment also have the semantic inter-

pretation "that which V's" and are strictly [-Human] in accordance with

selectional restrictions on their underlying verbs.

An emission is "that which is emitted," just as an injection is "that

which is injected." The nouns reflection, selection, collection, assumption

and assertion are similarly "that which is V'd". An embarrassment or dis-

appointment, however, is "that which V's".

The transitive verbs lacerate, abrade, and incise, and the intran-

sitive inflame and swell have the derived nouns laceration, abrasion,

incision, inflammation and swelling. Semantically related is contusion,

which has no verbal source. These nouns are similar to zero-derived nouns

from the verbs tear, cut, and hurt.

B.3 SUMMARY

What we have shown in this appendix is that derived nominal morphology (in particular, the suffizes -$\underline{tion}$ and -$\underline{ment}$) yields derived nouns with semantic content similar to that found in other deverbal noun derivatives.

In the following table, the nouns on the left have nominal morphology, while those on the right are similar zero-derivatives:

(72) obstruction, impediment   block$_N$

     extension, enlargement   supplement$_N$

     adaption, improvement   change$_N$ (abstract)

     decoration, embellishment   change$_N$ (concrete)

     creation, achievement   report$_N$

     reception, interment   dance$_N$

     excavation, settlement   dig$_N$

     salutation, indictment   claim$_N$

APPENDIX C - NOUNS AND NOMINALS FROM ADJECTIVES

C.1 NEUTRAL PARAMETERS AND FACTIVE NOMINALS

Two major types of nouns derived from adjectives must be distinguished: neutral parameters and factive nominals. In some cases the morphology formally manifests this distinction, as in wide$_A$/width$_N$/wideness$_{Nom}$ and dense$_A$/density$_N$/denseness$_{Nom}$, but the difference is quite subtle and for many speakers the latter formatives may be in essentially free variation. The semantic distinction between the two is clear, however.

The neutral parameter occurs with verbs involving quantity and measurement: estimate, evaluate, measure, ascertain, guess at, depend upon, affect, alter, change. The following are examples where the de-adjectival derivative is a neutral parameter:

(1) The senator guessed at the strength of his opposition.

(2) Mark estimated the length of the logs.

(3) The engineers determined the width and depth of the river.

(4) The teachers tried to evaluate the pupils' intelligence.

(5) The nurse measured Martha's height and weight.

(6) The committee sought to ascertain the truth of the students' accusation.

(7) Students' interest in your course will depend upon the relevance of its subject matter to their lives.

(8) The density of smog is affected by changes in the weather.

The neutral parameter is generally derived from the "positive" pole: strong (+)/weak, long (+)/short, deep (+)/shallow, wide (+)/narrow, high (+)/ low, heavy (+)/light, true (+)/false, intelligent (+)/stupid, sweet (+)/sour. The choice of the positive pole for the parametric derivative is consistent

Some adjectives appear to lack parameters of this type:

(18) How full is the gas tank? Martha asked about the __?__ of

the gas tank.

On the other hand, some parameters have no directly associated adjectives:
circumference, volume, area, distance, potential, capacity, pressure, amount,
quantity, level, degree, extent. Big, far, and much appear vaguely to
express the content of some of these parameters, and capacious is associated
to capacity for some speakers (although not for its electrical meaning,
however.)

In contrast to the neutral parameters, factive nominals are not re-
stricted to the positive pole:

(19) The shallowness/narrowness of the river surprised the explorers.

(20) The stupidity of the Attorney General both amused and frightened

the citizenry.

(21) The weakness of the current made bridge-building easy.

(22) The falseness of the charges was evident to all.

As we observed earlier, some speakers morphologically distinguish
certain of the factive nominals from neutral parameters, preferring -ness
forms for the former:

(23) Our flight was delayed because of the denseness (*density) of

the fog.

(24) Helen was impressed by the wideness (*width) of the river.

(25) Galileo was persecuted for the profaneness (*profanity) of

his science.

(26) The deepness (*depth) of the Grand Canyon surprised the

explorers.

(27) The warmness (*warmth) of the weather annoyed our visitors.

Note the curious fact that although highness, goodness, heaviness, richness, and trueness exist, they are not the nominals of the ordinary senses of high, good, heavy, rich, and true:

(28) John's perpetual highness comes from inveterate pot smoking.

(29) Elizabeth's self-effacing goodness is simply intolerable.

(30) The heaviness of Marcuse's style makes his work hard to read.

(31) Danish food is famous for its richness.

(32) The monks' trueness to their discipline was exemplary.

For the ordinary meanings of these adjectives we find suppletions in the factive system:

(33) City Council deplores the height (*highness) of the new buildings.

(34) Critics acknowledge the quality (*goodness) of Jean's painting.

(35) Because of its weight (*heaviness) the bank vault had to be installed on the first floor.

(36) The landowners' extreme wealth (*richness) angered the peasants.

(37) The truth (*trueness) of the accusations was evident to all.

(38) The students' lack of judgment was blamed on their youth (*youngness).

(39) The old woman's failing eyesight was blamed on her extreme age (*oldness).

Particularly striking are those cases where suppletive parameters are used in place of morphologically regular factive nominals, even when such suppletion introduces polar lexical ambiguities:

(40) Students complained about the size (*bigness) of their workload.

(41) Students complained about the size (*smallness) of their stipends.

(42) The faculty deplored the quality (*badness) of student work.

(43) The faculty praised the quality (*goodness) of student work.

These observations suggest that the lexical items size and quality may
require entry in the lexicon as nominals, since both receive S-interpretation.

(44) Students complained about the fact that their workload was

so big.

(45) Students complained about the fact that their stipends were

so small.

Size appears to be assigned in the lexicon as suppletion for both *bigness
and *smallness (perhaps as size-ness) and quality is suppletive for *badness
(or *poorness) and *goodness (as quality-ness). Both nominals may be dis-
ambiguated toward the negative pole:

(46) Students complained about the small size of their stipends.

(47) The faculty deplored the poor (low) quality of student work.

The fact that morphology supports a consistent theory of adjective polar-
ization suggests that work in this field may contribute some insight into
basic problems in semantics.

