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The Relation between Inheritance and Argument Linking: Deverbal Nouns in Dutch*

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1. INTRODUCTION

It is a well-known observation from the morphological literature on English that in complex words such as *truck-driver* and *pasta-eater* the nouns *truck* and *pasta* can be interpreted as Theme-arguments of the underlying verbs *drive* and *eat*, respectively (cf. Selkirk 1982, Lieber 1983b). The same situation obtains for Dutch, as the following examples illustrate:

(1) a. schoenmaker 'shoe maker'
b. ijsverkoper 'ice seller'
c. aardappeleter 'potato eater'
d. jeneverdrinker 'gin drinker'

The aim of this paper is to present arguments for the following analysis of this type of complex word:

(a) Words like *jeneverdrinker* are compounds, i.e. they have the morphological structure $[[jenever]]_N$ $[[drink]ver]_N]_N$, not the structure $[[[jenever]_N[drink]_V]ver]_N$;
(b) The argument interpretation of the left constituents of such compounds is made possible by the fact that the deverbal noun inherits the argument structure of its verbal base.

The notion 'inheritance' is used in relation to the effect of morphological processes on the syntactic valency of their input words. To facilitate further discussions of this notion, I will first make some elementary assumptions about the syntactic valency of verbs.[1]

This syntactic valency of verbs is encoded in their lexical representations. Each verb has zero or more arguments associated with it. For each

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argument, it is indicated which thematic role (θ-role) it bears, e.g. Agent or Theme. We also have to include some syntactic information concerning the syntactic realization of the arguments: it may be external (in which case it occurs in the subject position), direct internal (it then appears as direct object), or indirect internal. In the latter case the argument is realized syntactically as a PP with a specific preposition, or as a case-marked NP with a specific case, e.g. dative. The following examples illustrate these assumptions:

(2)	lopen	'to walk'	V, Agent
	eten	'to eat'	V, Agent, Theme
	zetten	'to put'	V, Agent, Theme, Location$_i$
	geven	'to give'	V, Agent, Theme, Goal$_i$

In these examples, the external arguments are underlined, and the indirect internal arguments bear a subscript *i*. The choice of preposition for the syntactic realization of an indirect argument need not always be specified in the lexical representation. For instance, *zetten* allows for a number of locational prepositions like *in* 'in', *op* 'on', *onder* 'under', etc. The only requirement is that the Location- argument is realized syntactically, witness the ungrammaticality of e.g. **Hij zet de fles* 'He puts the bottle'.

Furthermore, I will assume that the similarities in syntactic valency between a base word and its derivatives must be stated in terms of argument structure, not in terms of syntactic subcategorization (cf. Rappaport 1983) and that the argument structure of a base word is inherited by the derived word, unless the semantics of the word formation process involved gives rise to changes in this argument structure (as is the case for causativization processes which add a new Agent-argument, the causer). For instance, the Dutch nominal deverbal suffix *-ing* has no semantic contribution of its own that affects argument structure, and hence it inherits the argument structure of its base verb, as is evidenced by the parallellisms in the following constructions:

(3) a. Jan straft de leerling
'John punishes the pupil'
b. De bestraffing van de leerling door Jan
'The punishment of the pupil by John'
c. Jans bestraffing van de leerling
'John's punishment of the pupil'

According to Rappaport (1983) the syntactic differences between sentence (3a) and the NP's (3b) and (3c) follow from the different ways in which verbs and nouns identify the θ-roles of their arguments: unlike verbs, nouns

always require explicit identification of the θ-roles of their arguments, for instance by means of a preposition, the only exception being the prenominal POSS-position which is not restricted to one θ-role, since at least both Agent and Theme can appear there. Hence, in (3b) the Theme-role is indicated by the preposition *van*, and the Agent by *door*. In (3c), *Jan* is the Agent, in POSS-position (in Dutch this position is restricted to proper names and pronouns which are [+ human]).

It will be clear then that 'inheritance' is not a theoretical primitive of morphological theory, but a term referring to the (absence of the) effect of a word formation process with respect to the argument structure of its input words.

We are now prepared to take a closer look at the effect of deverbal *-er*-affixation on argument structure, and its consequences for the analysis of complex words like *jeneverdrinker*.