C.2 NOUNS IN -NESS AND -TH

There is another interesting argument concerning adjectives of the type
we have been considering. We observed earlier that nominals are [-count].
If we examine derivatives in -ness$_{AN}$ we find almost no cases of real deriva-
tion which permit pluralization. Business has a plural, but it is not a
synchronic derivative of busy, and illness can be pluralized when it means
disease. We do encounter two derivatives in -ness which exhibit plurals:
thickness and weakness.

(48) The hole can be plugged by inserting several thicknesses

of paper.

(49) The candidates' weaknesses were compared with their strengths.

The existence of these pluralized forms can be naturally explained by our theory of lexical deep structure. Thickness in a non-nominal meaning falls into semantic analogy with breadth, width, depth, and length:

(50) This lace is available in twenty-inch breadths.

(51) It is easier to swim widths of the pool than lengths.

(52) The water was tested at various depths.

In underlying form, thickness (+count) could be represented as $-th[thick_A]_N$. This derivational function $-th_{AN}$ yields count nouns meaning INSTANCE DESCRIBED AS ADJ, so that a thickness is "a piece which is thick". Similarly, weakness as a count noun is underlyingly $-th[weak_A]_N$, meaning "a point which is weak" just as strength means "strong point" when it is count.

But why does this suppletion occur? Why do these forms have suppletive realization in surface structure? The answer lies in phonology. *Thickth and *weakth contain [kθ] clusters which violate morpheme-structure constraints in English. These forms do not exist because they are not pronounceable; it is "easier" to use the nominal formative as a suppletion.

C.3 DE-ADJECTIVAL NOMINALS WITH DEVERBAL MORPHOLOGY

We have observed that derived nominals may have either verbal or adjectival sources. In some cases nominals of both sorts coincide in one surface form. We have defined nominals semantically, rather than phono-logically, and as Chomsky and others have observed, the morphology of nominals is quite idiosyncratic.

Among verb/nominal pairs we find extremely varied surface patterns: reside/residence, suppose/supposition, rescue/rescue, torture/torture, nominate/nomination, destroy/destruction, derive/derivation, demolish/

demolition, banish/banishment, deliver/delivery, murder/murder, inquire/ inquiry, arrive/arrival, die/death, depart/departure, apply/application.

The adjective/nominal morphology is equally irregular: happy/happiness, free/freedom, sincere/sincerity, ignorant/ignorance, warm/warmth, true/truth, unstable/instability, bigamous/bigamy, idolatrous/idolatry, desperate/desperation, brief/brevity, obstinate/obstinacy, sagacious, sagacity, wise/ wisdom, savage/savagery, grave/gravity, deep/depth, naïve/naïvete, determined/ determination, dejected/dejection, detached/detachment.

It is important to note that some of the deverbal morphology (ending in -ment and -tion) occurs in the de-adjectival set as well, particularly in cases where the related adjective has participial phonology. For example, refinement is de-adjectival, not deverbal. The nominal of the verb refine is the gerundive refining:

(53) The refining of oil is an essential process in modern economies.

(54) *The refinement of oil is an essential process in modern economies.
Refinement is the nominal of the adjective refined, meaning "cultured":

(55) Martha's refinement was evident from her diction.
The observation that apparently deverbal nominals may actually be the derivatives of adjectives opens up some new alternative explanations to problems in syntax.

In "Remarks on Nominalization" Chomsky discusses the impossibility of the nominal constructions:

(56) *John's difficulty to please

(57) *John's certainty to win the prize

(58) *John's amusement of the children with his stories
Chomsky disqualifies (56) on the grounds that in deep structure difficult modifies sentences (not HUMAN NP's) and thus there is no underlying string

difficult to please which could be the source of difficulty to please.

Eager, on the other hand, does modify HUMAN, so eager to please and eager-

ness to please both occur. We may also dismiss (56) on lexical grounds,

however, since difficulty is a derived noun, not a derived nominal. We have

for example:

> (59) One of John's difficulties was that he had no sense of
>
> perspective.

Note that difficulty is COUNT in this context. The nominal use is quite

stilted:

> (60) ? The problem's difficulty pleased John.

One can say:

> (61) The difficulty of finding an integral solution has been
>
> underestimated.

This is a parametric rather than factive nominal use, however. Note the

impossibility of *difficultness.

The construction (57) may be dismissed on the grounds that the adjective

certain modifies propositions, ordinarily with that complementizers. Sentence

(62) is thus not underlying:

> (62) John is certain to win the prize.

Certainty is the nominal of certain, but the adjective is constrained in deep

structure in such a way that the S-interpretation of (57) is blocked. To be

interpretable, a that-clause must follow:

> (63) John's certainty that the moon is made of green cheese

Certainty in this case is best viewed as a deverbal nominal from the underlying

verb be certain$_V$, which is semantically close to the verbs suspect and be aware,

both of which require that-clauses as objects:

> (64) John's $\begin{cases} \text{suspicion that the moon is made of green cheese} \\ \text{awareness} \end{cases}$

Thus, for <u>certainty</u> we posit the entry:

(65) certainty$_N$: NOMINAL, from <u>be certain</u>

Example (58) can be disqualified in the reverse way. Rather than being

a deverbal derivative of <u>amuse</u>$_V$, <u>amusement</u> is the de-adjectival derivative of

<u>amused</u>$_A$. Like other de-adjectival nominals, <u>amusement</u> can take only one

possessive NP (either as an <u>of</u>-phrase or as a preposed possessive determiner).

Thus we have:

(66) John's $\begin{cases} \text{amusement was evident from his laughter.} \\ \text{astonishment} \\ \text{happiness} \\ \text{delight} \end{cases}$

Phrase (58) does not occur for the same reason that (67) is out:

(67) *John's happiness of the children

Only one possessive NP may appear with the nominal

We do find, however, (68), as Chomsky observes:

(68) John's amusement at the children's antics

Here <u>amusement (at)</u> is a deverbal nominal from <u>be amused at</u>, which is seman-

tically close to <u>enjoy</u>, <u>delight in</u>, <u>be interested in</u>. If <u>amusement</u> of (58)

is taken as deverbal, the phrase is ungrammatical because the particle <u>at</u>

would have to replace <u>of</u>, because <u>be amused at</u> does not take instrumental

adverbs such as <u>with stories</u>, and because <u>children</u> is the wrong kind of object.