2. SUBJECT NAMES IN DUTCH

Dutch possesses a number of deverbal suffixes for the coining of subject names, i.e. suffixes which bind the external argument of the input verbs: *-er* (with its allomorphs *-aar* and *-der*), *-ator*, *-ateur*, *-ist* and the female suffix *-ster*:

(4)

verb:[2]		*deverbal noun*:	
fiets-en	'cycle'	fiets-er	'cyclist'
teken-en	'draw'	teken-aar	'drawer'
ler-en	'learn'	leer-der	'learner'
organiser-en	'organize'	organis-ator	'organizer'
reparer-en	'repair'	repar-ateur	'repairer'
componer-en	'compose'	compon-ist	'composer'
kok-en	'to cook'	kook-ster	'female cook'

In this paper I will concentrate on *-er*-nouns, but my claims may be generalized to all the (partly rival) suffixes in (4). What is meant with 'binding' here, is that the syntactic realization of one of the arguments, in this case the external one, is blocked. One could also say that the affix is the formal realization of the external argument. Note that we do not call *-er* a suffix that creates *agent* nouns, because we also find *-er*-nouns for verbs whose external argument bears another θ-role, e.g. *lijder* 'sufferer' (from *lijden* 'to suffer') and *daler* 'dropper' (from *dalen* 'to drop'), a term used at the stock exchange, where the external arguments bear the θ-role of Patiens and Theme respectively.[3]

Certain classes of verbs do not allow for *-er*-affixation. One such class

is formed by psychological verbs such as *verbazen* 'to amaze' and *verheugen* 'to please'. This may be explained by the fact that psychological verbs do not possess an underlying external argument (cf. Belletti & Rizzi, to appear). Other verbs without underlying external arguments are NP-raising verbs like *schijnen* 'to seem', *blijken* 'to appear' and *lijken* 'to seem'. Thus, it is correctly predicted that **schijner*, **blijker* and **lijker* are ungrammatical.

A further restriction on *-er*-affixation is that only two types of verbs qualify as correct inputs: verbs with an external argument only, and verbs with an external argument and a direct internal argument. All other types of verb are excluded, e.g.:[4]

(5) a. *Verbs with an indirect internal argument*:

houden van kaas	*houder van kaas
'to like cheese'	'lover of cheese'
vertrouwen op de mens	*vertrouwer op de mens
'to rely on man'	'relier on man'
wonen in Amsterdam	*woner in Amsterdam
'to live in Amsterdam'	'liver in Amsterdam'

b. *Verbs with a direct and an indirect internal argument*:

een boek beloven aan Jan	*belover van een boek aan Jan
'to promise a book to John'	'promiser of a book to John'
een boek op de plank zetten	*zetter van een boek op de plank
'to put a book on the shelf'	'putter of a book on the shelf'

Note that the observed restriction is not a restriction on the inheritance of arguments, but on the word formation process itself, since words like **houder*, **vertrouwer*, **woner*, **belover* en **zetter* are ill-formed anyway, even if we omitted the complements. It is understandable, though, while such restrictions have sometimes been interpreted as restrictions on inheritance (cf. Randall 1982). This is due to the fact that many verbs possess more than one argument structure. For instance, the verb *beginnen* 'to begin' has two subentries: the intransitive *beginnen* from which *beginner* can be derived, and *beginnen* with a sentential complement, for which there is no *-er*-noun: **beginner te schrijven* 'beginner to write'. Similarly, *denken* 'to think' can be used without internal arguments (hence the wellformedness of *denker* 'thinker'), but also with an indirect internal argument (e.g. *denken aan geld* 'to think of money'), in which case there is no deverbal *-er*-noun: **denker aan geld.*

There seem to be cases, though, where *-er*-affixation takes place with other internal arguments than direct ones involved, e.g.:

(6)	reizigers[5] [naar Groningen]	cf.	reizen naar Groningen
	'travellers to Groningen'		'to travel to Groningen'
	lijders [aan pleinvrees]		lijden aan pleinvrees
	'sufferers from agoraphobia'		'to suffer from agoraphobia'
	heerser [over Europa]		heersen over Europa
	'ruler of Europe'		'to rule Europe'

The fact that nouns allow for PP-complements, however, is not a distinguishing property of deverbal *-er*-nouns. For instance, the simplex nouns *trein* 'train' and *koning* 'king' also combine with PP's: *de trein naar Groningen* 'the train to Groningen', *koning over de Nederlanden* 'king of the Netherlands'. That is, there is no reason to invoke inheritance as explanation for the possibility of PP-complementation with *-er*-nouns. Note that nouns like *reiziger*, *lijder* en *heerser* can be derived from the subentries for the verbs *reizen*, *lijden*, *heersen* without internal arguments: these verbs can be used with an external argument only.

This position with respect to *-er*-affixation also implies that the choice of a specific preposition in the PP-complements of *-er*-nouns cannot be assumed to be determined by inheritance (of both the arguments and their specific syntactic form). This is confirmed by the following data.

(7)	a.	woordvoerder naar de ouders	compare:	*woordvoeren naar
		'spokesman to the parents'		'to speak to'
	b.	de gebieder over hen allen		*gebieden over
		'the commander of all of them'		'to command'
	c.	een verrader aan de heilige zaak		*verraden aan
		'a traitor of the holy cause'		'to betray'

In these examples, the underlying verbs do not occur with the specific preposition selected by the deverbal noun. Hence, the choice of preposition must either be determined by semantic factors or analogy with related expressions. For example, the choice of *aan* in (7c) may be related to the expression *verraad plegen aan* (lit.: to commit treason of).

The analysis of deverbal *-er*-affixation given so far implies that direct internal arguments are inherited by the *-er*-noun. This prediction is correct since many *-er*-nouns derived from verbs with an obligatory direct internal argument do not occur without a complement, as is illustrated in (8):

(8)	a.	*-*er* als vormer	/-*er* als vormer van subjectsnamen
		'-*er* as former'	'-*er* as former of subject names'
	b.	*de bedrijvers	/de bedrijvers van het kwaad
		'the doers'	'the doers of harm'

c. *de bereiders /de bereiders van maaltijden
'the preparers' 'the preparers of meals'

As pointed out in section 1, in NP's the Theme-role can also be realized in POSS-position. Hence we also find well formed NP's with deverbal *-er*-nouns of the following kind:

(9) a. zijn bestrijders
'his opponents'
b. mijn Maker
'my Creator'
c. hun beschermer
'their protector'

(*bestrijder*, *maker* and *beschermer* all derive from verbs with an obligatory direct internal argument.) In (9), *zijn*, *mijn*, and *hun* bear the role of Theme with respect to the head noun.

These facts imply that we cannot assume a general rule of argument reduction for deverbal nouns, as has been suggested by Hoeksema (1984) and Mackenzie (1985). However, it is indeed true that the syntactic realization of the argument structure of derived nouns may be blocked, namely due to lexicalization.

The effect of lexicalization on the syntactic realization of argument structure can be illustrated by the Dutch verb *gebruiken* 'to use'. Normally, it is obligatorily transitive, but it may be used without a direct object, with the meaning 'to use drugs'. That is, an argument-variable, the Theme-argument, gets a fixed semantic value, becomes a constant, and hence it is not realized syntactically. The same can be observed for the verb *eten* 'to eat'. When used transitively, it be can be combined with all kinds of objects like shoes or paper. However, when used intransitively, the understood object can only be food. Similarly, when *drinken* 'to drink' is used intransitively, the understood object is always some beverage.

This type of lexicalization, an argument-variable getting a fixed semantic value is also found with deverbal *-er*-nouns. Consider, for instance, the following examples, all derived from verbs with an obligatory direct internal argument:

(10)

verb:		*noun*:	
begunstigen	'to patronize	begunstiger	'financial supporter of societies'
bezetten	'to occupy'	bezetter	'(foreign) occupier of one's country'
dragen	'to bear'	drager	'bearer of dead bodies at funerals'

hervormen	'to reform'	hervormer	'reformer of the Roman-Catholic church'

In all these examples the inherited Theme-argument of the verbal base gets a fixed semantic value, as the paraphrases show, and hence it is not realized syntactically.

In sum, the basic distribution of *-er* can be stated in syntactic terms, without reference to specific θ-roles: it binds the external argument of the verb, and cannot be attached to verbs with indirect internal arguments. Apparent discrepancies in syntactic valency between verbs and their corresponding *-er*-nouns are explained by the intervening factor of lexicalization in the form of semantic fixation of the Theme-argument variable.[6]

3. INHERITANCE AND ARGUMENT LINKING

As shown above, *-er*-nouns derived from obligatorily transitive verbs normally do not occur in isolation. The inherited internal argument must be realized syntactically, or – and this is the main point of this section – as the left constituent of compounds whose right constituent is the *-er*-noun. A number of such compounds (so-called verbal compounds) has already been presented in (1). Some additional examples are those in (11); the *-er*-noun cannot be used in isolation.[7]

(11)	*nemer	initiatiefnemer	nemer van initiatieven
	'taker'	'initiative taker'	'taker of initiatives'
	*verbeteraar	mensenverbeteraar	verbeteraar van mensen
	'improver'	'people improver'	'improver of people'
	*beoefenaar	sportbeoefenaar	beoefenaar van sport
	'practiser'	'sports practiser'	'practiser of sports'
	*bereider	ijsbereider	bereider van ijs
	'producer'	'ice producer'	'producer of ice'

That is, I assume, like Selkirk (1982) does for the analogous verbal compounds of English, that a word like *initiatiefnemer* has the structure of ordinary nominal compounds, i.e. $[[initiatief]_N[nemer]_N]_N$, but with this special property that the inherited thematic role of the right constituent is assigned to the left one. Thus the left constituent is interpreted as an argument. This phenomenon has been called 'argument linking' in Lieber (1983b).