In general, <u>be amused at</u> takes abstract objects such as <u>antics</u>, <u>remarks,</u>

<u>behavior</u>, <u>naïvete</u>, <u>talkativeness</u>, etc. (If <u>be amused at</u> takes a human object,

it is elliptical: <u>John was amused at the children</u> means <u>John was amused at</u>

<u>the behavior of the children</u>.) We thus posit two lexical entries:

(69) amusement$_N$: NOMINAL, from <u>amused</u>$_A$

(70) amusement (at)$_N$: NOMINAL, from <u>be amused at</u>$_V$

Nominal (69) occurs in sentence (66), and (70) occurs in (68). Neither can

occur in Chomsky's (58). Since (69) is de-adjectival, it cannot be found in

(58), because that structure contains two possessive NP's. And since (70)
requires the particle at, structure (58) is again out because it contains of
instead.

C.4 PSYCHOLOGICAL CAUSATIVES

Chomsky indicates [p. 191] that it may be necessary "to postulate that
such sentences as John amused the children with his stories are themselves
derived from an underlying structure of a different sort." He goes on to
discuss a class of verbs which we shall call psychological causatives. Ex-
amples are: amaze, amuse, astonish, surprise, disgust, delight, enrage, con-
fuse, frighten, sadden, madden, gladden, anger, interest, terrify, please,
mislead, infuriate, satisfy, irritate, comfort, dismay, inhibit, convince,
inspire, vex, horrify, pacify, discourage, displease, annoy, bother.

Nominal derivatives related to this class of verbs have, in general,
adjectives (which often look like participles) as their morphological sources.
Thus, we find the factive interpretations (72) for (71):

(71) John's extreme $\begin{cases} \text{surprise was evident.} \\ \text{delight} \\ \text{anger} \\ \text{astonishment} \end{cases}$

(72) It was evident that John was extremely $\begin{cases} \text{surprised.} \\ \text{delighted} \\ \text{angry} \\ \text{astonished} \end{cases}$

Many of these nominals, like astonishment, show deverbal morphology or violate
the principle of accretion: amazed/amazement, surprised/surprise, disgusted/
disgust, delighted/delight, confused/confusion, frightened/fright, sad/sadness,
glad/gladness, angry/anger, interested/interest, terrified/terror, infuriated/
fury, satisfied/satisfaction, irritated/irritation, comforted/comfort, dismayed/
dismay, inhibited/inhibition, inspired/inspiration, vexed/vexation, horrified/

horror, displeased/displeasure, annoyed/annoyance. In general these nominals
do not take a second possessive NP, as is consistent with their adjectival
source: *John's amazement of Sarah, *the report's annoyance of the govern-
ment, *Bill's satisfaction of Mary. (The acceptable nominal phrase Bill's
satisfaction of Mary's demands is derived from the homophonous verb satisfy
meaning "meet, comply with". In this meaning the verb is not a psychological
causative.)

Psychological causatives have the unusual selectional restriction that
subject NP's are unspecified, while objects must be HUMAN (or in some cases,
ANIMATE):

(73) Martha's indignant departure amused John.

(74) Martha's smile amused John.

(75) Martha's poodle amused John.

(76) Martha's puritanism amused John.

(77) The riots in France amused John.

(78) *The rainy weather amused the rock.

(79) *Martha's poodle amused John's puritanism.

(80) *Sincerity amused democracy.

Chomsky's remark in Aspects about "the irrelevant pseudo-relation Subject-
Object" [p.73] notwithstanding, it seems that in a transitive language like
English, verbs can be expected to be human-unspecified:

(81) John fears
- sincerity
- Martha
- poodles
- rainy weather
- riots

or human-human:

(82) John
- helped Martha
- insulted
- murdered
- complimented

but not ordinarily <u>unspecified-human</u> as the psychological causatives are. It is unusual for a verb to be constrained <u>only</u> in its object, in other words.

This unusual variety of surface selectional restriction need not be posited in deep lexical structure if the psychological causatives are derived appropriately. We observe, for example, that <u>sadden</u> and <u>gladden</u> are derived from the adjectives <u>sad</u> and <u>glad</u> (both of which are in general the modifiers of HUMAN nouns) by the function $-en_{AV}$. (See section 2.2.2.) The ungrammaticality of (83) can be correlated with the ungrammaticality of (84):

(83)⎧ *The rock is sad.
　　⎨ *Mud
　　⎬ *Virtue
　　⎩ *Democracy

(84) *John saddened⎧the rock.
　　　　　　　　　⎨mud
　　　　　　　　　⎬virtue
　　　　　　　　　⎩democracy

The adjective <u>mad</u> applies to both people and animals, so it is not surprising to find that the verb <u>madden</u> takes both as objects:

(85)⎧The dog is mad.
　　⎪Martha
　　⎨*The rock
　　⎬*Mud
　　⎪*Virtue
　　⎩*Democracy

(86) John maddened⎧the dog
　　　　　　　　　⎪Martha
　　　　　　　　　⎨*the rock
　　　　　　　　　⎬*mud
　　　　　　　　　⎪*virtue
　　　　　　　　　⎩*democracy

<u>Frighten</u>, <u>terrify</u>, and <u>confuse</u> also take ANIMATE objects, which is consistent with the ANIMATE specification of the adjectives: <u>a frightened cat</u>, <u>terrified dog</u>, <u>confused turtle</u>. In general, for causative verbs derived from adjectives, the object of the resultant causative is restricted in exactly the same way that the underlying adjective is restricted.

We observe, also, that the nominals of psychological causatives takes adjectives like <u>utter</u> and <u>extreme</u>: <u>utter dismay</u>, <u>extreme amusement</u>. These adjectives do not, in general, modify deverbal nominals since <u>extremely</u> and <u>utterly</u> do not modify verbs: *<u>John married Martha extremely</u>, *<u>Martha is extremely married</u>, *<u>Martha's extreme marriage</u>. *<u>Peter corresponds extremely</u>, *<u>Peter's extreme correspondence</u>. The reverse is true with psychological causatives: <u>John amused Martha extremely</u>, <u>Martha is extremely amused</u>, <u>Martha's extreme amusement</u>. <u>Bill utterly confused Alice</u>, <u>Alice is utterly confused</u>, <u>Alice's utter confusion</u>.