The observation that the inherited argument of deverbal nouns can be realized in two ways, either syntactically or morphologically, also holds for the other suffixes mentioned in (4):

(12)

motorreparateur 'engine repairer'	/ reparateur van motors
congresorganisator 'congress organizer'	/ organisator van congressen
muziekcomponist 'music composer'	/ componist van muziek
garnalenpelster 'fem.shrimp scaler'	/ pelster van garnalen

When an inherited θ-role of the deverbal head of a compound is not linked to the left constituent, this θ-role should of course be linked somewhere else. However, this appears to be impossible, as Selkirk (1982) has shown for English: expressions like *tree eater of pasta* are ill-formed, even if *tree* is interpreted as location. She therefore suggests that argument linking is subject to a locality condition, the First Order Projection Condition (FOPC) which reads as follows:

(13) All non-SUBJ [i.e. internal, G.E.B.] arguments of a lexical category X_i must be satisfied within the first order projection of X_i (Selkirk 1982:37).

In *tree eater of pasta* the first order projection of eater is the N dominating *tree eater*. Therefore, argument linking can only take place here within the compound.

The FOPC also makes correct predictions for analogous constructions in Dutch. In those verbal compounds in which the inherited Theme-role of the underlying verb is not linked to the left constituent, this Theme-role can nevertheless not be linked to a syntactic complement, as shown in (14):

(14) a. *een pentekenaar van rivierlandschappen
a pen drawer of river landscapes
b. *een fabrieksbereider van ijs
an industrial maker of ice

The restriction on *-er*-affixation that it does not apply to verbs with indirect arguments also predicts correct restrictions on possible verbal compounds. For instance, **kaashouder* 'cheese lover' and **Amsterdamwoner* 'inhabitant of Amsterdam' are ill-formed because *houder* and *woner* are. We do find compounds like *maanlander* 'moon-lander' and *Romereiziger* 'Rome-traveller', in which the left constituent receives a locational interpretation. However, this has nothing to do with inheritance of indirect arguments: *lander* and *reiziger* are wellformed nouns, and the locational interpretation

can be seen as an instantiation of the general interpretational scheme for compounds of the form AB: 'a B which bears some relation to A'.

A consequence of the hypothesis that argument linking in compounds is made possible by the inheriting nature of the affix in the head constituent is that we do not expect argument linking to be possible within compounds whose head is deverbal and contains a non-inheriting (opaque) affix. The data in (15) seemingly contradict this prediction: the deverbal suffixes *-erig* and *-erij* are opaque, and yet in the words given in (15) the left constituents are interpreted as Themes:

(15)	a.	[[zoek] erig]	ruziezoekerig	*zoekerig naar ruzie
		'seeking'	'quarrel seeking	seeking for quarrel'
		[[liefhebb] erig]	natuurliefhebberig	*liefhebberig van natuur
		'loving'	'nature loving	nature loving'
	b.	[[drag] erij]	waterdragerij	*dragerij van water
		'carrying'	'water carrying	carrying of water'
		[[jag] erij]	baantjesjagerij	*jagerij van baantjes
		'hunting'	'jobs hunting	hunting for jobs'

However, formations like *ruziezoekerig* can be interpreted as derivations from verbal compounds (e.g. *ruziezoeker* 'quarrel seeker') with argument linking having taken place in these underlying verbal compounds. There is independent evidence for this derivational history of the words in (15):
(i) Certain words in *-erig* such as *bevelhebberig* 'commander-like' can only be assumed to have been derived from a nominal compound, *bevelhebber* (lit.: command haver, commander). *Bevelhebberig* cannot be interpreted as $[[bevel]_N[hebberig]_A]_A$ because the adjective *hebberig* has the idiosyncratic interpretation 'greedy' which we do not find in *bevelhebberig*. Nor can *bevelhebberig* be derived from the complex verb $[[bevel]]_N[hebben]_V]_V$ since this word does not exist in Dutch, and $[NV]_V$ compounds do not form a productive morphological category in Dutch. Therefore, *bevelhebberig* can only be derived from *bevelhebber*, by means of substitution of *-erig* for *-er*. This is supported by the fact that the idiosyncratic interpretation 'commander' of the word *bevelhebber* recurs in *bevelhebberig*.[8]
(ii) A second argument derives from the observation made by Hoeksema (1984) that in compounds with a nominal head adverbs do not occur as left constituents except for compounds in *-er*, *-erig* and *-erij*:

(16)	a.	*snelblussing	'fast extinguishing'
		*hardwerking	'hard working'
	b.	langslaper	'longsleeper'
		valsspeler	'false player'

c.	langslaperig	'long sleeping'	(A)
	langslaperij	'long sleeping'	(N)

The correlation in this respect between complex words in *-er* and those in *-erig* and *-erij* follows from the assumption above that these words in *-erig* and *-erij* are derived from those in *-er*. That is, the grammar of Dutch compounds only has to account for the combinability of deverbal *-er*-nouns with adverbs.