All these facts lead us to posit adjectival sources for the psychological causatives:

(87) amuse$_V$: CAUSATIVE from <u>amused</u>

(88) please$_V$: CAUSATIVE from <u>pleased</u>

(89) delight$_V$: CAUSATIVE from <u>delighted</u>

(90) sadden$_V$: CAUSATIVE from <u>sad</u>

(91) anger$_V$: CAUSATIVE from <u>angry</u>

It is important to observe that the principle of accretion (see 5.2) is violated by many of these entries. It seems, given the semantic evidence, that an overall analysis is still best structured in this way. The various derivatives (87)-(91) are gotten by application of allofunctions of -en$_{AV}$, whose existence is independently established. One of these allofunctions will have to delete -<u>ed</u> in (87) - (89).

APPENDIX D - THE FUNCTIONS $-\underline{ED}_{NA}$ AND $-\underline{LESS}_{NA}$

We observed in Chapter Four that $-\underline{er}_{VN}$ is a productive derivational function that cannot be plausibly accounted for in transformational terms. We now examine the possibility of transformational analysis for two other productive suffixes, $-\underline{ed}_{NA}$ and $-\underline{less}_{NA}$. These suffixes occur in examples of the following types:

(1) I saw a bearded man.

(2) I saw a beardless man.

(3) The king met with the landed nobles.

(4) The king met with the landless peasants.

(5) Helmeted soldiers marched by.

(6) Helmetless soldiers marched by.

(7) Sighted people have no trouble with this experiment.

(8) Sightless people have trouble with this experiment.

A transformationalist analysis would presumably explain these sentences by deriving them from underlying sentences containing <u>have</u>-clauses or prepositional phrases in <u>with</u> or <u>without</u>. Thus, (1) and (2) would come transformationally from:

(9) I saw a man with a beard.

(10) I saw a man who had a beard.

(11) I saw a man without a beard.

(12) I saw a man who did not have a beard.

In the argument which follows, we will assume that the most plausible transformational source for the above is a sentence with a <u>have</u>-clause. Predicative use of the noun-based adjective is hard to account for otherwise. The sentence

(13)   John is bearded.

must come from

(14)   John has a beard.

If (14) is not taken as the source, the transformation would have to apply

obligatorily in main clauses, since (15) is not grammatical:

(15)   John is with a beard.

The same argument holds for the sentence

(16)   John is beardless.

coming from the source

(17)   John does not have a beard.

since

(18)   *John is without a beard.

is ungrammatical.

   And so the transformationalist treatment suggests two transformations

sensitive to have-clauses with and without Neg. We have asserted above

that the suffixes in question are productive. This does not mean, however,

that the trar.sformations can apply unconstrainedly. If a new noun, glick,

enters English and has an appropriate meaning it may also be lexicalized

as the adjective glicked or the adjective glickless. (Marchand asserts,

[p. 324] that "-less is, formally speaking, the negative counterpart of

-ful." This was once true, but is no longer. A new adjective glickful

is unlikely in modern English.)

   The (semantically limited) productivity of these suffixes does not

imply that the transformations could operate freely. We note, for example,

that the have transformation (producing -ed adjectives) requires in many

cases that an adjective modify the object noun in the structural description.

We encounter sentences like:

(19) A crooked-nosed man came to visit.

Also permissible in this frame are:

(20) long-legged, broad-shouldered, big-bellied, sharp-tongued,

weak-kneed, pigeon-toed, pasty-faced, fat-headed, hairy-chested,

quick-footed, long-haired, brown-eyed, red-blooded, one-armed,

nimble-fingered, scatter-brained, cauliflower-eared, big-mouthed,

thin-necked, sway-backed, tender-hearted.

But these forms in -ed may not occur without modifiers:

(21) *A nosed man came to visit.

(22) *A hearted man came to visit.

This means that in some cases the have transformation would apply only if

the object noun is modified, since the -ed adjective cannot stand alone.

Thus, sentence (23) is acceptable, but (24) is strange:

(23) John shot a blue-feathered bird.

(24) ? John shot a feathered bird.

It is apparent that this fact is basically semantic, or perhaps extra-

linguistic, but not syntactic in nature. The -ed adjectives require

modifiers because otherwise they convey no "new" information, since in

general most men have legs, shoulders, heads, chests, etc., and most birds

have feathers. Sentence (24) is strange because it is nearly tautologous,

and the same is true for (21) and (22).

We cannot restrict the transformation syntactically, however, since in

many other cases the -ed form does occur unmodified. In addition to the

examples cited above we find:

(25) ivied walls, wooded land, winged horses, flowered wallpaper,

iced tea, pebbled walk, cultured people, domed buildings,

partitioned spaces.

The semantic fact in question does not simply involve body parts. We find high-ceilinged rooms, low-ceilinged rooms, and plaster-ceilinged rooms, but *ceilinged rooms is anomalous. Similarly, we find heart-shaped candy-boxes and chocolate-covered cones, while *shaped candy-boxes and *covered cones are strange.

This seems to be the same semantic fact as is evident in the following:

(26) I need some quick-drying paint.

(27) ? I need some drying paint.

(28) Anₐcin is a fast-acting pain reliever.

(29) ? Anacin is an acting pain reliever.

(30) The factory is conveniently located.

(31) ? The factory is located.

(32) The carefully worded statement was read.

(33) ? The worded statement was read.

(34) John's hand-written letter pleased his mother.

(35) ? John's written letter pleased his mother.

Similar examples such as theater-goer, but *goer, are cited in section 4.2.3. It appears that adverbial and adjectival modifiers are often required semantically to ensure "sufficient meaning". This inclues the prefix un- as modifier, since unwanted garbage is acceptable, but *wanted children is strange.

We cannot state the adjective requirement as a transformational constraint to insure that we get (19), but not (21) or (22). Instead the semantic restrictions belong in the lexicon as rules for interpretation. Sentence (24) is out on semantic grounds, not on syntactic ones, since we can say:

(36) I saw a feathered horse.

Unfortunately, transformational analysis predicts -ed adjectives which are not, in fact, lexicalized, just as it produces -er agent nouns [see 4.2.3] which do not occur. We find the sentences:

(37) Mary has red socks.

(38) John has a blue jacket.

But we do not have:

(39) *Mary is red-socked.

(40) *John is blue-jacketed.