Thus, words like *ruziezoekerig* do not constitute counterexamples to the hypothesis that argument linking in compounds depends on inheritance.

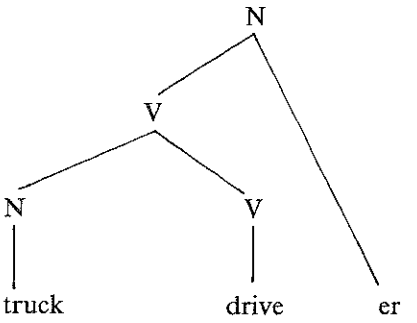
In conclusion, we have seen that Selkirk's hypothesis that verbal compounds in *-er* are ordinary compounds with the structure $[[N][N]]_N$ and with the property that an inherited θ-role of the head is linked to the left constituent, carries over the Dutch verbal compounds of the same type. The inheritance-effect appeared to be crucial in explaining why nouns derived from verbs with a direct internal argument normally only occur with either a syntactic or a morphologial complement.

A second conclusion is that the similarities in valency between verbs and deverbal nouns must be stated at the level of argument structure, not at the level of syntactic subcategorization: the realization of the inherited argument of deverbal nouns differs in a predictable way from the corresponding argument of the underlying verbs: it can be a PP, a possessive (pro)noun in Specifier-position or – a morphological realization – an N as left constituent of a compound whose head is deverbal.

4. ALTERNATIVE THEORIES OF VERBAL COMPOUNDS

Lieber (1983b) presents a first alternative to the theory of verbal compounds defended above. She assumes that nouns do not have argument structure. Therefore, a verbal compound like *truckdriver* in which *truck* functions as Theme with respect to *driver* is assumed to be derived from the complex verb *truckdriver*. That is, the following structure is assigned to *truckdriver*:

(17)



In this structure, argument linking takes place within the subtree dominated by the upper V, in which *drive* and *truck* c-command each other.

There are at least three arguments against this analysis. First, the category of $[NV]_V$-compounds is not productive in English (cf. Selkirk 1982, Botha 1984), nor in Dutch (De Vries 1975:104). Yet, in both languages the class of [N V-*er*]-compounds is very productive. Therefore, it is problematical to assume $[NV]_V$-compounds as bases for [N V-*er*]-compounds. Secondly, Lieber's theory cannot relate argument linking in compounds to the fact that deverbal *-er* nouns may inherit an internal argument from the verbal base. That is, Lieber's theory does not express the fact that *-er*-nouns derived from obligatorily transitive verbs must link the Theme-role to either a morphological or syntactic complement. Thirdly, by not making use of the notion 'inheritance' with respect to argument linking in compounds we cannot account for a parallel phenomenon in Dutch with another nominalizing deverbal affix, the prefix *ge-*. Consider the following cases (the verbs are optionally transitive):

(18)	a.	vreten	aardappelgevreet/gevreet van aardappels
		'to eat excessively'	'excessive eating of potatoes'
	b.	zuipen	jenevergezuip/gezuip van jenever
		'to drink excessively'	'excessive drinking of gin'

Since *ge-* is a prefix, it is impossible to assign a structure to, for instance, *aardappelgevreet* in which *aardappel* and *vreet* form one constituent directly dominated by the same node. Hence we can only account for the alternation in the realization of the Theme *aardappel* by assuming that *gevreet* has inherited the Theme-role of *vreten*.

Language acquisition data may also throw some light on the choice between the two possible structures of verbal compounds in *-er*, [N [V-*er*]] (Selkirk 1982) versus [[N V]-*er*] (Lieber 1983b). Such data are available with respect to English. Clark e.a. (1986) provide evidence that English verbal compounds are acquired in three stages (O = object, our 'Theme'):

(19)			
	Stage 1	*V + N	wash-man, open-man
	Stage 2	*V + O	hug-kid, break-bottle
		*V-ing + O	moving-box, throwing-ball
		*V-er + O	cutter-grass, puller-wagon
	Stage 3	O + V-er	water-drinker, well-builder

(Clark e.a. 1986:21)

These three stages are very well interpretable if we assign verbal compounds in *-er* the structure [N [V *-er*]]. At stage 1 only the most simple compounds are used, e.g. *wash-man* = *washer*. At stage 2 we find e.g. *cutter-grass* 'grass cutter', that is, a combination of a deverbal noun and a noun, exactly as was defended in the preceding section. The only deviation is that the object is located after the deverbal noun, in accordance with the following acquisition strategy (Clark e.a. 1986:22):

(20) All Verb + Object constructions have canonical predicate order

For English, this canonical predicate order is 'Verb before Object', hence *cutter-grass* instead of *grass-cutter*.