In general, clothes do not work like body parts. Similarly, we find carpeted rooms but not *furnitured rooms. (It may be, however, that carpeted and partitioned are the participles of denominal verbs carpet and partition rather than -ed$_{NA}$ derivatives). To block the derivation of *furnitured rooms we require rule-feature machinery at least as complicated as lexical listing, since we have to record somewhere the fact that *furnitured does not exist.

The Neg-have transformation, in contrast to that yielding -ed, would have to be constrained against modifiers of the object noun in its structural description. For example, we find

(41) Mary does not have shoes.

which might be the source for

(42) Mary is shoeless.

but we cannot derive (44) from (43):

(43) Mary does not have red shoes.

(44) *Mary is red-shoeless.

Similarly, we find (45) but not (46):

(45) George is hatless.

(46) *George is hard-hatless.

There are many derived adjectives in -less which have no counterpart

in -ed or -ful, such as:

> (47)   odorless, helpless, sleepless, expressionless, dreamless,
>
> breathless, speechless, ceaseless, homeless, timeless, swordless,
>
> soundless, friendless, endless, childless, seedless, meatless,
>
> topless, smokeless, godless

Not all nouns can undergo Neg-have, however:

> (48)   This room does not have a television.
>
> (49)   *This room is televisionless.
>
> (50)   Mary does not have a dictionary.
>
> (51)   *Mary is dictionariless.
>
> (52)   John does not have an appendix.
>
> (53)   *John is appendixless.

There appear to be phonological constraints on adjectives in -less.   In

particular, the function tends not to apply to nouns of more than two

syllables.   If this constraint holds true, this fact powerfully argues

against transformationalist analysis, since it is undesirable theoretically

to constrain a syntactic transformational phonologically.

The lexicalist position which we have been presenting can say that the

derivational functions -ed$_{NA}$ and -less$_{NA}$ are productive phonologically (with

-less$_{NA}$ generally restricted to words of three syllables or fewer) and semi-

productive semantically (neither takes proper nouns).   The two functions

(with -ful$_{NA}$ of meaningful an allofunction of -ed$_{NA}$) are semantically opposite

in interpretation, but the existence of an adjective of one type does not

guarantee the existence of the other: blue-feathered, *blue-featherless,

homeless, *homed, *homeful.

APPENDIX E - MORE REMARKS ABOUT ZERO-DERIVATION

E.1 RELEXICALIZATION

In Chapter Three we noted that noun-underlying and verb-underlying cases of zero-derivation should be kept distinct morphologically. It is unsatisfactory to assert merely that the homophonous noun and verb are "associated" or "related" without specifying whether the noun is derived from the verb, or the verb from the noun.

Deverbal derivatives of the $\emptyset[\text{hiss}_V]_N$ type are distinct from the class of primitive nouns in that, for example, the derivatives are generally not concrete. Similarly, denominal verbs of the $\emptyset [\text{water}_N]_V$ type differ from primitive verbs in that the derivatives take a restricted range of instrumental objects. The verb _water_ means TO APPLY N TO, where N is implicitly identical with the lexically underlying noun:

(1) John waters his plants every day (with water).

(2) Bill always salts his meat (with salt).

(3) In the summer Alice ices her coffee (with ice).

(4) Sarah spiced the gravy (with spices).

Not all nouns show such verbal forms. For my dialect the following are unacceptable (although Webster's _Third_ gives sugar_V and jam_V):

(5) *John milks his morning cereal.

(6) *Bill sugars his tea.

(7) *Alice fudged her icecream.

(8) *Martha whiskeyed her sour.

(9) *Johnny jammed his toast.

Denominal verbs may be _relexicalized,_ however, dropping restrictions on instrumental nouns in deep lexical structure. For example, we find

(10) Alice buttered the wound with salve.

(11) The company bottles cola in cans.

(12) Alice bludgeoned her sister with a poker.

Here the denominal verbs _butter_, _bottle_, and _bludgeon_ are used with nouns differing from their lexical sources--effectively, now the verbs are primitives. Another relexicalized verb is _ship_, which once belonged to the group $truck_V$, $cart_V$, bus_V, $ferry_V$ meaning TO MOVE BY N. Now the verb _ship_ has a more generalized meaning, so that we find:

(13) John shipped the trunk by train.

E.2 PROBLEMS WITH TRANSFORMATIONAL ANALYSIS

We have noted that when a verb is derived from a noun by a zero operation, the verb characteristically has a meaning which might suggest that some fundamental verb has simply been deleted from a verb phrase, as in $truck_V$ from _move NP by truck_:

(14) Sarah trucked her vegetables into town.

(15) Sarah moved her vegetables by truck into town.

To derive (14) from (15) transformationally, we would require that an appropriate transformation be sensitive to the verb _move_ and to the instrumental noun _truck_, since we do not wish to get (16) from (17):

(16) *Alex trucked Sarah's rutabaga patch.

(17) Alex destroyed Sarah's rutabaga patch with a truck.

But paradoxically, a transformation could _not_ be sensitive to the noun _truck_, since we have (18) which has no such noun in deep structure:

(18) Sarah trucked her vegetables into town in the back seat of her

    Cadillac El Dorado.

Here the verb _truck_ has been partially relexicalized to mean primarily MOVE,

but interpreted with truck "flavor", since in (17) Sarah's Cadillac is

likened to a truck. Note also that we do not get

(19) *Sarah dump-trucked her vegetables into town.

from the sentence

(20) Sarah moved her vegetables into town by dump-truck.

This is explained lexically by noting that there is no verb dump-truck in

the lexicon. The transformation would have to block modifiers in its

structural description.

Interestingly, ship differs from truck in that (21) does not imply that

Sarah went along, while (14) does:

(21) Sarah shipped the vegetables into town.

This follows from the relexicalization of ship in the meaning SEND rather than

MOVE. It is unclear how a transformationalist treatment would handle these

facts.

E.3 ELLIPSIS

Similarly perplexing problems appear with other elliptical derivational

phenomena. We find, for example, many nouns derived from adjectives by the

omission of particular nouns: $criminal_N$ ("criminal person"), $spectacular_N$

("spectacular TV show"), $commercial_N$ ("commercial propaganda"), $radical_N$

("person with radical views"), $special_N$ ("special TV program"or "special sale"),

$musical_N$ ("musical comedy"), $revolutionary_N$ ("person with revolutionary goals").

In French, the derivation of nouns from adjectives by ellipsis is

extremely widespread: un indigne, un fou, une folle, des enragés. In

English the process is not quite so well developed. Many of the nouns

derived from underlying adjectives are restricted to the plural and the

definite: the poor, the rich, the sick, the wounded, the young, the aged,

the elderly, the insane. Such de-adjectival nouns must be handled within the lexicon, since if there were a syntactic transformation to effect deletion we would expect to find *the pregnant or *the liberated by striking out the plural noun women. Facts of usage of this sort should be entered as idiosyncrasies in the lexicon, since they cannot, in general, be predicted. We do not find *the happy, *the angry, *the careful, although we do find the jobless, the needy, the unemployed. The derivational function $\emptyset_{AN}$ is only semi-productive, but it seems lexically based, not transformational in nature.

APPENDIX F - DERIVATION IN OTHER LANGUAGES

In Section 5.4 we claimed that N, V, and A are major derivational categories in English, each being mapped onto the others by derivational functions. This appendix presents evidence from five other languages suggesting that this pattern is widespread, if not universal.

F.1 FINNISH

In Finnish, $-inen_{NA}$ regularly forms adject ves from nouns, both abstract and nonabstract: ilo_N "joy"/$iloinen_A$"glad", $lasi_N$ "glass"/ $lasinen_A$ "glass", puu_N "tree, wood"/$puinen_A$ "wooden", $kala_N$ "fish"/ $kalainen_A$ "full of fish". The function $-uus_{AN}$ performs the reverse mapping: $hyvä_A$"good"/$hyvyys_N$ "goodness", $vapa_A$ "free"/$vapaus_N$ "freedom", $kalainen_A$ "full of fish"/$kalaisuus_N$ "abundance of fish" (in a lake).

The function $-ntaa_{A(N)V}$ forms causative verbs from both nouns and adjectives: $suuri_A$ "large"/$suurentaa_V$ "to enlarge", $suomi_N$ "Finland"/ $suomentaa_V$ "to translate into Finnish", $huono_A$ "bad"/$huonontaa_V$ "make worse". Finnish verbs yield nouns in $-us$: $kysyä$ "to ask"/$kysymys_N$ "question", $vaatia_V$ "to demand"/$vaatimus$ "demand", $ilmoittaa_V$ "to notify"/$ilmoitus_N$ "notice, announcement," $kirjoittaa$ "to write"/ $kirjoitus_N$ "writing". And finally, adjectives can be derived from verbs by $-va_{VA}$: $puhua_V$ "to speak"/$puhuva_A$ "speaking", $syödä$ "to eat"/ $syötävä_A$ "edible", $lentää$ "to fly"/$lentävä$ "flying". There are, of course, many other functions in Finnish of each type, but this brief sketch shows that Finnish has the minimal configuration of 5.4. In fact its derivational scheme is much more detailed.

F.2 SWEDISH AND GERMAN

Swedish forms adjectives from nouns by application of $-ig_{NA}$:

$fukt_N$ "dampness"/$fuktig_A$ "damp", $hast_N$ "haste"/$hastig_A$ "hasty", $synd_N$ "sin"/$syndig_A$ "sinful". Nouns are derived from adjectives by $-het_{AN}$: $färdig_A$ "ready"/$färdighet_N$ "readiness", dum_A "dumb, stupid"/$dumhet_N$ "stupidity", $farlig_A$ "dangerous"/$farlighet_N$ "dangerousness".

Swedish has a function yielding verbs from adjectives which is very similar to $-en_{AV}$ of English, except that the operator is umlaut: $glad_A$ "cheerful"/$glädja_V$ "to cheer up", $varm_A$ "warm"/$värma_V$ "to warm up," $lugn_A$ "calm"/$lugna_V$ "to calm down." Similar to English, too, is the derivation of verbs from nouns: $fisk_N$ "fish"/$fiska_V$ "to fish", $krig_N$ "war"/$kriga_V$ "to wage war", $cykel_N$ "bicycle"/$cykla_V$ "to ride a bicycle", $tank_N$ "gas tank"/$tanka_V$ "to fill up with gas", $snö_N$ "snow"/$snöa_V$ "to snow", $vatten_N$ "water"/$vattna_V$ "to water, sprinkle." Nouns are derived from verbs by an operation similar to zero-derivation in English: $prata_V$ "to talk"/$prat_N$ "talk, chatter", $jakta_V$ "to hunt"/$jakt_N$ "hunt", $skratta_V$ "to laugh"/$skratt_N$ "laugh", $gråta_V$ "to cry"/$gråt_N$ "cry", $hata_V$ "to hate"/ hat_N "hate", $slakta_V$ "to slaughter"/$slakt_N$ "slaughter". Finally, there are several functions giving adjectives from verbs: $tacka_V$ "to thank"/ $tacksam_A$ "thankful", $prata_V$ "to talk"/$pratsam_A$ "talkative," $tänka_V$ "to think"/$tänkbar_A$ "conceivable", se_V "to see"/$sebar_A$ "visible", $bliva_V$ "to become"/$blivande_A$ "future, prospective." Thus, Swedish exhibits the complete configuration.

Since German is so similar to both English and Swedish, we will give only one example for each function: $Ruhe_N$ "quiet"/$ruhig$ "quiet", $krank_A$ "sick"/$Krankheit_N$ "sickness", $warm_A$ "warm"/$wärmen_V$ "to warm", $Schnee_N$

"snow"/$\underline{schneien}_V$ "to snow", $\underline{rufen}_V$ "to call"/$\underline{Ruf}_N$ "call", $\underline{singen}_V$ "to sing"/$\underline{singbar}_A$ "singable". Again we find the full complement of functions.

F.3 RUSSIAN

Russian also shows functions of all six types. Nouns are derived from adjectives by -ost'$_{AN}$: $\underline{gibkij}_A$ "flexible"/$\underline{gibkost'}_N$ "flexibility", $\underline{absol'útnyj}_A$ "absolute"/$\underline{absol'útnost'}_N$ "absoluteness", $\underline{xolódnyj}_A$ "cold"/ $\underline{xolódnost'}_N$ "coldness". Adjectives are derived from nouns by -nyj$_{NA}$: $\underline{xólod}_N$ "cold"/$\underline{xolódnyj}_A$ "cold", $\underline{gólod}_N$ "hunger, starvation"/$\underline{golódnyj}_A$ "hungry", $\underline{t'ma}_N$ "darkness"/$\underline{t\text{ĕ}mnyj}_A$ "dark".