On the other hand, the position of *-er* in between V and O at stage 2 and hence the possibility of formations like *cutter-grass* and *puller-wagon* is excluded by principle in a theory that assumes [NV]-verbs as the bases of verbal compounds in *-er*. Such a theory predicts that only [V N *-er*] compounds are possible for stage 2, given strategy (20). As a matter of fact, this type of compound occurs in the speech of four- and five years old English speaking children (Clark e.a. 1986:25), for example *dry-hairer* 'hair dryer' and *sit-chairer* 'chair-sitter'. In the Selkirkian theory of verbal compounds such formations can be accounted by assuming that children of this age either consider $[VN]_V$-compounds as a productive morphological category (which thus function as inputs to *-er*-affixation) or attach *-er* to VP's.

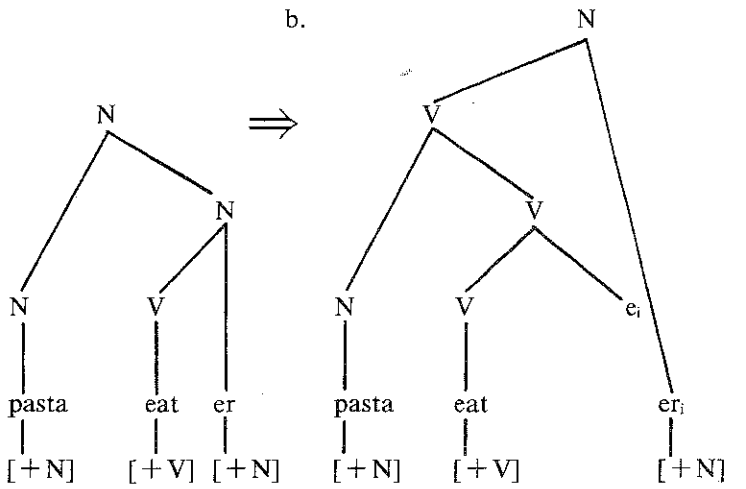
In sum, the available language acquisition data only bear negatively on Lieber's theory of verbal compounds, because it principally excludes compounds of the *cutter-grass*-type for that stage of language acquisition at which strategy (20) holds.[9]

A second alternative theory of verbal compounds is outlined in Pesetsky (1985). Pesetsky's analysis is similar to ours in that he assumes the structure [N [V *-er*]] for the words under discussion here. Instead of making use of the notion 'inheritance' he postulates a rule of Affix Movement that derives the Logical Form of verbal compounds from their S-structure:

(21) *Affix Movement*
Adjoin a category C to some node that dominate C
(Pesetsky 1985:216)

For example, the Logical Form of *pasta eater*, in which *pasta* functions as Theme with respect to *eater*, is derived as follows:

(22) a. b.

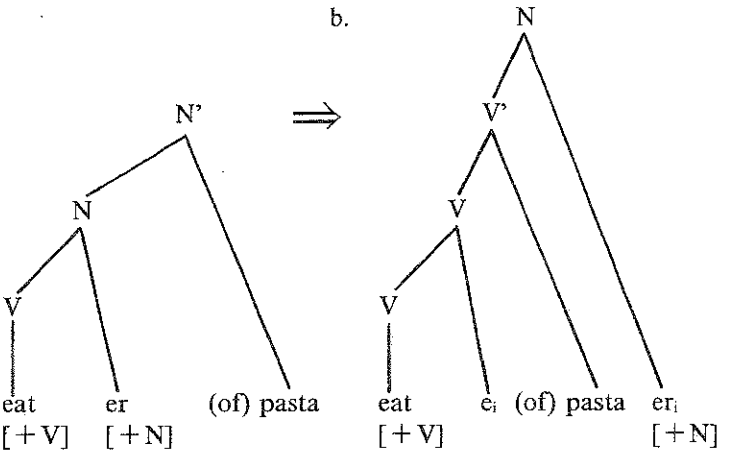


The relabeling of the nodes in (22b) is effected by the well-known percolation conventions of Lieber (1983b), and the assumption that traces do not belong to a specific syntactic category. In (22b), the Logical Form of *pasta eater*, *pasta* belongs to the projection of V, and thus receives the Theme-role from *eat*.

An advantage of this analysis is that it directly expresses that, from a semantic point of view, *-er* has scope over [*pasta eat*], whereas in a theory that makes use of the notion 'inheritance', this wide scope for *-er* must be specified as concomitant with inheritance.

There are some serious problems for this theory of Affix Movement that I will point out here. First, we must be able to derive the Logical Form of *eater of pasta* in the same way as that of *pasta eater*, with *-er* having scope over *eat pasta*. Pesetsky therefore concludes (p.239) that Affix Movement should also be allowed to apply to phrases, for instance:

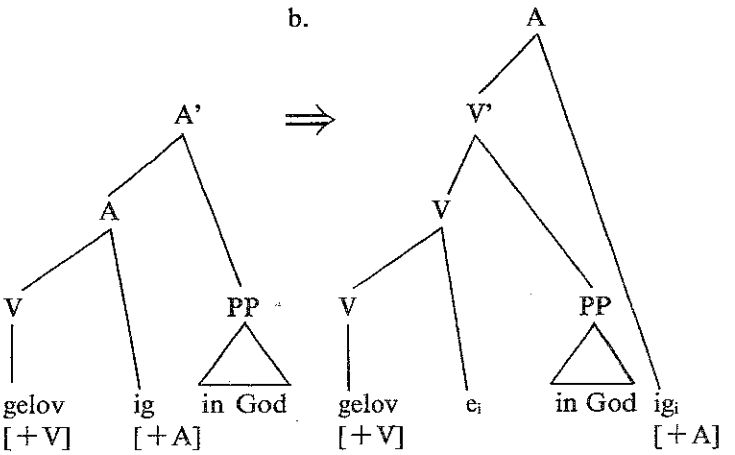
(23) a. b.



In (23b) *pasta* will be θ-marked by *eat* because *pasta* now belongs to the V-projection. Note, however, that Affix Movement now violates the 'String Vacuousness Restriction' (Pesetsky 1985:227) which says that Affix Movement may not change the linear order of morphemes. This restriction appeared to be necessary in order to avoid the derivation of wrong Logical Forms for certain types of complex words that could otherwise be derived. Violation of the String Vacousness Restriction would even be required at the lexical level when Dutch verbal compounds like *aardappelgevreet* and *jenevergezuip* (cf. 18) are taken into account: the prefix *ge-* here has scope over [*aardappel vreet*] and [*jenever zuip*] respectively.[10]

Another problem for the theory of Affix Movement is that this rule is far too general. It would also apply to structures with opaque, non-inheriting suffixes like the Dutch deverbal adjectival suffixes *-ig* and *-erig*:

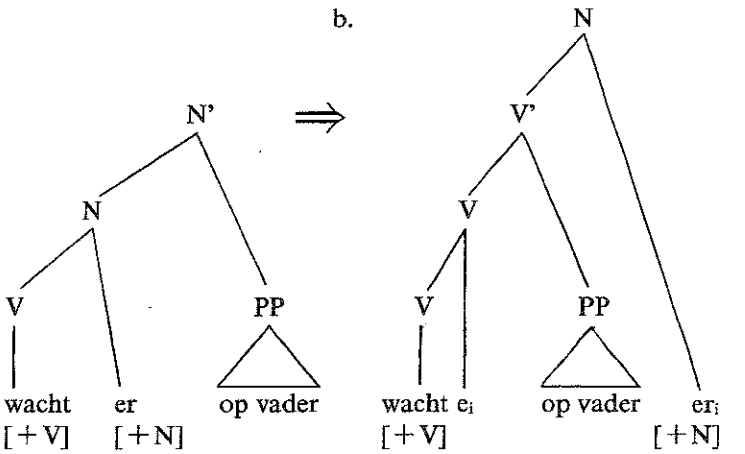
(24) a. b.



Dutch adjectives allow for PP-complements. Thus, the phrase *gelovig in God* could receive the wrong Logical Form in which *God* is the Theme of *geloven*.[11]

Thirdly, Affix Movement is also too powerful in that it would violate the restriction on *-er*-affixation discussed in section 2. For instance, although the verb *wachten* 'to wait for' is subcategorized for an obligatory prepositional object with the preposition *op*, the phrase **wachter op vader* 'waiter for father' is ill-formed. Yet, this phrase will not be excluded in Pesetsky's theory, because in this theory the level at which subcategorizational restrictions must be satisfied is crucially that of Logical Form:

(25) a. b.



In the logical form (25b) the requirement that *wachten* occurs with an *op*-PP as complement is met, and hence *wachter op vader* will be qualified as a well-formed expression.

Therefore, I think it is justified to conclude that Pesetsky's theory of Affix Movement is inadequate with respect to verbal compounds.

5. CONCLUSIONS

Verbal compounds in *-er*, both in Dutch and in English, should be analysed as ordinary compounds whose heads are deverbal *-er*-nouns. The possibility of thematic interpretation (argument linking) for the left constituents of such compounds is explained by the inheriting nature of *-er*: it binds the external argument of its verbal base, and inherits the direct internal argument. This theory appeared to be superior to both Lieber's theory of argument linking and Pesetsky's theory of Affix Movement.