Adjectives are derived from verbs by the participial ending -nyj$_{VA}$: $\underline{vidét'}_V$ "to see"/$\underline{vidnyj}_A$ "visible", $\underline{obessílet'}_V$ "to grow weak"/$\underline{obessílen\text{-}}$ $\underline{nyj}_A$ "tired out", $\underline{civilizovát'}_V$ "to civilize"/$\underline{civilizóvannyj}_A$ "civilized". Adjectives yield verbs by application of -et'$_{AV}$: $\underline{xoróšij}_A$ "good"/ $\underline{xoro\check{s}ét'}_V$ "to become better looking", $\underline{bélyj}_A$ "white"/$\underline{belét'}_V$ "to become (appear) white," $\underline{\check{c}\text{ĕ}rnyj}_A$ "black"/$\underline{\check{c}ernét'}_V$ "to become (appear) black."

Nouns are derived from verbs: $\underline{osvoboždát'}_V$ "to free"/$\underline{osvoboždénie}_N$ "liberation", $\underline{plávat'}_V$ "to swim"/$\underline{plávanie}_N$ "swimming", $\underline{znat'}_V$ "to know"/ $\underline{znánie}_N$ "knowledge". Finally, verbs come from nouns by -it'$_{NV}$: $\underline{strax}_N$ "terror"/$\underline{stra\check{s}ít'}$ "to terrify", $\underline{pe\check{c}ál'}_N$ "sadness"/$\underline{pe\check{c}álit'}_V$ "to sadden", $\underline{gruz}_N$ "load, weight"/$\underline{gruzít'}_V$ "to load up"

The Russian derivational system is so complete it is often hard to say which formative is underlying. For example, we find $\underline{naxál}_N$ "an impudent person (male)", $\underline{naxálka}_N$ "an impudent person (female)", $\underline{naxál'nyj}_A$ "impudent", $\underline{naxál'stvo}_N$ "impudence", $\underline{naxál'ni\check{c}at'}_V$ "to be impudent." Semantically, it seems most likely that the adjective is

underlying, although it is longer than the noun <u>naxál</u>. If so, we have
an apparent violation of the principle of accretion [Section 5.2].

F.4 FRENCH

Abstract nouns can be derived from French adjectives: <u>gentil</u>$_A$
"nice"/<u>gentillesse</u>$_N$ "niceness", <u>petit</u>$_A$ "small"/<u>petitesse</u>$_N$ "smallness",
<u>fin</u>$_A$ "fine"/<u>finesse</u>$_N$ "fineness". Adjectives are formed from nouns:
<u>fleur</u>$_N$ "flower"/<u>fleuré</u>$_A$ "flowered", <u>poisson</u>$_N$ "fish"/<u>poissoneux</u>$_A$ "aboun-
ding in fish", <u>barbe</u>$_N$ "beard"/<u>barbu</u>$_A$ "bearded".

Verbs are derived from nouns: <u>flamme</u>$_N$ "flame"/<u>enflammer</u> "to
enflame", <u>fleur</u>$_N$ "flower"/<u>fleurir</u>$_V$ "to flower", <u>graisse</u>$_N$ "grease"/
<u>engraisser</u>$_V$ "to fatten". Verbs also come from adjectives: <u>rose</u>$_A$
"pink"/<u>roser</u>$_V$"to make pink", <u>noir</u>$_A$ "black"/<u>noircir</u>$_V$ "to blacken,"
<u>gros</u>$_A$ "big"/<u>engrossir</u> "to be pregnant".

Nouns are derived from verbs: <u>chanter</u>$_V$ "to sing"/<u>chant</u>$_N$ "song",
<u>chasser</u>$_V$ "to hunt"/<u>chasse</u>$_N$ "hunt", <u>choisir</u>$_V$ "to choose"/<u>choix</u>$_N$ "choice".
(In these cases we again find violations of the principle of accretion.)
Finally, we have adjectives from verbs: <u>défendre</u>$_V$ "to defend"/
<u>défendable</u>$_A$ "defensible", <u>connaitre</u>$_V$ "to know"/<u>connaissable</u>$_A$ "recog-
nizable", <u>comprendre</u>$_V$ "to understand"/<u>compréhensible</u>$_A$ "understandable".
Thus, French also shows derivations of each of the six types.

FOOTNOTES

1. "See Chomsky's review of Greenberg's Essays in Linguistics in this connection.

2. Note also that bi-weekly has two meanings, bi[week-ly] "twice a week" and [bi-week]-ly "every two weeks"

3. The lexicon must record each morpheme of the language, and many of the words. In the case of sing, the ablaut forms of the verb must also be stored, since they are not predictable. Halle (1973) observes that "there is every reason to expect that paradigms must appear as entities in their own right somewhere in a grammar. If my proposal is correct one such place would be the dictionary, from which the lexical insertion transformations draw items for insertion into a sentence." [p.9] Siegel (1974) discusses in some detail the lexical representation of formatives, distinguishing four principal classes: (1) formatives which happen to be words, (2) stems, (3) suffixes, and (4) prefixes. [p.104] A case of a word which does not need to be listed in the lexicon is walked, the past participle of walk. It is regularly formed and its existence is guaranteed by the general fact that all English main verbs have such participles. Sung must be listed, since its form does not follow the general pattern.

4. Paul Kiparsky has pointed out that historical evidence for this claim is the fact that the adjectives are retained in their old form when the participles are regularized analogically, e.g., gilt/gilded, burnt/burned, showing that they are separate lexical entries. See Kiparsky, "Remarks on analogical change," Proceedings of the First International Conference on Historical Linguistics, North Holland Press, 1974.

5. The Greening of America was a cleverly chosen book title for precisely the reason that green$_V$ does not exist, and thus the title evokes surprise.

6. Analogies are intended as diagnostic contexts, not as theoretical additions to the grammar. The lexicon does not contain analogies, but they are used in its compilation.

7. This tree, and the others like it in subsequent discussion, is not to be taken as a syntactic derivative, but rather represents a structure which has semantic interpretation analogous to that of the noun under discussion. See section 2.2.1.3 for clarification.