A more general conclusion is that morphology and syntax can be

conceived of as relatively autonomous levels of grammatical analysis. Their main point of interface is the argument structure of words.

NOTES

1. These assumptions derive from Williams (1981a) and Levin & Rappaport (1986).
2. *-en* is the infinitive ending; the infinitive is the citation form of Dutch verbs.
3. A similar 'syntactic' characterization of the Dutch deverbal suffix *-er* can be found in Hoekstra (1984:261) and for the English equivalent in Burzio (1981) and Keyser & Roeper (1984:395). My analysis of Dutch *-er* in Booij (1986) differs from e.g. that of Keyser & Roeper in that I do not assume a separate θ-role of Instrument as a possible role for the subject-position. Instead, the instrumental interpretation of words like *cutter* and *trimmer* is derived from the (personal) agent-interpretation via a conceptual extension scheme Personal Agent >Impersonal Agent> Instrument. Note that in Dutch we cannot say e.g. *Het mes snijdt het brood* 'The knife cuts the bread'. That is, the subject of transitive verbs never bears an Instrument-role. As pointed out in Booij (1986), a number of Dutch verbs which have been analyzed as so-called unaccusative verbs in Hoekstra (1984), i.e. as having no underlying external argument, do admit *-er*-suffixation, contrary to what we expect, e.g. *daler* 'dropper', *stijger* 'riser', *breker* 'breaker' (= wave that breaks), *beginner* 'beginner' etc. Thus, these *-er*-nouns constitute a class of potential counterexamples to the 'unaccusative hypothesis'.
4. Verbs with a sentential complement do not allow for *-er*-affixation:

beginnen [te schrijven]	*beginner [te schrijven]
'begin to write'	'beginner to write'
beloven [dat hij komt]	*belover [dat hij komt]
'promise that he will come'	'promiser that he will come'

Therefore, I assume that sentential complements are not direct arguments. Koch (1976) and Roeper (1987) make similar observations with respect to German and English deverbal *-er* respectively. There may be other, more semantic restrictions as well. For instance, Roeper (1987) argues for the restriction that the "properly governed object must be an affected object theme". This may explain the difference between *an illustrator of books* and **an illustrator of problems*. Cf. also Koch (1976) and Fanselow (1985).
5. In *reiziger*, *-iger* is an idiosyncratic allomorph of *-er*.
6. This conclusion should not be taken to imply that no word formation process can refer to the thematic roles of arguments. This is a matter in which much more research is needed. Note, in this connection, that Roeper (1987) qualifies English deverbal *-er* as an affix with the thematic grid Agent, Theme. This grid has to match that of the base verb. Thus, Roeper makes use of a thematic restriction on *-er*-affixation. If direct internal arguments always bear the θ-role of Theme, there is no empirical difference between the two theories with respect to the class of well-formed *-er*-nouns. However, it is important to realize that this restriction is not necessarily of a thematic nature: it can also be stated in syntactic terms, as argued above.
7. There is, however, one asymmetry effect of the difference between the morphological and the syntactic realization of the inherited argument. For instance, in *een draaier van schroeven* 'a driver of screws' the *-er*-noun can only be interpreted as Agent, not as Instrument, whereas in the case of *schroevedraaier* 'screw driver' there are two possible interpretations, agent or instrument (the second is the usual one). This exclusion of the instrumental

interpretation for the *-er*-noun with Theme-complement is systematic. The observation can also be found in Roeper (1987). Probably, this has to do with the fact that lexicalization of nouns (in this case the instrumental interpretation of nouns) may cause loss of argument structure, just like action nominals when they lexicalize into result nouns lose argument structure. This explanation presupposes that e.g. *schroevedraaier* in its instrumental interpretation is a lexicalization of the whole compound, not a combination of *schroeve* with the lexicalized *draaier,* since in the compound, *schroeve* is still interpreted as Theme. This assumption is correct, since *draaier* as such does not exist with an instrumental interpretation.

8. Cf. van Marle (1985) for a more extended analysis of this type of word formation, and arguments for this derivational interpretation of formations like *bevelhebberig*.

9. Clark e.a. (1986:25ff.) make a mistake, however, by suggesting that Selkirk's analysis presupposes a phrasal source for verbal compounds. This misrepresentation of the theory implies that the objections raised by Clark e.a. against Selkirk's theory are irrelevant because they argue against a phrasal source for such compounds.

10. This inconsistency with respect to the use of the String Vacuousness Restriction has independently been noted by Hoeksema (1987), who points out a number of problems for Pesetsky's theory.

11. A possible, but ad hoc solution for this problem is to make the application of Affix Movement dependent on specific affixes.