8. Barbara Partee (personal communication) has suggested some ways of formulating these relationships in terms of meaning-postulates.

9. See James H. Rose, "Principled Limitations on Productivity in Denominal Verbs" on this point.

10. Actually, it should be *John is the robber of things. The problem of articles must also be dealt with.

11. This argument depends upon the entirely reasonable assumption that transformational rules should be more "regular" than lexical rules.

12. Kiparsky has pointed out to me that this phonological evidence is contradicted by the pair relieve$_V$/relief$_N$, where the noun presumably comes from the verb. The noun is abstract, however, so a different process may be operative here, since we also find believe$_V$/belief$_N$, and grieve$_V$/grief$_N$. Following the concrete pattern are calf$_N$/calve$_V$, shelf$_N$/shelve$_V$, half$_N$/halve$_V$. The noun dwarf does not voice when made into a verb.

13. Some subtle problems remain, such as the choice of determiner. Note that we could also have John is the inventor of gizmos.)

14. Again, there are problems with determiners.

15. Observe that in a few cases both functions apply: refrigerator and refrigerant, cooler and coolant, polluter and pollutant, propeller and propellant.

16. See section 3.3. Note that these prefixes are not to be confused with the semantically distinct un- applying strictly to nouns: Unmensch, Untier, etc. The noun Untiefe, interestingly, is ambiguous, meaning "very deep place" where the "awful" un-$_N$ applies, and "shallow place" where the "not" un-$_A$ applies.

17. Kiparsky has suggested the possibility that thieve is morphologically derived from thief, but semantically underlying. In general in this work we have assumed that such crossing of relations is not the case.

18. Use of the adjective paradigm for these adverbs is somewhat similar to the use of the genitive to form animate masculine accusatives in Russian; paradigmatic substitution seems to occur fairly frequently.

19. These examples, frivolously intended, are from Emily Pope.

20. Compounding works quite differently from suffixation. Adverbs and nominals are certainly not terminal for compounding. For example, we find soft-spoken, hard-pressed, self-contemplation, self-denial.

BIBLIOGRAPHY

Aronoff, Mark, Word Structure, unpublished doctoral dissertation, MIT, 1974

Bloomfield, Leonard, Language, Holt, Rinehart and Winston, 1933

Bowers, John S., "Some Adjectival Nominalizations in English," unpublished, MIT, December 1968

Chapin, Paul G., On the Syntax of Word-Derivation in English, unpublished doctoral dissertation, MIT, n.d.

Chomsky, Noam, "Review of Joseph H. Greenberg, Essays in Linguistics," in WORD, vol. 15, no. 1, April 1959, pp. 202-218

_____ , Aspects of the Theory of Syntax, MIT Press, 1965

_____ , "Remarks on Nominalization" in Readings in English Transformational Grammar, Jacobs and Rosenbaum, eds., Ginn, 1970

_____ , and Morris Halle, The Sound Pattern of English, Harper & Row, 1968

Greenberg, Joseph H., ed., Universals of Language, second edition, MIT Press, 1966

Gruber, Jeffrey, Functions of the Lexicon in Formal Descriptive Grammars, System Development Corporation, 3 December 1967

Hakulinen, Lauri, Suomen kielen rakenne ja kehitys, Otava, Helsinki, 1968

Halle, Morris, "Prolegomena to a Theory of Word Formation," Linguistic Inquiry, vol. IV, no. 1, pp. 3-16, 1973

Jackendoff, Ray S., Semantic Interpretation in Generative Grammar, MIT Press, 1972

Lakoff, George, Irregularity in Syntax, Holt, Rinehart, and Winston, 1970

Lees, Robert B., The Grammar of English Nominalizations, Mouton, 1966

Ljung, Magnus, English Denominal Adjectives, Acta Universitatis Gothoburgensis, Studentlitteratur, Lund, 1970

Maher, J. Peter, "The Paradox of Creation and Tradition in Grammar: Sound Pattern of a Palimpsest," Language Sciences, no. 7, October 1969, Research Center for the Language Sciences, Bloomington, Indiana

Marchand, Hans, The Categories and Types of Present-Day English Word Formation, Verlag C. H. Beck, München, 1969

Matthews, P. H., Morphology: An introduction to the theory of word-structure, Cambridge University Press, 1974

McCawley, James D., "Lexical Insertion in a Transformational Grammar Without Deep Structure," Papers from the 4th Regional Meeting, Chicago Linguistic Society, 1968

Newmeyer, Frederick J., "The Source of Derived Nominals in English," Language, vol. 47, no. 4, pp. 786-796, 1971

Norbury, J. K. W., Word Formation in the Noun and Adjective, vol. 3, Studies in the Modern Russian Language, Cambridge University Press, 1967

Pennanen, Esko, "Current Views of Word-Formation," Neuphilologische Mitteilungen, vol. 73, pp. 292-308, Helsinki, 1972

Penttilä, Aarni, Suomen kielioppi, Werner Söderström, Helsinki, 1963

Quirk, Randolph, and Sidney Greenbaum, A Concise Grammar of Contemporary English, Harcourt Brace Jovanovich, 1973

Revard, Carter, "Notes on the 'Conversion' of Nouns into Verbs in English," (draft), System Development Corporation, n.d.

Rose, James H., "Principled Limitations on Productivity in Denominal Verbs," Foundations of Language, vol. 10, no. 4., pp. 509-526

Sapir, Edward, Language, Harcourt Brace and World, 1921

Schane, Sanford A., French Phonology and Morphology, MIT Press, 1968

Stern, Gustaf, Meaning and Change of Meaning, Indiana University Press, Bloomington, 1931

Sturtevant, Edgar H., Linguistic Change, University of Chicago Press, 1965

Walker, J., The Rhyming Dictionary of the English Language, revised edition, E. P. Dutton, 1936

Wasow, Thomas, and Tom Roeper, "On the Subject of Gerunds," unpublished, May 1971

Wessen, Elias, Svensk språkhistoria, II, Almqvist & Wiksell, Stockholm

Zemskaya, E.A., and D.N. Šmelev, eds., Razvitie slovo-obrazovanija sovremennogo russkogo jazyka, Izdatel'stvo "Nauka", Moscow, 1966

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